ES. EXECUTIVE SUMMARY

ES.1 INTRODUCTION

ES.1.1 Why is this report written?

In November 2004, voters in the Denver area Regional Transportation District (RTD) approved the FasTracks initiative through a sales tax increase, to be used to expand public transit services in the metropolitan Denver area over a 12-year period. The *FasTracks Plan* (RTD 2004) is a comprehensive program to construct and operate new rail lines and improve elements of bus rapid transit (BRT), bus service and park-n-Rides throughout the region.

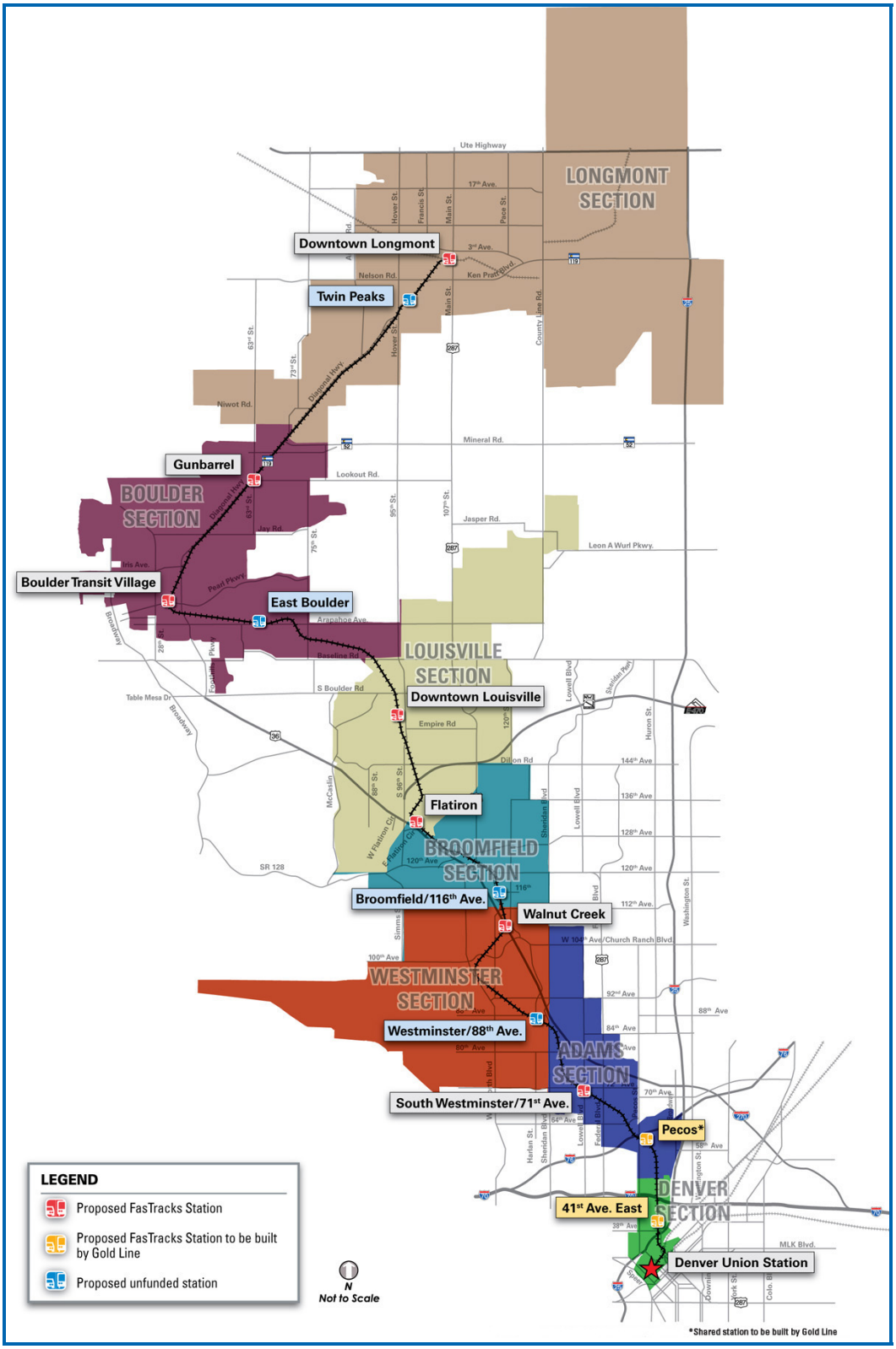
As part of FasTracks, RTD has initiated the Northwest Rail Corridor Environmental Evaluation (NWR Corridor EE) to identify and evaluate impacts of implementing a fixed-guideway, commuter rail transit service between Denver, Boulder and Longmont, Colorado. The project will be phased; the first phase, from Denver Union Station (DUS) to the South Westminster/71^{s} Avenue Station (approximately up to Bradburn Boulevard) would use Electric Multiple Unit (EMU) technology. Phase 2 would use Diesel Multiple Unit (DMU) technology from DUS to Longmont and would share tracks used by the EMU vehicles in the Phase 1 segment between DUS and the South Westminster/71st Avenue Station. The United States Army Corps of Engineers (USACE) is the lead federal agency for this project, rather than the Federal Transit Administration (FTA), because this project will not be seeking federal funds. However, the project will impact waters of the United States (US) consequently requiring wetland permits per Section 404 of the Clean Water Act. The USACE issued a Section 404 Nationwide Permit for Phase 1 on 1 April 2010. Phase 2 is expected to require an Individual Permit as part of the Clean Water Act. Comments received and their responses on the Draft EE are provided in Appendix G: Response to Comments of this Final EE.

RTD developed this document, following National Environmental Policy Act of 1969 (NEPA) processes and procedures, for use by the USACE. The USACE will utilize information contained in this document to determine compliance with NEPA, and the Section 404 (b)(1) guidelines for subsequent Section 404 permit applications submitted by RTD. See Appendix A, Section 404 (b)(1) Showing, for more details on Section 404 (b)(1) guidelines.

ES.1.2 Where is this project?

The project study area (Figure ES-1) includes portions of several communities in the northwest Denver metropolitan area that extend from DUS to Longmont, including the City of Denver, the City of Westminster, the City and County of Broomfield, the City of Louisville, the City of Boulder, the City of Longmont and unincorporated areas of Adams, Boulder and Jefferson Counties.

FIGURE ES-1. NORTHWEST RAIL CORRIDOR PROJECT STUDY AREA AND SECTIONS



Source: NWR Corridor Project Team, 2010.

More specifically, for analysis purposes, the NWR Corridor EE includes two different study areas that are discussed separately in this evaluation:

Project Study Area – Overall area within a specific boundary in which the potential of a project's indirect impacts will be assessed. This area is typically equal to the area described in the affected environment section for each environmental resource.

Resource Analysis Area – An area generally defined by direct impacts to various environmental resources, such as physical acquisition of property and impacts to wetlands. The direct impact area is determined by comparing the construction limits of the project to the physical location of the environmental resources. The construction limits have been defined through engineering design and include permanent and temporary construction features, such as construction access and staging areas.

ES.1.3 What is the organization of this EE?

This EE is organized as follows:

Executive Summary – Provides a summary of the document, including a project description, Purpose and Need, anticipated impacts, and recommended mitigation measures.

Chapter 1: Purpose and Need – Presents a discussion of the Purpose of the project, and the Need for improvements.

Chapter 2: Alternatives Considered – Describes the alternatives screening process and results used to define the Preferred Alternative for the NWR Corridor Project study area.

Chapter 3: Affected Environment and Environmental Consequences – Describes the existing social and natural environmental conditions in the project study area and describes the anticipated impacts associated with the No Action and Preferred Alternative. Proposed mitigation measures are identified. These mitigation measures will be finalized during the development of the final NWR EE. This Final EE will be prepared to assist in obtaining a Nationwide Permit for Phase 1 and eventually an Individual Permit for the remainder of this project (as may be required under the Clean Water Act and in compliance with NEPA).

Chapter 4: Transportation Systems – Discusses the existing transportation system and the anticipated benefits and impacts that would result from implementation of the No Action and Preferred Alternative.

Chapter 5: Public Involvement Program – Describes the public involvement program, including coordination with the NWR Governments Team (NWR GT) and subcommittees, state and federal resource and regulatory agencies, and the general public for selecting the Preferred Alternative.

Chapter 6: List of Preparers

Chapter 7: References – Lists the sources for all references shown in this document. A list of acronyms is provided in a section following the Table of Contents.

Appendix A – 404(b)(1) Showing – The purpose of this document is to summarize the information necessary to meet the requirements of Section 404 mandates. Information in this appendix is extracted from the NWR Corridor EE and associated technical memoranda. Content includes the Purpose and Need, alternatives considered, and impact analysis and mitigation measures associated with the Preferred Alternative for resources under USACE jurisdiction.

ES.1.4 How will this EE inform decision making?

Comments received on the Draft EE were considered as input into the development of this Final EE that was submitted to the USACE, the lead agency. This Final NWR Corridor EE was adopted by the RTD Board of Directors in May 2010.

ES.2 PURPOSE AND NEED FOR ACTION

ES.2.1 What is the purpose of this project?

The purpose of the NWR Corridor Project is to implement fixed guideway, commuter rail, mass transit service between Denver, Boulder and Longmont.

ES.2.2 Why do we need this project?

Need 1: Improve mobility – Mobility improvements are needed to provide alternatives to congested single occupant vehicle (SOV) travel for project study area residents, employees, and visitors.

Per the *2035 Metro Vision Regional Transportation Plan (MVRTP)* (DRCOG 2007):

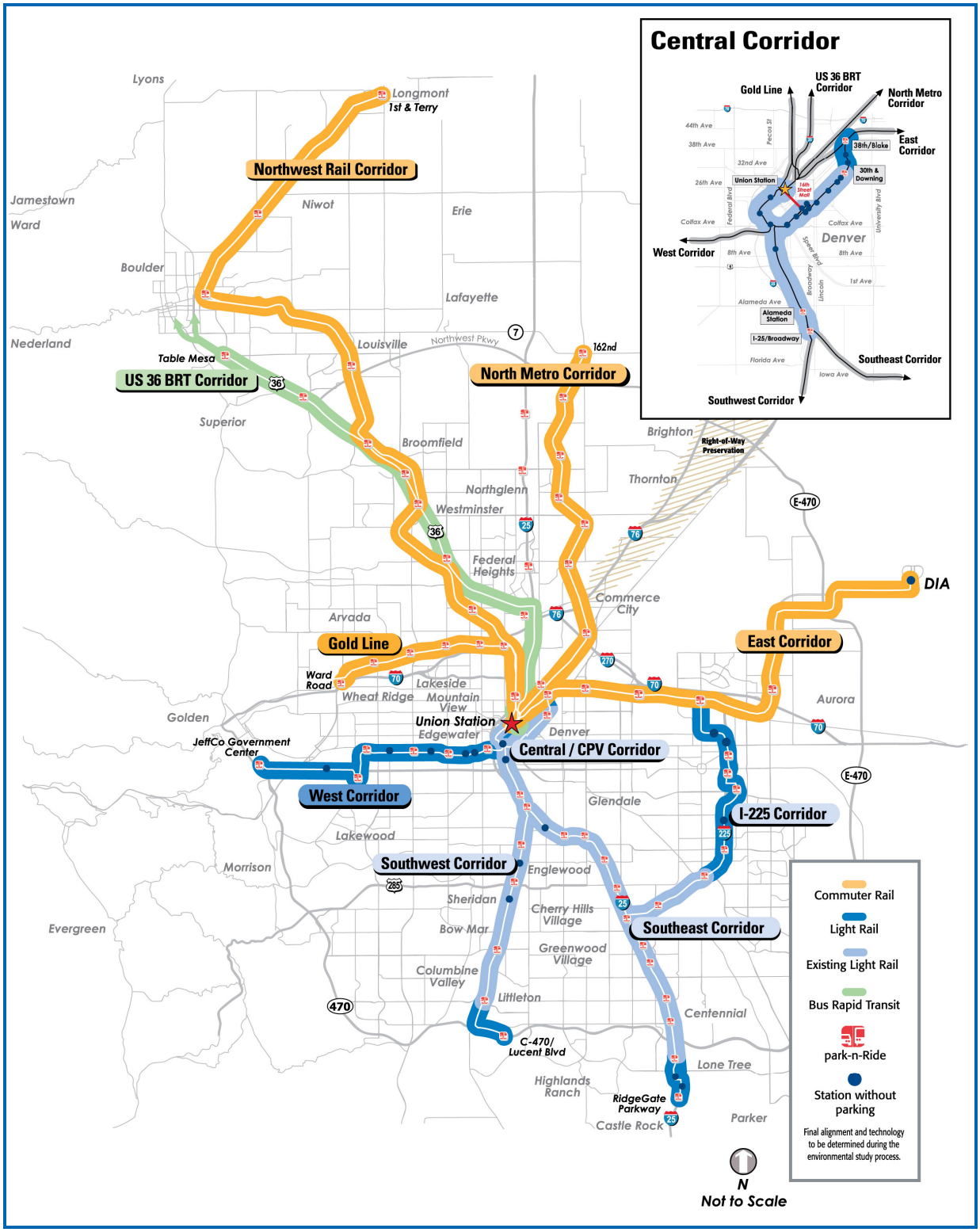
- By 2035, population in the project study area is forecast to increase by 43 percent and employment is forecast to increase by 58 percent.

- Programmed roadway improvements are not expected to keep pace with projected demand, as: (1) regional personal trips will increase by 59 percent, (2) regional vehicle miles traveled (VMT) will increase by 72 percent, (3) regional roadway lane miles with more than three hours per day of severe congestion will increase by 203 percent, and (4) regional vehicles hours of delay will increase by 353 percent.

Need 2: Provide consistent and reliable transit travel times – Unreliable automobile travel times are anticipated both from day to day and throughout the day (peak versus off-peak) in 2035. Travelers will also experience unexpected delays due to accidents or inclement weather. An option such as rail transit would provide more consistent, reliable, safe, and congestion-free travel on its own dedicated and protected right-of-way (ROW).

Need 3: Enhance regional connectivity – The Denver metropolitan region currently has gaps in multi-modal regional transit connectivity. FasTracks is primarily a plan to fill in major gaps with fixed guideway transit (rail) and bus rapid transit. The NWR Corridor would link with seven other RTD rail corridors at DUS (see Figure ES-2).

FIGURE ES-2. FASTRACKS PROGRAM



Source: RTD, 2009.

Need 4: Provide an affordable transit investment – Any transit improvements must be affordable within the FasTracks budget. In addition, the associated operating costs must be realistic and reasonable for RTD to assume the service. In 2004, the *FasTracks Plan* allocated $565.1 million (in year of expenditure dollars) for NWR Corridor capital costs out of the overall $4.7 billion system-wide budget. The 2009 RTD Annual Program forecasts the NWR Corridor Project capital costs at $641.1 million (in 2008 dollars).

Need 5: Reinforce local and regional transportation and land use plans – The NWR Corridor is part of the 122-mile system of new rail transit facilities proposed within the regional FasTracks Program. To assess potential local community acceptance of the NWR Corridor Project, regional and local plans were reviewed. Local plans for communities along the proposed rail alignments were found to be in support of commuter rail serving their jurisdiction. Plans found to be in support of the NWR Corridor Project include:

- *FasTracks Plan* (RTD 2004)*;*
- *2035 MVRTP* (DRCOG 2007)*;*
- *Adams County Comprehensive Plan, 2004;*
- *Adams County Transportation Plan, 1996;*
- *Adams County Transit Oriented Development and Rail Station Area Planning Guidelines, 2007;*
- *Adams County Clear Creek Valley Transit Oriented Development Plan, 2009;*
- *Westminster Comprehensive Plan, 2004;*
- *Original Broomfield Neighborhood Plan, 2008;*
- *City and County of Broomfield Comprehensive Plan, 2005;*
- *City of Broomfield Strategic Plan, 1998;*
- *The Highway 42 Revitalization Area Comprehensive Plan, 2003;*
- *Downtown Louisville Framework Plan, 1999;*
- *Boulder Transit Village Area Plan, 2007;*
- *City of Boulder Transportation Master Plan, 2003;*
- *Boulder County Comprehensive Plan, 1978;*
- *Gunbarrel Community Center Plan, 2004;*
- *Longmont Multi-Modal Transportation Plan, 2005; and*
- *Longmont/RTD Station and Transit Oriented Development (TOD) Analysis, 2005.*

ES.3 PREVIOUS PLANNING STUDIES

Previous studies recommended the implementation of rail transit in the NWR Corridor. The NWR Corridor EE uses those conclusions as the starting point for further evaluation, carries forward the outcomes of those previous rail studies as assumptions, and updates and builds upon the data collected (consistent with FHWA/FTA guidance, *Linking the Transportation Planning and NEPA Processes [FTA and FHWA 2005]*).

The studies that have analyzed transit improvements for portions of the NWR Corridor since 2000 are summarized in Table ES-1.

TABLE ES-1. PREVIOUS TRANSPORTATION STUDIES

Date Completed	Title (Agency)	Summary
2001	*US 36 Major Investment Study* (RTD)	Recommended commuter rail service in US 36 Corridor along the BNSF Railway Company alignment and highway improvements along US 36.
2004	*FasTracks Plan* (RTD)	Regional rail and bus expansion initiative adopted in December 2004 that included commuter rail, specifically DMU, along the BNSF Railway Company alignment.
2005	*Longmont Diagonal Rail Feasibility Study* (RTD)	Determined that a commuter rail transit extension from Boulder to Longmont was feasible.
2006	*Longmont Diagonal Rail Environmental Evaluation* (RTD)	Environmental Evaluation of commuter rail transit improvements along the BNSF Railway Company alignment from Boulder to Longmont.
2007	*US 36 EIS/BE (URS)**	DEIS and BE for transit and roadway improvements in US 36 Corridor between Denver and Boulder. Recommended commuter rail along the BNSF Railway Company alignment and highway improvements along US 36. The US 36 Final EIS was distributed to the public on October 30, 2009 and a ROD was signed by FHWA and FTA in December 2009.
2009	*Commuter Rail Maintenance Facility Supplemental Environmental Assessment to FasTracks Commuter Rail Corridors* (RTD)	Supplemental Environmental Assessment (SEA) for a commuter rail maintenance facility and lead track from DUS to Pecos Street. This document is a supplement to the Gold Line Final EIS that is described below. Recommended a track alignment from DUS to Pecos Street along the BNSF Railway Company alignment and a commuter rail maintenance facility at Fox North site (north of 48th Avenue and Fox Street in the City and County of Denver).
2009	*Gold Line Final EIS* (RTD)	Final EIS and BE for transit improvements primarily along the Union Pacific Railroad Company and BNSF Railway Company alignments from DUS to Ward Road in Wheat Ridge, Colorado. The Gold Line ROD was signed on November 2, 2009.

Source: NWR Corridor Project Team, 2009.

Notes:

*The early stages of US 36 DEIS/BE were a joint effort between CDOT and RTD that analyzed rail and highway improvements. In 2006, FHWA and FTA decided that the rail and highway elements of the project had independent utility and should proceed separately. The resulting US 36 DEIS/BE concluded in 2007 and only included highway improvements.

BE = Basic Engineering
CDOT = Colorado Department of Transportation
DEIS = Draft Environmental Impact Statement
DMU = diesel multiple unit
CRMF SEA = Commuter Rail Maintenance Facility Supplemental Environmental Assessment
DEIS = Draft Environmental Impact Statement
DMU = diesel multiple unit
DUS = Denver Union Station
Final EIS = Final Environmental Impact Statement
FHWA = Federal Highway Administration
DMU = Federal Transit Administration
ROD = Record of Decision
RTD = Regional Transportation District
US 36 = United States Highway 36

ES.4 ALTERNATIVES CONSIDERED

ES.4.1 What alignment alternatives were evaluated?

The NWR Corridor EE evaluated a No Action Alternative and seven Build Alternatives. Table ES-2 and Figure ES-3 through ES-5 present the reasonable range of alternatives considered during the NWR Corridor EE. Under the No Action Alternative, no new rail transit projects would be constructed within the project study area for the NWR Corridor Project. The No Action Alternative provides a basis for comparison to the build alternatives. See Section ES-4.6 for more details.

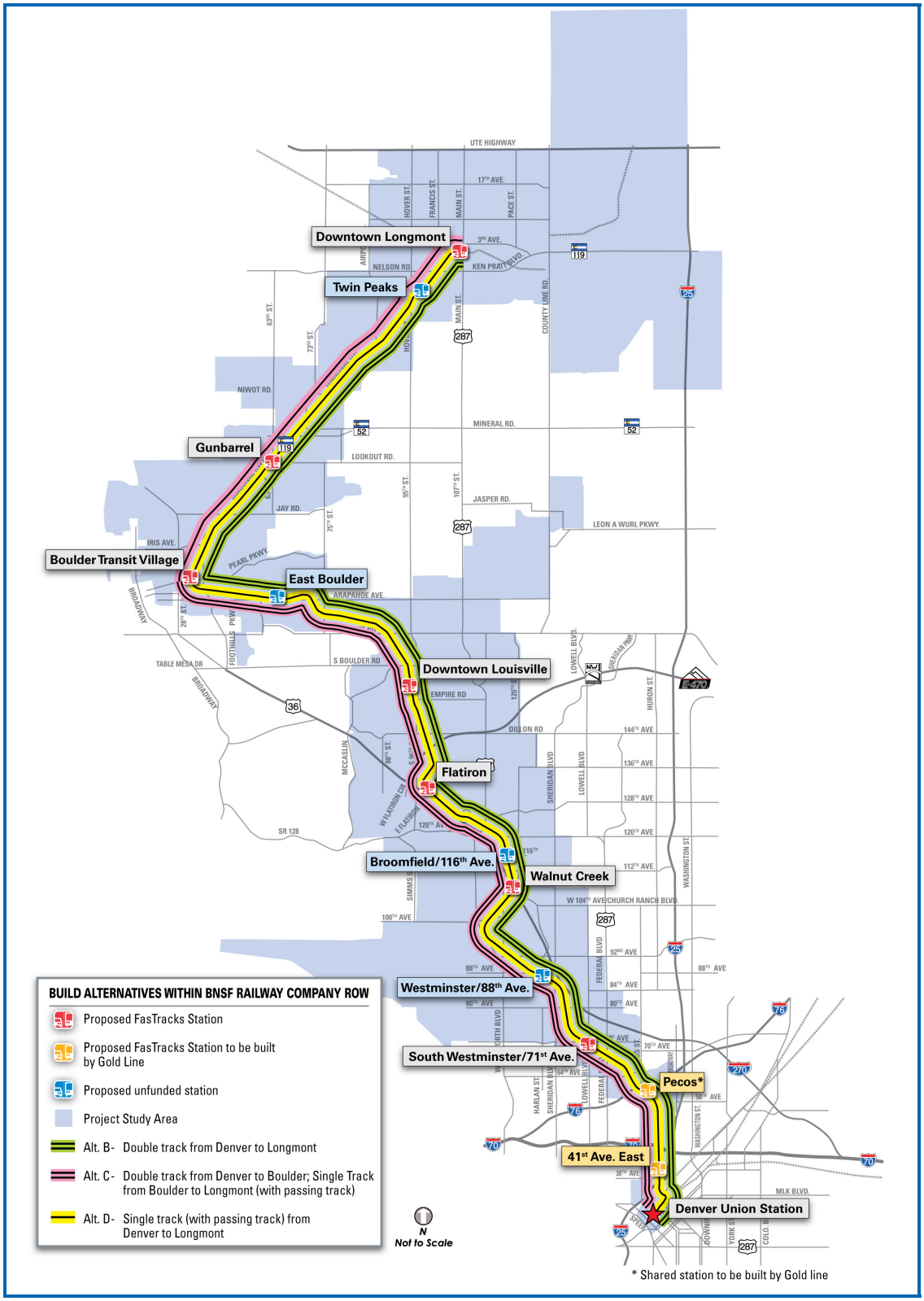
Early on in the NWR EE process, conceptual alignment alternatives were evaluated. The alternatives analysis considered alignments that would stay within the BNSF Railway Company ROW, and others that were outside of the railroad ROW. Alternative alignments outside of the BNSF Railway Company ROW considered building the project along the existing proximate highways (US 36 and SH 119) and roadways or building the project adjacent to, but not within, the BNSF Railway Company ROW. All alternatives located outside of the BNSF Railway Company ROW that were evaluated were eliminated during Level 1 screening because they did not meet the project's Purpose and Need and were not practicable, due to the requirement for additional property acquisition that would result in impacts to a large number of private properties and impacts to sensitive environmental resources.

TABLE ES-2. COMPLETE RANGE OF CONCEPTUAL ALTERNATIVES

No Action Alternative
Alternative A - No Action Alternative
Within BNSF Railway Company Right-of-Way
Alternative B – Double Track from Denver to Longmont
Alternative C – Double Track from Denver to Boulder; Single Track (with passing track) from Boulder to Longmont
Alternative D – Single Track (with passing track) from Denver to Longmont
Outside BNSF Railway Company Right-of-Way (Single Track with Passing Track)
Alternative E – Highway Corridor (US 36/SH 119)
Alternative F – BNSF Railway Company Alignment Adjacent to the East
Alternative G – BNSF Railway Company Alignment Adjacent to the West
Alternative H – BNSF Railway Company Alignment Adjacent East/West Combination

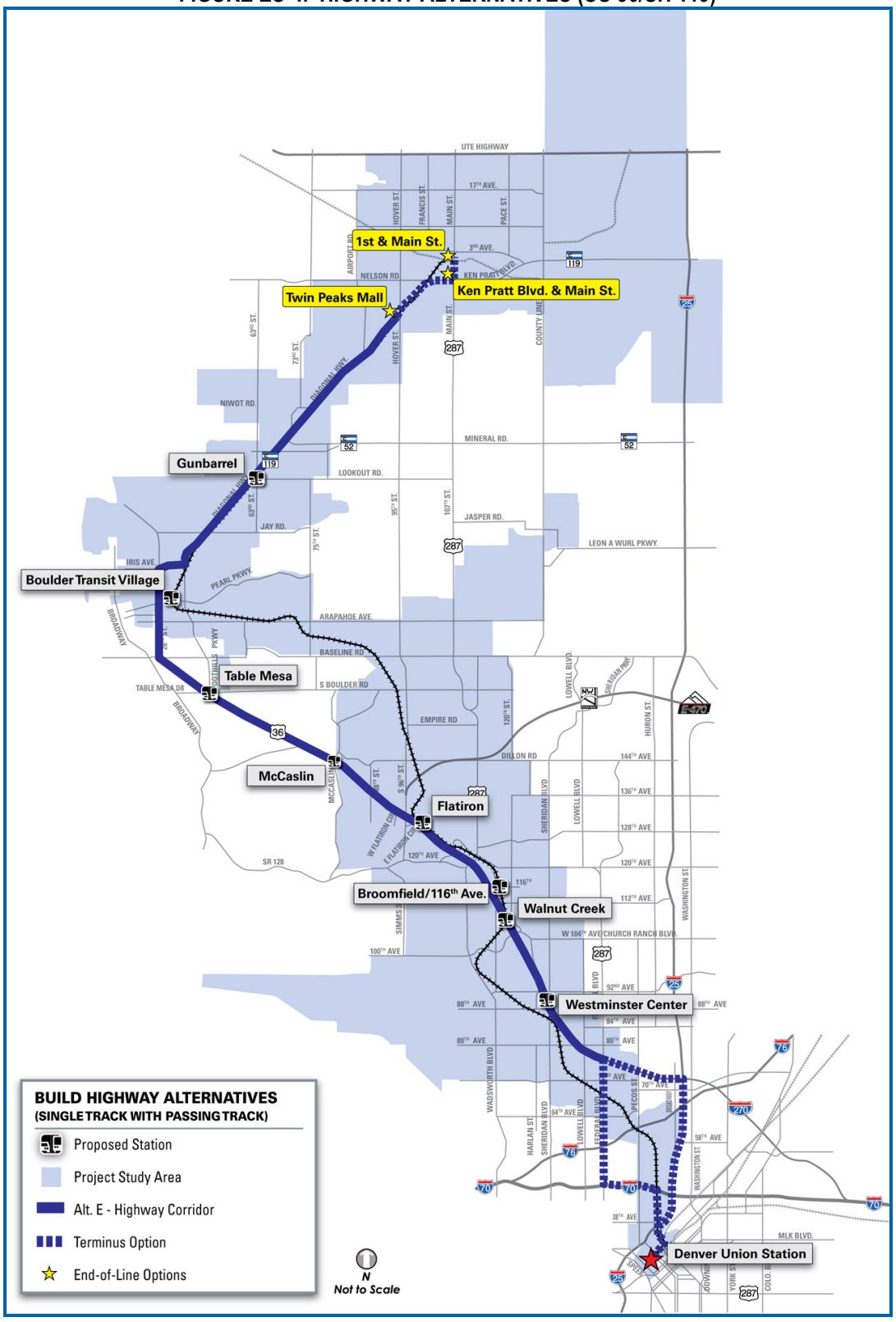
Source: NWR Corridor Project Team, 2008.

FIGURE ES-3. ALTERNATIVES INSIDE BNSF RAILWAY COMPANY RIGHT-OF-WAY



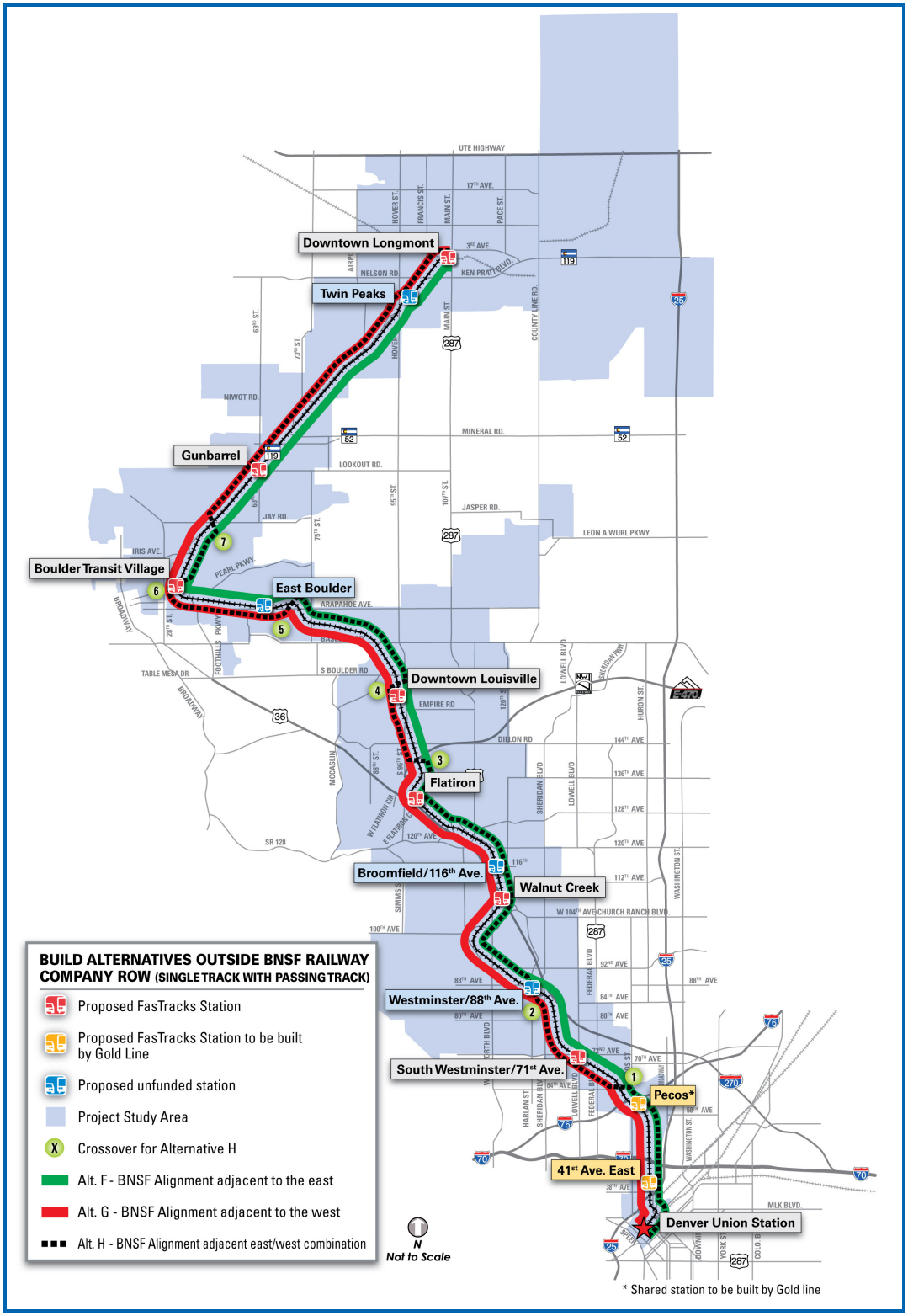
Source: NWR Corridor Project Team, 2010.

FIGURE ES-4. HIGHWAY ALTERNATIVES (US 36/SH 119)



Source: NWR Corridor Project Team, 2007.

FIGURE ES-5. ALTERNATIVES OUTSIDE BNSF RAILWAY COMPANY RIGHT-OF-WAY



Source: NWR Corridor Project Team, 2010.

ES.4.2 How were alternatives evaluated?

The alternatives underwent three levels of screening including: Level 1 – Conceptual Alternative Screening, Level 2 – Preferred Alternative Refinement, and Level 3 – Detailed Alternative Analysis. These are described in more detail below.

Level 1 – The Conceptual Alternative Screening examined a broad range of alternatives. This screening focused on meeting the Purpose and Need statement, avoiding unmitigable environmental impacts, and practicability. An alternative is practicable if it is capable of being implemented after taking into consideration cost, existing technology, and logistics. The result of this screening was the identification of a Preferred Alternative. Since the implementation of a rail transit alternative is a major action, it is important to identify how the Preferred Alternative performs compared to the No Action Alternative within the project study area for the NWR Corridor. All alternatives located outside of the BNSF Railway Company ROW that were evaluated were eliminated during Level 1 screening because they did not meet the project's Purpose and Need.

Level 2 – The Preferred Alternative Refinement focused on design modifications, a re-evaluation of vehicle technologies, development of station architectural styles, and identification of corridor fencing materials. Following the identification of a Preferred Alternative in the Level 1 – Conceptual Alternative Screening, the NWR Corridor Project Team conducted a number of refinements to avoid and/or minimize impacts to environmental resources and to select a preferred vehicle technology.

Level 3 – The Detailed Alternative Analysis subjected the Preferred Alternative to a detailed examination of capital costs, ridership, travel time, environmental impacts, and public and agency support. The Preferred Alternative was also compared with a No Action Alternative (comprised of existing and committed transportation improvements in the corridor). This level of analysis was both qualitative and quantitative and focused on the identification of the Least Environmentally Damaging Practicable Alternative (LEDPA). The LEDPA as defined in 40 CFR Part 230.10(a), is "*the alternative with the least impacts to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences*." The identification of the LEDPA is important to meet the requirements of the USACE, the lead federal agency involved in the project as well as the overall intent of NEPA. The NWR Corridor EE document summarizes this evaluation and presents the results of the Level 3 – Detailed Alternative Analysis.

ES.4.3 What criteria were used to evaluate the alternatives?

The criteria used to evaluate the alternatives for each screening level are presented in Table ES-3.

TABLE ES-3. NWR CORRIDOR EE SCREENING EVALUATION CRITERIA

Level 1 – Conceptual Alternative Screening	Level 2 – Preferred Alternative Refinement	Level 3 – Detailed Alternative Analysis
Purpose and Need Examination of environmental impacts including: • Social Impacts • Environmental Justice • Land Use • Economic Considerations • Land Acquisition • Cultural/Historic Resources • Visual • Park Land/Open Space • Air Quality and Energy • Noise and Vibration • Biological Resources • Water Quality/Floodplains • Wetlands • Hazardous Materials • Public Safety and Security • Utilities • Transportation	**Purpose and Need** Potential for avoidance and/or minimization of resource impacts including: • Reducing Station Platform Size • Eliminating Bypass Tracks at Stations • Modifying Station Concept Plans • Modifying the Rail Track Alignment to avoid disturbing property, wetlands, and "drainages" along the entire length of the corridor. Technology Evaluation based on: • Cost effectiveness • Environmental Impacts • Noise and Vibration • Air Quality • Expandability • Alternative fuel options • Maintenance • Community Input Other: • Constructability Evaluation of: • Fencing type • Station architectural style	**Purpose and Need** • Capital cost • Ridership • Travel time • Environmental impacts • Public and agency support

Source: NWR Corridor Project Team, 2009.

ES.4.4 What were the results of the screening?

The results of the three levels of screening are presented in below.

Results of Level 1 – Conceptual Alternative Screening:

During Level 1 screening, Alternatives C & D were eliminated because they would not be able to provide reliable and consistent travel times as identified in the project Purpose and Need. Alternatives E, F, G, and H were eliminated because they would result in greater environmental impacts. As a result, the identified Preferred Alternative is Alternative B.

Results of Level 2 – Preferred Alternative Refinement

Avoidance and/or Minimization of Resource Impacts: Through the NWR Corridor EE process, the footprint of the Preferred Alternative was modified to avoid and/or minimize impacts. The following is a brief description of the minimization measures used to avoid and/or minimize impacts.

Reducing Station Platform Size
The length of all station platforms was reduced from 800 feet to 400 feet, which would accommodate a four-car train. The width of the platform was also narrowed.

Eliminating Passing Tracks at Stations
Initially, a design that completely separated the passenger rail traffic from the freight rail by adding passing tracks at each platform was considered to accommodate level boarding of the passenger trains. In the original design, at each station, one 1,500-foot long passing track would be located on each side of the mainline tracks. In order to minimize impacts, the decision was made to redesign the station platforms without passing tracks. Instead, RTD would provide high blocks, ramps, or other accommodations at each station platform to meet the Americans with Disabilities Act requirements for level boarding, while not prohibiting freight movement.

Modifying Station Concept Plans
Prior to a wetland minimization exercise, four of the 11 proposed stations would have wetland impacts. Those stations include Westminster/88th Avenue, Walnut Creek, East Boulder, and Gunbarrel. After re-evaluating each station concept plan, it was determined that the Westminster/88th Avenue Station concept plan could be modified to eliminate impacts to wetlands.

In Chapter 3 of this EE, impacts of the Preferred Alternative are divided into three categories: corridor alignment, corridor stations and Phase 1 (track from DUS to Bradburn Boulevard including the South Westminster/71st Avenue Station). Note that the wetland impacts at the East Boulder Station, Walnut Creek Station, and Gunbarrel Station are associated with the platforms for the stations, which are included in the impact calculations for the NWR Corridor alignment as opposed to the “station” category of impacts.

Modifying the Rail Track Alignment
In order to minimize wetland and drainage impacts along the length of the corridor, several modifications were made to the initial design of the rail tracks. In total, impacts to

jurisdictional wetlands and other waters were reduced by 0.92 jurisdictional (J) acre to 4.13 J acres (3.35 acres of wetlands and 0.78 acre of other waters) for the 41-mile NWR corridor.

Vehicle Technology Evaluation: Although the original FasTracks Plan, the US 36 DEIS, and the Longmont EE assumed diesel technology, the initial selection of the DMU technology was re-evaluated due to concerns and requests raised by the public. EMU and DMU commuter rail technologies were evaluated and compared to determine which was the more appropriate and viable option for the project. DMU was ultimately selected by the RTD Board as the preferred vehicle type for the project, based on the following determinations:

- More cost-effective for future service expansion to North Front Range;
- Consistency with the original FasTracks Plan (RTD 2004);
- No visual impact or additional costs from catenary system;
- Most cost-effective over 30-year planning horizon; and
- Ability to use alternate fuel in the future.

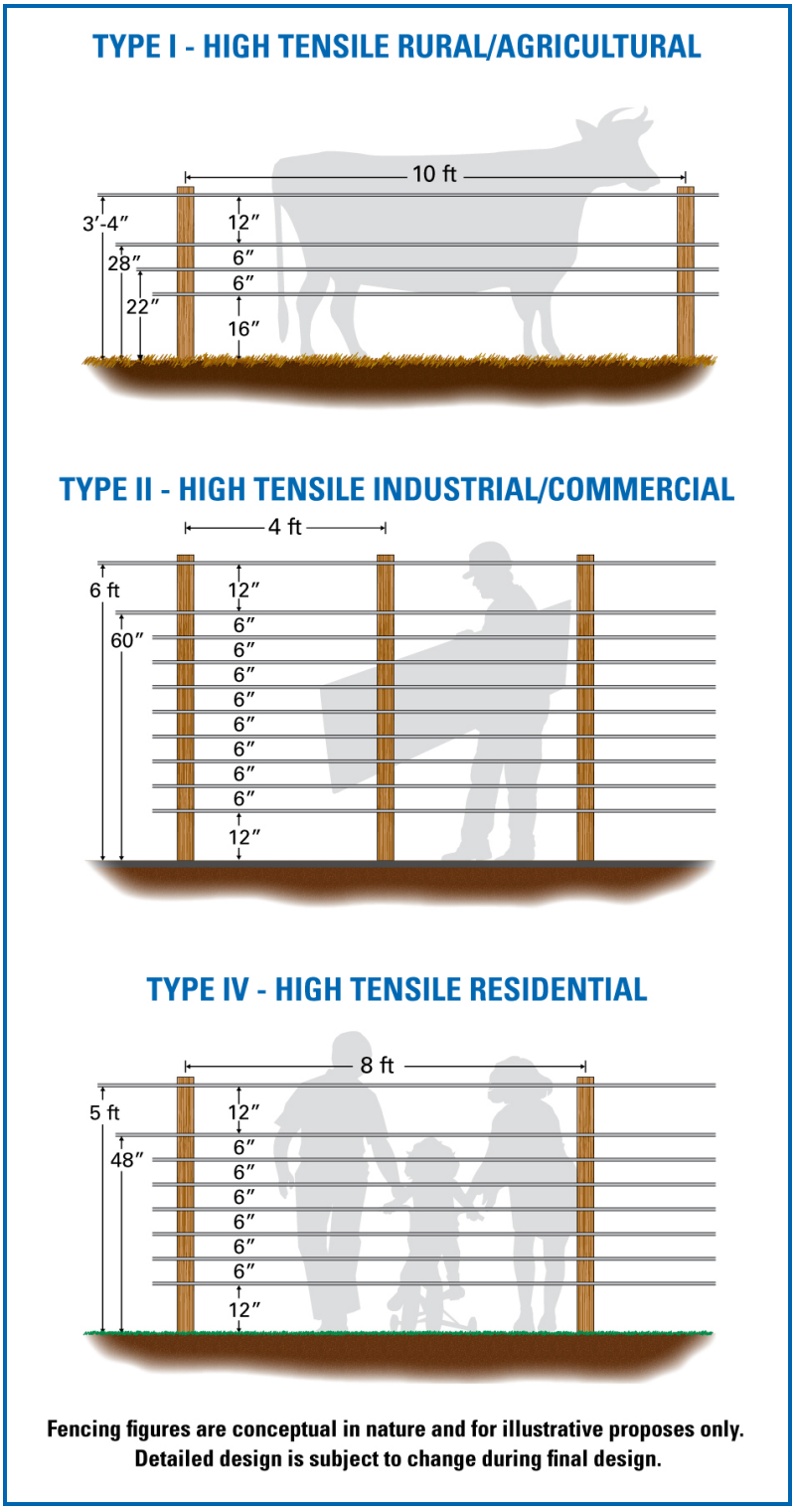
Additionally, in October 2007 the RTD Board unanimously adopted the Responsible Rail Amendment. This amendment commits RTD to work to ensure it purchases fuel efficient, environmentally responsible and sustainable commuter rail vehicles.

Evaluation and Selection of Alignment Fencing Materials: Because trespassers in commuter rail alignments have been found to be the primary cause of fatalities, RTD's Safety and Security protocols require that the alignment be fenced. The presence and aesthetic effect of alignment fencing was a concern of local agencies and jurisdictions during the NWR Corridor EE process. For this reason, RTD developed an approach to engage local governments and agencies in the selection of the proposed fencing materials. This process was conducted with the understanding that in some cases the premium for materials more costly than the chain link fence (RTD design standard) would be paid for by the local entity. The purpose of the process was to review adjacent land use types (rural/agricultural, industrial/commercial, and residential) along the corridor, identify key design issues (train speed and related safety issues, security issues, environmental concerns, and aesthetic concerns) and receive stakeholder feedback on the selected fencing types recommended for the project design, while considering safety and security.

The process involved establishing a NWR Fencing Subcommittee consisting of representatives from the local jurisdictions and resource agencies to assist RTD with developing recommendations for fencing types along the NWR Corridor. As a result of NWR Fencing Subcommittee meetings, specific fencing design and materials were recommended for the alignment. A conceptual depiction of the high-tensile fencing types is provided in Figure ES-6.

Additionally, RTD will consider utilizing existing fences along the alignment in lieu of additional NWR-provided fences in areas where desired and where RTD criteria can be met. RTD criteria includes a requirement that the fence be owned and maintained by a governmental agency or other permanent entity or organization that has authority to enter into an agreement with RTD and where the existing fence meets specific design standards. In these specific locations, RTD will continue to work with the local jurisdictions and adjacent property owners throughout final design.

FIGURE ES-6. PROPOSED FENCING TYPES PROPOSED FOR THE NWR CORRIDOR PROJECT



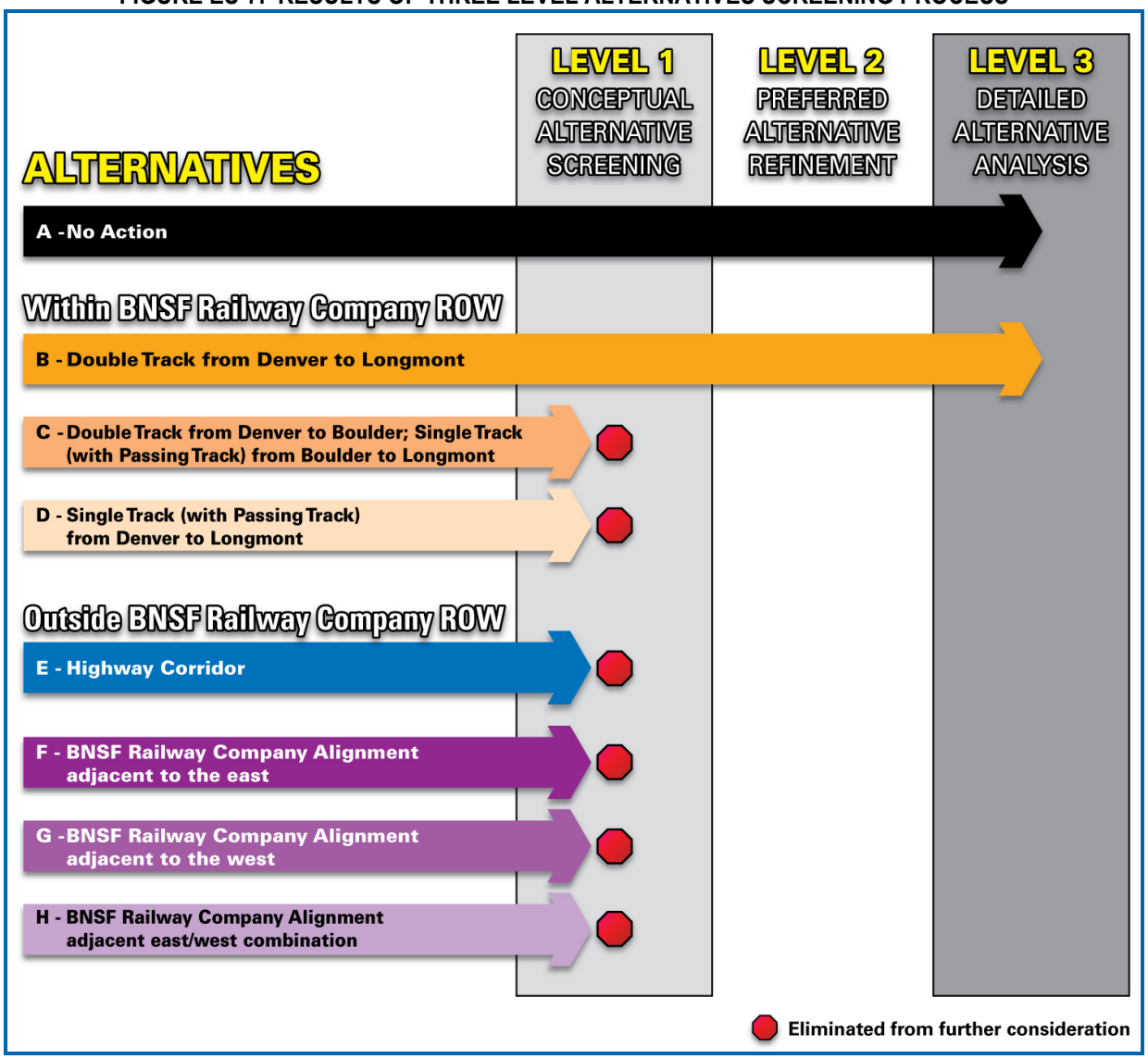
Source: NWR Corridor Project Team, 2009.

Note: This figure is conceptual in nature and for illustrative purposes only. Specific dimensions and details on materials will be identified during final design. No Type III fence was identified for use in the NWR at this preliminary stage. This is subject to change during final design.

Conclusion

As a result of the Level 1 – Conceptual Alternative Screening and Level 2 – Preferred Alternative Refinement, Alternative B – Double Track from Denver to Longmont was selected as the Preferred Alternative. Alternative A – No Action and the Preferred Alternative, with DMU vehicle technology, was carried forward to undergo detailed evaluation in the NWR Corridor EE. Figure ES-7 depicts a summary of the screening process.

FIGURE ES-7. RESULTS OF THREE LEVEL ALTERNATIVES SCREENING PROCESS



Source: NWR Corridor Project Team, 2009.

ES.4.5 What are the alternatives carried into the EE?

Alternative A, No Action, is carried forward as a baseline for comparison to the Preferred Alternative. Alternative B, Double Track within BNSF Railway Company ROW from Denver

to Boulder to Longmont with Downtown Longmont Station terminus was identified as the Preferred Alternative in the Level 1 screening evaluation and was carried forward for detailed evaluation in this EE.

ES.4.6 What is the No Action Alternative?

The No Action Alternative provides a basis of comparison for determining the impacts of project alternatives. It does not mean that "nothing happens." The No Action Alternative includes existing projects and financially committed projects within the study area to respond to the expected growth in the study area to the year 2035. These projects would be completed with or without implementation of the Preferred Alternative. By accounting for other projects to be built in a corridor or study area, the No Action Alternative provides the benchmark from which the Preferred Alternative is evaluated. Both highway and transit projects are part of the No Action Alternative.

Transit Projects

In the No Action Alternative, bus service changes or enhancements likely to occur in the next one to five years were included, as well as committed service enhancements that will occur between 2005 and 2035. The No Action Alternative assumes no additional transit facilities in the project study area for the NWR Corridor. Existing park-n-Rides in the project study area would remain in their same locations and configurations as today. Bus operation modifications for the No Action Alternative include more frequent service on existing routes B and H between Denver and Boulder, a re-routed skyRide route for service from Boulder to Denver International Airport, and new Activity Center Connector routes to activity centers in the corridor. In addition to changes in bus service, the No Action Alternative would assume the implementation of the entire FasTracks Plan, except for the NWR Corridor project.

Roadway Projects

The roadway improvement projects identified under the No Action Alternative for the 2035 planning year horizon (DRCOG, 2009) are indicated in Table ES-4.

TABLE ES-4. NORTHWEST RAIL CORRIDOR NO ACTION ALTERNATIVE HIGHWAY IMPROVEMENTS

Project Location/Name	Project Description
SH 119 (Longmont Diagonal): Foothills Parkway to Hover Road Operational Improvements	Highway operational improvements
SH 119: SH 52 New Interchange	New interchange
US 36 Foothills Parkway to I-25	Add managed BRT/HOV lane
US 36: McCaslin Boulevard Interchange Reconstruction	Interchange reconstruction
US 36: Sheridan Boulevard Interchange Reconstruction	Interchange reconstruction
US 36: Wadsworth Parkway Interchange Reconstruction	Interchange reconstruction
US 36 Bikeway	Bikeway

Source: DRCOG, 2009.
BRT = bus rapid transit
HOV = high-occupancy vehicle
I-25 = Interstate 25
RTP = Regional Transportation Plan
SH = State Highway
US 36 = United States Highway 36

More information on the US 36 EIS/BE process is provided in Section 2.1.3, US 36 EIS and Basic Engineering. The US 36 Final EIS was distributed to the public on October 30, 2009 and a Record of Decision (ROD) was signed by FHWA and FTA in December 2009.

ES.4.7 What is the Preferred Alternative?

Elements of the Preferred Alternative include the rail alignment, station locations, and operational characteristics as described below and depicted in Figure ES-8.

Alignment

The NWR Corridor Project will be phased; the first phase, from DUS to the South Westminster/71^{s} Avenue Station (approximately up to Bradburn Boulevard) would use EMU technology. Phase 2 would use DMU technology from DUS to Longmont and would share the tracks used by the EMU vehicles in the Phase 1 segment between DUS and the South Westminster/71st Avenue Station. Ultimately, the Preferred Alternative would assume the provision of commuter rail transit from DUS in the City and County of Denver to downtown Longmont. Track from the DUS terminal to what is known as the DUS "throat" near Coors Field at Park Avenue was considered a part of the DUS Project. As a result, impacts for this segment of track (DUS to the throat) are presented in the DUS Final Environmental Impact Statement (Final EIS) document. The study area for the NWR EE initiates at the DUS “throat” and extends to the north. The first 3.5 miles of the alignment between the DUS throat and Pecos Street would be shared with the Gold Line Project. The remaining 37.5 miles of track would be dedicated to the NWR Corridor.

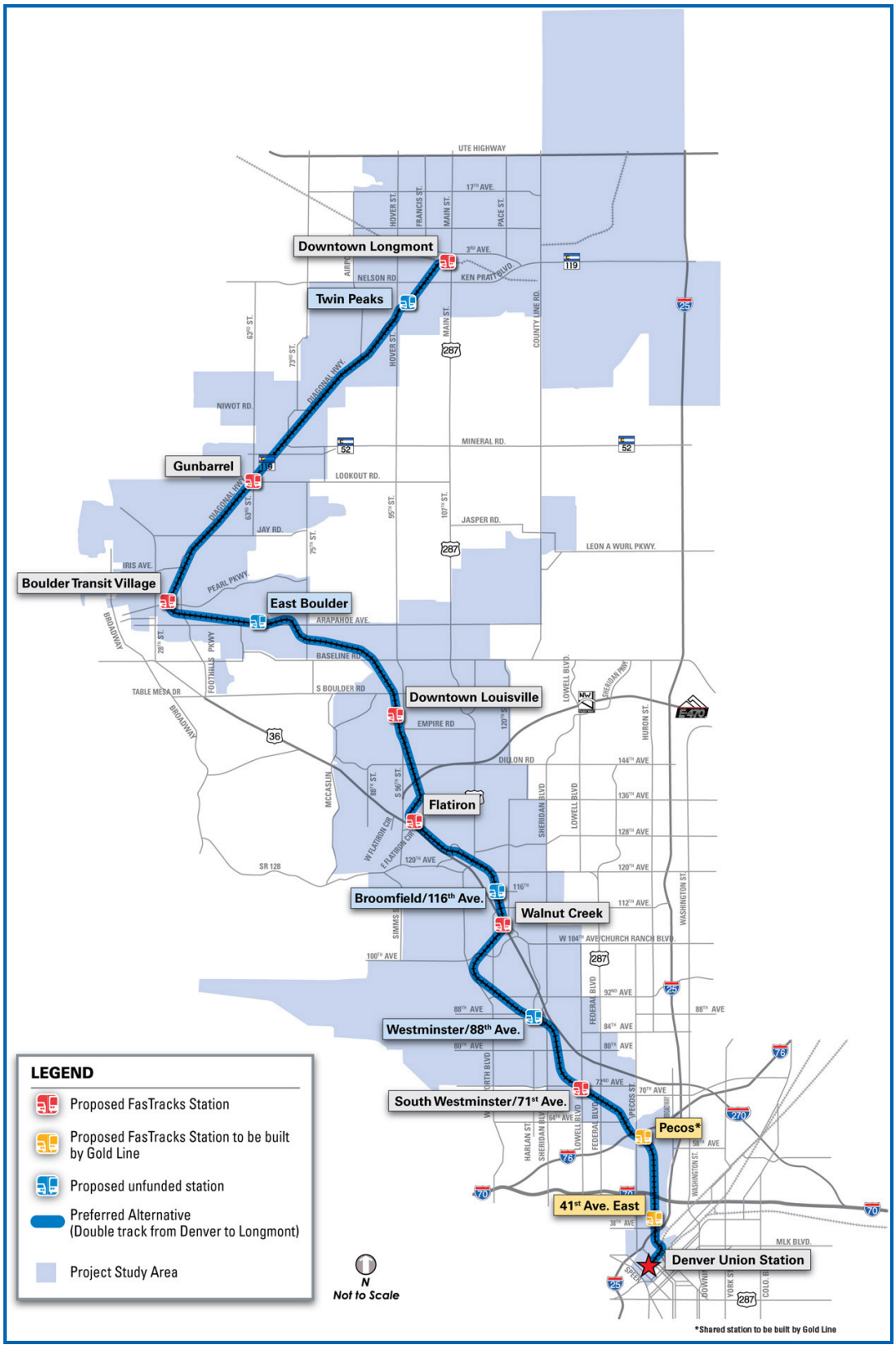
Between the South Westminster/71st Street Station and Longmont, the existing BNSF Railway Company track would be rehabilitated/replaced, and one new track adjacent to the existing BNSF Railway Company track would be constructed. Both tracks would be utilized

by freight and commuter rail vehicles. Between the South Westminster/71st Street Station and DUS, the track would be in exclusive transit ROW, owned by RTD.

The NWR Corridor cannot function without a supporting Commuter Rail Maintenance Facility (CRMF). Therefore, the Preferred Alternative assumes the provision of a CRMF located on the Fox North Site, north of downtown Denver. The CRMF would include facilities to repair, maintain, clean, fuel, and store both DMU and electric multiple unit (EMU) commuter rail trains for the FasTracks commuter rail program. The impacts associated with the CRMF were initially presented in a Supplemental Environmental Assessment (SEA), a supplement to the Gold Line DEIS, which was distributed to the public in April 2009. Since that time, the design of the CRMF was updated and environmental impacts associated with the CRMF are presented in detail in the *Gold Line Final Environmental Impact Statement* (Federal Transit Administration 2009). The Gold Line ROD was signed by FTA on November 2, 2009. The CRMF impacts are incorporated here by reference. See Figure ES-21 in Section ES.4.10, Phased Implementation, for a depiction of the location of the CRMF.

A depiction of a DMU Commuter Rail vehicle

FIGURE ES-8. PREFERRED ALTERNATIVE



Source: NWR Corridor Project Team, 2010.

Stations

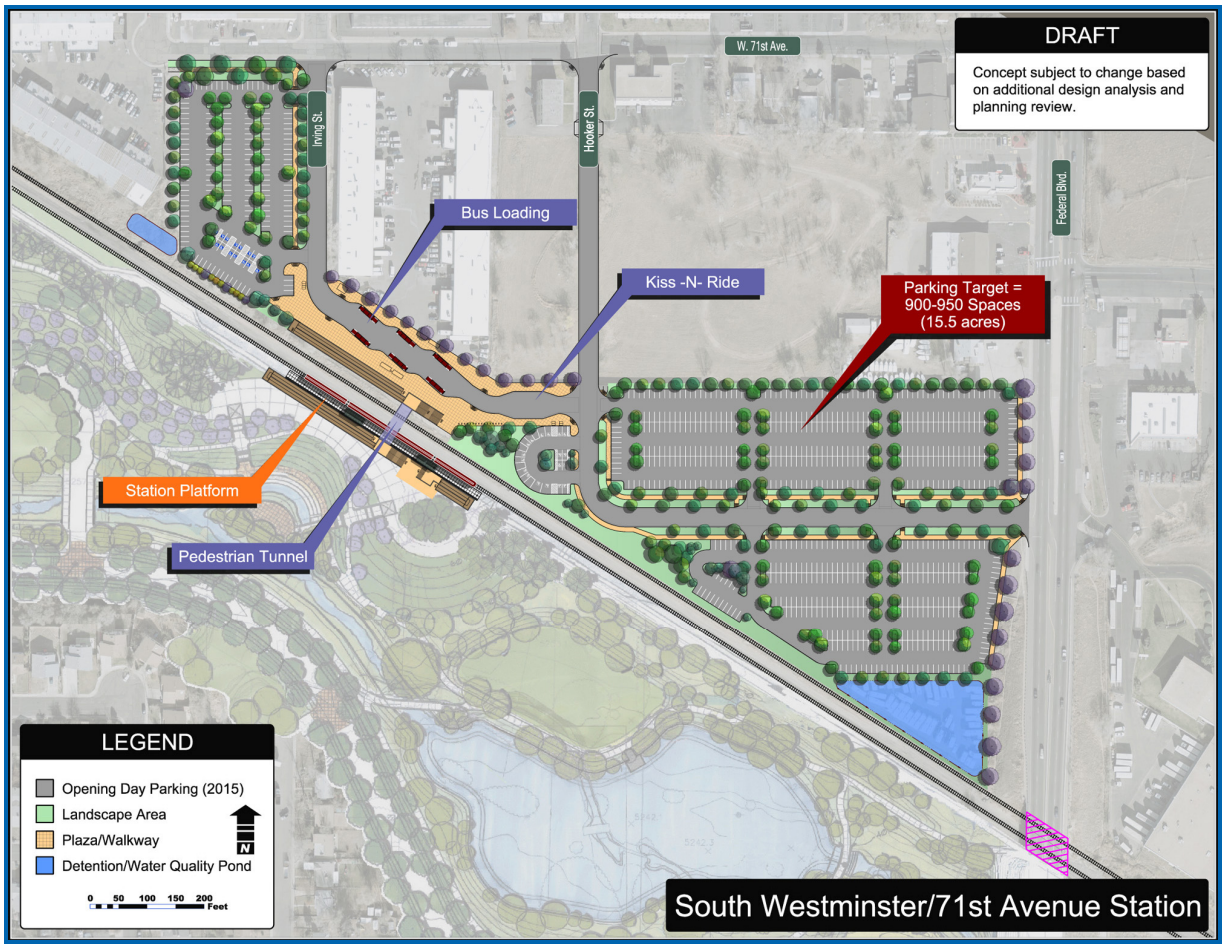
There are 11 stations included as part of the Preferred Alternative located at:

- South Westminster/71st Avenue
- Westminster/88th Avenue
- Walnut Creek
- Broomfield/116th Avenue
- Flatiron
- Downtown Louisville
- East Boulder
- Boulder Transit Village
- Gunbarrel
- Twin Peaks
- Downtown Longmont

Four of the 11 stations – Westminster/88th Avenue, Broomfield/116th Avenue, East Boulder, and Twin Peaks – would not be funded by FasTracks and would require additional funding sources in order to be constructed. The environmental impacts (including aquatic) related to the four unfunded stations are included as part of the evaluation in this EE.

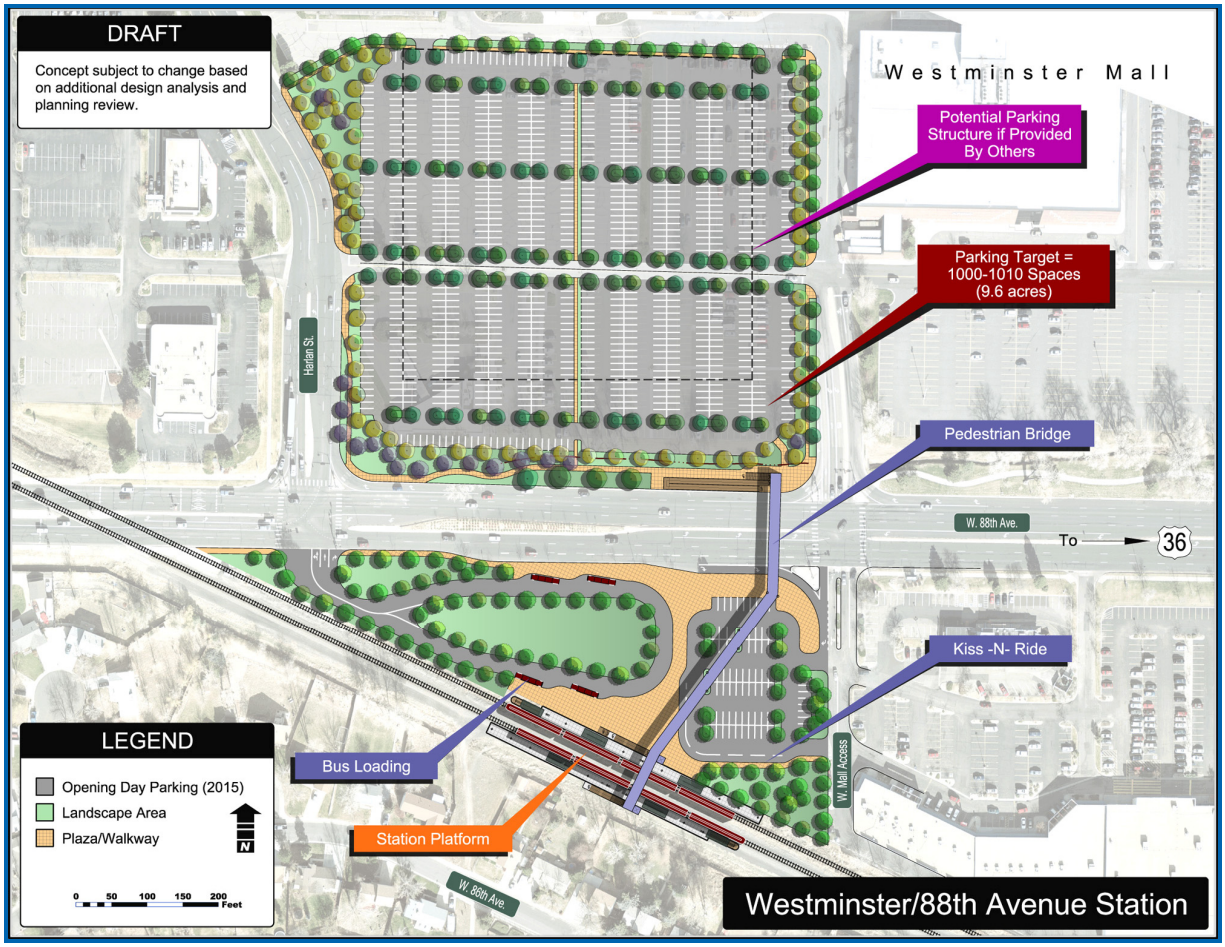
Conceptual site layouts for the proposed stations are provided in Figures ES-9 through ES-20 below.

FIGURE ES-9. SOUTH WESTMINSTER/71ST AVENUE STATION CONCEPT PLAN



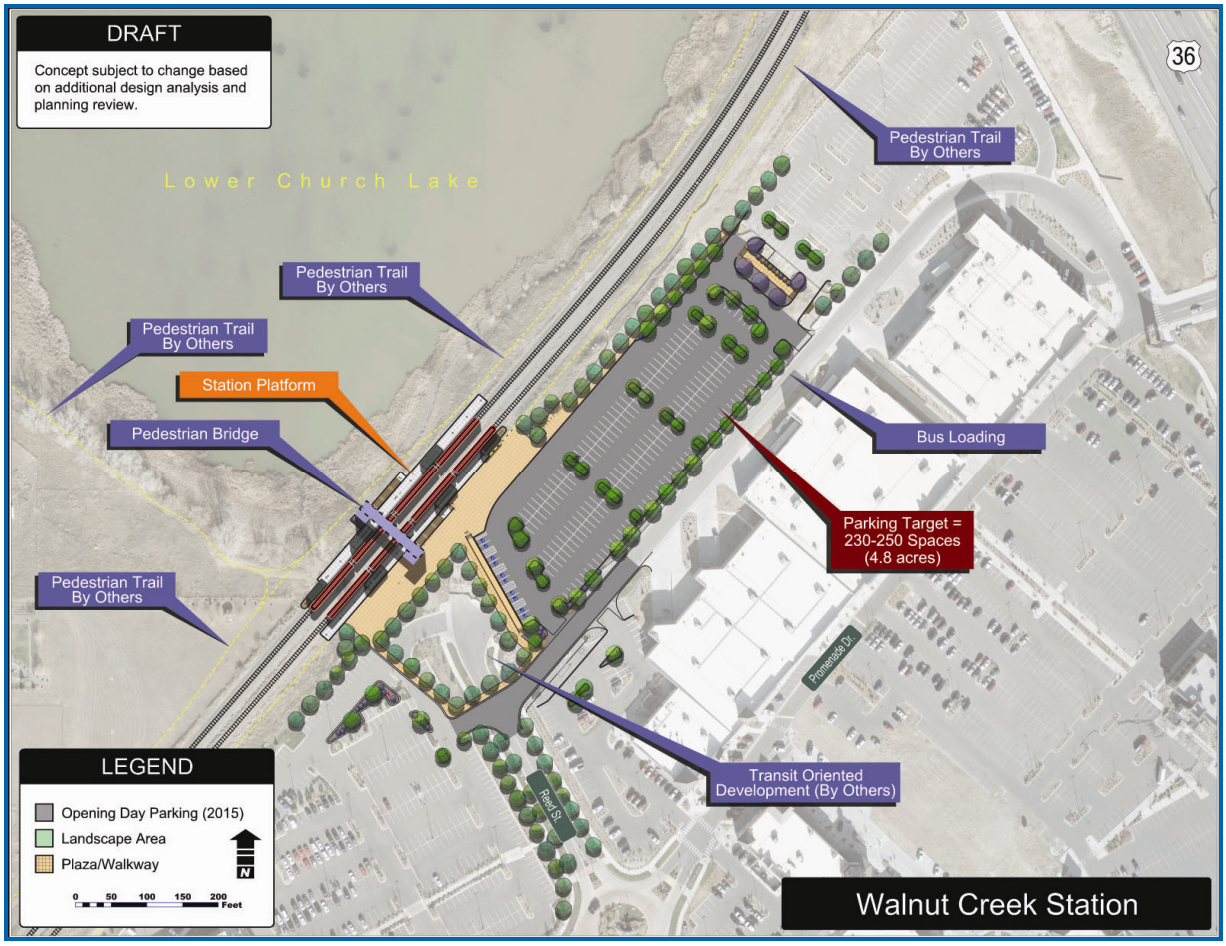
Source: NWR Corridor Project Team, 2009.

FIGURE ES-10. WESTMINSTER/88TH AVENUE STATION CONCEPT PLAN



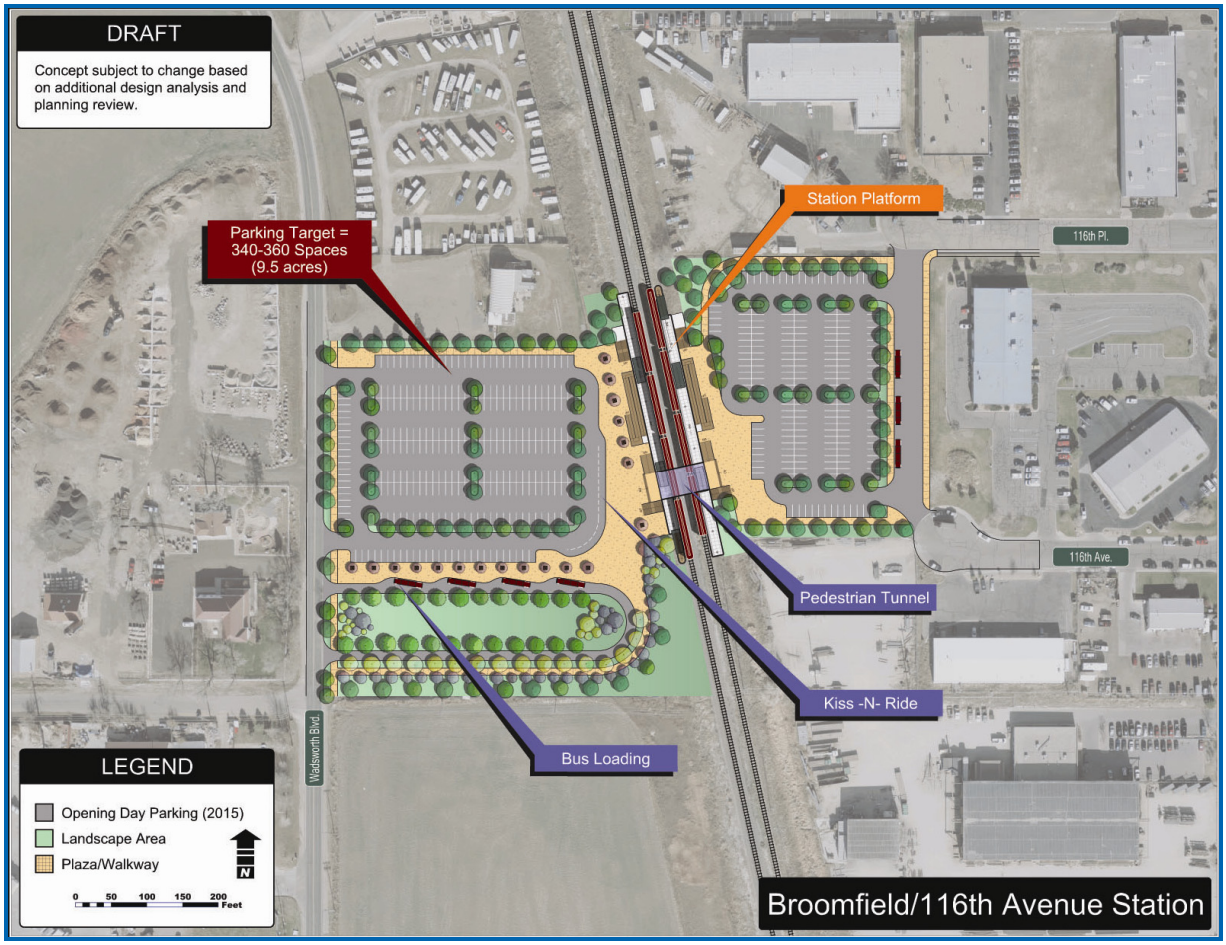
Source: NWR Corridor Project Team, 2009.

FIGURE ES-11. WALNUT CREEK STATION CONCEPT PLAN



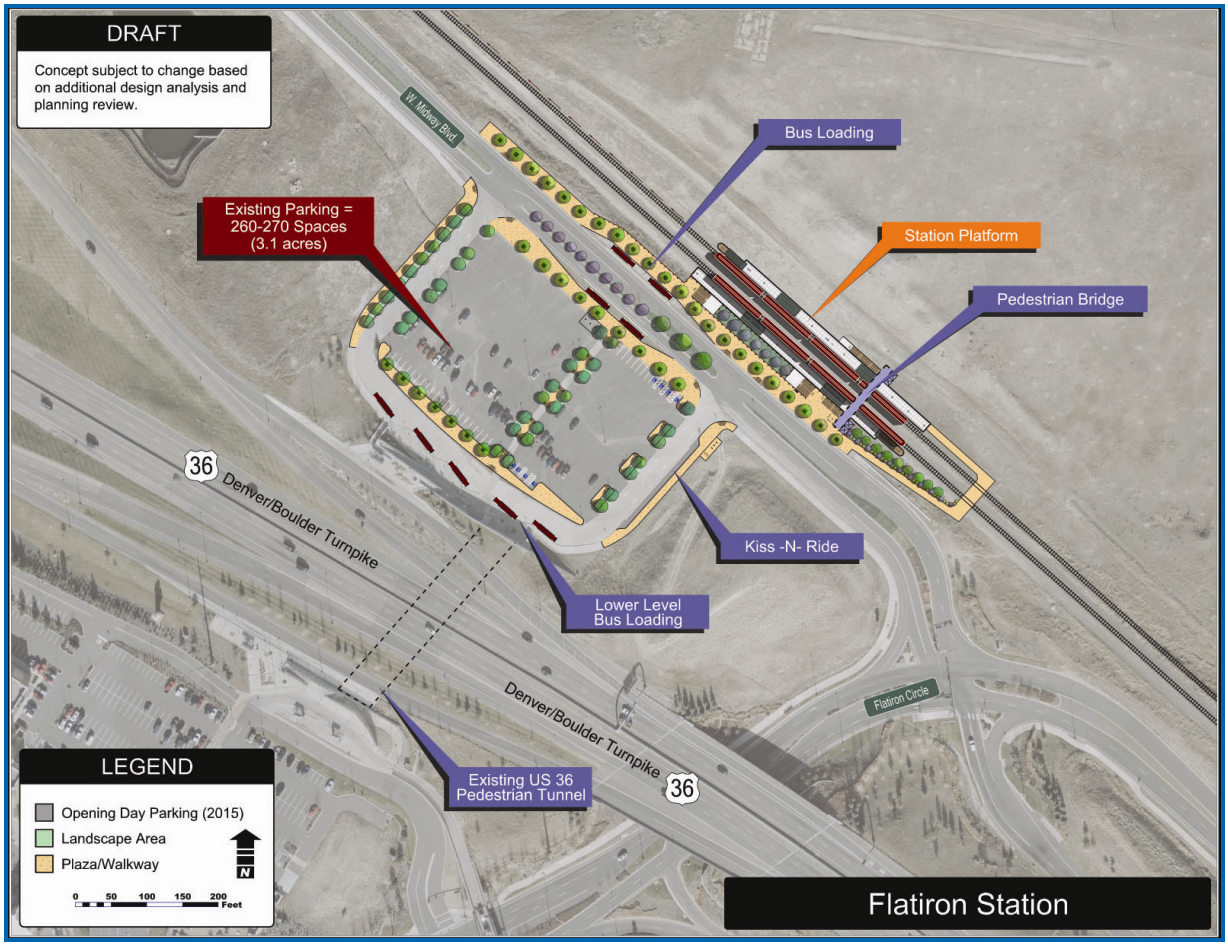
Source: NWR Corridor Project Team, 2009.

FIGURE ES-12. BROOMFIELD/116TH AVENUE STATION CONCEPT PLAN



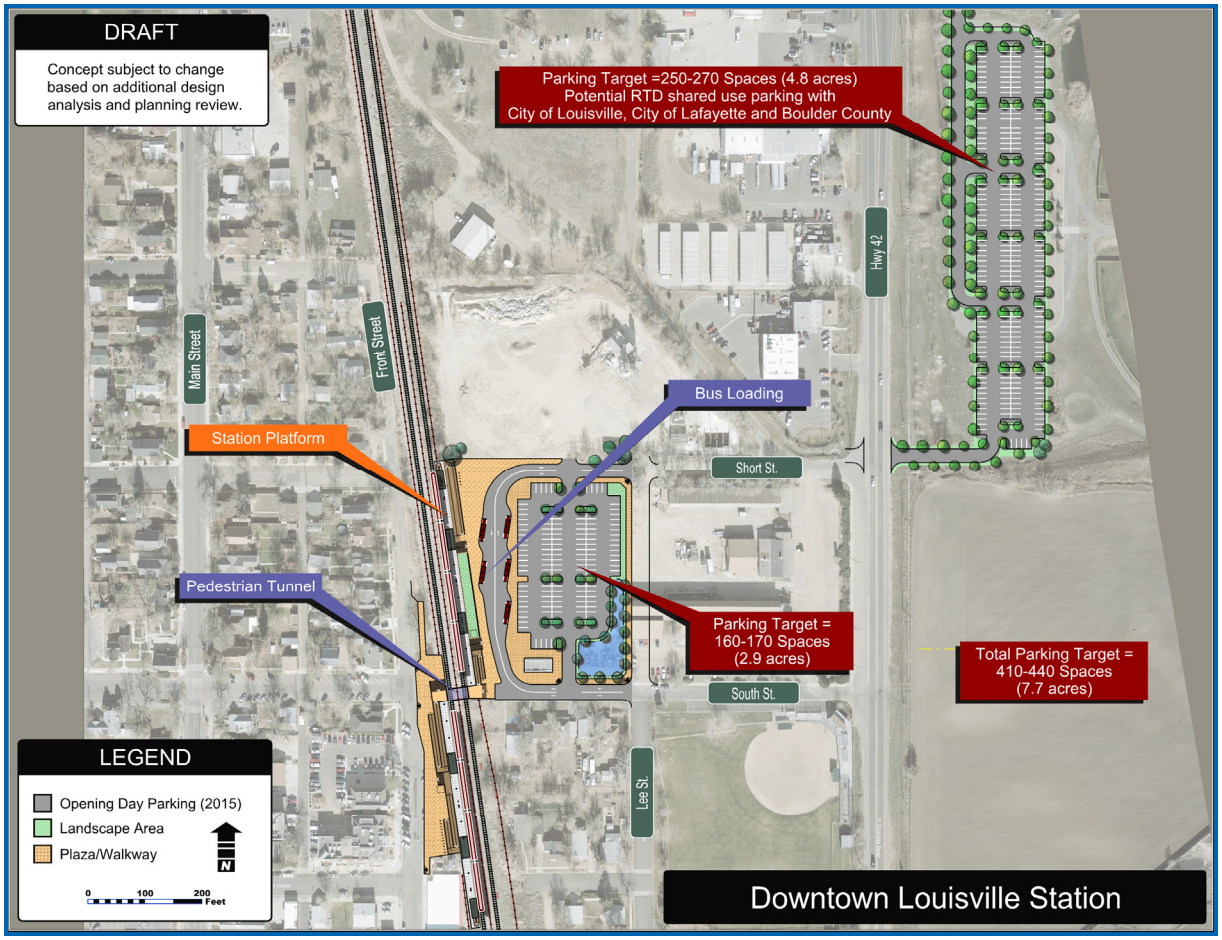
Source: NWR Corridor Project Team, 2009.

FIGURE ES-13. FLATIRON STATION CONCEPT PLAN



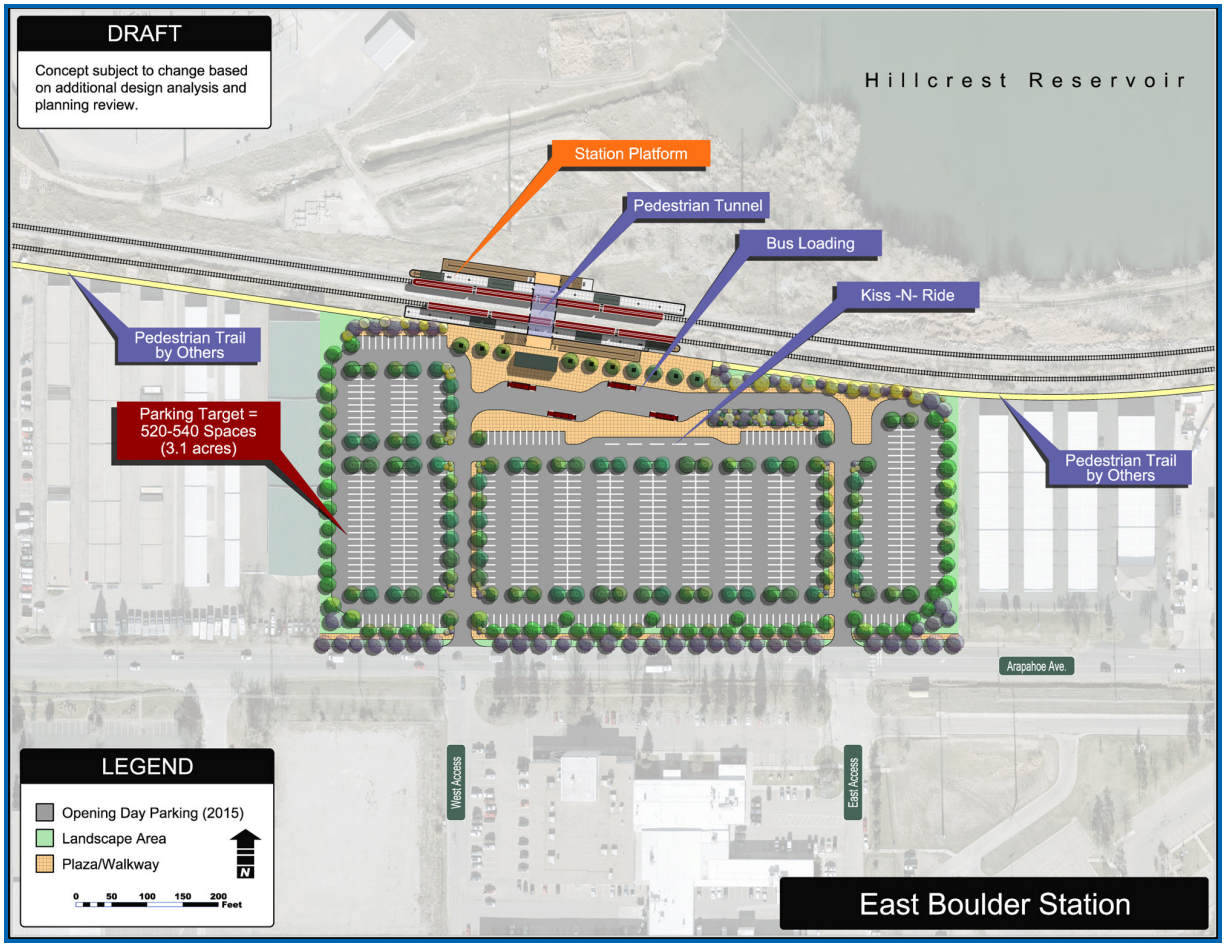
Source: NWR Corridor Project Team, 2009.

FIGURE ES-14. DOWNTOWN LOUISVILLE STATION CONCEPT PLAN



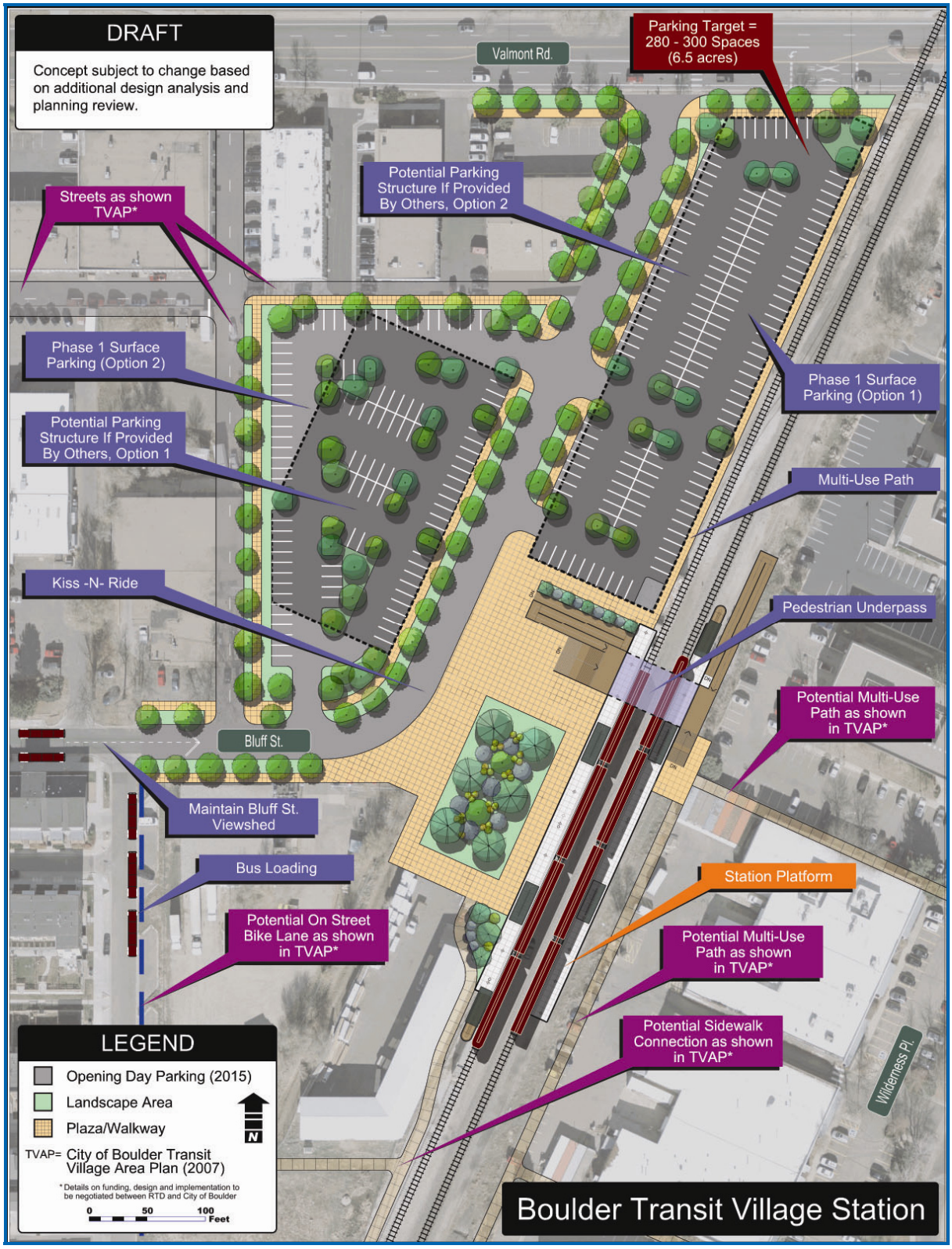
Note: The use of parking at Miners Field is dependent on an agreement between Louisville, Lafayette, and Boulder County.
Source: NWR Corridor Project Team, 2009.

FIGURE ES-15. EAST BOULDER STATION CONCEPT PLAN



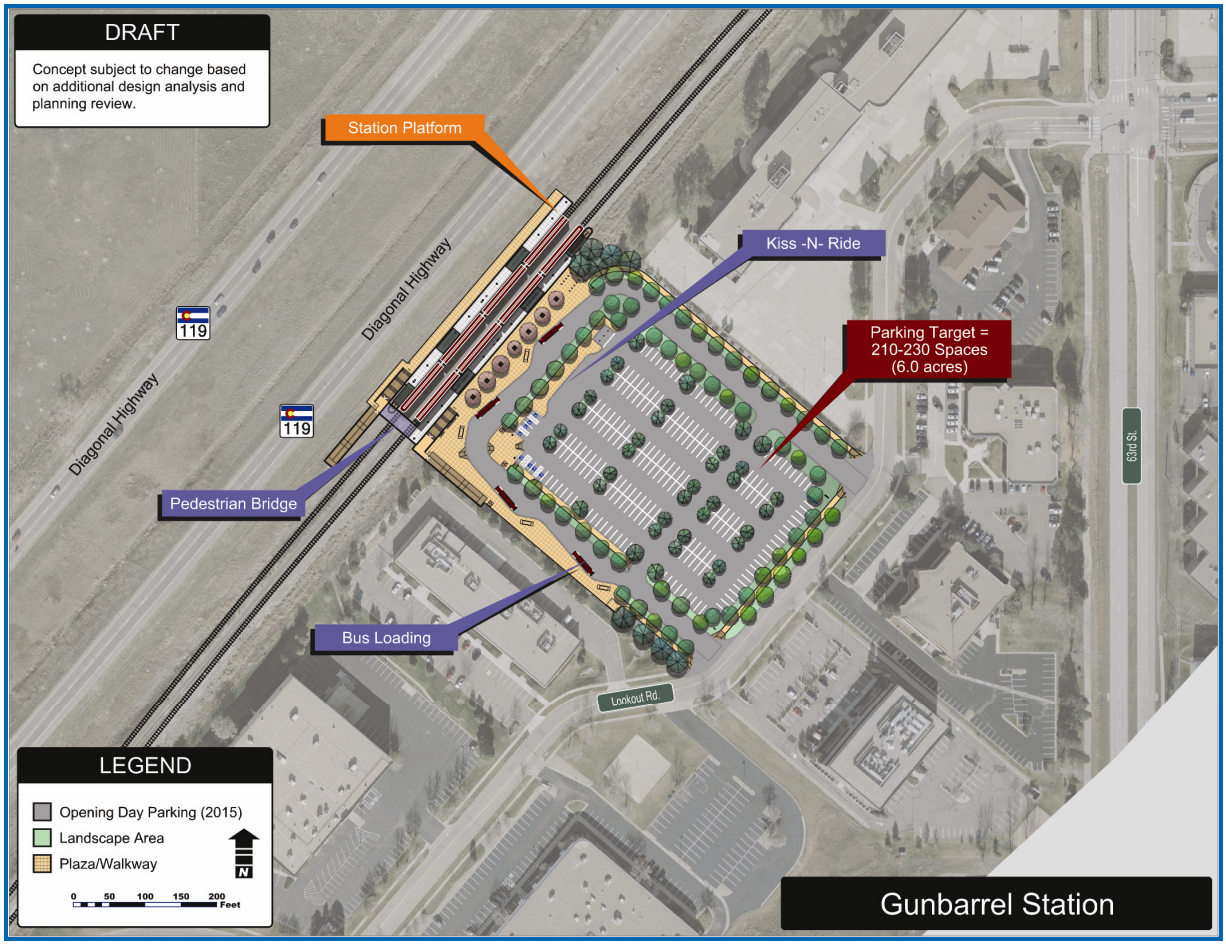
Source: NWR Corridor Project Team, 2009.

FIGURE ES-16. BOULDER TRANSIT VILLAGE STATION CONCEPT PLAN



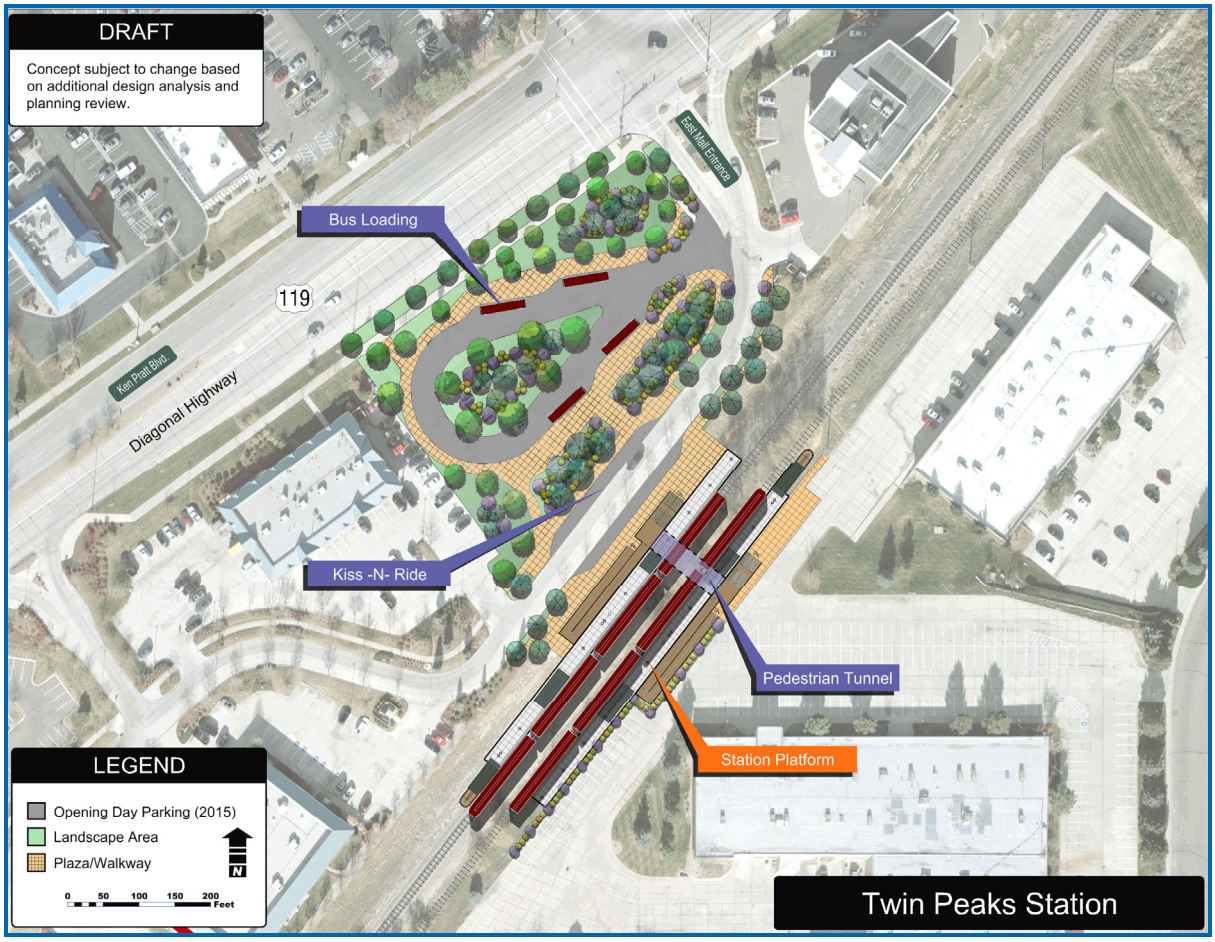
Source: NWR Corridor Project Team, 2009.

FIGURE ES-17. GUNBARREL STATION CONCEPT PLAN



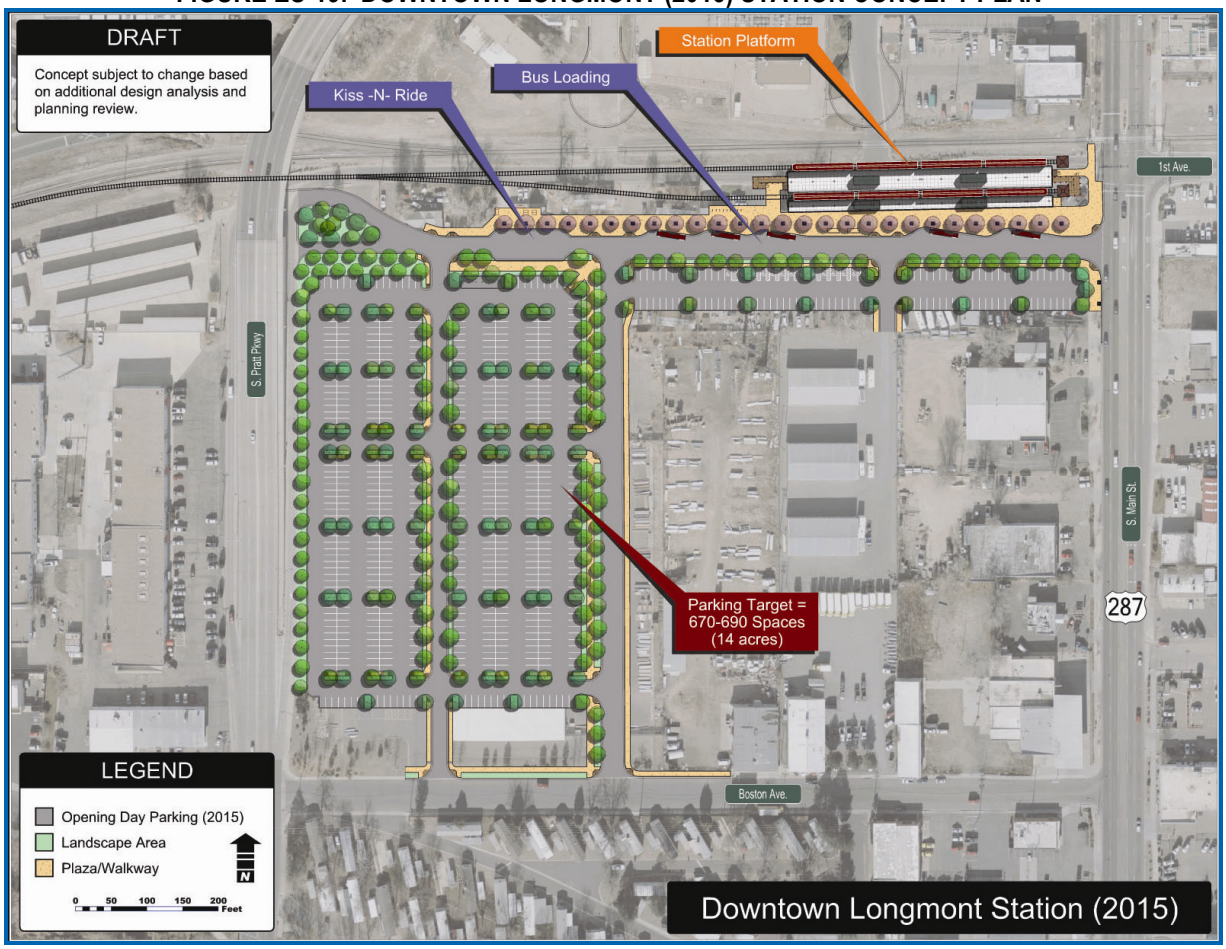
Source: NWR Corridor Project Team, 2009.

FIGURE ES-18. TWIN PEAKS STATION CONCEPT PLAN



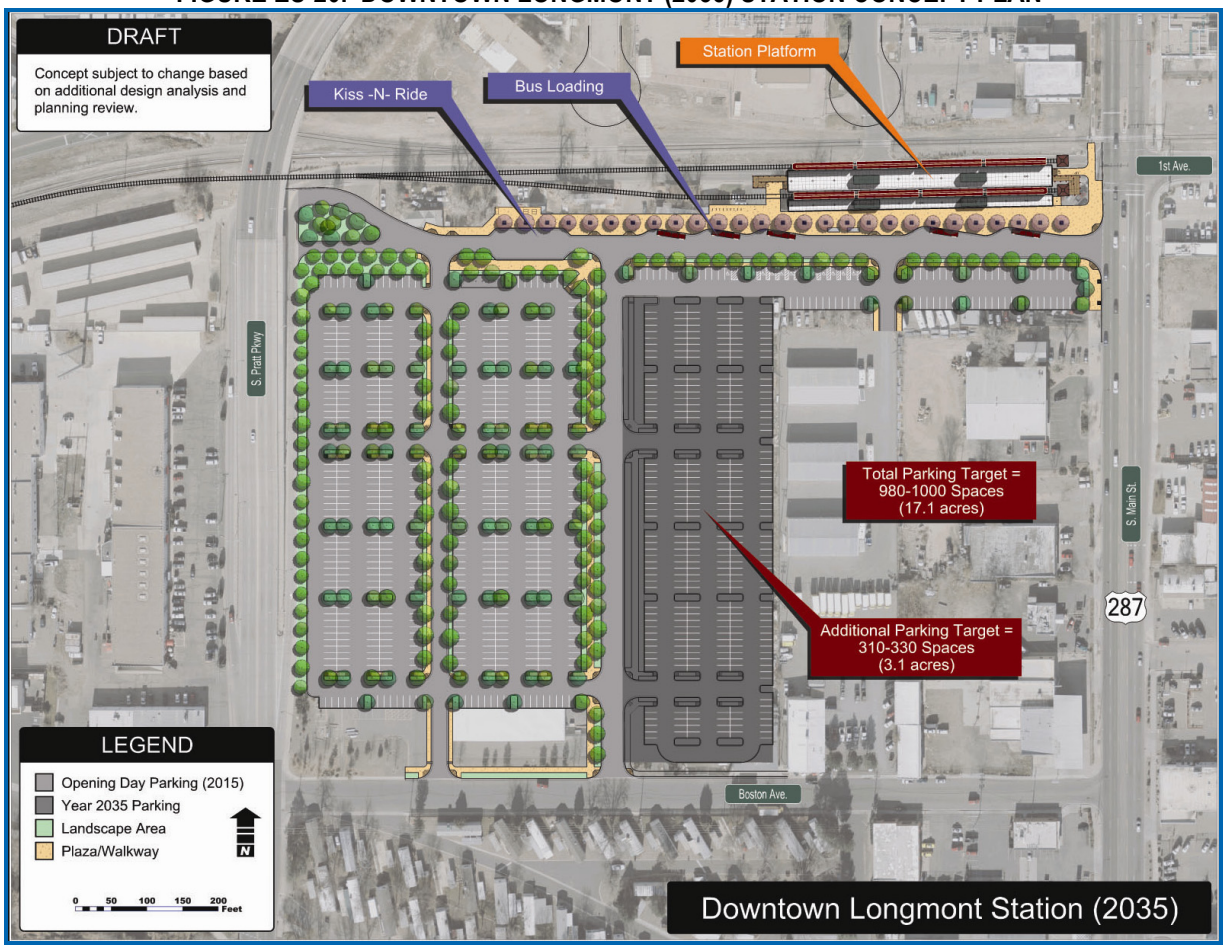
Source: NWR Corridor Project Team, 2009.

FIGURE ES-19. DOWNTOWN LONGMONT (2015) STATION CONCEPT PLAN



Source: NWR Corridor Project Team, 2009.

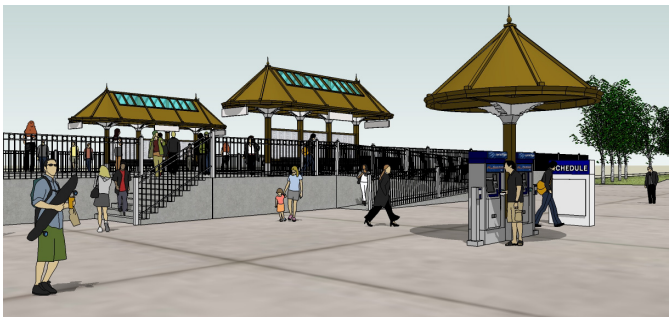
FIGURE ES-20. DOWNTOWN LONGMONT (2035) STATION CONCEPT PLAN



Source: NWR Corridor Project Team, 2009.

Evaluation and Selection of Station Architectural Styles: Further design refinement of the Preferred Alternative included identification of station typologies for the NWR Corridor Project. Recommended design typologies developed are depicted in Table ES-5.

TABLE ES-5. NORTHWEST RAIL CORRIDOR STATION TYPOLOGIES STYLE

Typology	Schematic Design
Neighborhood Craftsman	
Main Street Historic	
Town Center Contemporary	
Industrial Loft Modern	

Source: NWR Corridor Project Team, 2009.

Transit Improvements

The assumed bus operations for the Preferred Alternative would be the same for the No Action Alternative except that service on the BOLT would be reduced and rerouted to service the Boulder Transit Village Station, and the S route would be eliminated.

Roadway Improvements

The highway improvements assumed under the Preferred Alternative would be identical to those identified for the No Action Alternative.

ES.4.8 When will the train operate?

By 2015 the Preferred Alternative would provide 30-minute peak period service and 60-minute off-peak period service throughout the corridor (Denver to Longmont).

In 2035 the Preferred Alternative would provide 15-minute service in the morning and evening peak periods from Boulder to Denver and 30-minute service between Longmont and Boulder. Service would be provided at 30-minute headways at most other times throughout the corridor. Peak periods are defined as weekday mornings from 6:00 a.m. to 9:30 a.m. and weekday evenings from 2:30 p.m. to 7:30 p.m.

ES.4.9 What would the Preferred Alternative cost?

The capital and operational costs of the Preferred Alternative are included in Tables ES-6 & ES-7.

TABLE ES-6. CAPITAL COSTS

Preferred Alternative Element	Capital Cost* (2008 Dollars)
NWR Corridor Project with proposed FasTracks stations	$641.1 million
Shared Alignment Gold Line/NWR Corridor (DUS to Pecos Street)	$261.5 million[1]
Four Unfunded Stations	$100.3 million[2]
Total	**$1.0 billion**

Source: NWR Corridor Project Team, 2009.
Notes:
* These estimates represent the 2015 planning horizon.
1. The cost for the Shared Alignment segment, although illustrated in this estimate, will be funded as a FasTracks program-wide expense since the section from DUS to the Pecos Station will be shared jointly by the Gold Line, and the section from DUS to the Maintenance Facility will be used by the East and North Metro corridors.
2. Proposed unfunded station costs estimate the following capital cost per station:
– Westminster/88th Avenue Station: $52.9 million
– Broomfield/116th Avenue Station: $13.3 million
– East Boulder Station: $22.8 million
–Twin Peaks Station: $11.3 million

TABLE ES-7. OPERATING COSTS

Preferred Alternative Element	Annual Operations and Maintenance Cost* (2008 Dollars)
NWR Corridor Project with proposed FasTracks stations	$17.9 million
Shared Alignment Gold Line/NWR Corridor (DUS to Pecos Street)	
Four Unfunded Stations	$2.8 million
Total	**$20.7 million**

Source: NWR Corridor Project Team, 2009.
Notes:
* These estimates represent the 2035 planning horizon.
1. The cost for the Shared Alignment segment, although illustrated in this estimate, will be funded as a FasTracks program-wide expense since the section from DUS to the Pecos Station will be shared jointly by the Gold Line, and the section from DUS to the Maintenance Facility will be used by the East and North Metro corridors.

ES.4.10 Phased Implementation

Phase 1 would include construction from DUS to the South Westminster/71st Avenue Station (approximately Bradburn Boulevard). Phase 1 would be constructed as a component of RTD's Eagle P3 project. The Eagle P3 is a Public Private Partnership that will conduct final design and build RTD's East Corridor, the CRMF, Gold Line and this portion of NWR. Phase 1 would be in exclusive transit ROW, owned by RTD and would be EMU. Phase 1 includes a new grade separation where 64th Avenue would cross over the rail corridor. Future phases constructed beyond the South Westminster/71st Avenue Station would share ROW with freight operations and would require an operating agreement for RTD to use BNSF Railway Company's ROW. RTD is currently negotiating the purchase of ROW and operating agreements with the BNSF Railway Company. Because the Eagle P3 project includes EMU technology for the Gold Line and East Corridor projects, the Phase 1 Alignment would be electrified from DUS to the South Westminster/71st Avenue Station.

Future phases constructed north of the South Westminster/71st Avenue Station would be DMU. DMU technology would eventually operate seamlessly (sharing the track with the Phase 1 EMU) from DUS to downtown Longmont. See Figure ES-21 below for a depiction of the Phase 1 study area.

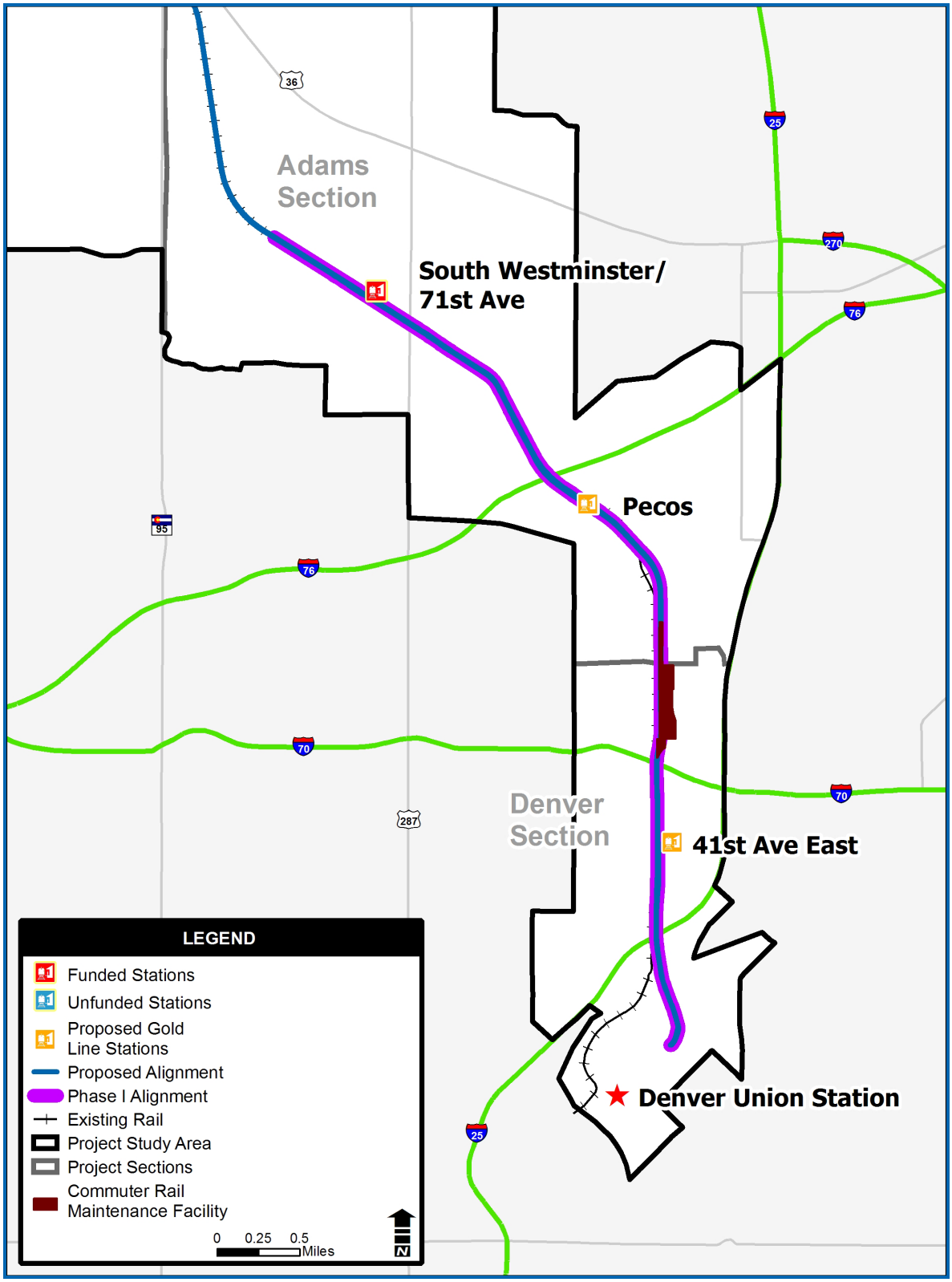
ES.4.11 Projects Linked to the NWR Corridor Project

Two projects that were conducted concurrently and are linked with the NWR Corridor Project are the Gold Line EIS and the Commuter Rail Maintenance Facility Supplemental Environmental Assessment (CRMF SEA). These proposed projects are to provide commuter rail from DUS in downtown Denver to Ward Road in Wheat Ridge, Colorado for Gold Line, and a CRMF to serve the FasTracks commuter rail system.

As indicated earlier, these projects share facilities with the NWR Corridor Project. The Gold Line shares track from DUS to Pecos Street, and the CRMF is located along this segment of track north of 48th Avenue and east of Fox Street in the City and County of Denver. Impacts from the track from DUS to Pecos Street and the CRMF are also part of the impacts of the Preferred Alternative for the NWR Corridor Project.

The CRMF SEA was distributed to the public in April 2009, and the Gold Line Final EIS, which was distributed to the public in August 2009, incorporated updates to the CRMF design and comments on the CRMF SEA document. The impacts documented in the CRMF SEA and in the Gold Line Final EIS are incorporated into this NWR EE document by reference. Subsequently, the Gold Line Project Team responded to comments on the Gold Line Final EIS and a ROD was issued by the FTA on November 2, 2009, marking the end of the project's planning process.

FIGURE ES-21. PHASE 1 STUDY AREA



Source: NWR Corridor Project Team, 2009.

ES.5 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

ES.5.1 What resources were considered?

Resources that were evaluated in the EE are listed below. Five key resources with impacts from the Preferred Alternative have been highlighted and include: land use, zoning, economic considerations, land acquisition, displacements and relocation of existing uses, noise, vibration, and wetlands. The impacts and the proposed mitigation of the Preferred Alternative are shown in Table ES-10 at the end of this Executive Summary under Section ES.8, Mitigation Measures.

- Social Impacts and Community Facilities
- Environmental Justice
- Land use/Zoning
- Farmlands
- Economic Considerations
- Land Acquisition, Displacements and Relocation of Existing Uses
- Historic, Archaeological, and Cultural Resources
- Visual and Aesthetic Qualities
- Parklands, Open Space and Recreational Resources
- Air Quality
- Energy
- Noise
- Vibration
- Biological Resources
- Mineral Resources, Geology and Soils
- Water Resources/Water Quality
- Wetlands and Other Waters
- Floodplains/Drainage/Hydrology
- Hazardous Materials
- Public Safety and Security
- Utilities
- Transportation Systems

ES.5.2 What kind of environmental effects will the project have?

Impacts to key resources are summarized below.

Locations of proposed stations would be generally consistent with planned future land use, zoning, and transportation plans.

Land Use, Zoning, and Economic Considerations

Land Use and Zoning

The intent of the land use and zoning evaluation is to determine that local land use planning around proposed station areas has been prepared to take advantage of the local transit investment. Because the proposed project involves an expansion of the existing rail line rather than construction of a new rail line, improvements are generally compatible with existing and future land uses. The conversion of existing land uses to rail facilities where ROW is currently constrained would primarily occur at the proposed station locations. And, due to the extensive level of proposed station area planning that has already been completed by municipalities, locations of proposed stations would be generally consistent with planned future land use, zoning, and transportation plans.

Implementation of the Preferred Alternative could provide an overall benefit to land use planning and help conserve land resources by promoting increased density at station locations over more consumptive, dispersed development practices. RTD will continue to work with local governments in supporting plans encouraging TOD, which is a compact and mixed-use residential or commercial area designed to maximize access to public transit.

Existing industrial uses and rail yards in Denver

Economic Considerations

Economic impacts of the Preferred Alternative are measured by effects to businesses and employees, and lost revenue from property taxes. During project development, the Preferred Alternative was modified to avoid and minimize impacts to businesses wherever possible. The Preferred Alternative would use the existing rail corridor, minimizing the amount of property required for acquisition. Station footprints were designed in coordination with local municipalities with efforts to minimize the need for business and employment relocations.

Station footprints were designed in coordination with local municipalities with efforts to minimize the need for business and employment relocations.

Even with these avoidance and minimization efforts, the Preferred Alternative would require the acquisition of 134.40 acres of property resulting in the relocation of 76 businesses and approximately 478 employees. Approximately $1,040,226 in annual property tax revenue would be lost as a result of property acquisition. However, potential development at stations associated with the Preferred Alternative could increase land values near the proposed stations and offset this loss of property tax revenue.

Existing industrial uses and railroad in Adams County

The Preferred Alternative would also generate 5,764 direct jobs over the 5-year construction period and would stimulate economic development at station sites.

Land Acquisition, Displacements, and Relocation of Existing Uses

Property acquisition is the result of the need to obtain property for public ROW for the construction of the Preferred Alternative. Concerns regarding property acquisition have been expressed by the public and project stakeholders during public involvement activities and have remained an important issue throughout project development.

Property acquisition and permitting would be a joint effort between the BNSF Railway Company and RTD. Unlike other FasTracks corridors, RTD would not own the entire ROW. Phase 1 of the project (from DUS to the South Westminster/71st Avenue Station) would be constructed as part of the Eagle P3 project. The Eagle P3 project is a Federal Transit Agency (FTA) pilot program that would allow RTD to retain a private contractor to design, build and operate the East Corridor, Gold Line and CRMF commuter rail projects. The Phase 1 portion of the NWR project would operate in exclusive transit ROW. The mainline track north of the South Westminster/71st Avenue Station would be located within BNSF Railway Company ROW to Downtown Longmont. Additionally, the BNSF Railway Company would complete final design, construct, and maintain this portion of the alignment. RTD would acquire, construct, and maintain the proposed station sites funded through the FasTracks program.

BNSF Railway Company ROW Behind Westminster Mall

The majority of property acquisition is associated with proposed stations and consists primarily of private property and slivers of public ROW.

The Preferred Alternative would require the acquisition of 134.40 acres of property, resulting in the relocation of 76 businesses and 16 residences. The majority of property acquisition is associated with proposed stations and consists primarily of private property and slivers of public ROW. The Downtown Louisville Station would impact 3.58 acres of the Louisville Sports Center for shared parking.

The acquisition of real property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act) and the Fifth Amendment of the United States Constitution. The Uniform Act applies to all acquisitions of real property or displacements of people resulting from federal or federally assisted programs or projects. In addition, all impacted owners will be provided notification of RTD and BNSF's intent to acquire an interest in property, including a written offer letter of just compensation specifically describing those property interests. A relocation analysis and relocation assistance advisory services will also be provided.

Broomfield Industrial Sports Complex

Noise

Noise is one of the principal environmental impacts associated with rail transit projects and has been defined as a public issue of concern throughout the NWR Corridor public involvement process. Prior to implementation of mitigation, the Preferred Alternative would result in both severe and moderate noise impacts at multiple residences

It is predicted that all of the severe noise impacts would be mitigated by implementing Quiet Zones to eliminate train horn noise at selected crossings.

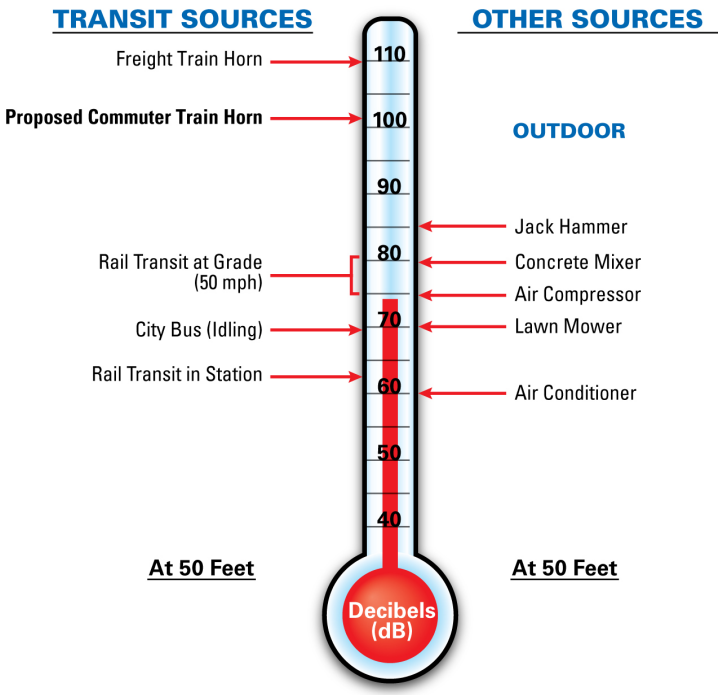
and institutional uses (museums, hospitals, day care centers, etc.) along the Northwest Rail (NWR) Corridor. The summary of severe and moderate impacts is provided in Table ES-8 below. The noise analysis accounted for all 11 stations that are part of the Preferred Alternative. However, because only seven of these stations are currently funded though the FasTracks program, the analysis also examined a scenario with only the seven funded stations for comparison.

TABLE ES-8. SUMMARY OF NOISE IMPACTS (WITHOUT MITIGATION)

		Preferred Alternative FasTracks Only (7 stations)		Preferred Alternative All Stations (11 stations)	
		2015	2035	2015	2035
Severe	Residential	538	723	583	828
	Institutional	8	9	8	9
Total Severe		**546**	**732**	**591**	**837**
Moderate	Residential	1,271	1,505	1,380	1,518
	Institutional	4	3	4	3
Total Moderate		**1,275**	**1,508**	**1,384**	**1,521**

Source: NWR Corridor Project Team, 2009.

It is predicted that all of the severe noise impacts would be mitigated (under either station scenario) by implementing Quiet Zones to eliminate train horn noise at select crossings between West 64th Avenue to State Highway (SH) 119. A Quiet Zone is an area where crossings of the rail line include sufficient safety mechanisms, so that trains are no longer required to sound their horns when crossing. Quiet Zones need to be implemented by local government through approvals from the Public Utilities Commission (PUC), Federal Railroad Administration (FRA), and the railroads. RTD is committed to assisting jurisdictions in the Quiet Zone application, but cannot itself submit the application to implement a Quiet Zone. Because implementation of Quiet Zones would eliminate horn noise from existing freight train operations (as well as from future commuter rail operations), the total horn noise exposure along the Quiet Zone would be significantly reduced from current conditions. Additionally, the Quiet Zone would be supplemented by noise barriers at three locations along the NWR Corridor.



It is expected that residual moderate noise impacts would remain in 2035 following the implementation of the Quiet Zone and noise barrier mitigation measures. However, the residual moderate impacts in 2035 would be limited to 235 residences for the all-stations scenario and to 89 residences for the FasTracks-only scenario. Moderate noise impacts in 2035 would also remain at four institutional uses under both the station scenarios.

Vibration

Vibration is a fine movement or low rumble that is radiated through the ground and is felt in the motion of room surfaces. The FTA impact criteria for a General Vibration Assessment are based on land use and train frequency and vibration impacts that exceed FTA criteria are considered to be significant and to warrant mitigation, if reasonable and feasible. Like the noise analysis, the vibration analysis also included a FasTracks-only scenario with 7 stations and an all-stations scenario with 11 stations.

Potential vibration impacts from NWR commuter trains in both opening year and 2035 are projected at 113 residences (for the FasTracks-only scenario) and 144 residences (for the all-stations scenario). The greater number of impacts for the all-stations scenario reflects higher speeds between stations needed to offset the delays from added station stops. In addition to the residential impacts, vibration impacts are projected at one school, one hotel and two day care facilities for both scenarios in both opening year and 2035.

Based on the current analysis, it is expected that the relocation or use of special hardware for selected turnouts could eliminate vibration impacts at 30 residences and three institutional uses. For the remainder of the impacts, the feasibility of track vibration isolation treatments would need to be investigated. The current General Vibration Assessment is likely to be somewhat conservative. A Detailed Vibration Analysis will be carried out to refine the impact assessment and mitigation recommendations during final design.

Wetlands and Other Waters of U.S.

Throughout the NWR EE process, the footprint of the Preferred Alternative was refined to avoid and/ or minimize impacts to wetlands.

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) (33 Code of Federal Regulations [CFR] 328.3, 1986) and the US Environmental Protection Agency (40 CFR 230.3, 1980) as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” The protection of these areas is critical for maintaining the physical, chemical, and biological integrity of the waters within the United States.

The USACE 404(b)(1) permitting process requires the consideration of all jurisdictional (J) wetlands and other water features impacted, including temporary construction impacts. As a result, the USACE considers a total of 4.82 J acres of wetlands and other water features to be impacted by the Preferred Alternative. Phase 1 of the Preferred Alternative is

Left Hand Creek

considered by the USACE to impact 0.22 J acre of wetlands and other water features. A Nationwide Permit would be required for Phase 1 of this project and was issued by the USACE on 1 April 2010. An Individual Permit would be required for the remainder of this project, per Section 404 of the Clean Water Act.

Also per Section 404 of the Clean Water Act, impacts to wetlands and other water features must be avoided, minimized, or mitigated (in order of preference). Throughout the NWR EE process, the footprint of the Preferred Alternative was refined to avoid and/or minimize impacts to wetlands. All impacted wetlands and other water features will be mitigated in accordance with current USACE mitigation policies and in accordance with the USACE Section 404 Permit. In addition, all mitigation plans will be developed in coordination with the USACE and other appropriate agencies during the Section 404 permitting process. USACE requires mitigation for all impacts to jurisdictional wetlands and other water features, and focuses on maintaining existing levels of function. However, RTD policy requires 1:1 mitigation for all impacts, either jurisdictional or non-jurisdictional. All mitigation for the wetlands along the proposed alignment would be mitigated in accordance with USACE, RTD and local policies.

For the NWR EE process, wetlands and other water feature impacts, along with riparian buffers are categorized in terms of two categories: (1) direct and permanent; and (2) temporary construction. They are presented below.

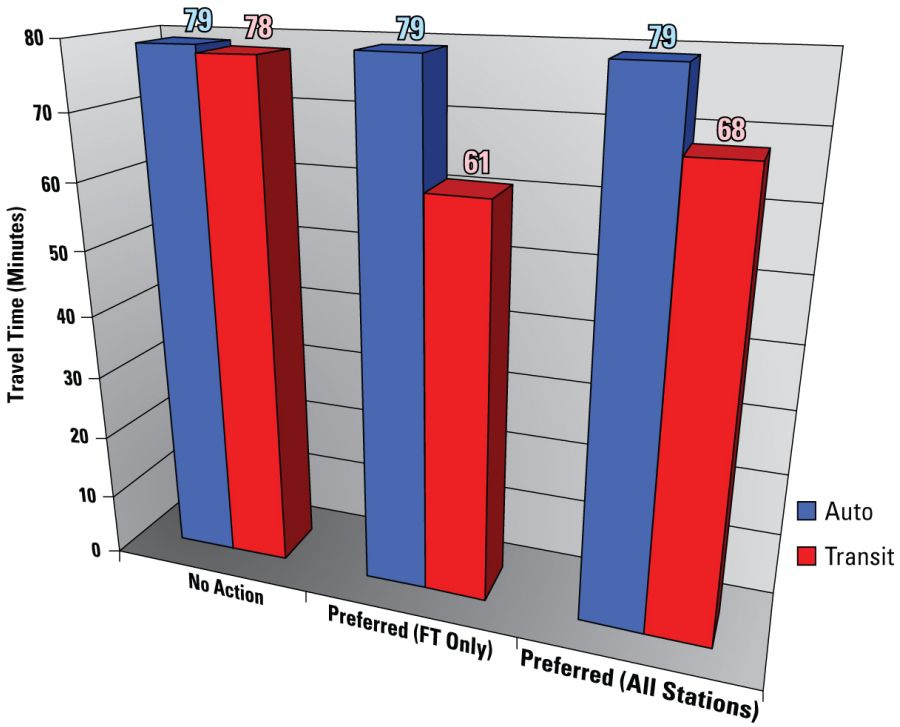
Related to the EE process, the Preferred Alternative would result in the direct, permanent impact of 6.15 acres (3.35 J and 2.80 non-jurisdictional [NJ]) of wetlands in the project study area. In addition, the project would result in direct permanent impact to 1.25 acres (0.78 J and 0.47 NJ) of other water features and 2.37 acres of impact to riparian buffers (an important consideration related to water quality). Jurisdictional waters of the United States are coastal waters, rivers, streams, lakes and other waters the Clean Water Act identifies as requiring a permit from the U.S. Army Corps of Engineers before dredged or fill materials can be put into them. Therefore, the Preferred Alternative would have a permanent impact on 4.13 J acres of wetlands and other waters of the United States. Construction of the Preferred Alternative would result in temporary impacts to 0.69 J acre of wetlands and other waters of the United States. It was determined that no impacts to waters of the US would result along the NWR Corridor Project between DUS and Pecos Street.

Jurisdictional waters of the United States are coastal waters, rivers, streams, lakes and other waters the Clean Water Act identifies as requiring a permit from the U.S. Army Corps of Engineers before dredged or fill materials can be put into them.

For Phase 1 a total of 0.05 J acre of wetlands and 0.06 J acre of other water features would be impacted by the Preferred Alternative. In addition, temporary construction impacts would occur to 0.11 J acre of other water features.

ES.6 TRANSPORTATION IMPACTS

This section summarizes how the Preferred Alternative would affect future transit, roadways, freight rail, bicycle and pedestrian facilities, and parking in the NWR Corridor Project study area. The picture below indicates the travel time savings for NWR users in the early morning rush hour.



2035 A.M. Peak Hour Travel Times (Longmont to DUS)

The following summarizes the primary mobility improvements and benefits of the Preferred Alternative that address the NWR Project Purpose and Need.

ES.6.1 What transit benefits would the Preferred Alternative provide?

The Preferred Alternative would provide new high-capacity commuter rail service to areas in the NWR Corridor generally along US 36 and SH 119 and meet the Purpose and Need of the project. Such service would enhance regional connectivity and reinforce regional transit plans.

Location of Proposed Downtown Longmont Station

The Preferred Alternative would provide a reliable transit option to congested roadway travel and offer improved travel times. Estimated transit travel time in the early morning peak hour in 2035 for the Preferred Alternative from the Downtown Longmont Station at 1st Avenue/Terry Street to DUS is 61 minutes with FasTracks-only stations and 68 minutes with all stations. The projected auto travel time from 1st Avenue/Terry Street in Downtown Longmont to DUS is 79 minutes along I-25 in general travel lanes.

The assumed bus operations for the Preferred Alternative would be the same as for the No Action Alternative except that service on the BOLT would be reduced so as not to compete with the new NWR Corridor rail line, and the S route would be eliminated. Existing bus routes would be routed to provide service to the proposed commuter rail stations.

Estimated transit travel time in the early morning peak hour in 2035 for the Preferred Alternative from the Downtown Longmont Station to DUS is 61 to 68 minutes while projected auto travel time is 79 minutes along I-25 in general travel lanes.

The Preferred Alternative would serve between 8,400 and 12,100 rail riders daily.

The Preferred Alternative would provide service to 8,400 rail riders under the funded FasTracks program scenario and 12,100 riders including the unfunded stations during an average weekday in 2035.

ES.6.2 How will the improvements affect existing roadways in the study area?

The Preferred Alternative would reduce regional VMT by approximately 4,710 miles per day. Implementation of the NWR Corridor would have impacts on local roadways as a result of ridership and associated parking demand. The EE forecast those impacts and made recommendations on mitigation measures for them.

The following summarizes the mitigation required for station areas.

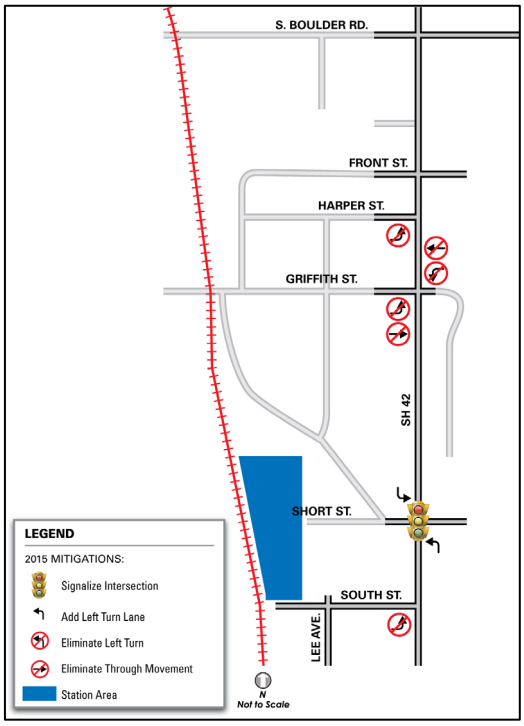
- South Westminster/71st Avenue: The station access intersection at Federal Boulevard would be signalized (2015). The southbound right turn lane will be converted into a shared through/right lane at the Federal Boulevard/70th Avenue intersection (by 2035). At the Federal Boulevard/71st Avenue intersection, the left turn from eastbound 71st Avenue to northbound Federal Boulevard will be prohibited (by 2035).

Diagonal Highway

- Westminster Mall/88th Avenue: A westbound left turn lane will be added at the Harlan Street /Mall Access intersection (2015).

- Broomfield/116th Avenue: The Teller Street/120th Avenue intersection will be signalized (2015).

- Downtown Louisville: No project specific mitigation is required for the Downtown Louisville Station if the proposed improvements along SH 42[1] are constructed prior to the construction of the station. If the SH 42 improvements are not made prior to the construction of the station, the following mitigation measures will be made. Each mitigation is consistent with the recommendations in the *State Highway 42 Traffic & Access Study* (City of Louisville 2007).



Downtown Louisville Station Mitigations

  - Harper Street/SH 42: The eastbound left turn would be eliminated (2015).
  - Griffith Street/SH 42: The eastbound and westbound left turns, as well as the through movements would be eliminated (2015).
  - Short Street/SH 42: Northbound and southbound left turn lanes will be striped onto the existing pavement at Short Street. The east leg of the intersection will be constructed and the intersection is proposed to be signalized (2015).

[1] Proposed improvements are detailed in the State Highway 42 Traffic and Access Study (February 9, 2007)

- South Street/SH 42: The eastbound left turn would be eliminated (2015).

- East Boulder: The West access/Arapahoe Avenue intersection will have left turns prohibited from minor streets (2015), and the East access/Arapahoe Avenue intersection will be signalized (2015). A northbound right turn lane will be added to the intersection of Westview Drive/Arapahoe Avenue (2015).

Boulder Transit Village

- Boulder Transit Village: The 30th Street/Bluff Street intersection will be signalized (2015).

- Downtown Longmont: The Main Street/Boston Avenue intersection will be signalized (2015). An eastbound left turn lane on Boston Avenue would be added at the Pratt Parkway/Boston Avenue intersection in 2015, and by 2035 that intersection will be signalized.

ES.6.3 What railroad/roadway crossing improvements would be made?

Railroad Crossing Improvements

The majority of improvements to at-grade crossings under the Preferred Alternative include providing either dual gates with a raised median or quad gates (gates on all lanes to provide full closure), if the crossing does not already have these elements installed. See below for more details on improvements at railroad crossings.

At-Grade Crossing Roadway Improvements

The following summarizes the mitigation required for at-grade roadway crossings of the railroad in the year 2035:

West 72nd Avenue and Bradburn Boulevard

- Add a left turn lane with 150 feet of storage to the southbound approach of Bradburn Boulevard at 72nd Avenue. The approach would consist of one left turn lane and one shared left/right turn lane.

- Widen 72nd Avenue east of Bradburn Boulevard to six lanes by adding one westbound right turn lane and converting the two-way left-turn lane (TWLTL) to a westbound through lane. The widened segment of 72nd Avenue would consist of three westbound through lanes, a westbound right turn lane and two eastbound through lanes east of Bradburn Boulevard.

- Widen 72nd Avenue between Bradburn Boulevard and Raleigh Street to six lanes, adding one westbound through lane and one eastbound left-turn lane. The TWLTL

would be converted into a westbound left turn lane. The widened segment of 72nd Avenue would consist of two westbound through lanes, one westbound left-turn lane, two eastbound through lanes and one eastbound left turn lane.

- Change the westbound left turn signal phase of the 72nd Avenue/Raleigh Street intersection from permissive only, to protected/permissive.

- Interconnect all signals, including the four on 72nd Avenue and one on Bradburn Boulevard, into one coordinated signal system. Optimize the signal timing to reduce overall corridor delay and queue lengths.

- The widening of roadways and addition of new pavement in the mitigations would require property acquisition. Specific locations of acquisition would be identified during the design process of proposed mitigations.

South Boulder Road

Mitigations tested would not completely eliminate the traffic queues on South Boulder Road in both directions between the rail crossing and Centennial Drive. It is expected that railroad priority or preemption controls would likely be effective in eliminating the problem; however, the standard software used for analyzing FasTracks corridor traffic impacts is not sophisticated enough to test such signal controls. It is therefore recommended a more detailed study be undertaken at this location using more sophisticated software to perform further study of railroad priority/preemptions controls. If such controls prove to be ineffective, corridor capacity improvements along South Boulder road should be evaluated.

Niwot Road and 2nd Avenue

- Construct an additional through lane approximately 500 feet in length along northbound Diagonal Highway approaching Niwot Road.

- Construct an additional lane along northbound Diagonal Highway between Niwot Road and 2nd Avenue (approximately 1,000 feet). The additional lane would become a right turn lane at 2nd Avenue.

- Re-stripe westbound Niwot Road between the railroad crossing and northbound Diagonal Highway to provide a though lane and a shared through/right turn lane.

- Interconnect all four signals to operate at one coordinated system and optimize the signal system.

- The widening of roadways and addition of new pavement in the mitigations would require property acquisition. Specific locations of acquisition would be identified during the design process of proposed mitigations.

Mineral Road (SH 52)

In the DRCOG 2035 Metro Vision Regional Transportation Plan, CDOT has identified an interchange construction project at the Mineral Road (SH 52) and Diagonal Highway (SH 119) intersection. The proposed interchange includes a grade-separation of SH 52 and SH

119. However, funding for the interchange has not been fully identified. In the absence of the interchange project moving forward, potential mitigation measures for the interim at-grade condition were studied.

- Eastbound approach on Mineral Road (SH 52): Construct a second left turn lane with 300 feet of storage, and a second through lane. The widened approach would consist of two left turn lanes, two through lanes and one right turn lane. These improvements would require the widening of pavement for this approach. The second through lane would extend across Diagonal Highway (SH 119) and the rail crossing and would become a right turn lane at the intersection of Mineral Road/71st Street.

- Westbound approach on Mineral Road (SH 52): Construct a second left turn lane, a second through lane and a right turn lane. The widened approach would consist of two left turn lanes, two through lanes and a right turn lane.

- Northbound approach on Diagonal Highway (SH 119): Construct two additional through lanes. The widened approach would consist of two left turn lanes, four through lanes, and one right turn lane. The four through lanes would extend through the Mineral Road intersection. The additional lanes would end a maximum of 1,000 feet north of the intersection, with only two lanes continuing north along Diagonal Highway.

- Southbound approach on Diagonal Highway (SH 119): Construct one additional left turn lane with 300 feet of storage and two additional through lanes. The widened approach would consist of two left turn lanes, four through lanes and one right turn lane. The four through lanes would extend through the Mineral Road intersection. The additional lanes would end a maximum of 1,000 feet south of the intersection, with only two lanes continuing south along Diagonal Highway.

- Optimize the signal system.

- The traffic signal should be coordinated with the Mineral Road rail crossing.

These extensive intersection improvements proved insufficient in eliminating queue spillbacks between the intersection of SH 52/SH 119 and the railroad crossing. RTD will work with CDOT to identify funding possibilities for implementing CDOT's proposed interchange project.

ES.6.4 What parking would be provided?

As a result of the Preferred Alternative, parking will be provided at stations as indicated in Table ES-9.

TABLE ES-9. PREFERRED ALTERNATIVE STATION AREA PARKING IN 2015 AND 2035

Station	Opening Day 2015 Parking Spaces[1]	Parking Spaces Added by 2035	Total 2035 Parking Spaces
Funded Stations			
South Westminster/71st Avenue	925	0	925 surface spaces
Walnut Creek[2]	240	0	240 surface spaces
FlatIron	264	0	264 surface spaces
Downtown Louisville[4]	425	0	425 surface spaces
Boulder Transit Village	290	0	290 surface spaces
Gunbarrel	230	0	230 surface spaces
Downtown Longmont	590	435	1,025 surface spaces
Funded Subtotal	**2,964**	**435**	**3,399 surface spaces**
Unfunded Stations			
Westminster/88th Avenue[3]	1,055	0	1,055 surface spaces
Broomfield/116th Avenue	350	0	350 surface spaces
East Boulder	530	0	530 surface spaces
Twin Peaks[3]	100	250	350 surface spaces
Unfunded Subtotal	**2,035**	**250**	**2,285 surface spaces**
Corridor Total	**4,999**	**685**	**5,684 surface spaces**

Source: NWR Corridor Project Team, 2009.
Notes:
[1]Number of spaces represents average of FasTracks targets in concept plans.
[2]The Walnut Creek Station is a joint NWR/US 36 BRT station; the parking spaces shown here are for the NWR Corridor Project (not US 36 BRT)
[3]Twin Peaks and Westminster/88th Avenue stations are expected to have shared parking with the redeveloped mall adjacent to each station —no RTD-funded/managed spaces.
[4] The use of parking at the Louisville Sports Complex is dependent on an agreement between Louisville, Lafayette, and Boulder County.
US 36 BRT = United States Highway 36 Bus Rapid Transit
RTD = Regional Transportation District

ES.6.5 What are the impacts to freight operations?

The Preferred Alternative would allow for shared use of tracks for freight rail operations. It is estimated that there would be negligible effects on freight rail operations. There would be no at-grade crossings (rail to rail) of freight tracks. Details of impacts to freight operations will be further defined once RTD and BNSF have final negotiations for the operations agreement.

ES.6.6 How will bicyclists and pedestrians access the rail?

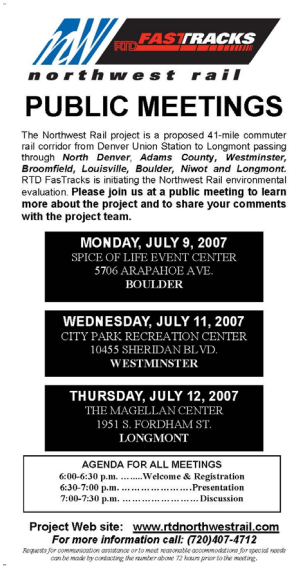
Connectivity between stations and bicycle and pedestrian facilities is essential to providing multi-modal connectivity at station locations. The Preferred Alternative would not permanently impact existing pedestrian and bicycle facilities and would not preclude the development of planned pedestrian and bicycle facilities in the vicinity of the proposed alignment and stations. Some trails may be temporarily impacted due to construction, but would be mitigated by providing temporary detours. Any necessary detours and closures

would be coordinated with the appropriate jurisdictions. Detours which have been agreed to as of February, 2010 appear in Appendix C, Agency and Public Coordination.

ES.7 COORDINATION, CONSULTATION, AND COMMENTS

ES.7.1 How has the public been involved with this project?

Between 2007 and 2010 an extensive public involvement program has been conducted for the NWR Corridor Project to engage the public and stakeholders in an exchange that would be both informative and solicit comments. More details on the public involvement process and its history are provided in Chapter 5, Public Comment and Agency Coordination.


PUBLIC MEETINGS

The Northwest Rail project is a proposed 41-mile commuter rail corridor from Denver Union Station to Longmont passing through *North Denver, Adams County, Westminster, Broomfield, Louisville, Boulder, Niwot and Longmont.* RTD FasTracks is initiating the Northwest Rail environmental evaluation. **Please join us at a public meeting to learn more about the project and to share your comments with the project team.**

MONDAY, JULY 9, 2007
SPICE OF LIFE EVENT CENTER
5706 ARAPAHOE AVE.
BOULDER

WEDNESDAY, JULY 11, 2007
CITY PARK RECREATION CENTER
10455 SHERIDAN BLVD.
WESTMINSTER

THURSDAY, JULY 12, 2007
THE MAGELLAN CENTER
1951 S. FORDHAM ST.
LONGMONT

AGENDA FOR ALL MEETINGS
6:00-6:30 p.m. .....Welcome & Registration
6:30-7:00 p.m. .....Presentation
7:00-7:30 p.m. .....Discussion

Project Web site: www.rtdnorthwestrail.com
For more information call: (720)407-4712

NWR Public Meeting Newspaper Ad

The public involvement for the NWR Corridor EE built on the recommendations from previous studies to implement commuter rail along the BNSF Railway Company alignment between Denver and Longmont. The NWR Corridor EE public involvement focused on five key project milestones which included:

Milestone #1: Project Initiation
Milestone #2: Commuter Rail Vehicle Technology
Milestone #3: Special Issues – Station Planning, Fencing, and Noise/Quiet Zones
Milestone #4: Preferred Alternative, Impacts, and Mitigation
Milestone #5: Review of Draft NWR Corridor EE

During the NWR Corridor EE process numerous pieces of informational materials were distributed to keep the public informed of project progress starting in June 2007. Materials distributed included newspaper ads, radio announcements, flyers, meeting invitations and newsletters. Materials were distributed in both hard copy and electronic format (via e-mail).

Formal project initiation (Milestone #1) occurred with a series of public meetings that were held in July 2007 in Boulder, Westminster and Longmont. There were 372 individuals that attended these meetings.


July 2007 Open House at NWR Corridor Project Kick-off Meeting

A second series of public meetings (Milestone #2) occurred in September 2007 held in Broomfield, Denver and Gunbarrel/Boulder that reinitiated evaluation of commuter rail vehicle technology and solicited input regarding the evaluation.

In addition, several other public involvement activities were conducted with smaller groups of stakeholders to address specific concerns (Milestone #3). For example, meetings were held that focused on station planning, fencing, and

noise/Quiet Zones. A total of over 30 small group public outreach meetings were conducted between July 2007 and April 2010.

Prior to the NWR Corridor Draft EE being released, the NWR Governments Team (NWR GT) and regulatory agencies were afforded an opportunity to comment on the impacts and mitigation measures proposed to address impacts associated with the Preferred Alternative (Milestone #4).

Following the release of the Draft EE, corridor-wide public meetings and associated small group outreach meetings occurred to present the Draft EE to the public including the results of the impacts and analysis and proposed mitigations, and to collect input from members of the public on the document (Milestone #5).

Extensive public outreach was also conducted to engage environmental justice communities (minority and/or low income populations). Project publicity materials were distributed in both Spanish and English. Numerous meetings with Spanish speaking groups and Spanish radio announcements and interviews were broadcast. A total of over 90 outreach efforts with environmental justice communities and groups were conducted between September 2007 and November 2009. These efforts included one-on-one meetings, small and large group meetings, flyer distributions, television and radio programs, and information tables at fairs.

ES.7.2 How have agencies been involved?

Numerous agencies have been involved during the NWR Corridor EE process. Three primary groups of agencies involved include:

- State and Federal Resource and Regulatory Agencies
- NWR Governments Team (NWR GT)
- NWR Fencing Committee

State and Federal Resource and Regulatory Agencies: In keeping with the intent of the Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU), RTD proactively coordinated with state and federal resource and regulatory agencies. Agency involvement occurred to identify any issues of concern regarding the project's potential social, environmental, or community impacts or any issues that could substantially delay or prevent an agency from granting a permit or other approval needed for the project.

To date, a total of three meetings occurred with the state, federal and regulatory agencies during the NWR Corridor EE process, between July 2007 and September 2009.

NWR Governments Team (NWR GT): The NWR GT consists of elected officials and technical staff representatives from NWR Corridor communities. It also includes members representing other neighboring communities, local, state and federal agencies, and community organizations. The NWR GT serves several functions, including the identification of project-related issues requiring further study, the provision of input into study recommendations and technical analyses, and consideration of public input. Overall, the NWR GT provides an important mechanism for communicating the interests, concerns, and

ideas of the communities along the NWR Corridor to the Project Team and RTD decision makers.

For major milestones, the NWR Corridor Project Team took the following approach to ensure that local government input informed RTD decision making in a timely and relevant manner:

- First, the Project Team presented preliminary recommendations to the NWR GT.
- Then, corridor-wide workshops or stakeholder meetings were conducted to gather public input about the proposed recommendations.
- Finally, the Project Team returned to the NWR GT to either finalize or comment on the study recommendations before forwarding them to the RTD Board of Directors for consideration.

To date, a total of nine NWR GT meetings took place during the NWR Corridor EE process between July 2007 and September 2009. In addition, small group meetings were held with representatives from local jurisdictions for the purposes of information sharing on specific issues. Over 50 meetings (briefings and coordination) were conducted between July 2007 and September 2009.

NWR Fencing Committee: A subgroup of the NWR GT, the NWR Fencing Subcommittee, was formed to address major issues pertaining to RTD's fencing policy. A total of three Fencing Subcommittee meetings took place during the NWR Corridor EE process between May 2008 and March 2009.

ES.7.3 What issues or comments have been most common among the community?

Table ES-10 below highlights the comments received from the public and stakeholders during the NWR Corridor EE process. See Appendix G: Response to Comments for comments received during the formal comment period that occurred between 26 February 2010 and 29 March 2010.

TABLE ES-10. TOP PUBLIC COMMENT ISSUES FOR NORTHWEST RAIL CORRIDOR PROJECT

Issue	Description	Response
Noise /Mitigation Measures	Most comments in this category addressed concerns about elevated noise and vibration levels in their respective areas, and advocated for the appropriate mitigation measures to address noise. Many of these comments supported Quiet Zones as a mitigation measure.	The NWR Project Team conducted noise analysis to determine the significance of noise impacts throughout the corridor and proposed the appropriate mitigation strategies. These strategies were also coordinated with an overall RTD FasTracks programmatic effort to address noise.
Stations	Most comments indicated support for the station locations; some advocated for the inclusion of the un-funded stations; some identified specific impacts related to stations; and others requested station plans or other station related information.	The Project Team worked closely with the communities to develop and continuously refine station concept plans, which were ultimately supported by each of the NWR corridor jurisdictions.

TABLE ES-10. TOP PUBLIC COMMENT ISSUES FOR NORTHWEST RAIL CORRIDOR PROJECT

Issue	Description	Response
Cost/Funding	Many comments addressed the budget shortfall for funding the FasTracks program and how that related to Northwest Rail. Later in the project, comments focused on the programmatic decisions regarding how to pursue funding.	The Project Team periodically updated the public about RTD strategies for meeting funding challenges and how programmatic efforts related to Northwest Rail.
Project Schedule	Most comments in this category supported project completion and opening day in 2015.	The Project Team periodically updated the public about the project schedule and worked towards keeping the project on schedule.
Right-of-Way/ Property Impacts	Comments in this category addressed individual property impacts and requested responses related to specific properties along the corridor.	Project Team members continually communicated and met with property owners along the rail line to provide them with the most up-to-date information about how their properties would (or would not) be impacted.
Community Impacts	Many of these comments supported the benefits that this project will bring into their communities and for their families. Some questioned the need for the project and expressed concern for impacts that NWR may have (i.e. noise levels, property values, disrupting the current community way of life).	The Project Team presented the project at corridor-wide public meetings around the project kick-off, and subsequent milestones. Environmental and traffic impact analyses were conducted to determine the impacts and proposed mitigations for the project which were presented in the Draft EE. These impacts and proposed mitigations were communicated to the public and public comments are taken into consideration for the Final EE. Additionally, responses to comments received on the Draft EE have been provided in the Final EE.
Public Involvement	Most comments supported the public involvement process for the project. Many expressed support for frequent and substantive public communications.	Corridor-wide public meetings were held at major milestones to review project developments and elicit public comment. These meetings were held at project kick-off; technology selection; Gunbarrel Station site selection; stations, alignment, impacts/mitigations, and release of the Draft EE. Small group outreach meetings were conducted on an on-going basis throughout the study. Newsletters, email communications, and Web site postings were also provided on a regular basis to keep the public informed.
Vehicle Technology	Most comments in this category supported the selection of EMU technology over DMU for the commuter rail vehicles.	Public comment was summarized and provided to the RTD Board of Directors to be considered for their decision.
Community Preference	Most comments expressed general support for the project. Others expressed support for US 36 BRT over NWR rail service.	Public comment was solicited throughout the project and these comments were taken into consideration for RTD decision making.

TABLE ES-10. TOP PUBLIC COMMENT ISSUES FOR NORTHWEST RAIL CORRIDOR PROJECT

Issue	Description	Response
Transit Ridership	Some comments in this category expressed concern about the projected ridership numbers in relation to the project cost. Some comments indicated interest in riding Northwest Rail on a regular/daily basis and inquired about projected operating plans.	All comments were responded to by RTD to keep the public informed about the latest ridership projections and project costs. Those inquiring about operations information were responded to with the most up-to-date information.

Source: NWR Corridor Project Team, 2009.

ES.7.4 How can we provide effective input to RTD?

The Draft NWR Corridor EE was distributed to the public for review and comment on 26 February 2010. Announcements were provided via the various publicity material distribution methods including local newspaper ad, radio announcement, emails, flyers and postings on the project website. NWR Corridor Project public meetings occurred in March of 2010. Once the draft NWR Corridor EE was made available, a formal 30-day public comment period ensued. During this period a series of public meetings were conducted for the primary purpose of reviewing the NWR Corridor EE findings, including impacts and proposed mitigation, and gathering and recording public comments. At the public meetings, verbal comments were recorded. See Appendix G: Response to Comments, for the summaries of public meetings and a matrix compiling responses to comments received during the formal comment period that occurred between 26 February 2010 and 29 March 2010.

This Final EE will be made available to the public on the project Web site. Copies of the document will also be made available to the public at the following locations:

Denver

- Denver Public Library – Central Library
  10 West 14th Avenue Parkway
  Denver, CO 80204
- RTD FasTracks
  1560 Broadway, Suite 700
  Denver, CO 80202

Adams County

- Adams County Planning & Development
  12200 N Pecos Street
  Westminster, CO 80234

Westminster

- Westminster Public Library
  College Hill Branch
  3705 West 112th Avenue
  Westminster, CO 80031

Longmont

- Longmont Public Library
  409 4th Avenue
  Longmont, CO 80501

Louisville

- Louisville Public Library
  951 Spruce Street
  Louisville, CO 80027
- 36 Commuting Solutions
  287 Century Circle, Suite 103
  Louisville, CO 80027

Boulder

- City of Boulder Transportation & Planning
  1739 Broadway Blvd. 2nd Floor
  Boulder, CO 80306

Broomfield

- City and County of Broomfield
  Community Development
  1 DesCombes Drive
  Broomfield, CO 80021

Online

www.RTD-FasTracks.com

METHODS FOR THE PUBLIC TO KEEP INFORMED AND REMAIN INVOLVED

- Visit the RTD FasTracks Web site for the current information about the project
- Submit a comment by phone, email, mail or through the project Web site
- Request a meeting with your organization
- Call the RTD FasTracks information line

HOW YOU CAN CONTACT US

- Web site: www.RTD-FasTracks.com
- Email: nwrail@RTD-FasTracks.com
- Phone: (303) 299-2000
- Mail Comments to:

  RTD FasTracks Northwest Rail
  1560 Broadway, Suite 700
  Denver, CO 80202

ES.8 IMPACTS AND MITIGATION MEASURES

Table ES-11 provides a summary of impacts and mitigation measures described in greater detail in Chapter 3, Affected Environment and Environmental Consequences. The table is organized as follows:

Direct Impacts: Effects that occur immediately with implementation of the proposed action.

Direct impacts assocated with the Preferred Alternative are presented based on the following categories:

NWR Corridor Alignment – Impacts that would result from implementation of the track alignment north of the South Westminster/71st Station to Longmont.

Proposed Stations – Impacts that would result from implementation of the station platforms and associated park-n-Rides. Both funded and unfunded stations are included in the impact analysis. Impacts associated with the South Westminster/71st Station are included in Phase 1, because this station would be constructed as part of Phase 1.

Phase 1 – Impacts that would result from implementation of the project between DUS and the South Westminster/71st Street Station. Phase 1 would be constructed first, as part of RTD's Eagle P3 project.

Indirect Impacts: Impacts caused by the proposed action later in time or impacts further removed in distance but reasonably foreseeable. For example, transit-oriented development may develop over time near stations to serve the needs of transit commuters.

Temporary Construction Impacts: Temporary construction impacts have been included for consideration in this analysis. These impacts result from the actual construction of the proposed action and may include, but are not limited to, noise, dust, clearing and excavation, visual change, and traffic congestion from construction equipment.

Cumulative Impacts: Results of the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or organization undertakes those actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. See Appendix B, Programmatic Cumulative Effects Analysis, for more details.

Mitigation Measures: Describes mitigations that will be implemented to avoid, minimize, or compensate for impacts. Note that Phase 1 mitigations are called out separately.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Social Impacts and Community Facilities	
NWR Corridor Alignment and Proposed Stations Direct Impacts – With the combination of Quiet Zones and the noise barrier mitigation proposed, residual moderate noise impacts would remain at 235 residences and 4 institutional uses in 2035. – Preferred Alternative would provide a benefit to approximately 128,000 residents in neighborhoods within 0.5 mile of proposed transit stations by offering an alternative mode of transportation. – Preferred Alternative would benefit community services located within 0.25 mile of the proposed stations and serving populations with limited access to personal vehicles. – Preferred Alternative would require acquisition and relocation of the Boulder Emergency Squad, an emergency response organization that provides supplemental assistance to other emergency response providers and whose service area includes all of Boulder County.	– The Boulder Emergency Squad facility will be relocated in compliance with the Uniform Relocation Assistance and Real Property Act of 1970 (Public Law 91-646, 84 Stat.1894) as amended. To the greatest extent possible, the Boulder Emergency Squad will be relocated along a major arterial or highway to maintain easy access for responding to emergencies. – Refer to mitigations below for Land Acquisition, Displacements, and Relocation of Existing Uses, for additional information on relocation procedures. – Noise walls and quiet zones will be implemented to mitigate noise impacts and are described below for Noise and Vibration.
Phase 1 Direct Impacts – Implementation of Phase 1 would not require acquisition of community facilities. Phase 1 would not bisect residential areas along the alignment from DUS to South Westminster/71st Avenue Station. Two residual moderate level noise impacts would occur in the Adams Section.	– No mitigation required.
Preferred Alternative Indirect Impacts – Preferred Alternative could increase population density within 0.5 mile of proposed station areas due to TOD and higher density development. These changes are supported by local and regional plans.	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Temporary Construction Impacts – During the 5 year construction phase, neighborhoods would experience increased congestion and out-of-direction travel, dust, increased noise levels, and visual impacts due to construction materials storage and activities. – Harris Park Elementary school in Adams County would temporarily be affected by detours, the movement of construction materials and equipment, and increases in noise levels, vibration, and dust.	– Working with the communities, RTD will prepare a Construction Management Plan that specifies public communications and construction means and methods to reduce or mitigate the inconveniences of construction such as noise, dust, visual blight, construction traffic, and preservation of access to homes, businesses, and community facilities. – RTD will coordinate with impacted neighborhoods prior to and during construction activities. – Refer to mitigation for Transportation Systems – Refer to mitigation for Noise and Vibration – Refer to mitigation for Air Quality – Refer to mitigation for Visual and Aesthetic Qualities.
Preferred Alternative Cumulative Impacts – Preferred Alternative could encourage redevelopment opportunities surrounding the transit stations. In combination with other planned transportation improvement projects, the Preferred Alternative may promote compact development patterns, reducing the need for extensive infrastructure systems and reducing less efficient development patterns.	– No mitigation required.
Environmental Justice	
NWR Corridor Alignment and Proposed Stations Direct Impacts – The Preferred Alternative would not result in disproportionate impacts to minority or low-income populations in the project study area. Minority and low-income populations would benefit from the Preferred Alternative as a result of improved access to community facilities. – The Downtown Longmont station would require the acquisition of 15 low-income residences. Ten of these are associated with the Park Patio mobile	– Refer to mitigation for Land Acquisition, Displacement, and Relocations of Existing Uses below. – RTD will provide displaced low income and minority residents with an RTD EcoPass for a one year period.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
home park at 1st Avenue and Terry Street. This area is constrained by industrial uses and a historic property to the north, with limited opportunities for realignment.	
Phase 1 Direct Impacts – Phase 1 would not result in disproportionate impacts to minority or low-income communities. No residential properties would be acquired in this segment. Adjacent neighborhoods would not be further divided. Project effects would not exceed those of the general population.	– No mitigation required.
Preferred Alternative Indirect Impacts – With access to the FasTracks system, connections between communities would be strengthened. – Proximity to mass transit stations may increase the desirability of adjacent property. This may affect minority and low-income residents near the proposed Downtown Longmont and Boulder Transit Village stations.	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Temporary Construction Impacts – Construction in minority and/or low-income areas could result in increased noise, visual effects, and traffic congestion. However, these impacts would not exceed those experienced by the general population within the NWR project study area.	– No mitigation is required.
Preferred Alternative Cumulative Impacts – With additional opportunities for TOD, the Preferred Alternative may be able to accommodate regional demand for affordable housing more efficiently than the No Action Alternative. – Preferred Alternative would provide additional transportation options throughout the NWR project study area and would moderately improve the mobility of minority, low-income, and traditional transit users to access to the rest of the RTD system.	– No mitigation required.
Land Use/Zoning	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Preferred Alternative would include conversion of existing land uses to rail facilities where ROW is currently constrained, particularly at proposed stations. – Development of the proposed alignment is compatible with all adopted land use and transportation plans, and planned future land uses.	– No mitigation required.
Phase 1 Direct Impacts – Phase 1 would include conversion of existing land uses for ROW expansion, particularly at the South Westminster/71st Avenue Station. – Development of Phase 1 would be compatible with all adopted land use and	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
transportation plans.	
Preferred Alternative Indirect Impacts – Preferred Alternative would result in higher density residential and/or commercial development within a 0.25-mile radius of proposed stations.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Land use policies and planning would be unaffected by the construction activities associated with the Preferred Alternative.	– No mitigation required.
Preferred Alternative Cumulative Impacts – Residential and commercial growth in the proximity of the proposed stations would limit the need to drive, improve localized air quality, could limit the consumption of undeveloped land, and require compact infrastructure.	– No mitigation required.
Farmlands	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Preferred Alternative would impact 4.0 acres of farmland (3.6 acres of prime farmland and 0.4 acre of farmland of statewide importance) along the alignment due to need for acquisition of small slivers of land adjacent to existing BNSF Railway Company ROW in the Broomfield, Boulder and Longmont sections. – No permanent loss of access to farmland or isolation of portions of active farm properties would result from the Preferred Alternative.	– Mitigation will be provided to agricultural properties, consistent with the ROW policies described in Section 3.3, Land Acquisition, Displacements, and Relocation of Existing Uses. – Existing, legal access to farm properties will remain available during and after construction. Typically, access rights are demonstrated by easements, license agreements, or other legal permits, etc.
Phase 1 Direct Impacts – No impacts to farmlands would occur as a result of Phase 1, because there is no farmland located within 1,000 feet of the project impact area.	– Same mitigation proposed for direct impacts.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Indirect Impacts – Approximately 229 acres of farmland (46 acres of farmland classified as prime if irrigated, and 183 acres of farmland of statewide importance) surround the Flatiron, East Boulder, and Gunbarrel station sites. Land surrounding these sites is primarily protected as open space and is not currently being used for agricultural purposes. New development around these stations would be limited by current regulations and plans that protect these lands from development.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Construction of the Preferred Alternative would temporarily impact 5.8 acres of farmlands (increase in traffic, noise, dust and need for temporary easements) but not impair the agricultural productivity of the area or the potential for agricultural activities in the future.	– All irrigation pipes and ditches will be replaced in-kind – Irrigation will not be interrupted during construction. – Mitigation will be provided to agricultural properties, consistent with the ROW policies described in Section 3.3, Land Acquisition, Displacements, and Relocation of Existing Uses. – Existing, legal access to farm properties will remain available during and after construction. Typically, access rights are demonstrated by easements, license agreements, or other legal permits, etc.
Preferred Alternative Cumulative Impacts – Preferred Alternative could result in increased densities around proposed stations, possibly delaying development of existing farmland in the fringes of local jurisdictions. By reducing the conversion of important farmlands, the Preferred Alternative could result in fewer cumulative impacts. Future development would be restricted in areas protected as open space.	– No mitigation required.
Economic Considerations	
NWR Corridor Alignment and Proposed Stations Direct Impacts	– Refer to mitigation for Land Acquisition, Displacements, and Relocation of Existing Uses.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– The NWR Corridor Alignment would require acquisition of 12.77 acres of private property that would result in a loss of $40,836 in property tax revenues each year. No business or employee relocations would be required. – Proposed station sites would require acquisition of approximately 72.99 acres of private property, resulting in the relocation of 69 businesses and 249 employees. An estimated loss of $706,190 in annual property tax revenues is anticipated.	
Phase 1 Direct Impacts – Phase 1 would require an acquisition of 48.64 acres (36.41 acres for the alignment and 12.23 acres for the station), resulting in the relocation of seven businesses and approximately 229 employees. These acquisitions would potentially result in an annual property tax revenue loss of $293,200.	– Refer to mitigation for Land Acquisition, Displacements, and Relocation of Existing Uses.
Preferred Alternative Indirect Impacts – Anticipated development surrounding stations may offset property tax impacts and create a net growth in the tax base and revenues by 2035. – Number and variety of businesses and employment opportunities could be likely to increase around proposed stations. – Approximately 369 jobs would be created for maintenance and operation of the Preferred Alternative.	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Temporary Construction Impacts – Direct construction jobs: 5,764 jobs over the 5-year construction period, or approximately 1,153 jobs per year – Jobs created indirectly by construction: 1,460 jobs – Construction activities would temporarily inconvenience shoppers and affect businesses along the proposed alignment with noise, traffic, and visual degradation. – Some businesses would temporarily experience restricted access during construction.	– Create Construction Management Plans and work with local communities and businesses. – Provide clear signage and directions for alternate access. – Coordinate with local groups, business districts, and jurisdictions using a variety of media (for example radio, flyers, advertisements, and Web Site), where appropriate. – Provide temporary access during normal business hours, where possible. – Ensure contractors obtain all necessary local permits. – Develop traffic maintenance plans to maintain access and circulation. – Refer to mitigation for Visual and Aesthetic Qualities. – Refer to mitigation for Air Quality. – Refer to mitigation for Noise and Vibration. – Refer to mitigation for Transportation Systems.
Preferred Alternative Cumulative Impacts – FasTracks is expected to save individuals $210 annually in 2030, as compared to the cost of congestion without FasTracks (RTD, 2007). – Construction of FasTracks would result in additional employment and economic activity. For every dollar spent on construction capital costs, more than 2 dollars of additional economic activity would be generated in the Denver region. In addition, every dollar spent on capital costs would translate directly into $0.72 in new wages and salary for jobs outside the construction field. Furthermore, for every 1,000 workers hired for the operation of FasTracks, 1,533 jobs would be in industries not involved in FasTracks (RTD 2007).	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Land Acquisitions, Displacements and Relocations of Existing Uses	
NWR Corridor Alignment and Proposed Stations Direct Impacts – NWR Corridor alignment would require the acquisition of 12.77 acres of private property. This excludes BNSF Railway Company ROW. No businesses or residences would be relocated as a result of the proposed alignment. – Proposed station sites would require acquisition of approximately 72.99 acres of private property, resulting in relocation of 16 residences and 69 businesses. – The Downtown Longmont Station would result in the relocation of 15 residences. Ten of these 15 residences are located in the Park Patio mobile home park. The one other residential relocation, of the 16 total residences, would occur at the Broomfield/116th Avenue Station. – The businesses impacted by proposed stations range from offices and retail/commercial businesses to larger warehouse and manufacturing operations.	– **Acquisition.** The acquisition of real property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act) and the Fifth Amendment of the United States Constitution. The Uniform Act applies to all acquisitions of real property or displacements of people resulting from federal or federally assisted programs or projects. – All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in property, including a written offer letter of just compensation specifically describing those property interests. – **Relocation Analysis.** RTD will prepare a relocation analysis to enable relocation activities to be planned in such a manner that the problems associated with the displacement of property are recognized and solutions are developed to minimize the adverse impacts of displacement. The Relocation Study will estimate the number, type, and size of businesses to be displaced and the approximate number of employees that may be affected; and consider any special advisory services that may be necessary from RTD and other cooperating agencies. – **Relocation Assistance Advisory Services**. Relocation assistance will include determining the relocation needs and preferences of each property to be displaced and explaining the relocation payments and other assistance for which each owner or tenant is eligible; providing current and continuing information on the availability, purchase prices, and rental costs of comparable replacement properties, and other programs administered by the Small Business Administration and other federal, state, and local programs offering

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	assistance to displaced businesses. – **Payments**. The relocation payments provided to displaced businesses are determined by federal eligibility guidelines.
Phase 1 Direct Impacts – Phase 1 would result in acquisition of 48.64 acres (36.41 acres for the alignment and 12.23 acres for the station). Acquisitions would result in relocation of seven businesses.	– Mitigation for Phase 1 will be the same as those measures identified for the direct impacts above.
Preferred Alternative Indirect Impacts – Property acquisitions would indirectly result in job losses as discussed under Economic Considerations.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Temporary construction impacts are related to the temporary easements that would be needed from 162 parcels on approximately 22.7 acres to build the Preferred Alternative. The needs for easements would be greatest in the Louisville, Boulder, and Longmont sections.	– No mitigation required.
Preferred Alternative Cumulative Impacts – Property acquisition required for the Preferred Alternative would be additive to the property required for the roadway and transit projects included in the No Action Alternative, plus the additional land needed for new public infrastructure to serve the 2035 population in the NWR project study area, estimated at approximately 1,800 acres. As described under the No Action Alternative, up to 31,000 acres would be required for public infrastructure to accommodate the 2035 population estimated for the Denver metropolitan area and up to 5,800 acres would be required for public infrastructure to	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
accommodate the 2035 population of the North Front Range metropolitan area.	
Historic, Archaeological, and Cultural Resources	
NWR Corridor Alignment and Proposed Stations Direct Impacts – There are no known direct impacts to National Register of Historic Places (NRHP)-eligible or –listed archaeological resources from the Preferred Alternative. – The NWR Corridor Alignment would impact 16 NRHP-eligible or –listed resources, none of which result in a finding of Adverse Effect. – There is one direct impact related to Proposed Stations. – Impacts to these resources result in a finding of No Adverse Effect.	– No mitigation would be required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Phase 1 Direct Impacts – Phase 1 results in directly impacting six NRHP-eligible or –listed resources. Impacts to these resources result in a finding of No Adverse Effect.	– No mitigation is required.
Preferred Alternative, Indirect, Temporary Construction, and Cumulative Impacts – There are no known indirect, temporary construction, or cumulative impacts to NRHP-eligible or -listed archaeological resources from the Preferred Alternative. – Historic properties within the Area of Potential Effect (APE) would be subject to indirect impacts due to noise or visual change and include: The Bowles House Museum and the Oleson House in the Adams Section under Phase 1; and the La Salla-Wilson House, the Stolmes House, Mrs. Downer's Cabins (2 properties), and the Steinbaugh-Murgallis House in the Louisville Section. No Adverse Effects would result from noise impacts and/or visual changes. – Temporary impacts due to the noise, air quality, visual, and traffic- diverting effects of construction would occur. These impacts would result in a finding of No Adverse Effect to the historic resources.	– Refer to mitigation for Transportation Systems – Refer to mitigation for Visual and Aesthetic Resources – Refer to mitigation for Air Quality – Refer to mitigation for Noise and Vibration. – Where known archaeological sites are present, ground-disturbing activities will be avoided, where possible. RTD will complete archaeological monitoring during construction activities. In the event that cultural deposits are discovered during construction, work would cease in the area of discovery and the SHPO would be notified. The designated representative would evaluate any such discovery, and in consultation with SHPO, complete appropriate mitigation measures, if necessary, before construction activities resume. – There would be no vibration impacts to the Bowles House Museum (5AM64) resulting from the project. However, RTD has committed to the following mitigation measure for this property: RTD will conduct additional vibration analysis at the Bowles House prior to adjacent construction. The vibration measurements will be taken adjacent to the Bowles House and the vibration analysis will be re-run at that time based on those measurements.
Visual and Aesthetic Qualities	
NWR Corridor Alignment and Proposed Stations Direct Impacts Project features that present the potential for visual change include:	– Noise barriers and retaining walls will be designed with consideration for rail passengers' and residents' views. When feasible, noise barriers and retaining walls will avoid impacting open areas, reflect natural appearance in textures

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– In areas where retaining walls, bridges, or noise walls would be proposed, these structures would have the potential to block views of visual resources. – Noise barriers, though required only along three segments, would generate a high degree of visual change. Refer to Noise and Vibration for more information. – The widening of the existing rail corridor from one track to two and the provision of fencing along the entire rail corridor would constitute the largest permanent change along the proposed alignment, though it would generate a low degree of visual change. – RTD developed fencing recommendations through an extensive outreach process with local jurisdictions to provide fencing that is compatible with the surrounding land uses. RTD will continue ongoing coordination with the local jurisdictions regarding fencing, including the use of existing fencing at specific locations along the proposed alignment. – At proposed station sites the degree of visual alteration would be noticeable. However, proposed stations would be constructed with compatible architectural designs, would fit in with planned future land uses, and would be located in areas of previous development. – Overhead pedestrian walkways would be included at the following stations: Westminster/88th Avenue, Walnut Creek, Flatiron, and Gunbarrel. Additionally, station platforms, roof shelters, parking, and drop-off areas would constitute other visual changes.	and colors, and be graffiti resistant. – Stations will be landscaped consistent with RTD design criteria. Parking lot design will conform to local parking standards. – Fencing options will be compatible with surrounding land uses as is feasible. Proposed fencing recommendations are listed in Table 2-19, Northwest Rail Alignment Fencing Recommendations.
Phase 1 Direct Impacts – New structures, retaining walls, track, catenary, and fencing would be visually compatible with the industrial character of the corridor. – Provision of electrification would represent a visual change, but is	– Mitigation for Phase 1 will be the same as those measures identified for the Alignment and Stations Direct and Temporary Construction Impacts.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
considered compatible with the industrial character of the area.	
Preferred Alternative Indirect Impacts – Preferred Alternative may result in a potential increase in urban density around the proposed stations. In general, increased density surrounding NWR transit stations is anticipated to be moderate. The extent of this development would depend on the market feasibility of the sites.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Throughout construction, the visual appearance of the NWR project study area would change due to the presence of construction equipment, staging areas, machinery, vehicles, construction materials, and excavated material piles. – Temporary construction would create the largest impact when adjacent to the open space areas where disturbed vegetation may take years to reestablish.	– Staging areas will be fenced and/or screened. – Construction lighting will be shielded and directed at work areas to reduce glare and light trespass. – All landscaping will be replaced where removed for construction efforts, except in immediate trackway.
Preferred Alternative Cumulative Impacts – Since the 1950s, substantial development has occurred in the NWR project study area. Much of the undeveloped, rural lands north of the Denver metropolitan area have been developed into commercial and residential land uses. Overall, the FasTracks program would encourage higher density development within urban areas and would slightly slow the continued conversion of undeveloped lands. This would help to preserve the existing visual character of the NWR project study area.	– No mitigation required.
Parklands, Open Space and Recreational Resources	
NWR Corridor Alignment and Proposed Stations Direct Impacts	– Negotiate compensation for parkland acquisition with the owner of the public

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– Preferred Alternative would result in the acquisition of 1.68 acres of parks, open space, and recreational resources along the proposed alignment. – Additional impact to 3.58 acres at the Louisville Sports Complex, which would share parking with the Downtown Louisville Station. Parking would be constructed in an area already used for parking and would not result in an impact to any of the recreational features of the complex. – The BNSF Railway Company has discussed the potential need for additional storage track in Westminster along Little Dry Creek Trail. If this additional storage track is required by the BNSF Railway Company, the track would result in an additional impact of 0.18 acres.	lands' local representatives. – Open space acquired from the City of Boulder will follow the approved process set forth in the Charter of the City of Boulder, Article XII, Section 177, which states that transfer of open space from City of Boulder ownership must be approved by City Council and the Open Space Board of Trustees.
Phase 1 Direct Impacts – Phase 1 would result in the acquisition of 1.11 acre of parklands.	– Refer to mitigation for impacts above.
Preferred Alternative Indirect Impacts – No indirect impacts to park or recreation resources.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Construction of the Preferred Alternative would require temporary construction staging areas, requiring temporary use of 5.67 acres of park and open space land. – Construction of the Preferred Alternative would result in temporary construction impacts where existing trails cross the proposed alignment. Impacted trails would include: the South Platte River Greenway Trail, Little Dry Creek Trail, Wolff Run Trail, Big Dry Creek Trail Crossing, Walnut Creek Trail Crossing, Coal Creek Regional Trail, South Boulder Creek Trail, Boulder Creek Trail, Goose Creek Trail, Fourmile Creek Trail, and the St. Vrain Greenway Trail.	– Detour plans for the South Platte River Greenway Trail were approved by the City and County of Denver in a letter dated September 25, 2008 and proposed trail detours for Big Dry Creek and Wolf Run Trails in the City of Westminster were approved in documentation dated January 29, 2010. In addition, the City of Longmont approved a detour to the St. Vrain Greenway in documentation dated February 5, 2010, and Adams County approved detours for Little Dry Creek and Clear Creek Trails in documentation dated May 26, 2010. – Return trails to their existing or comparable state following construction. – In coordination with local jurisdictions, construction plans defining the best management practices (BMP) for the following will be developed: (1) Public safety and security for the project site, this plan should include all appropriate

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	access, signing, and public information BMPs; (2) Maintain traffic, pedestrian, and bicycle access to the project area during construction – Refer to mitigation for Visual and Aesthetic Qualities. – Refer to mitigation for Noise and Vibration.
Preferred Alternative Cumulative Impacts – It can be anticipated that additional parkland and recreation areas would be provided as part of the TOD around proposed stations.	– No mitigation required.
Air Quality	
NWR Corridor Alignment and Proposed Stations Direct Impacts Air Quality impacts were assessed for both the seven and eleven station scenarios. – Preferred Alternative would have similar emissions to the No Action Alternative. The scenario including all 11 stations would result in slightly lower VMT and emissions when compared to the seven funded station scenario. The decreased VMT for the All-Station scenario is likely to be related to the shorter distances the passenger vehicles drive to the additional four stations. – Region-wide daily emissions of VOC, CO, NO_x, and PM_{10} in 2015 and 2035 for both station scenarios are much lower than those in the baseline year 2005, attributed to the addition of newer vehicles with tighter emission controls, cleaner fuels, and more stringent emission restrictions in future years. – The Preferred Alternative would have higher emissions in 2035 than in 2015 due to the increased VMT in the region in 2035. – The analytical results indicated that the project operation would not cause a	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
CO hot spot impact in the future years. – MSAT emissions (although slightly higher) were comparable to both existing conditions and the No Action Alternative. – Both the seven station scenario and the 11 stations scenario under Preferred Alternative would result in small increase of PM_{10} emissions when compared to the No Action Alternative – The Preferred Alternative would not be expected to cause any violation of the PM_{10} NAAQS. – The anticipated traffic reduction due to FasTracks ridership (system-wide) would result in a slight decrease in future CO_2 emissions (RTD 2007), therefore reducing the impacts of global warming.	
Phase 1 Direct Impacts – Phase 1 would not cause any regional air quality impacts for criteria pollutants. – The MSAT analysis and CO hot spot analysis demonstrated comparable emissions to the No Action Alternative and no anticipated PM_{10} or CO violations of the NAAQS.	– No mitigation required
Preferred Alternative Indirect Impacts – The Preferred Alternative would have no indirect impacts.	– No mitigation required
Preferred Alternative Temporary Construction Impacts – The fugitive dust emissions (estimated as PM_{10}) associated with construction of the proposed project would be 100 pounds per day, based on the assumption that the maximum disturbed area would be 10 acres per	– For winter construction, the contractor shall install engine pre-heater devices to eliminate unnecessary idling. – The contractor shall be prohibited from tampering with equipment to increase horsepower or to defeat emissions control device effectiveness.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
day. There would also be emissions associated with diesel fueled equipment used for temporary construction activities, which would cause air quality violations.	– Construction vehicles and equipment used by the contractor shall be properly tuned and maintained. – Construction vehicles and equipment used by the contractor shall be equipped with the minimum practical engine size for the intended job requirement. – All construction equipment used by the contractor will be equipped to burn ultra low sulfur diesel fuel. – The contractor shall use water or wetting agents to manage dust. – The contractor shall use wind barriers and wind screens to minimize the spreading of dust in areas where large amounts of materials are stored. – The contractor shall use a wheel wash station and/or large-diameter cobble apron at egress/ingress areas to minimize dirt being tracked onto public streets. – The contractor shall use vacuum powered street sweepers to control dirt tracked onto streets. – The contractor shall cover all dump trucks leaving the site. – The contractor shall cover or wet temporary excavated materials. – The contractor shall use a binding agent for long-term excavated materials.
Preferred Alternative Cumulative Impacts – The Preferred Alternative would have not cumulative impacts.	– No mitigation required
Energy	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Preferred Alternative would result in 0.0005 percent more regional energy usage than the No Action Alternative in both 2015 and 2035. – An increase in energy consumption by 90,481,000 British thermal units (Btu) in 2015.	BMPs to reduce energy usage during construction could include: – Locating materials onsite or within close proximity to the project site. – Using newer, more energy efficient construction vehicles. – Programs to encourage construction workers to carpool or use public transportation for travel to and from the construction site.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– 143,392,000 Btu consumed annually in 2035. – Regional reduction of 2.4 million passenger vehicle miles traveled (VMT) per year and a total regional reduction of 0.1 million VMT per day in 2035 compared to 2015.	Design efforts to reduce energy consumption and overall VMT could include: – Creating multiple access points for parking lots, where possible. – Carefully designing "kiss-n-ride" drop-offs to maximize efficiency and minimize number of idling vehicles. – Positioning stations to be more easily acceptable by pedestrians and bicyclists. – Design park-n-Ride improvements to decrease energy usage consistent with RTD's sustainability policy.
Phase 1 Direct Impacts – The difference in technology from DMU to EMU would result in a negligible increase in regional energy use.	– Refer to mitigation for Alignment and Stations Direct Impacts above.
Preferred Alternative Indirect Impacts – Energy use associated with TOD is potentially less then the No Action Alternative because of smaller residences, decreased dependence on automobiles, and increase in transit use.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – During the 5-year construction period, approximately 990,080 million Btus would be consumed for the construction of the Preferred Alternative. – Approximately 17 percent of this (169,844 Btus) would be for the construction of Phase 1.	– Refer to mitigation for Alignment and Station Direct Impacts above.
Preferred Alternative Cumulative Impacts – The implementation of the Preferred Alternative and the No Action Alternative would result in comparable regional energy consumption. The projected modest density increases surrounding the proposed stations may result in smaller average home sizes and more efficient use of public	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
infrastructure. Both of these effects would help to reverse the past trends of energy consumption increasing faster than population. Although the Preferred Alternative would result in a negligible increase in energy over the No Action Alternative, as stated in the *Programmatic Cumulative Effects Analysis* (RTD 2007), the entire FasTracks Plan would result in an overall energy reduction of 116,233,392 Btus/year (RTD 2007).	
Noise	
NWR Corridor Alignment and Proposed Stations Direct Impacts Noise impacts were assessed for both the FasTracks-Only Station scenario (seven stations) and for the All-Station scenario (11 stations) – Severe noise impacts would range from 533 residences under the 2015 FasTracks-Only station scenario and eight institutional uses to 811 residences, one hospital, two schools, one park and four day care facilities under the All-Stations scenario in 2035 without mitigation. However, all severe impacts would be mitigated with implementation of Quiet Zones and noise barriers. – Quiet Zones proposed at rail crossings under the Preferred Alternative would significantly decrease horn noise compared to the existing conditions under the No Action Alternative. – Moderate noise impacts would range from 1,212 residences plus four institutional uses under the FasTracks-Only scenario in 2015 to 1,434 residences, plus three institutional uses for the All-Stations scenario in 2035 without mitigation. – In terms of year of operation, greater noise impact is projected in 2035 than	– Quiet Zones will be implemented prior to operations at all but 7 grade crossings from W. 64th Avenue in Adams County to SH 119 in Longmont. – RTD will assist the local jurisdictions with their applications to the railroads and the FRA. Applications for Quiet Zones must be submitted by the local jurisdictions. – Should Quiet Zones not be implemented prior to operations, alternate methods of noise mitigation, such as wayside horns and sound insulation, will be used. – Install 3,200 lineal feet of 10-foot high noise barriers.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
in 2015 due to the higher train volumes in 2035. – With regard to station scenario, greater noise impact is projected for the all-stations scenario than for the FasTracks-only scenario due to the effects of DMU speed and throttle profile effects near the additional stations. – With the recommended Quiet Zone and noise barrier mitigation measures, moderate impacts in 2035 would remain at 89 residences for the FasTracks-Only scenario and at 235 residences for the All-Stations scenario. – There would be residual moderate noise impacts at four institutional sites in the Boulder Section including one hotel (the Marriott Courtyard hotel), one school (Naropa University), and two day care facilities (the UCAR Child Care Center and the Family Learning Center) for both station scenarios in 2035 with proposed mitigation.	
Phase 1 Direct Impacts – Severe impacts range from five residential in 2015 for FasTracks-Only to 16-17 residential and one institution under the 2035 for All-Stations scenario without mitigation. – Moderate impacts range from 59 residents and one institution in 2015 for FasTracks-Only to 84-85 residences in 2035 under the All-Station scenario in 2035 without mitigation. – There would be two residual moderate noise impacts for Phase 1 in the Adams Section for both station scenarios in 2035 with proposed mitigation.	– Implementation of Quiet Zones and Noise Walls as indicated above.
Preferred Alternative Indirect Impacts – No indirect noise impacts are projected for the Preferred Alternative.	– No mitigation required

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Temporary Construction Impacts – Noise would result from utility relocation, grading, excavation, paving, installation of structures, and track work. Such impacts may occur in residential areas and at other noise-sensitive land uses located within several hundred feet of the alignment. The potential for noise impact would be greatest at locations near pile-driving operations for bridges and other structures and at locations close to any nighttime construction activities.	– Minimize nighttime construction in residential neighborhoods. – Locate stationary construction equipment as far as possible from noise-sensitive sites. – Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers. – Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
Preferred Alternative Cumulative Impacts – There would be no cumulative noise impacts for the Preferred Alternative.	– No mitigation required.
Vibration	
NWR Corridor Alignment and Proposed Stations Direct Impacts Vibration impacts were evaluated for both the FasTracks-Only scenario (seven stations) for the All-Stations scenario (11 stations). – Impacts would be the same under both the 2015 and 2035 operating scenarios. The results project vibration impacts at a total of 110 residences and 141 residences, respectively, for these two scenarios. – The greater number of impacts for the all-stations scenario reflects higher speeds between stations needed to offset the delays from added station stops. – Project vibration impacts also result at one school, one hotel and two day care facilities for both station and year scenarios.	– Relocate turnouts away from sensitive areas or use special turnout hardware. – Install track vibration isolation treatment if necessary and feasible based on Detailed Vibration Analysis. – Consider operational changes to minimize impacts.
Phase 1 Direct Impacts – Phase 1 would result in three residential vibration impacts for both station and year scenarios.	– Refer to vibration mitigations above for Direct Impacts.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Indirect Impacts – No indirect vibration impacts are projected for the Preferred Alternative.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – The Preferred Alternative would result in temporary construction impacts related to activities associated with utility relocation, grading, excavation, track work, and installation of structures and systems components. – Impacts may occur in residential areas and at other vibration-sensitive land uses located near the proposed alignment. – The potential for vibration impact would be greatest at locations near pile driving for bridges and other structures and at locations close to vibratory compactor operations.	– Minimize nighttime construction in residential neighborhoods. – Use alternative construction methods to minimize the use of impact and vibratory equipment (such as, pile drivers and compactors). – Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
Preferred Alternative Cumulative Impacts – No cumulative vibration impacts are projected for the Preferred Alternative.	– No mitigation required.
Biological Resources: Fish, Wildlife, Vegetation, and Threatened and Endangered Species	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Preferred Alternative would impact a total of 89.7 acres of wildlife habitat as follows: • 77.3 acres in large blocks of grasslands in the Louisville, Boulder, and Longmont sections. • 12.4 acres of riparian woodland, riparian shrubland, and marsh habitat along the proposed alignment (mostly in the Boulder section). • 0.3 acres of riparian woodland habitat impacts at Downtown Louisville Station. • 2.1 acres of grasslands impacts at proposed stations. – Vegetation and habitat impacts would primarily occur from vegetation	– Bridge structures will span the largest amount of riparian habitat as possible under a constructed bridge to limit the amount of disturbance to vegetation and to allow for travel along the water's edge. – Fencing installed along the proposed alignment should use wildlife-friendly design at crossings of wildlife corridors, other stream and ditch crossings, and in all areas adjacent to open space land. In addition, other areas considered high quality wildlife habitat should provide for wildlife friendly fencing. – RTD is committed to coordination with USFWS and CDOW throughout final design and will consider additional mitigation measures, if necessary.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
clearing and earth moving. – Preferred Alternative would affect 18.7 acres of black-tailed prairie dog towns, primarily in the Boulder, Westminster, and Longmont sections. – Proposed alignment would not cause a new division of previously contiguous habitat. – Preferred Alternative is not expected to adversely affect the movement of wildlife along wildlife corridors at various streams and ditches. Security fences required by the Regional Transportation District (RTD) have been designed to allow movement through these areas. – Noise barriers would be located in primarily developed areas where noise sensitive receptors exist (residential areas, etc.). Therefore, wildlife movement through these areas is limited and would not block or impact significant wildlife corridors. – Preferred Alternative could affect nesting raptors and other migratory birds. One red-tailed hawk nest active in 2004 and 2008 is located within the 300 feet of the proposed alignment, and 10 additional nests that were active in 2008 are located near the proposed alignment and could be affected by construction noise or human activity. – Project related construction could introduce new noxious weeds into the NWR project study area or increase the abundance of existing noxious weeds.	
Phase 1 Direct Impacts – Phase 1 would primarily affect industrial habitat. It would affect 0.70 acre of riparian woodland and riparian shrubland in the Adams Section at Clear Creek and along Little Dry Creek.	– Refer to Preferred Alternative mitigation above.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– Impacts to 5.0 acres of grasslands would occur. – Construction impacts on aquatic resources are estimated to be 0.1 acre. Pier construction of bridge over the South Platte River in the Denver Section would occur above the riparian corridor, spanning the river, thus reducing the impact. No impacts to wetlands are anticipated. – The new bridge at the South Platte River would be elevated above the river and riparian area and would have no adverse effects on the wildlife corridor – Two bridges in the Adams Section one at Clear Creek and the other at Little Dry Creek would impact 0.2 acre of aquatic resources, but would have no adverse effects on the wildlife corridors. – South Westminster/88th Avenue Station would not directly impact biological resources. – No prairie dog towns or raptor nests would be affected in the Denver and Adams Sections.	
Preferred Alternative Indirect Impacts – The majority of the impacts would be within 0.25 mile of the proposed station platforms. However, this more efficient land use scenario and the more effective provision of urban services could allow more undeveloped land to be preserved within the region.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Removal or physical disturbance of existing vegetation on 99.5 acres of habitat. The majority (61.1 acres) would occur in the grasslands. – Wildlife disturbance and displacement, temporary habitat fragmentation, and effects on wildlife movement due to increased noise and activity associated with construction.	**Vegetation and Habitat** – Restoration of disturbed riparian habitat will include planting of native trees and shrubs, as well as seeding and re-grading. Native grasses, forbs, and shrubs will also be seeded in riparian areas. – Grading plans will minimize removal of riparian vegetation where possible. – During construction, vehicle operation will be limited to the designated construction area, and the limits of the construction area will be fenced

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– Temporary effects on aquatic habitats could also occur from erosion and sedimentation at stream crossings.	where adjacent to sensitive habitats including riparian areas, marshes, and upland trees and shrubs. – Silt fencing, erosion logs, temporary berms, and other BMPs will be used to prevent degradation of habitats adjacent to the construction area by transport of eroded sediment. – Areas of temporary disturbance within the right-of-way will be seeded with an appropriate mixture of native grasses and forbs. Shrubs will be planted where appropriate. **Prairie Dog Colonies** – RTD has issued guidance on prairie dog mitigation for the FasTracks projects. Corridor projects will be designed and constructed to avoid and minimize impacts to prairie dog colonies. Relocation of prairie dogs will be coordinated with CDOW and conducted in compliance with the CDOW Permit to Capture and Relocate Prairie Dogs. If a relocation site cannot be located for towns greater than 2 acres, the prairie dogs will be captured and donated to raptor rehabilitation facilities or turned over to USFWS for the black-footed ferret reintroduction program. At no time will RTD authorize earth-moving activities that result in burying live prairie dogs. If needed, humane techniques will be used for killing prairie dogs. – Prairie dog mitigation will be coordinated with applicable local jurisdictions including the City of Boulder, Boulder County, the City and County of Broomfield, and CDOT. **Migratory Birds (including Raptors)** – In compliance with the MBTA, construction activities in grassland, riparian, marsh, and stream habitats, and those that occur on bridges that would otherwise result in the take of migratory birds, eggs, young, and/or active nests will be avoided. – Although the provisions of MBTA are applicable year-round, most migratory bird nesting activity in eastern Colorado occurs during the period of April 1 to August 31. Raptors can be expected to nest in woodland from February 1 to July 15.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	– The USFWS recommends that a qualified biologist conduct a field survey of the affected habitats and structures to determine the presence or absence of nesting migratory birds. – Surveys will be conducted during the nesting season prior to construction. Where possible, nesting may be prevented until construction is complete, by removal of vegetation. The results of field surveys for nesting birds, along with information regarding the qualifications of the biologist(s) performing the surveys, will be maintained on file for potential review by the USFWS, until such time as construction on the proposed project has been completed. – The USFWS Colorado Field Office will be contacted immediately for further guidance if a field survey identifies the existence of one or more active bird nests that cannot be avoided by the planned construction activities. – Raptor nest surveys will be conducted annually during an appropriate season (generally May 1 to June 1) to determine presence of active raptor nests. If an active nest is located, seasonal buffers will be established and coordinated with the CDOW to prevent disturbance of nesting raptors during construction. – Raptor and other nests in the construction footprint will be removed when they are inactive, outside of the nesting season. **Noxious Weeds** An Integrated Noxious Weed Management Plan will be developed during final design. This plan will be implemented during construction and will include identification of noxious weeds in the area, weed management goals and objectives, and preventive and control measures. Preventive measures include the following: – Contractor's vehicles will be inspected before they are used for construction to ensure that they are free of soil and debris capable of transporting noxious weed seeds or roots. – Noxious weeds observed in and near the construction area at the start of

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	construction would be treated with herbicides or physically removed to prevent seeds blowing into disturbed areas during construction. – Potential areas of topsoil salvage would be assessed for presence and abundance of noxious weeds prior to salvage. Topsoil from heavily infested areas would either be treated by spraying, taken off-site, or buried during construction. – Areas of temporary disturbance will be reclaimed as soon as construction is finished and seeded using a permanent seed mixture. If areas are completed and permanent seeding cannot occur due to the time of year, mulch and mulch tackifier would be used for temporary erosion control until seeding can occur. – Only certified weed-free mulch and bales will be used in the project area. Weed control would use the principles of integrated pest management, to treat target weed species efficiently and effectively by using a combination of two or more management techniques (biological, chemical, mechanical, and/or cultural). Weed control methods would be selected based on the management goal for the species, the nature of the existing environment, and methods recommended by Colorado State University, county weed boards, and other weed experts. The presence of important wildlife habitat or threatened and endangered species would be considered when choosing control methods. ` **Aquatic Habitat** – BMPs will be used to control erosion and sedimentation during construction and to protect water quality in streams. BMPs may include berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, sheet mulching, silt fences, straw-bale barriers, surface roughening, and/or diversion channels. A spill prevention and emergency response plan will be prepared and used during construction for storage, handling and use of chemicals, fuels and similar products. – Refer to mitigation for Water Resources and Water Quality **Special Status Species** Burrowing owl (state-listed threatened) CDOW recommendations (CDOW,

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	2007b) for surveys and protection of nesting burrowing owls will be followed: – Surveys will be conducted prior to construction to determine presence of burrowing owls in prairie dog towns, and the locations of occupied nests. Surveys will be conducted for any construction activities in suitable habitat from March 15 to October 31 in prairie dog towns. – Construction will be avoided within 150 feet of burrows used by burrowing owls from March 15 to October 31. – Federally Listed Species. Consultation was conducted with the USFWS under Section 7 of the Endangered Species Act. A Biological Assessment was prepared, and the USFWS will issue a Biological Opinion with a determination of effect. Based on presence/absence surveys conducted in 2009, the Biological Assessment indicates that the project may affect but is not likely to adversely affect federally listed species. The USFWS concurred with this finding in December 2009. If requested by the USFWS, additional surveys will be conducted prior to construction. If individuals or populations of federally listed species are found or if other information indicates that a federally listed species has become present in the construction corridor, consultation will be reinitiated with the USFWS. Any conservation measures identified in the Biological Opinion will also be implemented.
Preferred Alternative Cumulative Impacts – Vacant land that now serves as generally marginal wildlife habitat would continue to be developed as the population increases by the year 2035. However, the TOD anticipated to be stimulated by the Preferred Alternative would slightly modify this trend because some percentage of the new development would occur at higher densities. This would have a modest	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
positive effect on wildlife as some vacant land would not be developed during the foreseeable future.	
Mineral Resources, Geology, and Soils	
Preferred Alternative Direct, Indirect and Temporary Construction Impacts – Geotechnical challenges, such as those that could lead to increased instability, soil erosion, slumping and caving of excavated or altered slopes, and shallow groundwater. – If unmitigated, the destructive effects of these factors may increase over time and damage structure foundations. – Seismic risk in the project study area is consistent with the moderate seismic risk present in the Denver metropolitan area. – No mineral extraction opportunities would be precluded with the implementation of the Preferred Alternative.	– Engineering slope cuts for stability; shoring of slope cuts and shallow excavations; retaining walls; and dewatering systems where appropriate. – Engineering techniques such as drainage systems to direct surface water and runoff; slope design; covering slope during construction; use of engineered fill; and prompt and appropriate revegetation. – Mitigation of expansive bedrock, soil, and surficial materials with deep foundations into bedrock below perennial water table; specialized piers and footings; over-excavation with moisture treatment and compaction of backfill; engineered or imported fill; subsurface drainage systems; and surface water diversions. – Mitigation of collapsible soils with shoring of excavations; retaining walls; drainage systems; excavation and engineered or imported fill; compaction; pre-construction flooding and/or loading; and use of geogrids or geotextiles. – Mitigation of corrosive soils with coated and resistant steel and concrete; and drainage systems. – Mitigation of shallow groundwater with engineered fills and dewatering systems. – Identification of shallow subsurface voids. – Engineering techniques such as grouting to fill shallow voids. – Appropriate engineering of foundation and structure. – Engineering and design to conform with anticipated probable maximum seismic event.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Phase 1 Impacts – Potential impacts to mineral resources in Phase 1 would be the same as those described above under Direct, Indirect and Temporary Construction Impacts above.	– Mitigation for the Phase 1 will be the same as those measures identified for the Preferred Alternative Direct, Indirect and Temporary Construction impacts above.
Preferred Alternative Cumulative Impacts – No cumulative impacts.	– No mitigation required.
Water Resources/Water Quality	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Potential decrease in water quality would be primarily due to the construction of an additional commuter rail track and improvements to the existing track, and the construction of 11 proposed stations. Amount of impervious area for the proposed stations would increase due to asphalt paving to cap the site (estimated at 69 acres), while the amount of impervious surfaces of the tracks would slightly increase due to new structures (estimated at 1 acre). Driscoll modeling indicates that there would be no negative water quality impacts as a result of urban runoff from the new parking facilities.	– Discharge into nearby storm sewer in accordance with local discharge permits. – Water detention ponds at all proposed stations. – Temporary BMPs such as silt fences, erosion log barriers, and temporary check dams during construction. – Spill, Prevention, Control, and Countermeasure Plan, if required. – Compliance with RTD Municipal Separate Storm Sewer System (MS4) requirements, as well as Adams County, Boulder County, City of Boulder, City and County of Broomfield, City and County of Denver, City of Longmont, City of Louisville, City of Westminster, and Colorado Department of Transportation (CDOT) MS4 requirements as appropriate. – During project construction within CDOT right of way, the CDOT Water Quality Consent Decree, which was issued to CDOT by Colorado Department of Public Health and Environment (effective, January 2009) will be followed as appropriate. – Permanent BMPs such as water quality detention basins and rip rap. – Non-Structural BMPs such as parking lot sweeping, use of vegetative buffers, spill containment measures, and minimizing disturbed areas by project

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	construction phasing. – Temporary and permanent BMP maintenance. – Onsite detention basins at each station in accordance with local requirements. This may benefit some areas that currently have no stormwater controls. – Permanent BMPS including, if necessary, flow attenuation devices and/or detention basins and rip rap. – Clean Water Act Section 402 NPDES Permits, including a stormwater construction permit, in accordance with all local and state regulations and dewatering permits. – Stormwater BMPs. – Project-specific temporary and permanent water quality plans. – Project-specific stormwater management plans. – Construction of onsite detention basins for water quality at all stations in accordance with municipal and state regulations and parking areas designed to minimize directly connected impervious surfaces. – Operations monitoring and supply wells will be protected or replaced in the same or similar location depending on the site conditions. – Non-operational monitoring and supply wells will be abandoned in accordance with state requirements.
Phase 1 Direct Impacts – Phase 1 would add 7.65 acres of new impervious surface. Runoff from the rail structures would be collected and brought to the stormwater system through under-drains and discharged to the local storm drainage system. – The South Westminster/71st Avenue Station would add approximately 14 acres of impervious surfaces. The potential for ground water to be encountered.	– Mitigation will be the same as those measures above.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Indirect Impacts – It is assumed that through traditional land development and local stormwater regulations, increased runoff would be detained in local and regional detention and retention ponds.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Potential for temporary riparian vegetation and water quality impacts during construction due to an increase in erosion and subsequent sedimentation of nearby surface waters. – It is estimated that a total of 580 acres would be temporarily disturbed during the construction of the Preferred Alternative.	Mitigation will be the same as those measures for Alignment and Stations Direct Impacts, with the addition of the following: – Temporary BMPs for construction, including reestablishment of native vegetation. – Dewatered water will be discharged to the storm sewer in accordance with discharge permits.
Preferred Alternative Cumulative Impacts – Construction of the Preferred Alternative would be consistent with existing land uses, but the amount of impervious surfaces would increase. As the population increases between 2005 and 2035, the amount of impervious area would increase by approximately 3,300 acres, assuming an average density of 10 people per acre and 40 percent impervious surfaces (Federal Highway Administration 2007). – .Water quality is not anticipated to degrade below existing conditions and may improve as water quality control measures are updated. – Development density is expected to increase around proposed stations, reducing the amount of urban sprawl and preserving more natural pervious surfaces that would be a qualitative benefit to water quality.	– No mitigation required.
Wetlands and Other Waters	
The USACE Section 404 permitting process requires the consideration of all jurisdictional (J) wetlands and other water features impacted by the Preferred	– All mitigations outlined in the USACE permit will be followed.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Alternative, including temporary construction impacts. As a result, the USACE considers a total of 4.82 J acres of wetlands and other water features to be impacted by the Preferred Alternative. Phase 1 of the Preferred Alternative is considered by the USACE to impact 0.22 J acre of wetlands and other water features. These numbers are further categorized below into two groups: (1) direct, permanent and (2) temporary construction. In addition, they are grouped by alignment, station and Phase 1, as is done for the other resource areas. NWR Corridor Alignment and Proposed Stations Direct Impacts **Wetlands** – Direct permanent impact to 6.03 acres of wetlands from the construction of the proposed alignment. The Boulder Section contains the greatest acreage of wetlands impacted (4.45 acres). The greatest impact would occur from the platform construction (considered as part of the alignment impacts), of the proposed Gunbarrel Station (0.58 acre). – The unavoidable impacts to wetlands impacted at the Gunbarrel Station are considered jurisdictional by the USACE. – A wetland functional assessment was conducted using the FACWet method. Wetlands were assessed both individually and in groups. – A total of 11 wetlands were assessed individually and either fell into the Functioning or Functionally impaired categories. The individually assessed wetland with the highest functional capacity index is Lower Church Lake. – All of the four groups assessed had generally low functional scores for hydrologic and wildlife habitat. This is mostly a result of the presence of contaminated water, managed/manipulated flows, and/or the presence of exotic plants. – Of the total direct, permanent impact from the construction of the alignment	– Wetland replacement will be completed per USACE requirements. – Wetland 1:1 replacement for non-jurisdictional wetlands per RTD requirements. Credits will be purchased or on-site mitigation conducted for non-jurisdictional impacts. – Appropriate permits will be acquired. Phase 1 Section 404 Permit was issued by USACE on 1 April 2010. – There will be no equipment staging, storage of materials, use of chemicals (such as soil stabilizers, dust inhibitors, and fertilizers), or equipment refueling within 50 feet of wetlands or other water features. – Any new or modified bridges will be designed to minimize direct discharge of stormwater runoff into wetlands.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
(6.03 acres), 1.79 J acres are PEM wetlands and 1.51 J acres are PEM/PSS wetlands, for a total of 3.30 J acres of wetlands. – An additional 0.7 non-jurisdictional (NJ) acre of permanent impact to wetlands would occur from development of all stations. **Other Water Features** – The Preferred Alternative alignment would result in 1.17 acres (0.72 J and 0.45 NJ) of direct, permanent impact to other water features. The most impacted acreage would occur to natural other water features within the Adams Section. – An additional 0.02 NJ acre of direct, permanent impact to other water features would occur from the construction of the Downtown Louisville and East Boulder stations. No impacted acreage from station construction is considered jurisdictional. **Riparian Buffers** – The alignment would result in a total of 1.86 acres of direct, permanent impact to mature, woody riparian buffers. The greatest amount of impact would occur to woody riparian buffers within the Boulder Section. – No impact to mature, woody riparian buffers would occur from station construction.	
Phase 1 Direct Impacts – Phase 1 would result in direct permanent impact to 0.05 J acre of impact to wetlands; 0.06 J acre of impact to other water features; and 0.51 acre of impact to riparian buffers. – Wetlands between DUS and Pecos Street were included in the February Nationwide Permit approved for the Gold Line Final EIS (FTA 2009) (Appendix C).	– Mitigation will be the same as those measures for Alignment and Stations Direct and Temporary Construction Impacts.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– The BNSF Railway Company is considering an additional storage track near the South Westminster/71st Avenue Station. If this option were to be implemented, it would create an additional direct, permanent impact to other water features of <0.01 acre. The impacted other water feature is not considered jurisdictional by the USACE.	
Preferred Alternative Indirect Impacts – Indirect permanent impacts to wetlands and other water features would include constriction of stream flow from bridge construction, erosion resulting in sedimentation, and noxious weed invasion.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Construction of the Preferred Alternative would result in temporary impacts to 0.80 acres (0.69 J and 0.11 NJ) of waters of the United States – Construction of Phase 1 of the Preferred Alternative would impact 0.11 acre of other water features.	– Prior to construction, orange temporary fence and sediment control measures will be placed to protect existing wetlands that are located outside the planned area of disturbance. – Wetland areas designated as areas of temporary disturbance that will be used for construction access will be covered with geotextile, straw, and soil prior to use. – Temporarily impacted wetlands will be restored to their preconstruction condition. – Construction equipment moving between watersheds will be washed prior to commencing work within a new area to prevent the spread of aquatic invasive species. – BMPs will be implemented during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	– When practicable, construction in waterways will be performed during low-flow or dry periods. – Flowing water will be diverted around active construction areas. – No fill material will be stored in wetlands or other water features. – No unpermitted discharges will be allowed. – There will be no equipment staging, storage of materials, use of chemicals (such as soil stabilizers, dust inhibitors, and fertilizers), or equipment refueling within 50 feet of wetlands or other water features. – Any new or modified bridges will be designed to minimize direct discharge of stormwater runoff into wetlands. – City of Boulder wetlands mitigations will be completed per City of Boulder requirements.
Preferred Alternative Cumulative Impacts – Since 1950, the amount of wetlands located in both the NWR project study area and the larger Denver metropolitan area has decreased due to more than doubling of the population. Historically, Colorado's wetlands only accounted for 3 percent of the surface area of the state. Due to a lack of regulations prior to the early 1970s, up to 50 percent of those wetlands have been lost, which is proportionately greater than other habitat type losses in Colorado (RTD, 2007). Due to improved regulations protecting wetlands, the loss of wetlands will be markedly less than experienced historically. Implementing the Preferred Alternative could encourage moderately denser growth, thus slightly reducing the potential for wetlands on some undeveloped land to be impacted in the future.	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Floodplains/Drainage/Hydrology	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Minimal effects on future flood elevations due to the construction of new bridges and the expansion of existing crossings on the 18 different 100-year floodplain crossings. But in two places the 100-year floodplain either remains the same or lowers in elevation. – Floodplain elevations would increase at Coal Creek and South Boulder Creek bridge crossings. In both cases, the proposed bridges would be adequate to pass the 100-year flow and the changes are less than the FEMA criteria allowing no more than a 1.0 foot elevation rise in the 100-year water surface elevation. – The Downtown Longmont Station (75% of total area) would be located within the 100-year floodplain, including parking lots and commuter rail platforms. – The City of Longmont is currently evaluating options for capturing and conveying flows from the 100-year storm event area that would minimize 100-year floodplain impacts at the Downtown Longmont Station.	– Onsite detention in accordance with UDFCD and local jurisdictions. – Obtain required floodplain modification permits.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Phase 1 Direct Impacts – Phase 1 would cross the South Platte River on a new bridge. Requires construction of two bridge piers in the South Platte 100-year floodplain, which is estimated to result in a rise of the 100-year flood elevation of 0.19 foot, which meets the FEMA criteria of a less than a 1-foot rise in the 100-year flood elevation. – Phase 1 would also cross the Clear Creek on a new bridge built just upstream of the existing bridge. The new bridge would result in an overtopping of the 100-year floodplain by 0.47 feet. – The South Westminster/71st Avenue Station (3% of total area) would be located in the floodplain. This station would be designed to accommodate the 100-year floodplain flows and adhere to all FEMA regulations.	– Onsite detention in accordance with Urban Drainage and Flood Control District (UDFCD) and local jurisdictions. – Obtain required floodplain modification permits.
– Preferred Alternative Indirect Impacts – Planned increase in urban density due to TOD would result in additional impervious surfaces. All planned developments would be required to fulfill state and local government storm drainage requirements that limit storm runoff to historic undeveloped levels.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Temporary construction impacts within the 100-year floodplain resulting in increased erosion and sedimentation due to land disturbance activities would be minimal due to the proper implementation of BMPs and erosion control techniques and devices.	– UDFCD and local jurisdictional requirements. – Temporary BMPs such as silt fence, erosion logs, check dams, sediment traps and basins, as well as storm sewer inlet protection and rip rap, will be implemented to reduce the amount of erosion and sedimentation during the construction process and prevent sediment from reaching state waters
Preferred Alternative Cumulative Impacts – The amount of impervious surfaces and runoff would continue to increase with continued urban expansion in the NWR project study area. Projected	– No mitigation required.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
development would substantially increase impervious surfaces in existing undeveloped areas by adding buildings, sidewalks, and streets to support an expanding economy as well as population. Continued population growth between 2005 and 2035 would result in approximately 3,300 acres of impervious surfaces in the NWR project study area. The Preferred Alternative would result in an additional 92 acres of impervious surfaces, or less than 3 percent of the estimated new impervious surfaces in 2035. Impacts associated with additional impervious surfaces would be managed to predevelopment conditions using jurisdictional detention requirements, which have proven to be effective in minimizing the effects of urban runoff (RTD, 2007b).	
Hazardous Materials	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Assessment and management of hazardous materials during construction of the proposed alignment outside the proposed station footprints would be the responsibility of BNSF Railway Company – Greatest potential to encounter hazardous materials would be during construction and would be closely correlated to land use; specifically with properties that have a history of commercial and/or industrial uses. There are approximately 27 sites ranked with a moderate to high risk ranking located within the proposed station footprints.	– Prepare a Materials Management Plan to address the potential to encounter contaminated soil and groundwater. – Conduct an individual site-specific Phase I Environmental Site Assessment (ESA) of properties prior to acquisition. – Complete site-specific Phase II ESA with subsurface investigation (soil and groundwater) for sites that may have been contaminated or affect final design, as documented by the Phase I ESA, where appropriate. – Determine engineering controls to minimize quantity of contaminated materials. – Determine long-term maintenance of potentially contaminated properties. – Complete an asbestos survey and a lead-based paint survey on the buildings and structures proposed for demolition; complete abatement as needed. – Follow Environmental, Health and Safety CDOT Standard Specifications for

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	Road and Bridge Construction. – Implement construction BMPs in accordance with a Stormwater Pollution Prevention Plan. BMPs may include secondary containment areas for refueling construction equipment, berms or ponds to control runoff, and a monitoring program to test stormwater for contaminants prior to discharge from the construction site. – Prepare and implement a Health and Safety Plan. – Compliance with Occupational Safety and Health Administration requirements for construction workers who may be exposed to hazardous materials.
Phase 1 Direct Impacts – Phase 1 would result in potentially impacting 12 hazardous sites generally associated with private commercial or industrial businesses. – Construction-related activities that may encounter hazardous materials include: • Removal or replacement of contaminated track ballast or railroad ties; • Excavation and drilling during construction of bridge abutments and piers; and • Excavation during construction of the proposed alignment • In addition, three potential hazardous materials sites at the South Westminster/71st Avenue Station may be impacted.	– Mitigation for Phase 1 will be the same as those measures identified for the Alignment and Stations Direct and Temporary Construction Impacts above.
Preferred Alternative Indirect Impacts – No indirect impacts.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – Impacts would be the same as those identified under Direct Impacts.	– Mitigation for temporary construction impacts will be the same as those measures identified for direct impacts above.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
Preferred Alternative Cumulative Impacts – No cumulative impacts.	– No mitigation required.
Public Safety and Security	
NWR Corridor Alignment and Proposed Stations Direct Impacts – Crime at transit stations or on board vehicles is expected to reflect the crime activity of the surrounding communities. – Increased train frequency at at-grade railroad crossings could increase emergency response times. The higher frequency of trains could also impact safety at railroad crossings. However, safety at most crossings would improve when crossings are outfitted with the minimum crossing protection measures required by RTD standards.	– No mitigation required beyond the adherence to RTD's station design standards for safety and security. – RTD will convene a Fire and Life Safety Committee that will assist in preparing in an emergency plan and coordinate response to emergency situations.
Phase 1 Direct Impacts – Phase 1 would result in no new public at-grade crossings, therefore avoiding any impairment to emergency services. – Crime rates at the South Westminster/71st Avenue Station would be expected to remain low, consistent with crimes reported at existing park-n-Ride stations in the area.	– Mitigation for Phase 1 will be the same as those measures identified for the direct and temporary construction impacts above.
Preferred Alternative Indirect Impacts – Transit stations may induce additional development in the surrounding areas that would generate higher traffic volumes in those areas and increase the potential for accidents at at-grade railroad crossings. However crossing protection measures required by RTD standards would improve safety at most crossings.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts	– RTD will prepare a Construction Management Plan that specifies public

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
– Construction-related hazards are a potential concern. – Police, fire, and emergency services may be adversely affected by increased response times due to construction activities.	communications and construction means and methods to reduce or mitigate construction traffic and preserve access to homes, businesses, and community facilities. – RTD will follow standard operating procedures to minimize traffic disturbances. – Traffic detour plans will be provided to address the two week closure of local streets during at-grade crossing construction.
Preferred Alternative Cumulative Impacts – No cumulative impacts to public safety and security.	– No mitigation required.
Utilities	
NWR Corridor Alignment and Proposed Stations Direct Impacts All impacts of the Preferred Alternative would occur during construction: – 235 potential utility relocations and 28 potential utility adjustments for construction of the proposed alignment. – 19 potential utility relocations and 58 potential utility adjustments for construction of the proposed stations.	– Relocation of electric transmission towers: schedule construction during period of low use (October to April); and modify design to avoid/minimize conflict. – Adjustment or relocation of high pressure gas line(s): schedule construction during period of lower use (May to September); modify design to avoid/minimize conflict; and protect in place. – Adjustment or relocation of buried fiber optic: early coordination with utility owners; modify design to avoid/minimize conflict; protect in place; and obtain variance to minimum depth requirement. – Adjustment or relocation of water lines and sanitary sewers: modify design to avoid conflict; schedule disruption of service for low use period; and minimize disruption of service to water lines. – New roadway or additional/reduced cover on buried utilities: add encasement or protective cover over utilities (protect in place). – Relocation of overhead telephone and electric distribution lines: early coordination with utility owners.
Phase 1 Direct Impacts	– Mitigation for Phase 1 will be the same as those measures identified for the

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
All impacts of the Preferred Alternative would occur during construction: – 58 potential utility relocations. – 19 potential utility adjustments.	Alignment and Stations Direct Impacts above.
Preferred Alternative Indirect Impacts – Increase in population related to TOD would require more utilities near stations. – Additional storm sewers to accommodate increase in impervious surface areas.	– No mitigation required.
Preferred Alternative Temporary Construction Impacts – All construction impacts to utilities are direct impacts.	– Mitigation for temporary construction will be the same as those measures identified for the Alignment and Stations Direct Impacts above.
Preferred Alternative Cumulative Impacts – Proposed development of the areas adjacent to the proposed stations would require the extension, augmentation, or modification of utilities. – Overall, the Preferred Alternative would not result in significant long-term secondary or cumulative adverse impacts on utilities.	– No mitigation required.
Transportation Systems	
Transportation Impacts	– All mitigation measures will be implemented as noted in 2015 or by 2035
NWR Corridor Preferred Alternative Direct Impacts – The Preferred Alternative would provide new high-capacity commuter rail service to areas in the NWR Corridor generally along United States Highway 36 (US 36) and State Highway (SH) 119. – The Preferred Alternative would provide a reliable transit option to congested roadway travel and offer improved travel times. Estimated a.m. peak hour transit travel time in 2035 for the Preferred Alternative from the Downtown Longmont Station at 1st Avenue/Terry Street to Denver Union Station (DUS) is 61 minutes with FasTracks-only stations and 68 minutes with all stations. The projected auto travel time from 1st Avenue/Terry Street in Downtown Longmont to DUS is 79	

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
minutes along Interstate 25 (I-25) in general travel lanes. – The Preferred Alternative would provide service to 8,400 riders under the FasTracks-only scenario and 12,100 riders under the all stations scenario during an average weekday in 2035. – The assumed bus operations would be the same as for the No Action Alternative except that service on the BOLT would be reduced so as not to compete with the new NWR Corridor rail line, and the S route would be eliminated. In addition, existing bus routes would be routed to provide service to the proposed commuter rail stations. – The Preferred Alternative would allow for shared use of tracks for freight rail operations. There would be negligible effects on freight rail operations. – The Preferred Alternative would not permanently impact existing pedestrian and bicycle facilities and would not preclude the development of planned pedestrian and bicycle facilities in the vicinity of the proposed alignment and stations. Some trails may be temporarily impacted due to construction. Trails would be rerouted when possible, and detours would be coordinated with local jurisdictions. – The Preferred Alternative would provide approximately 4,899 additional parking spaces at stations by 2015 as indicated in Table ES-8 above and add another 435 spaces by 2035 (at Downtown Longmont).	
– Station Area Traffic Impacts	South Westminster/71st Avenue – The station access intersection to Federal Boulevard will be signalized (2015) – The southbound right turn lane will be converted into a shared through/right lane at the Federal Boulevard/70th Avenue intersection (by 2035). – At the Federal Boulevard/71st Avenue intersection, the left turn from eastbound 71st Avenue to northbound Federal Boulevard would be prohibited (by 2035).

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	Westminster Mall/88th Avenue – A westbound left turn lane will be added at the Harlan Street/Mall Access intersection (2015).
	Broomfield/116th Avenue – The Teller Street/120th Avenue intersection will be signalized (2015).
	Downtown Louisville – No project specific mitigation is required for the Downtown Louisville Station if the proposed improvements along SH 42 are constructed prior to the construction of the station. – If the SH 42 improvements are not constructed prior to the construction of the station, then the following mitigations will be made: – Harper Street/SH 42: The eastbound left turn would be prohibited (2015). – Griffith Street/SH 42: The eastbound and westbound left turns, as well as the through movements would be prohibited (2015). – Short Street/SH 42: Northbound and southbound left turn lanes will be striped onto the existing pavement at Short Street. The east leg of the intersection will be constructed and the intersection is proposed to be signalized (2015). – South Street/SH 42: The eastbound left turn would be prohibited (2015).
	East Boulder – The West Access/Arapahoe Avenue intersection will have left turns prohibited from minor streets (2015), and the East Access/Arapahoe Avenue intersection will be signalized (2015). – A northbound right turn lane would be added to the intersection of Westview Drive/Arapahoe Avenue (2015).
	Boulder Transit Village – The 30th Street/Bluff Street intersection will be signalized (2015).

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	Downtown Longmont – The Main Street/Boston Avenue intersection would be signalized (2015). – An eastbound left turn lane will be added on Boston Avenue at the Pratt Parkway/Boston Avenue intersection in 2015, and by 2035 that intersection will be signalized.
– Roadway Mitigations Proposed in the vicinity of at-grade railroad crossings	West 72nd Avenue and Bradburn Boulevard – Add a left turn lane with 150 feet of storage to the southbound approach of Bradburn Boulevard at 72nd Avenue. The approach would consist of one left turn lane and one shared left/right turn lane. – Widen 72nd Avenue east of Bradburn Boulevard to six lanes by adding one westbound right turn lane and converting the two-way left turn lane (TWLTL) to a westbound through lane. The widened segment of 72nd Avenue would consist of three westbound through lanes, a westbound right turn lane and two eastbound through lanes east of Bradburn Boulevard. – Widen 72nd Avenue between Bradburn Boulevard and Raleigh Street to six lanes, adding one westbound through lane and one eastbound left turn lane. The TWLTL would be converted into a westbound left turn lane. The widened segment of 72nd Avenue would consist of two westbound through lanes, one westbound left turn lane, two eastbound through lanes and one eastbound left turn lane. – Change the westbound left turn phase of the 72nd Avenue/Raleigh Street intersection from permissive only, to protected/permissive. – Interconnect all signals, including the four on 72nd Avenue and one on Bradburn Boulevard, into one coordinated signal system. Optimize the signal timing to reduce overall corridor delay and queue lengths.
	South Boulder Road

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	– Railroad preemption controls (recommend further study)
	Niwot Road and 2nd Avenue – Construct an additional through lane approximately 500 feet in length along northbound Diagonal Highway approaching Niwot Road. – Construct an additional lane along northbound Diagonal Highway between Niwot Road and 2nd Avenue (approximately 1,000 feet). The additional lane would become a right turn lane at 2nd Avenue. – Re-stripe westbound Niwot Road between the railroad crossing and northbound Diagonal Highway to provide a though lane and a shared through/right turn lane. – Interconnect all four signals to operate at one coordinated system and optimize the signal system for cycle length and offsets.
	Mineral Road (SH 52) In the DRCOG 2035 Metro Vision Regional Transportation Plan, CDOT has identified an interchange construction project at the Mineral Road (SH 52) and Diagonal Highway (SH 119) intersection. The proposed interchange includes a grade-separation of SH 52 and SH 119. However, funding for the interchange has not been fully identified. In the absence of the interchange project moving forward, potential mitigation measures for the interim at-grade condition were studied. – Eastbound approach on Mineral Road (SH 52): Construct a second left turn lane with 300 feet of storage, and a second through lane. The widened approach would consist of two left turn lanes, two through lanes and one right turn lane. These improvements would require the widening of pavement for this approach. The second through lane would extend across Diagonal Highway (SH 119) and the rail crossing and would become a right turn lane at the intersection of Mineral Road/71st Street.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative	
Impacts	**Proposed Mitigation**
	– Westbound approach on Mineral Road (SH 52): Construct a second left turn lane, a second through lane and a right turn lane. The widened approach would consist of two left turn lanes, two through lanes and a right turn lane. – Northbound approach on Diagonal Highway (SH 119): Construct two additional through lanes. The widened approach would consist of two left turn lanes, four through lanes, and one right turn lane. The four through lanes would extend through the Mineral Road intersection. The additional lanes would end a maximum of 1,000 feet north of the intersection, with only two lanes continuing north along Diagonal Highway. – Southbound approach on Diagonal Highway (SH 119): Construct one additional left turn lane with 300 feet of storage and two additional through lanes. The widened approach would consist of two left turn lanes, four through lanes and one right turn lane. The four through lanes would extend through the Mineral Road intersection. The additional lanes would end a maximum of 1,000 feet south of the intersection, with only two lanes continuing south along Diagonal Highway. – Set all left turn signal phases to be protected only. – Set all right turn signal phases to be permissive/overlapping. – The traffic signal should be coordinated with the Mineral Road rail crossing. – The extensive intersection improvements proved insufficient in eliminating traffic queues between the intersection of Mineral Road/Diagonal Highway and the railroad crossing. These extensive intersection improvements proved insufficient in eliminating queue spillbacks between the intersection of SH 52/SH 119 and the railroad crossing. It is recommended that RTD and CDOT consider possibilities for joint participation in implementing CDOT's proposed interchange project.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative			
Impacts	**Proposed Mitigation**		
Improvements to grade crossings required for safety and/or Quiet Zones.	Street	Existing Rail Crossing Treatment	Mitigation (All 2015)
	West 64th Avenue	At-Grade – dual gates	At-Grade – dual gates with raised median
	Lowell Boulevard	At-Grade – dual gates	At-Grade – dual gates with raised median
	West 72nd Avenue	At-Grade – dual gates	At-Grade – three gate system with raised median
	Bradburn Boulevard	At-Grade – dual gates	At-Grade – quad gates
	West 76th Avenue	At-Grade – dual gates	At-Grade – quad gates
	West 80th Avenue	At-Grade – dual gates	At-Grade – quad gates
	West 88th Avenue	At-Grade – dual gates with raised median	Same as existing
	Pierce Street	At-Grade – dual gates with raised median	At grade – quad gates
	Old Wadsworth Boulevard	At-Grade – dual gates	At-Grade – dual gates with raised median
	West 112th Avenue	At-Grade – dual gates	At-Grade – dual gates with raised median
	West 120th Avenue	At-Grade – dual gates	At-Grade – quad gates
	Nickel Street	At-Grade – dual gates with raised median	Same as existing
	Brainard Drive	At-Grade – dual gates	At-Grade – dual gates

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative			
Impacts	**Proposed Mitigation**		
			with raised median
	Carbon Road	Closed	Same as existing
	Dillon Road	At-Grade – dual gates with raised median	Same as existing
	Lock Street	Closed	Same as existing
	Pine Street	At-Grade – dual gates	At-Grade – quad gates
	Griffith Street	At-Grade – dual gates	At-Grade – quad gates
	South Boulder Road	At-Grade – dual gates with raised median	Same as existing
	Baseline Road	At-Grade – dual gates	At-Grade – dual gates with raised median
	Private Road (MP 22.20)	At-Grade – passive	At-Grade – dual gates
	63rd Street	At-Grade – dual gates with raised median	At-Grade – quad gates
	55th Street	At-Grade – dual gates with raised median	Same as existing
	Private Road (MP 26.96)	At-Grade – passive	At-Grade – dual gates
	Pearl Street	At-Grade – dual gates with raised median	Same as existing
	Valmont Road	At-Grade – dual gates with raised median	Same as existing
	North 47th Street	At-Grade – dual gates with raised median	Same as existing

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative			
Impacts	**Proposed Mitigation**		
	Independence Road	At-Grade – dual gates	At-Grade – dual gates with raised median
	Jay Road	At-Grade – dual gates with raised median	Same as existing
	North 55th Street	At-Grade – dual gates	At-Grade – quad gates
	North 63rd Street	At-Grade – dual gates with raised median	Same as existing
	Mineral Road/SH 52	At-Grade – dual gates	At-Grade – dual gates with raised median[2]
	Monarch Road	At-Grade – dual gates	At-Grade – dual gates with raised median
	Niwot Road	At-Grade -- dual gates with raised median	Same as existing
	2nd Avenue	At-Grade – dual gates	At-Grade – dual gates with raised median
	83rd Street	At-Grade – dual gates	At-Grade – quad gates
	Ogallala Road	At-Grade – dual gates	At-Grade – quad gates
	Private Road (MP 40.65)	At-Grade – passive	At-Grade – dual gates
	95th Street/Hover Road	At-Grade – dual gates with raised median	Same as existing

[2] The Mineral Road (SH 52)/SH 119 intersection is identified as the location of a future interchange in the 2035 MVRTP; the treatment shown here would be applied under the at-grade condition.

TABLE ES-11. SUMMARY OF IMPACTS AND PROPOSED MITIGATION

Preferred Alternative			
Impacts	**Proposed Mitigation**		
	Sunset Street	At-Grade – dual gates	At-Grade – dual gates with raised median
	Ken Pratt Boulevard/SH 119**	At-Grade – dual gates with raised median**	Same as existing
	Terry Street	At-Grade – passive	Closure
	Coffman Street	At-Grade – passive	Closure
Preferred Alternative Indirect Impacts – Preferred Alternative would encourage TODs and slightly reduce future VMT.	– No mitigation required.		
Preferred Alternative Temporary Construction Impacts – Increased construction traffic would occur with the Preferred Alternative.	– Construction Mitigation Plans (CMPs). – Methods of handling traffic to be identified that could limit times of construction traffic on major routes.		

Source: NWR Corridor Project Team, 2009.