DEMO 0361-067

120th Avenue Connection

ENVIRONMENTAL ASSESSMENT
and
SECTION 4(f) EVALUATION

Submitted Pursuant to:

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By the
US Department of Transportation
Federal Highway Administration
and
Colorado Department of Transportation

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ENVIRONMENTAL ASSESSMENT

120th Avenue Connection
DEMO 0361-067

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

CITY AND COUNTY OF BROOMFIELD
COLORADO

March 2005

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Acronyms

BMP	best management practices
BNSF	Burlington Northern Santa Fe Railway Company
BPUD	Business Planned Unit Development
BRT	Bus Rapid Transit
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CO	Carbon Monoxide
CNHP	Colorado Natural Heritage Program
DB(A)	Decibels of A wave
DOLA	Department of Local Affairs
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EJ	Environmental Justice
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HOV	High-Occupancy Vehicle
LOS	Level of Service
LPA	Locally Preferred Alternative
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
MESA	Modified Environmental Site Assessment
MSAT	Mobile Source Air Toxics
MSE	Mechanically Stabilized Earth
MIS	Major Investment Study
MVMT	Million vehicle miles of travel
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Plan
NHS	National Highway System
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
OSP	Outfall System Plan
OSTAC	Open Space and Trails Advisory Committee
PM_{10}	Particulate matter less than ten microns in diameter
PUD	Planned Unit Development
RTD	Regional Transportation District
RTP	Regional Transportation Plan
SH	State Highway
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
TAC	Technical Advisory Committee
TDP	Transit Development Program
TIP	Transportation Improvement Program
TMO	Transportation Mobility Organization
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles of travel

Executive Summary

This document is an Environmental Assessment (EA) that evaluates the impacts of the proposed 120th Avenue Connection, a new six-lane roadway across US 36 to connect 120th Avenue and SH 128 in Broomfield, CO. The new connection would extend from the intersection of SH 128 and SH 121/Wadsworth Parkway on the west, to the intersection of 120th Avenue and Teller Street on the east, a distance of approximately 1.2 miles.

Various alternatives, including the No-Action Alternative, were considered for the connection, as described in Chapter 2.0. Based on environmental screening and public and agency comment, a Preferred Alternative was identified. The Preferred Alternative includes a new six-lane roadway across US 36, four-foot on-street bike lanes and six-foot sidewalks on either side of the new roadway, and two access points: a right in/right out on the west side of US 36, and a signalized "T" intersection at Allison on the east side.

Environmental impacts and mitigation measures associated with this Preferred Alternative are discussed in Chapter 3.0. The impacts are summarized as follows:

- Land Use—There will be a direct conversion of land to a transportation use. Approximately 51 acres of right-of-way is required for the construction of the Preferred Alternative. The Preferred Alternative is not anticipated to accelerate growth at a regional level.

- Farmland—The Preferred Alternative would not impact soils classified as Prime, Unique or Farmland of Statewide Importance in the study area.

- Social/Environmental Justice/Economic—There will be direct impacts to neighborhoods and businesses due to construction of the 120th Avenue Connection. However, the Preferred Alternative would not cause adverse impacts to minority and low-income populations. The Preferred Alternative would impact seven residential properties resulting in five residential relocations, none of which involve minority populations. A total of 29 parcels, including 13 commercially zoned parcels would be acquired, six of which are minority-owned. Acquisition of these properties also requires the relocation of eight businesses of which two are minority-owned. There also would be increases in noise and air pollution near the mobile home park.

- Right-of-Way and Relocations—Approximately 51 acres of right-of-way would be required for construction of the Preferred Alternative affecting 29 parcels. The Preferred Alternative would require the relocation of five residences and eight businesses.

- Pedestrian and Bicycle Facilities—The Preferred Alternative would improve conditions for pedestrians and bicyclists by providing facilities along the 120th Avenue Connection and on Allison Street. Four-foot on-street bike lanes and six-foot sidewalks would be added on both sides of the 120th Avenue Connection. Three-foot bike lanes would be added to the reconfigured Allison Street.

- Air Quality—The proximity of the alignment to the mobile home park would result in increased air pollution, including pollution from urban air toxics, however, no violations of one-hour or eight-hour standards for CO concentrations would occur in the year 2025. There would be an eight percent increase in CO concentrations near the mobile home park due to its proximity to the roadway, but would not result in any violations of the NAAQS. There would be no impact on PM_{10} emissions or concentrations.

- Noise—The Preferred Alternative would increase existing noise levels above the approach criteria of 66 decibels (dBA) at four residential locations in the study area. It is anticipated that a noise barrier would be required along the south edge of the 120th Avenue Connection (north edge of the Broomfield Mobile Home Park) to minimize impacts from noise at that location.

- Water Resource and Water Quality—Construction of the Preferred Alternative would result in an increase in impervious surface area by approximately 30 acres. This increase contributes to an increase in roadway runoff into surrounding waters, including study area ditches.

- Wetlands—The Preferred Alternative would impact approximately 0.07 acres of non-jurisdictional wetlands. Mitigation would be completed on at least a 1:1 replacement ratio within the study area by wetland creation and/or, if necessary, by purchase of credits at a wetland mitigation bank within the primary service area.

- Wildlife/Threatened and Endangered Species—Construction of the Preferred Alternative would impact approximately 1.2 acres of the black-tailed prairie dog towns located in the study area. Black-tailed prairie dog mitigation would be conducted according to the Broomfield *Policies for Prairie Dog Conservation and Management,* CDOT Interim Region 6 Prairie Dog Policy and in coordination with all appropriate entities.

- Historic Properties—The SHPO concurred with FHWA that there is *no adverse effect* to any of the historic properties within the study area.

- Hazardous Waste—The Preferred Alternative has the potential to be impacted by eight sites identified in the study area.

- Section 4(f)—The Preferred Alternative would require a permanent easement across the BNSF Railroad right-of-way. Impacts were evaluated in consultation with the SHPO in March 2003, and resulted in a *no adverse effect* to the railroad.

Public involvement activities have included meetings and communication with concerned citizens, property owners, businesses, advocacy groups and the general public. Other activities include phone calls, newsletters, emails, one-on-one meetings, small group meetings and public open houses. A project mailing list has been maintained, and as of January 2005, the list contained over 600 contacts.

On June 10, 2004 a project Open House was held to provide information concerning the project and to gather public comment. A public hearing has been scheduled for April 21, 2005 from

4:00 pm to 6:30 pm at the Jefferson County Airport, Mount Evans Room. The public hearing provides the public with the opportunity to officially comment on the EA and the Preferred Alternative.

This EA was made available to the public on April 6, 2005, for a 45-day review and comment period. The deadline for receiving comments on this EA is May 20, 2005. Written comments on the EA and the Preferred Alternative should be submitted to:

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During the 45-day review period the 120th Avenue Connection EA is available for public inspection at the following locations:

- City and County of Broomfield, Community Development
  One DesCombes Drive, Broomfield, CO 80020
- Mamie Doud Eisenhower Public Library
  3 Community Park Road, Broomfield, CO 80020
- CDOT Region 6 Office, Planning and Environmental Division
  2000 S. Holly Street, Denver, CO 80222
- Regional Transportation District
  1600 Blake Street, Denver, CO 80202
- Carter & Burgess
  707 17th Street, Suite 2300, Denver, CO 80202

Copies will also be available for review at the Public Hearing.

Chapter 1.0: Purpose and Need

1.1 INTRODUCTION

The City and County of Broomfield (Broomfield) proposes to provide a direct connection across US 36 between the intersection of State Highway 128 and Wadsworth Parkway (SH 121) on the west and 120th Avenue (SH 128/US 287) on the east. This Environmental Assessment (EA) evaluates options in providing the direct connection including examination of the purpose and need for the connection, alternatives under consideration, anticipated social, economic and environmental impacts associated with the project, and mitigation measures. Currently, both the SH 128 and 120th Avenue corridors run east-west and converge near the Wadsworth/US 36 Interchange.

The study area extends from the proposed new intersection of SH 128 and Wadsworth Parkway (currently under development by the Colorado Department of Transportation [CDOT] and not part of this project) on the west to the intersection of 120th Avenue and Teller Street on the east, a distance of approximately 1.2 miles. The general project location is shown in **Figure 1-1**. **Figure 1-2** shows the detailed study area. This project is located entirely within the City and County of Broomfield.

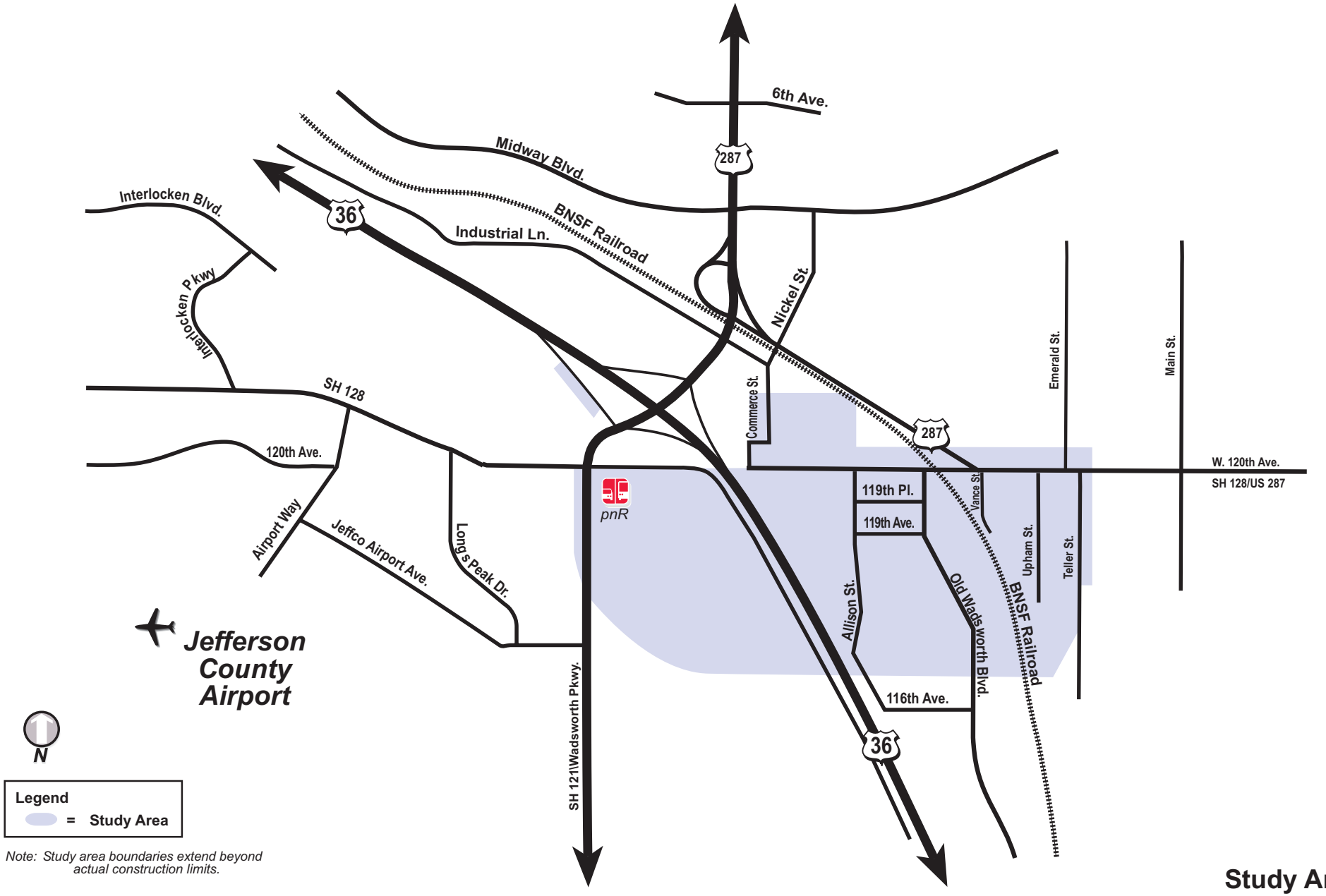
1.2 PROJECT PURPOSE AND NEED

The current roadway network in the study area consists of discontinuous routes, generally in the east-west direction. Two primary east-west corridors, SH 128 and 120th Avenue do not have a direct connection across US 36 which requires out of direction travel for east-west through traffic. SH 128 is discontinuous at Wadsworth Parkway where it jogs to the north about 0.62 mile to its intersection with the diagonal segment of US 287, and then follows the diagonal segment southeast to 120th Avenue.

Currently, the only two crossings of US 36 for east-west travel are W. Midway Boulevard (approximately two miles north of the study area) and the Wadsworth/US 36 Interchange. As Broomfield and the surrounding area have grown, this lack of continuity in the roadway network and the convergence of traffic at the Wadsworth/US 36 Interchange have led to increased congestion and travel delays on surrounding roadways, as well as presenting safety concerns. The interchange currently serves three major regional corridors: US 36, the east-west 120th Avenue corridor, and the north-south Wadsworth Parkway corridor. Both east-west and north-south travel in the area have become increasingly more difficult with the convergence of through traffic and interchange traffic on the Wadsworth bridge over US 36. All east-west through traffic on SH 128 and 120th Avenue must use the heavily congested Wadsworth/US 36 Interchange to cross US 36 which results in congestion for those wishing to travel north-south through the interchange.

General Project Location

Figure 1-1



Note: Study area boundaries extend beyond actual construction limits.

Study Area

Figure 1-2

The purpose of the 120th Avenue Connection project is to accommodate existing and forecasted east-west through traffic, reduce out of direction travel, and alleviate congestion along area roadways, including the Wadsworth/US 36 interchange. In summary, the needs for the proposed improvements include:

- Correcting the discontinuity of both the SH 128 and 120th Avenue corridors for through traffic crossing US 36 to reduce out-of-direction travel. Those desiring to travel east-west on SH 128/120th Avenue must now travel through the heavily congested Wadsworth/US 36 Interchange.

- Relieving peak hour congestion along 120th Avenue, SH 128 and through the intersection. Both SH 128 and 120th Avenue are operating at capacity in the peak hours, and will be above their functional capacity during peak hours in the future without the 120th Avenue Connection. Traffic forecasts indicate at least a doubling in traffic over the next 20 years. Traffic volumes are increasing due to regional and local growth and development in the vicinity resulting in congested conditions and greater traffic delays.

- Providing improved access to proposed RTD park-n-Ride facilities. RTD is planning to relocate the existing Broomfield park-n-Ride to new locations on both sides of US 36 in the vicinity of this project.

- Providing congestion relief in the Wadsworth/US 36 Interchange by removing most east-west through traffic, thereby improving north-south traffic on US 287 and Wadsworth Parkway.

- Reducing accident rates within the study area which are currently above the statewide average for both US 287 and SH 121/Wadsworth Parkway.

- Providing improved access and safety for pedestrians and bicyclists.

The 120th Avenue Connection project would address the needs listed above by providing a crossing of US 36 for east-west vehicular, transit, pedestrian and bicycle traffic. Completion of this improvement would ease existing and forecasted traffic congestion on SH 128 and 120th Avenue and on other area roadways such as Wadsworth Parkway, Midway Boulevard, Nickel Street, Commerce Street, and US 287, as well as through the Wadsworth/US 36 Interchange.

There are no additional roadways planned in the study area in the near future that would provide a connection across US 36, although consideration is being given to extending 112th Avenue across US 36 further to the south. The US 36 Corridor Environmental Impact Statement (EIS), begun in late 2003, will evaluate transportation improvement alternatives along US 36 and interchanges with US 36, including the Wadsworth/US 36 Interchange. The EIS is a multi-year project, and any potential improvements to the Wadsworth/US 36 Interchange would be phased over time. The proposed 120th Avenue Connection would be designed to accommodate any reasonably foreseeable improvements that could be made to the Wadsworth/US 36 Interchange.

In March and April of 2004, a Citizen Survey of Broomfield residents was conducted. The survey compared current results to a baseline survey conducted in 2002. As in the 2002 survey, residents felt that the most serious problem was traffic congestion, particularly on roadways within the study area. Improvements to the Wadsworth/US 36 Interchange and 120th Avenue corridor were two of the top project priorities expressed by area residents. Fire and ambulance services were deemed to be the most important services in Broomfield in both surveys.

1.3 PROJECT HISTORY

The 120th Avenue Connection project is located in the vicinity of the Wadsworth/US 36 Interchange. The Wadsworth/US 36 Interchange has been the subject of five transportation studies over the past six years and this history is important in understanding and evaluating the present needs for the 120th Avenue Connection.

The Wadsworth/US 36 Interchange was constructed as part of the Denver-Boulder Turnpike (US 36) project, which provided a more direct highway route between Denver and Boulder. Since the construction of the Wadsworth/US 36 Interchange in the 1960s, substantial population and employment growth has occurred along the entire US 36 Corridor from Boulder to Denver. The addition of Flatirons Crossing retail area, located at the US 36/96th Street Interchange approximately two miles north of the study area, has increased traffic substantially on SH 128. The Interlocken Loop extends from the 96th Street Interchange south to SH 128, and continues east providing a connection to the Interlocken Business Park and the Jefferson County Airport.

The five transportation studies focusing on the Wadsworth/US 36 Interchange and surrounding area since 1998 are briefly discussed below.

- The *US 36 Wadsworth Broomfield Interchange Feasibility Study*, completed in 1999, recommended a concept design that included a combination of improvements. Elements of this recommended improvement package addressed the Wadsworth Corridor, extension of 120th Avenue over US 36, US 36 ramp connections to Wadsworth and SH 128 with collector/distributor roads, and the Wadsworth connection to US 287. In addition, the recommendation included relocation of RTD's Broomfield park-n-Ride, and pedestrian and bicycle enhancements throughout the study area. The Transportation Commission of Colorado approved the Feasibility Study in the spring of 1999.

- The *US 36 Major Investment Study (MIS)*, completed in June 2001, entailed a collaborative process to identify potential solutions to long-term transportation needs along the US 36 Corridor between Denver and Boulder. The MIS recommendations included a multi-modal package of improvements. This study assumed the extension of 120th Avenue across US 36 and the relocation and expansion of the Broomfield park-n-Ride.

- An *Analysis of Roadway Options for US 36* was conducted concurrent with the US 36 MIS and evaluated the roadway capacity in the US 36 Corridor given the constraints at each

endpoint (Boulder and I-25 in Denver). The analysis was coordinated with the MIS to determine the appropriate laneage for US 36 and for the Wadsworth/US 36 Interchange.

- The *Wadsworth/US 36 Interchange Project Definition Report,* completed in December 2001, documented that the interchange had independent utility and that an Environmental Assessment (EA) represented the appropriate level of analysis for studying future interchange improvements.

- The *Wadsworth/US 36 Interchange Environmental Assessment* was started in September 2001 based on the findings in the *Feasibility Study* and *Project Definition Report*. The EA examined the impacts associated with reconstruction of the Wadsworth/US 36 Interchange, the extension of 120th Avenue across US 36, and new ramp connections from Wadsworth Parkway and SH 128 to US 36. However, this EA was discontinued in May 2003 due to a number of issues which included: a funding source had not been identified for the project; the project was not listed in the Regional Transportation Plan (RTP); and the US 36 Corridor EIS was about to begin which would include an evaluation of the interchange.

This study, the 120th Avenue Connection EA, represents a continuation of the Wadsworth/ US 36 Interchange EA process, but will focus solely on the extension of 120th Avenue across US 36, which was one of the phased components of the original EA. The 120th Avenue Connection project was determined to have independent utility based on the following:

- The 120th Avenue Connection identifies logical endpoints for a transportation improvement.

- This project addresses a significant transportation need without requiring implementation of future transportation projects.

- The design for the connection will be compatible with all reasonably foreseeable future improvements resulting from the US 36 EIS.

- Implementation of the proposed improvements will not irretrievably commit funds for other related projects.

A copy of the independent utility determination and concurrence by the Federal Highway Administration (FHWA) is included in **Appendix B**.

1.4 Existing and Future Traffic Issues

In January 2005 the DRCOG 2030 fiscally constrained Regional Transportation Plan (RTP) sketch model became available during the final review process for this EA. However, for traffic analysis purposes in this EA the DRCOG 2025 RTP sketch model was used since the majority of the information presented in this EA was completed for the *Draft Wadsworth/US 36 Interchange EA* in 2002 and updated in 2004. A comparison of 2025 to 2030 forecasts was conducted and several differences were noted (see Section 3.6.1.1). Even with the differences in forecasted roadway networks between the 2025 and 2030 modeling timeframes, the volumes forecasted

on 120th Avenue are similar and are still within the appropriate range for a six-lane facility as determined in the EA.

1.4.1 Roadway Network and Traffic Operations

The lack of continuity in the SH 128 and 120th Avenue corridors accounts for the majority of the major problems identified within the study area and discussed in Section 1.2. These problems are most evident when viewing the left turn from eastbound SH 128 to northbound Wadsworth Parkway. This left turn volume represents 75 percent of the volume approaching on SH 128, since turning left is the only way to access US 36, 120th Avenue, and US 287. The lack of a direct connection across US 36 requires out of direction travel for east-west through traffic. The convergence of traffic from three major regional corridors, US 36, the east-west 120th Avenue corridor, and north-south Wadsworth Parkway corridor, causes high peak period and daily traffic volumes for east-west and north-south traffic. These problems are due, in large part, to the lack of regional east-west crossings of US 36.

Traffic forecasts for study area roadways indicate at least a doubling in traffic over the next 20 years, especially at the Wadsworth/US 36 Interchange (see Section 3.6). The regional traffic forecasts for the area indicate that all of the arterials and freeways in the area will be operating at their functional capacity by 2020. The lack of continuity and high traffic forecasts for the SH 128 and 120th Avenue corridors suggest a strong need for an additional crossing of US 36 to maintain traffic flow on the main corridors.

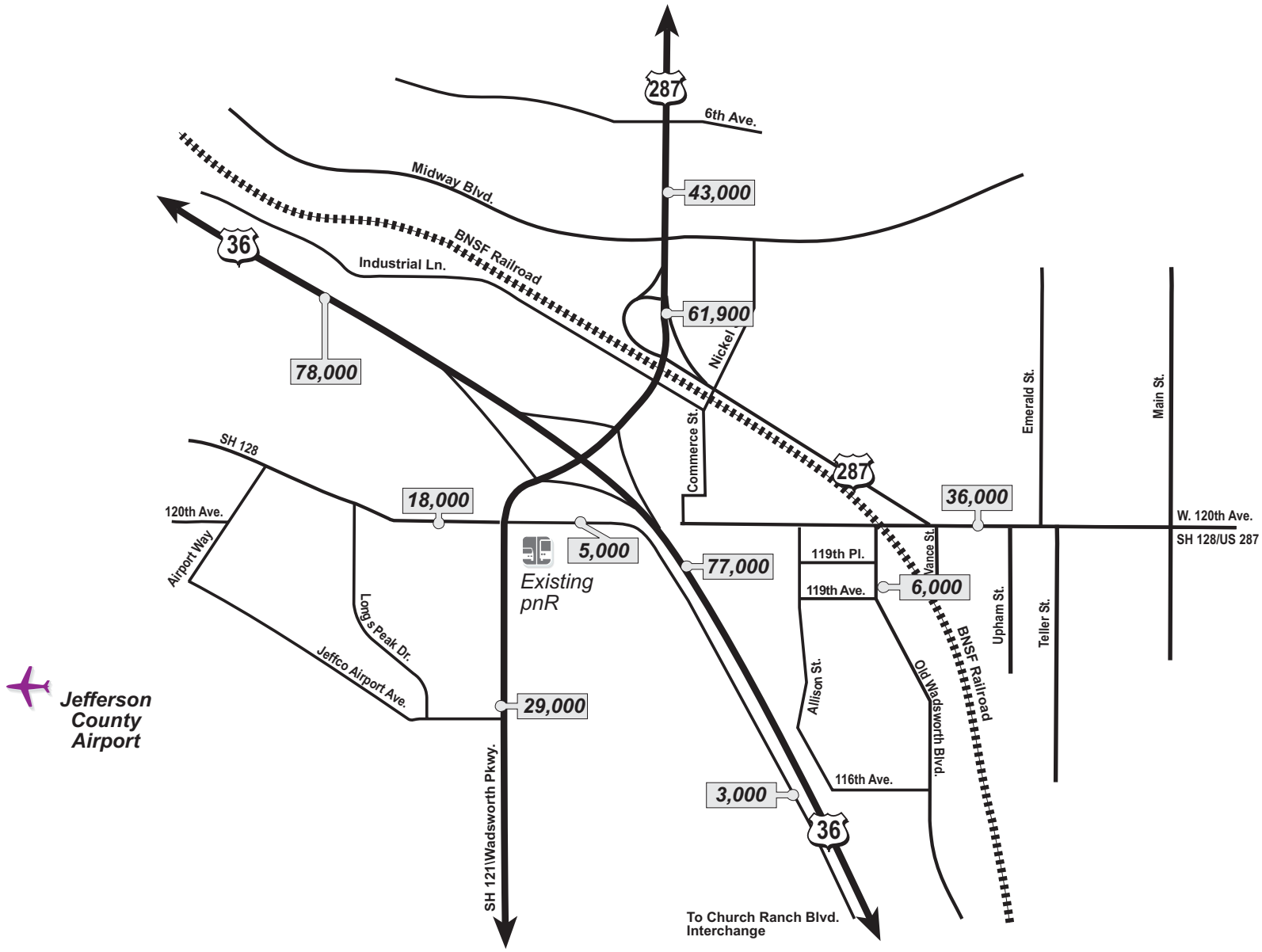
The traffic operations on the Wadsworth bridge over US 36 are currently at or above capacity during peak hours. The notable characteristic of the existing traffic volumes is that the Wadsworth crossing of US 36 is “double-loaded” with traffic from the north-south US 287 and Wadsworth Parkway corridors plus the east-west SH 128 and 120th Avenue corridors. The existing daily traffic volumes in the study area are shown in **Figure 1-3**. Congested conditions at the crossing exist for the following general reasons:

- Lack of alternative east-west crossing of US 36
- Inadequate through lanes for heavy traffic movements, both north-south and east-west
- High volumes of turning traffic
- Inadequate storage for turning vehicles
- Physical constraints to making interim improvements

1.4.2 Safety

CDOT provided accident data for the state highway routes within the study area. Analysis of this data, existing roadway deficiencies, and emergency service provider access within the study area shows that overall public safety can be improved with the construction of an additional connection across US 36.

Field observations and CDOT accident data confirm the safety issues created by high traffic volumes and congestion levels on study area roadways. Based on the data and observations in



Source: Broomfield and CDOT

Year 2002/2003 Daily Traffic Volumes

Figure 1-3

the field, there are several issues that contribute to higher than normal accident potential due to operational deficiencies.

- In order to access eastbound 120th Avenue from northbound US 287, vehicles must turn left (to access the ramp that turns and goes underneath SH 121) across two lanes of southbound US 287 without the aid of a signal. At this location gaps in traffic are not frequent enough to serve the volume demand. This results in drivers attempting to make the turns in shorter than desired gaps in traffic, leading to numerous accidents. In addition, there are severe back-ups at this location causing frequent operational difficulties with northbound through traffic.

- The double-loading of the Wadsworth bridge over US 36 causes backups due to lack of capacity at the signalized intersections. Unexpected slowing or stopped traffic contributes to numerous rear-end accidents.

- Frequent traffic congestion at all of the signalized intersections within the study area causes drivers to try and beat signals, run red lights, or queue into an intersection after the light has turned red, all contributing to accidents.

- Since the Wadsworth bridge is the only crossing of US 36 for about two miles in either direction, emergency services providers frequently need to use this crossing. The heavy congestion at this location inhibits the response times of the emergency service providers.

Study area roadways have a consistently high level of congestion, which can be the source of numerous rear-end accidents. This problem is combined with below-standard design attributes on the existing facilities, such as lack of shoulders, inadequate turn lane storage, numerous driveway accesses, and lack of pedestrian and bicycle facilities. Given the high level of congestion and these design deficiencies in the existing system, the high number of accidents is not an unexpected result.

Table 1-1 shows accident data compiled by CDOT for a three-year period (2000 to 2002). Data for portions of SH 121 (Wadsworth Parkway), SH 128 and US 287, which extend through the study area, were requested. Of the total accidents, a portion resulted in injuries. There were no fatalities reported.

Of the accidents on the 1.3 mile segment of SH 121, 67 percent were rear end collisions, 17 percent were sideswipe or broadside accidents, 10 percent were turning related, and less than one percent were head-on collisions. Of the accidents on the two-mile stretch of SH 128, 46 percent were rear end collisions, 23 percent were sideswipe or broadside accidents, 20 percent were turning related, and less than one percent were head-on collisions. Finally, of the accidents on the three-mile segment of US 287, 61 percent were rear end collisions, 20 percent were sideswipe or broadside accidents, 10 percent were turning related, and less than one percent were head-on collisions.

Table 1-1
Accident Data
(2000-2002)

Highway Segment	Milepost	# of Accidents	Property Damage Only	Injury Accidents	Fatality Accidents	Accident Rate
SH 121 (Wadsworth Parkway)	25 to 26.3 (between 112th Avenue and Midway)	465	380	85	0	10.48 per MVMT
SH 128	6 to 7.97 (between Simms and Wadsworth Parkway)	65	41	24	0	2.19 per MVMT
US 287	296 to 299 (between Sheridan and W. 10th Avenue)	666	494	172	0	6.49 per MVMT

Source: CDOT Transportation Safety and Traffic Engineering Detailed Accident Summary Report, August 2004

Accident rates provide an indication of the safety of roadways. The total accident rate is a measure of the total accidents per million vehicle miles of travel (MVMT). The calculated accident rate for the roadway segments may be compared to the average accident rates for similar type facilities. Average accident rates are documented in CDOT's *Crashes and Rates on State Highways 2002*. Both segments of US 287 and SH 121 through the study area are designated as Urban Other Principal Arterials. According to the *Crashes and Rates Report*, the average accident rate for this type of roadway is 5.27 per MVMT. The accident rates for US 287 (6.49 per MVMT) and SH 121 (10.48 per MVMT) are both higher than the state average. The segment of SH 128 is designated as an Urban Minor Arterial. The average accident rate for this roadway type is 4.08 per MVMT. The segment of SH 128 through the study area is lower than the average, with an accident rate of 2.19 per MVMT. The accident rates for all three roadway segments are listed in **Table 1-1**.

1.4.3 Pedestrian and Bicycle Facilities

The current study area transportation network was originally developed with more rural-type roadways that did not have attached sidewalks or specific bicycle facilities. Some improvements have been made in selected areas but the pedestrian and bicycle facilities are generally not continuous. Bicyclists in the community have expressed a strong desire to improve both recreational and commuter bike routes throughout the community. Pedestrian and bicycle access to the relocated RTD park-n-Ride facilities (see discussion in Section 1.5) is also highly desirable.

Bicycle plans and maps for the study area, including the *US 36 Bike Links Regional Map* and the *Broomfield Open Space, Parks, Recreation and Trails Master Plan* (2005), have been examined for this EA. Inclusion of pedestrian and bicycle facilities along the 120th Avenue Connection is compatible with existing transportation plans and supports the Transportation Element of the *Broomfield Strategic Plan* (1998), which states that the use of alternate modes of travel in Broomfield would ease congestion and provide positive alternative travel experiences.

1.5 COMPATIBILITY WITH TRANSPORTATION PLANS

The *2030 Metro Vision Regional Transportation Plan*, adpoted January 19, 2005, has identified 120th Avenue from Wadsworth to E-470 as a major regional arterial. The 120th Avenue Connection project is identified in the Fiscally Constrained 2030 RTP as a regionally significant project and is in the 2005-2010 TIP/STIP, though not fully funded in the TIP.

RTD has documented the operational deficiencies of the existing Broomfield park-n-Ride as part of the Feasibility Study for the Wadsworth/US 36 Interchange. RTD is planning to develop new park-n-Ride facilities along both sides of US 36, south of the proposed 120th Avenue Connection alignment. The planned new facility would include one lot on each side of US 36 with a grade-separated pedestrian connection between the slipramp platforms on each side of US 36.

The design for the 120th Avenue Connection would take into consideration the planned improvements by RTD and allowance would be made for those facilities. The extension of 120th Avenue and its connection with Allison Street would provide a connection point for access to the lot on the east side of US 36. The west-side lot would be accessed off of Wadsworth Parkway and the proposed 120th Avenue Connection.

1.6 CONCLUSION

The recommended 120th Avenue Connection improvements are intended to enhance regional mobility in the study area, decrease delays on area roadways, improve pedestrian and bicycle facilities, improve safety, and minimize community disruption. On a system level, this project provides a partial solution to accommodating travel demand on the three major regional corridors that converge at the Wadsworth/US 36 Interchange. The proposed improvements, fully described in Chapter 2.0, would address the following problems:

- Lack of continuity in the area's arterial grid.
- Insufficient capacity on study area roads and interchanges with traffic volumes expected to nearly double over the next 20 years.
- Lack of alternate through routes across US 36 for east-west traffic.
- Lack of safe pedestrian and bicycle facilities.

- Design deficiencies of local roadways.
- Accident rates higher than the state average on two of three study area highways (SH 121 and US 287).
- Double-loading of traffic through the heavily congested Wadsworth/US 36 Interchange.

Chapter 2.0: Alternatives

2.1 ALTERNATIVES DEVELOPMENT OVERVIEW

Alternatives development for a 120th Avenue Connection across US 36 began with the *US 36 Wadsworth Broomfield Interchange Feasibility Study* completed in 1999. The *Feasibility Study* developed alternatives for the entire Wadsworth/US 36 Interchange area to provide higher capacity on the arterial roadways and improved connections to US 36 ramps. During the *Feasibility Study* process, various alternatives were reviewed with a Technical Advisory Committee (TAC) and a Steering Committee. The TAC included representatives from the City and County of Broomfield, Jefferson County, Interlocken, CDOT, FHWA, RTD, the US 36 Transportation Management Organization, and the BNSF Railway Company. The Steering Committee was a smaller group of policy level representatives from Broomfield, Jefferson County, Boulder County, CDOT, and Interlocken. Alternatives were analyzed against a set of criteria developed by the TAC.

As part of the *Feasibility Study*, several public meetings and presentations were conducted, some in coordination with the *US 36 Major Investment Study (MIS)*. The *Feasibility Study* was prepared in accordance with CDOT Policy Directive 1601, which requires that all new interchanges or the reconstruction of existing interchanges on major state highways be reviewed and fairly evaluated in a consistent manner based on established guidelines. The alternatives analysis process determined that the recommended concept should be a combination of improvements, including the extension of 120th Avenue across US 36. The Colorado Transportation Commission approved the results of the *Feasibility Study* in 1999.

Following the approval of the recommended concept in the *Feasibility Study*, an environmental assessment was initiated to conduct a detailed study of the Wadsworth/US 36 Interchange and identify a Preferred Alternative. The Preferred Alternative identified in the draft EA included an interchange improvement alternative and a new 120th Avenue alignment across US 36. These improvements were similar to the recommended concept developed in the *Feasibility Study* with some minor modifications to access points along the 120th Avenue Connection and changes to local street connections and circulations. The EA was discontinued in May 2003 when decisions were made to study the interchange as part of the US 36 Corridor Environmental Impact Statement (EIS).

Following discontinuation of the *Wadsworth/US 36 Interchange EA* in 2003, the 120th Avenue Connection EA began in February 2004. The purpose of this EA is to focus on identifying and assessing alignments for a connection of 120th Avenue and SH 128 across US 36, and access options to the connection. The analysis presented in this chapter draws heavily upon work previously accomplished as part of the *Feasibility Study* and the draft *Wadsworth/US 36 Interchange EA*. A summary of the analyses is provided in subsequent sections.

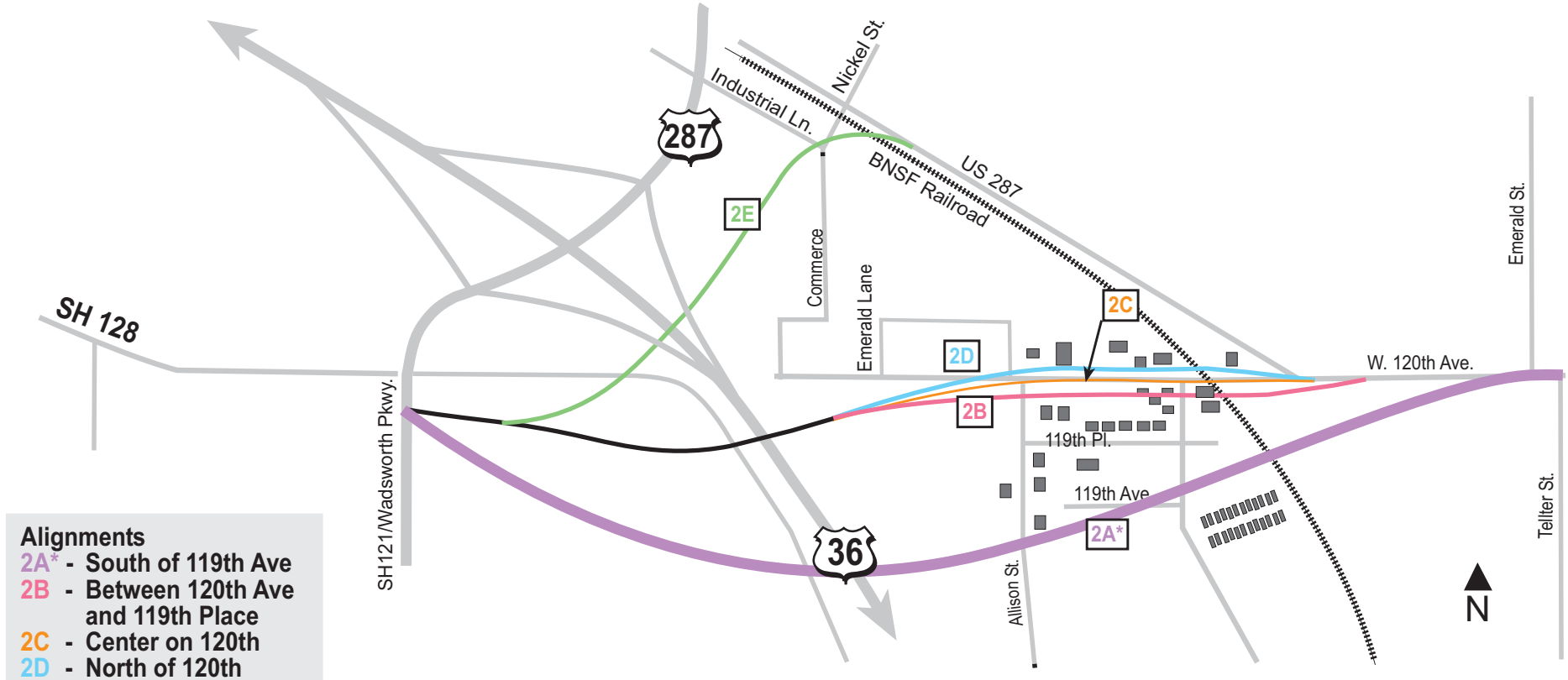
2.2 120TH AVENUE ALIGNMENTS

In order to accommodate the travel demand for east-west movements through the study area and relieve congestion for north-south movements, several alignments were examined to provide a direct connection across US 36 from SH 128 on the west to 120th Avenue on the east. Six alignments for a new connection of 120th Avenue over US 36 were developed and analyzed in the *Feasibility Study*. One of the six alignments was eliminated during the "fatal flaw" screening stage of analysis. All of the alignments for the 120th Avenue Connection were developed assuming that 120th Avenue would pass beneath the BNSF Railroad tracks (railroad bridge over roadway) except for Alignment 2E, which would be on a structure above the railroad. The five remaining alignments evaluated in the *Feasibility Study* are illustrated in **Figure 2-1** and are described briefly as follows:

- **Alignment 2A:** The new SH 128/120th Avenue connection would be on a new alignment to the south of the current 119th Avenue in an attempt to limit impacts to existing buildings.
- **Alignment 2B:** The new SH 128/120th Avenue connection would be aligned just south of the existing two-lane section of 120th Avenue through Old Broomfield, leaving the existing two-lane road as a frontage road for buildings on the north side.
- **Alignment 2C:** This alignment would widen the current two-lane section of 120th Avenue where possible and retain buildings on each side where access could be maintained before the alignment drops below the BNSF Railroad.
- **Alignment 2D:** The new SH 128/120th Avenue connection would be aligned just north of the existing two-lane section of 120th Avenue through Old Broomfield, leaving the existing two-lane road as a frontage road for buildings on the south side.
- **Alignment 2E:** This alignment does not go through Old Broomfield but stays on existing US 287 until approximately Nickel Street. At that point the new 120th Avenue alignment would climb up and over the BNSF Railroad. The new alignment would be nearly parallel with Wadsworth when crossing US 36, then curve back to the west to meet the SH 128 alignment west of Wadsworth.

Initially, in the *Feasibility Study* and again in the draft *Wadsworth US 36 Interchange EA,* these five alignments were evaluated in greater detail against a set of criteria that included: Design and Construction, Travel Demand, Environmental Issues, and Neighborhood/Community Issues. The alignments were developed to a concept level so that impacts and costs could be estimated. This evaluation was done at a qualitative/comparative level based on preliminary data gathered for the area. The results of this analysis were summarized in an evaluation matrix along with the screening conclusion for each alignment (see **Appendix D**).

Based on the preliminary screening in the *Feasibility Study*, as well as comments from the public, TAC, and the Steering Committee, the following alignments for 120th Avenue were brought forward for more detailed evaluation:



Alignments
- 2A* - South of 119th Ave
- 2B - Between 120th Ave and 119th Place
- 2C - Center on 120th
- 2D - North of 120th
- 2E - Curve over at Nickel

*Note: Preferred Alignment

Source: Wadsworth/US 36 Interchange Draft EA (Spring 2003)

120th Avenue Connection Alignments

Figure 2-1

- **Alignments 2A and 2B,** which each provide operationally desirable alignments with similar environmental impacts to other alignments.

These two alignments for the 120th Avenue Connection (2A and 2B) were brought to a higher level of design to more fully assess design needs, costs, traffic operations, and impacts. Additional engineering work was performed on Alignment 2A, resulting in the location of the 120th Avenue Connection bridge crossing of US 36 being adjusted slightly to the south to reduce the skew angle between the connection and US 36. This modification also requires a shorter and less complicated bridge structure over US 36, flattens the curvature of the 120th Avenue Connection requiring less super elevation and improving sight distances for potential future ramp intersections, avoids impacts to an existing communications tower, reduces the vertical grade on the 120th Avenue Connection from 6.0 to 5.5 percent, and reduces the vertical grade on the Allison Way T-intersection at 120th Avenue Connection from 6.5 to 3.75 percent. Adjustments also were made to avoid impacting the Broomfield Mobile Home Park.

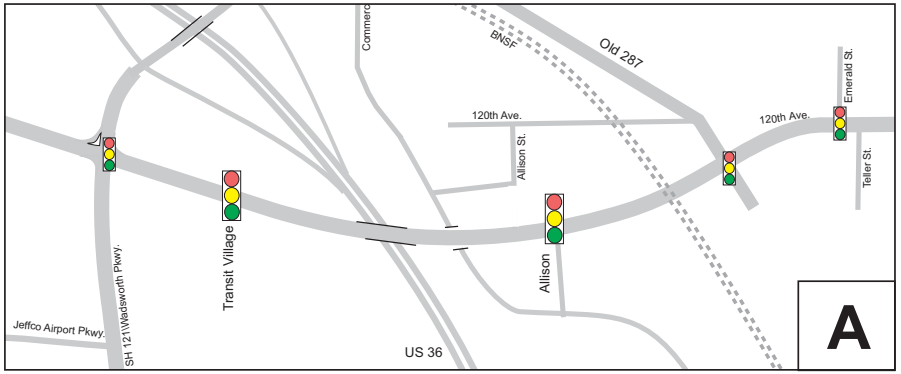
Based on a review of engineering and environmental factors, and public comments regarding the 120th Avenue Connection, Alignment 2A was recommended in the *Feasibility Study* to be carried forward for analysis of impacts in an EA. Under this alignment, the connection to the US 287 diagonal and 120th Avenue is more easily accomplished, no adverse impacts to historic properties along 120th Avenue, impacts to an established neighborhood are considerably reduced, and the connectivity to planned transit facilities is improved, as compared to Alignment 2B.

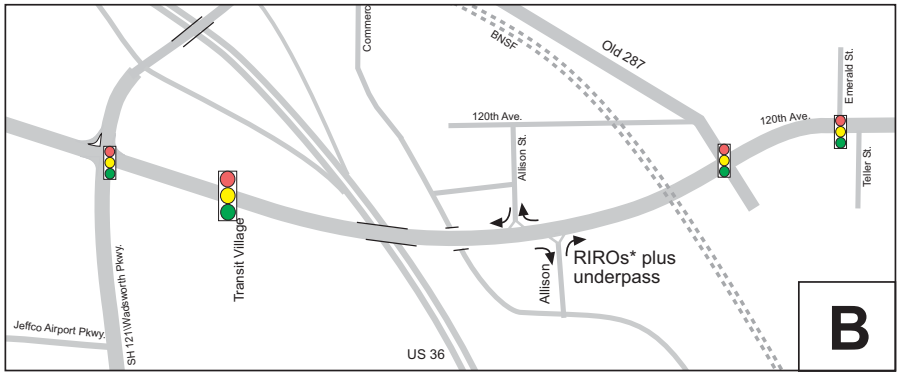
Alignment 2A was the recommended alignment assessed in the draft *Wadsworth/US 36 Interchange EA* prior to its discontinuation. After thorough review of the previously completed *Feasibility Study,* the draft *Wadsworth/US 36 Interchange EA*, and public input into the development of this EA, Alignment 2A is proposed as the Preferred Alternative alignment for the 120th Avenue Connection.

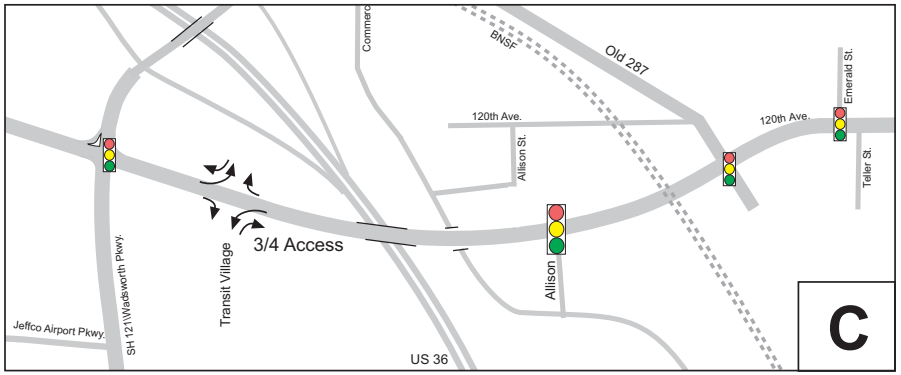
2.3 120TH AVENUE ACCESS OPTIONS

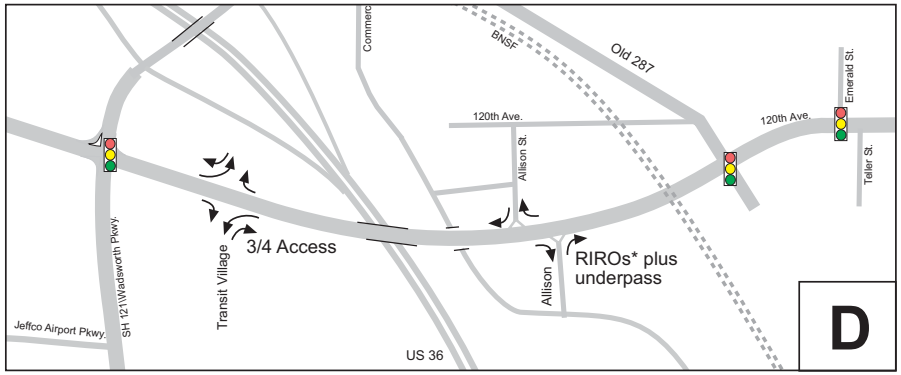
The *Feasibility Study* and draft *Wadsworth/US 36 Interchange EA* depicted two local access points along the 120th Avenue Connection. The access on the west side of US 36 was shown as a right-in/right-out (RIRO) access on each side of the connection with an underpass to connect them, allowing full movements via a low-speed intersection. The local access on the east side of US 36 was proposed as a full-movement signalized intersection at Allison Street.

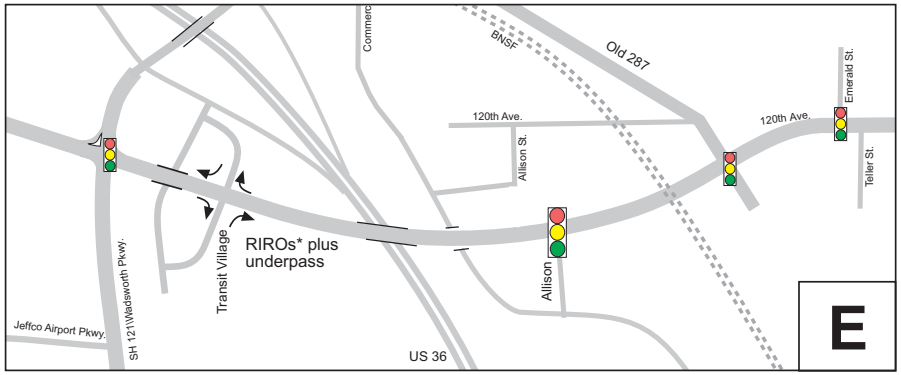
Continued discussion between CDOT, RTD, and Broomfield led to development of additional access options to be carried forward for analysis in the 120th Avenue Connection EA. In April 2004, six access combinations were presented to and agreed upon by the three parties for further study. These six access options are shown in **Figure 2-2** and are combinations of either signals or RIRO accesses on one side of 120th Avenue or the other as defined below.

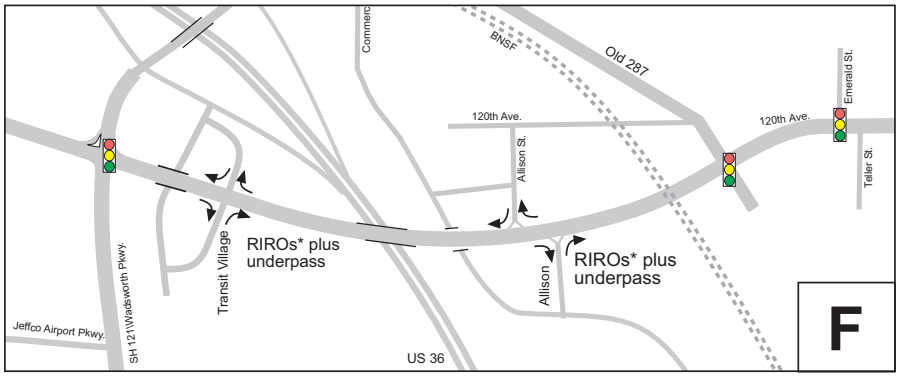












* Right-in, Right-out

120th Avenue Access Options

Figure 2-2

- **Access Option A:** Signal at Transit Village (west) and Signal at Allison (east)
- **Access Option B**: Signal at Transit Village (west) and RIROs (+ underpass) at Allison (east)
- **Access Option C:** 3/4 at Transit Village (west) and Signal at Allison (east)
- **Access Option D:** 3/4 at Transit Village (west) and RIROs (+underpass) at Allison (east)
- **Access Option E:** RIROs (+underpass) at Transit Village (west) and Signal at Allison (east)
- **Access Option F:** RIROs (+underpass) at Transit Village (west) and RIROs (+underpass) at Allison (east)

In July 2004 a technical memorandum, *Comparison of Access Options Along the Proposed 120th Avenue Connection,* was prepared to provide detailed evaluation of the six access options. Criteria considered in the evaluation include:

- Corridor progression, efficiency, and queuing
- Other traffic operations (such as weaving)
- Safety
- Design criteria and design issues
- Pedestrian and bicycle accommodations
- RTD access and route efficiency
- Development impacts to surrounding land
- Compatibility with potential future 120th/US 36 ramp interchanges
- Comparison of potential environmental impacts
- Comparison of potential community impacts
- Cost

An evaluation matrix was prepared and is shown in **Table 2-1**. The function of the matrix was to compare the access options against each other in each of the criteria categories. Color-coding was used to identify the worst (in red) versus the best (in green) in each of the criteria categories, with neutral or mid-level comparisons shown in yellow. It should be noted that red boxes denote the worst only in that particular category when compared against the other options, and do not necessarily indicate a fatal flaw for the option.

The results of comparing the six access options did not clearly reveal a superior access plan. A reduction in the number of signalized intersections in the corridor would have some clear benefits in overall traffic operations and safety in the corridor, yet would create additional community impacts, project costs, increased delay, and out-of direction travel, particularly for RTD operations.

Based on the analysis, a signalized intersection for the east-side access (Allison) has the benefit of substantially reducing community impacts and improving RTD operations on that side of US 36. The Allison signal also would have less impact on 120th Avenue traffic operations since it would be a T-intersection instead of a four-way. Additionally, RTD and Broomfield desire the

Table 2-1
Comparison Matrix for Six Access Options
(See "Comparison of Access Options Along the Proposed 120th Avenue Connection" Technical Memorandum for details on information contained in the table)

Criteria	Access Option A BTV = Signal, Allison= Signal	Access Option B BTV = Signal, Allison = RIRO	Access Option C BTV = ¾, Allison = Signal	Access Option D BTV = ¾, Allison = RIRO	Access Option E BTV =RIRO, Allison=Signal	Access Option F BTV = RIRO, Allison = RIRO
120th Avenue Corridor: progression, efficiency, queuing	**About 20%-30% less efficient than Option F**	Operations Mid-way between A and F	Operations Mid-way between A and F	About 20%-30% more efficient than Option A	Operations Mid-way between A and F	About 20%-30% more efficient than Option A
Other traffic operations		**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**		**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**		**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**
Safety issues	**Most signalized intersections, most potential conflict points**		**Allsion signal on grade between 5%-6%. Unprotected left-in at BTV for high demand left turn**	Unprotected left-in at BTV for high demand left turn	**Allsion signal on grade between 5%-6%**	Least signalized intersections, least potential conflict points
Design criteria issues	**Allison signal on grade between 5%-6%**	Short acceleration distance from WB Allison right-out	**Allsion signal on grade between 5%-6%**	Short acceleration distance from WB Allison right-out	**Allsion signal on grade between 5%-6%**	Short acceleration distance from WB Allison right-out
Bicycle and pedestrian	Signalized crossing for pedestrians at BTV, additional option for crossing at Allison	Signalized crossing for pedestrians at BTV,	**Leaves the crossing of 120th at BTV unserved by a signal or an underpass**	**Leaves the crossing of 120th at BTV unserved by a signal or an underpass**	Both pedestrian crossings via underpasses	Both pedestrian crossings via underpasses
RTD access, route efficiency	Shortest distance and most direct access for bus routes along 120th to reach park N Rides	Less direct route for RTD access from Allison. Good access at BTV	Most direct access for bus routes along 120th to reach park N Rides, one missing left-out from BTV	**Less convenient, more out-of-direction travel at both access points**	Less direct route for RTD access at BTV. Good access at Allison.	**Less convenient, more out-of-direction travel at both access points**
Development potential for surrounding properties	Most direct access, least impact of additional access roads	All movements provided, lefts and throughs are indirect/less convenient	Almost all movements provided some out-of-direction travel for lefts-out or throughs, lefts and throughs are indirect/less convenient	Almost all movements provided some out-of-direction travel for lefts-out or throughs, lefts and throughs are indirect/less convenient	All movements provided, lefts and throughs are indirect/less convenient	All movements provided, lefts and throughs are indirect/less convenient
Compatibility with future interchange	Good signal spacing	**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**	Good signal/access spacing	**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**	Good signal/access spacing	**Close spacing of north leg of Allison to future US 36 ramp, queue from right turn to US 36 backs past right out for Allison**
Comparison of environmental impacts	Least land area required, least potential impacts					**Most additional land area required, more potential impacts**
Comparison of community impacts	Allows Old Broomfield to be isolated from new construction but still have access	**Proximity and noise associated with more traffic on north leg of Allison**	Allows Old Broomfield to be isolated from new construction but still have access	**Proximity and noise associated with more traffic on north leg of Allison**	Allows Old Broomfield to be isolated from new construction but still have access	**Proximity and noise associated with more traffic on north leg of Allison**
Cost comparison (bridge over Allison is part of each so is not included in comparison)	$0.6 to $0.8 million Two signals	$0.3 to $0.4 million One signal	$0.3 to $0.4 million One signal	$0.1 to $0.2 million Accel-Decel lanes	**$2.3 to $2.8 million One additional bridge and additional access roads for BTV**	**$2.0 to $2.5 million One additional bridge and additional access roads for BTV**

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Best **Medium** **Worst**

access point to be signalized to provide more direct access to the future RTD park-n-Ride lot, both for patrons and for busses that need to access the lot. A final benefit of this option would be to provide better access to adjacent development that could follow from the proposed project.

At the proposed Transit Village access west of US 36, the results show that a proposed signal can operate with good level of service (LOS A for SH 128 through traffic) in each peak period. A benefit of this signal to the transit system is that it allows better access for park-n-Ride patrons, and allows a shorter route with less delay for local buses serving the park-n-Ride. However, a signalized intersection at this location raised concerns about traffic operations and safety along the new 120th Avenue Connection. In an effort to provide maximum mobility and safety on the new 120th Avenue Connection while still providing reasonable access to adjacent land parcels, the RIRO option is being recommended. RIRO plus the underpass is essentially a low-speed interchange, serving all turn movements. The updated design work for the 120th Avenue Connection EA determined that the underpass would most favorably be placed west of the RIRO access points, or closer to Wadsworth Parkway, since the profile of 120th is higher moving west. The travel time difference between this option and a signal may be minimal, since the out-of-direction travel time may replace time spent waiting at a red light. Signals on the connector roads to the RIROs are not anticipated, as these will be lower volume local roadways.

In summary, Option E, RIROs (+underpass) at the Transit Village on the west side of US 36 and a T-intersection with a signal at Allison on the east side, is the recommended access option for the 120th Avenue Connection. This conclusion is consistent with access recommendations provided in the *Feasibility Study* and the draft *Wadsworth/US 36 Interchange EA*.

2.4 ALTERNATIVES ADVANCED

2.4.1 No-Action Alternative

The No-Action Alternative (based on the *2025 Interim Regional Transportation Plan*) assumes that SH 128 and 120th Avenue would remain in their current configuration. The No-Action Alternative is therefore consistent with the 2025 *Interim Regional Transportaiton Plan* fiscally constrained network used for analysis purposes in this EA. The 2025 network does not include any improvements to the SH 128 and 120th Avenue corridors or US 36. Improvements forecasted in the 2025 Plan in the study area include widening of Wadsworth Parkway south of the US 36 Interchange, and widening of SH 128 west of the relocated intersection with Wadsworth Parkway. The existing intersection of SH 128 and Wadsworth Parkway would be shifted approximately 300 feet south of its present location. The poor traffic conditions would remain and would likely worsen as projected increases in traffic are realized as growth continues in the area. Traffic on other area roadways, including the Wadsworth/US 36 Interchange, also would worsen resulting in significant delays.

Level of Service (LOS) is one way to describe the quality of operations at a controlled intersection based on a numeric calculation of average delay. The LOS scale is A to F, where A and B describe minimal average delay at a signal, perhaps five to 15 seconds per vehicle. LOS

C and D are desirable measures for urban areas, usually 30 to 40 seconds of average delay per vehicle. LOS E would describe the peak hour condition at many locations in the urban area, with about 50 seconds of average delay per vehicle. LOS F describes high delay at the signal, usually well over one minute of delay.

Based on the 2025 No-Action traffic forecasts, the LOS at study area intersections would be as shown in **Figure 2-3**. It should be noted that the LOS F condition at a few of the locations has the effect of metering traffic into and out of the Wadsworth/US 36 Interchange, which allows some other intersections to operate with better LOS.

Some of the undeveloped land in the study area would be developed with the No-Action Alternative. A planned urban development that includes the Transit Village is approved and is moving forward. Further development of the Interlocken complex is likely to occur independent of this project.

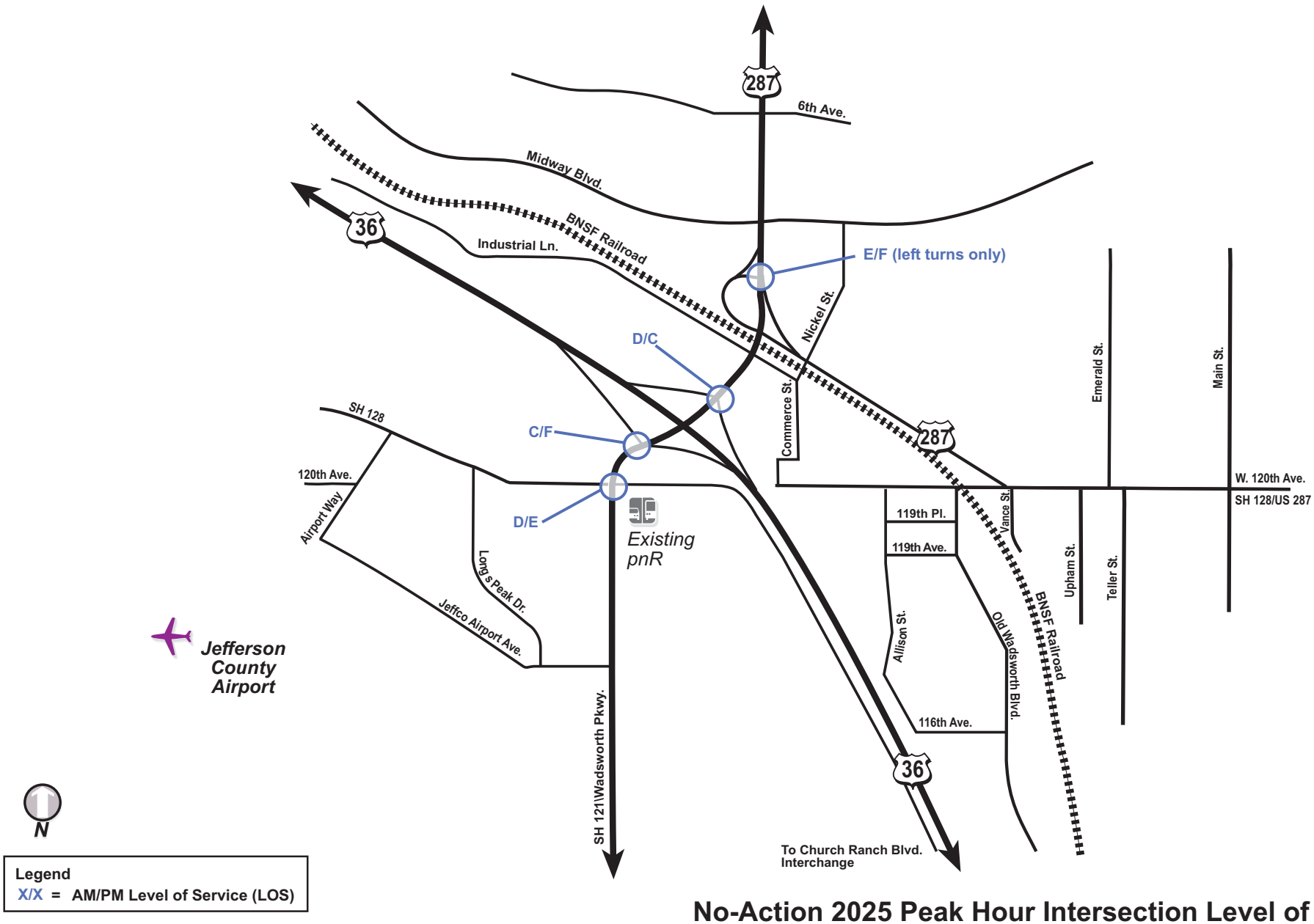
The No-Action Alternative would include construction of the relocated SH 128/SH 121 (Wadsworth Parkway) intersection and the relocated RTD park-n-Ride lots on both sides of US 36. RTD has included funds for the design of these facilities in its 5-year plan. Construction fund allocations would be considered as the timing for the 120th Avenue Connection improvements is identified.

2.4.2 Preferred Alternative

The Preferred Alternative would consist of a six-lane roadway across US 36 connecting 120th Avenue and SH 128, four-foot bike lanes, six-foot sidewalks and two access points to the connection. The Preferred Alternative has been developed to a preliminary level of design for assessment in this EA. Specific design details may change as this alternative is refined during the final design process. The Preferred Alternative is shown in **Figure 2-4**. The roadway network that would be in place with the Preferred Alternative is shown in **Figure 2-5**.

2.4.2.1 120th Avenue Connection

In order to facilitate east-west movements, which are now forced to go through the heavily congested Wadsworth/US 36 Interchange, 120th Avenue would be extended from Teller Street on the east to connect with the relocated SH 128 and Wadsworth intersection on the west. This new roadway would include six through lanes, plus auxiliary lanes where needed, along with four-foot on-street bike lanes and six-foot sidewalks on either side. The proposed cross-section for 120th Avenue is shown in **Figure 2-6**. Once constructed, US 287 and SH 128 designation is proposed to be shifted from the diagonal segment of roadway to the new 120th Avenue Connection. The existing diagonal segment of US 287 would then convert to a local Broomfield street.



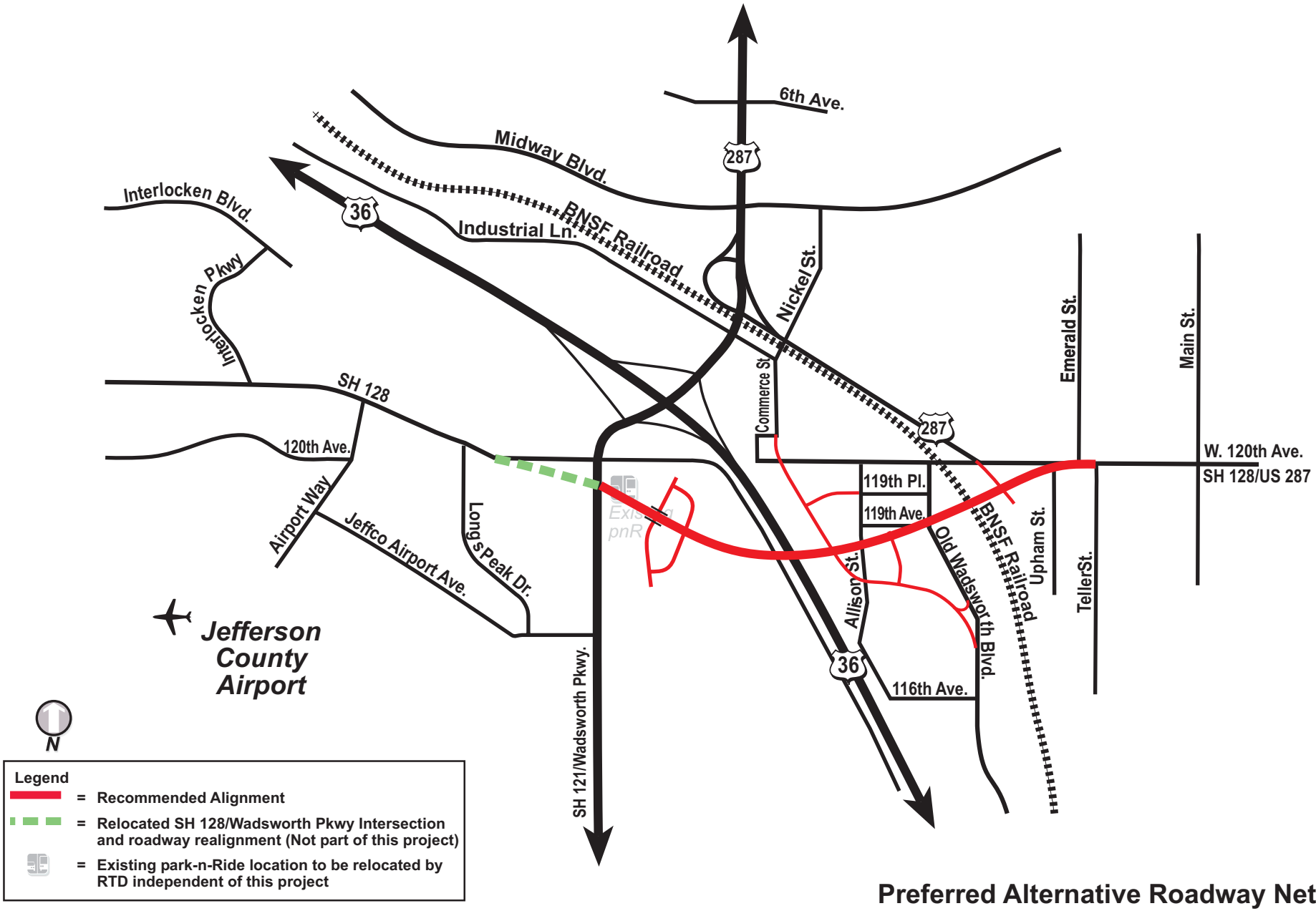
No-Action 2025 Peak Hour Intersection Level of Service

Figure 2-3

Aerial Source: AirPhotoUSA, 2002

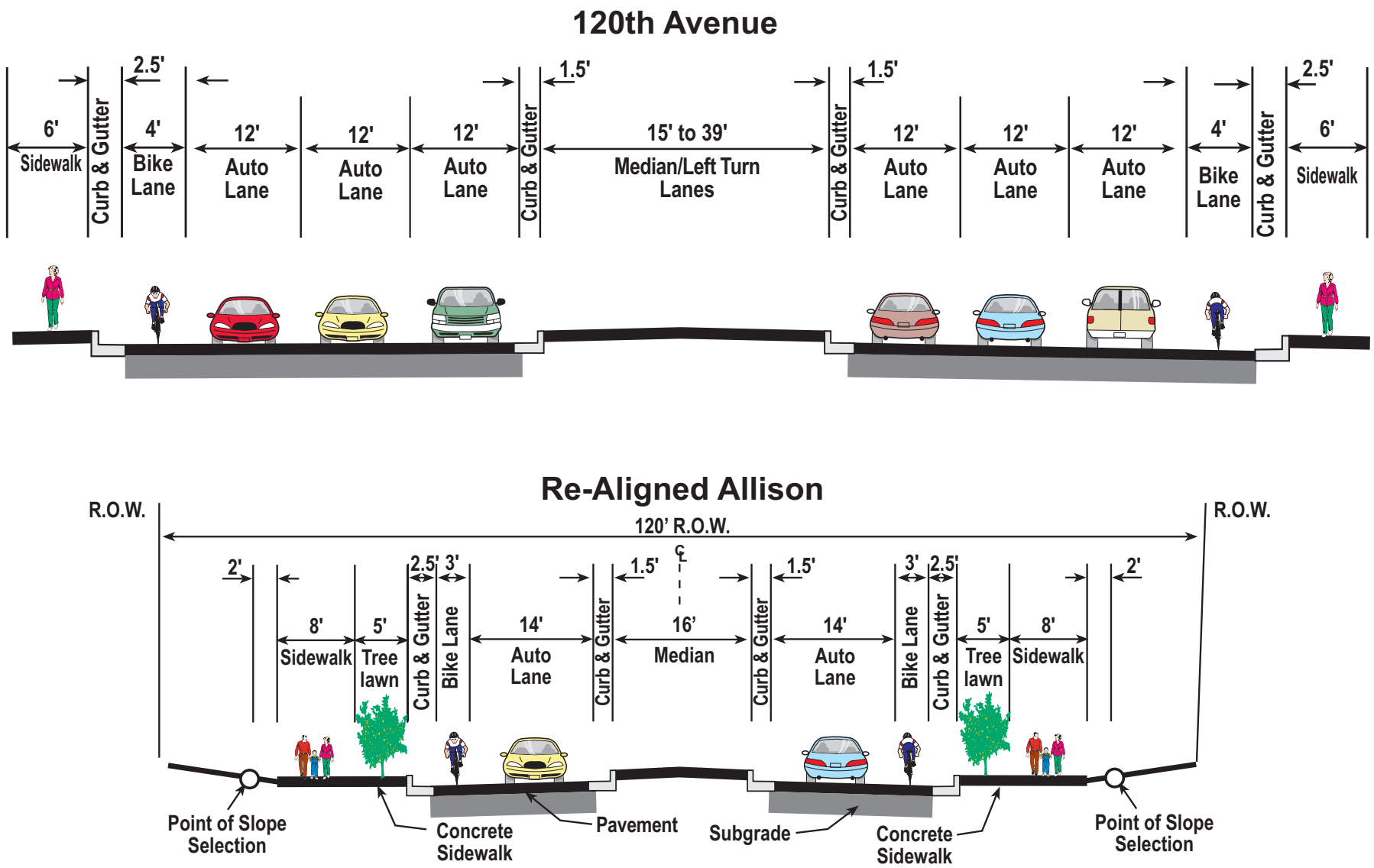
Preferred Alternative

Figure 2-4



Preferred Alternative Roadway Network

Figure 2-5



Preferred Alternative Cross-Sections

Figure 2-6

2.4.2.2 Access Options

On the west side of this new roadway, at a point between Wadsworth Parkway and US 36, there would be a RIRO access on the north and south with an underpass connecting the two. This would provide access to properties both north and south. The updated design work for the 120th Avenue Connection EA determined that the underpass would most favorably be placed west of the RIRO access points, or closer to Wadsworth Parkway, since the profile of 120th is higher moving west. The restricted movement is the left turn movement from either side. This access also would provide an intermodal connection to the west side RTD park-n-Ride facility. The roadway would continue to the east over US 36 where it would connect to a "T" signalized intersection with the newly aligned Allison Street, and continue on to Teller Street.

Allison Street would be the primary intermodal access route for the east-side park-n-Ride lot as planned by RTD. East of that point, the roadway would be depressed so that it can extend under the existing BNSF Railroad tracks. Wadsworth Boulevard, or "Old Wadsworth" would dead-end on either side of this new alignment. North-south movements in the Old Wadsworth area would be accommodated on the re-aligned Allison Street. On the east side of the railroad tracks, the roadway would climb back up to existing grade and tie into 120th Avenue at Teller Street. A new signalized intersection would be constructed to connect the US 287 diagonal to the new 120th Avenue. This new signalized intersection would occur north of 119th Place between Vance and Upham Streets. Some access points to businesses in this area would need to be modified to accommodate this new intersection.

2.4.2.3 Allison Street

Allison Street south of 119th Avenue would be realigned as part of the Preferred Alternative, so that improved north-south access is provided. This new street would be designed to include two travel lanes, a center median, a three-foot bike lane on each side, and sidewalks. The proposed cross-section for Allison Street is shown in **Figure 2-6**. The new alignment would connect to Wadsworth Boulevard, or "Old Wadsworth," south of 119th Avenue, then would continue in a northwesterly direction, crossing under the new 120th Avenue alignment. The roadway would then proceed northward and tie into Commerce Street, north of 120th Avenue. Two connector streets allowing right-in and right-out movements to and from 120th Avenue would provide the access between 120th Avenue and Allison Street. Access to the proposed park-n-Ride lot on the east side of US 36 would be from the newly re-aligned Allison Street.

2.4.2.4 Traffic Operations

The Preferred Alternative was developed to provide an optimum balance of improvements along the 120th Avenue Connection and the surrounding roadway network. The through laneage on the 120th Avenue Connection was designed to be consistent with the through lanes at both ends of the realigned roadway. Maintaining consistent laneage throughout is an important component of the proposed improvements due to the regional continuity of both SH 128 and 120th Avenue.

The Preferred Alternative would minimize local access points to facilitate through traffic movements. RIRO access on both sides of 120th Avenue with an underpass is proposed between Wadsworth Parkway and US 36. This access point would serve the properties near the proposed Transit Village and the new RTD park-n-Ride to the south. The Allison Way access is proposed as a "T" intersection on the south side of 120th Avenue and would serve the proposed re-aligned Allison Street, which would be grade separated from 120th Avenue. As part of the Preferred Alternative, Allison would connect to Commerce Street on the north side of the project and Wadsworth Boulevard on the south. The US 287 diagonal would be converted to a Broomfield minor arterial. The intersection of the US 287 diagonal and the 120th Avenue Connection would be signalized. This signal would also serve a realigned Upham Street to the south. Emerald Street near the east end of the project may be signalized in the future, if traffic volumes warrant a signal.

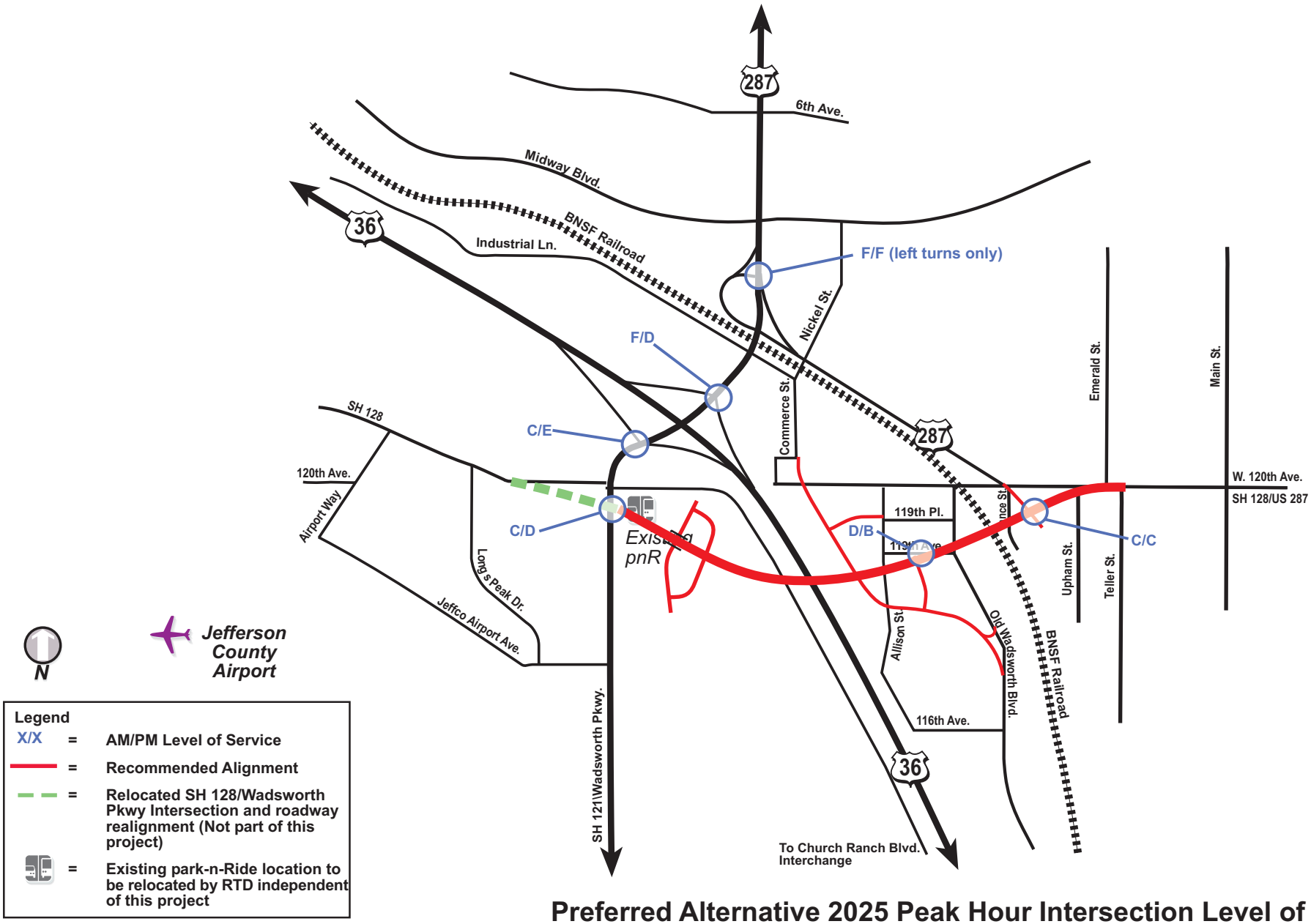
LOS analysis of the Preferred Alternative was conducted for 2025 peak hour traffic operations. A summary of the 2025 LOS for the Preferred Alternative is shown in **Figure 2-7**.

2.4.2.5 Drainage Plan

Drainage concepts for the 120th Avenue Connection include the development of existing and proposed condition basin maps and a major basin Outfall System Plan (OSP). The drainage concepts for the project are based upon the *Broomfield and Vicinity Outfall Systems Planning Study—Alternatives Development and Evaluation Report*, prepared by the Urban Drainage and Flood Control District (District). The final drainage plan would be developed with input from the City and County of Broomfield as well as from the District. A conceptual drainage report was developed for the entire Wadsworth/US 36 Interchange area and is dated October 16, 2002. The 120th Avenue Connection area is only a portion of this overall area and includes basins CP12 and CP13 from the plan.

The drainage plan includes outfall systems within the City Park basin. The drainage system for the 120th Avenue Connection would be designed to include best management practices and be compatible with existing systems or with planned improvements in the area. In general, the existing drainage system would be upgraded to handle a five-year event within a pipe or channel. Flow that exceeds the five-year pipe or channel capacity would be conveyed as overflow in the adjacent street section. The drainage plan generally would follow the concepts developed in the District's master plan for Broomfield and vicinity.

A new grade-separated structure is proposed east of US 36 where the new 120th Avenue Connection crosses under the existing BNSF Railroad tracks. A sump would be formed by the new roadway at this location and would require a storm drainage outfall. A gravity outfall alternative is preferred at this location. Specific alternatives for the outfall alignment would be evaluated during final design.



Preferred Alternative 2025 Peak Hour Intersection Level of Service

Figure 2-7

At the Transit Village undercrossing of the 120th Avenue Connection a sump would be formed requiring a storm drainage outfall. The undercrossing was designed to be west of the RIRO intersection since the profile grade of 120th Avenue rises to the west of the intersection. This allows the sump area to be drained by gravity. The sump, which is just north of 120th Avenue, drains to the infield area bounded by 120th Avenue, the Transit Village road and the North Transit Village road. The stormwater flows from the sump would be routed through sediment basins at two locations, on land currently owned by Jefferson County. The first is at the point of the outfall to the infield area. The second is at a point where the infield flows are collected and pass out of this area under the North Transit Village Road. The existing topography then directs the flows easterly to an existing detention pond, which is would be enlarged as part of the project. The detention pond provides 100-year storm detention as well as water quality benefits prior to storm water flows being released into the basin.

The Dry Creek Valley Ditch south and west of US 36 and owned by Broomfield currently meanders across the proposed 120th Avenue Connection limits. Protection of water flow and water quality would consist of enclosing a portion of the ditch under the roadway extension in a four-foot diameter pipe. The ditch would remain as open channel flow both north and south of the roadway extension. Alternative drainage plans for addressing the 120th Avenue cross culvert effects on the open ditch would be evaluated during final design.

2.4.2.6 Bridge Structures

The 120th Avenue Connection structure over US 36 must span the ultimate cross-section of US 36 as well as potential adjacent collector/distributor roads. A four-span precast girder bridge is proposed. Pier placement must be located such that the future US 36 section and future transit options are accommodated. Precast members allow for quick erection over the highway with minimal disturbance to the flow of traffic during construction. Tiered retaining walls in front of the abutments reduce abutment height and are part of the landscape/aesthetic features. This tiered wall configuration will conform to the landscaping/aesthetics used at other bridges along the US 36 Corridor.

The 120th Avenue Connection structure over the Allison by-pass and the 120th Avenue Connection structure over the Transit Village access road would be single span precast girder bridges. The use of retaining walls in front of the bridge abutments reduces the height of the abutments and reduces the span length by eliminating the need for slope paving. The retaining walls would be designed with aesthetic features that will conform to the overall aesthetic requirements of the corridor and provide for a visually pleasing appearance. The use of the precast girders in combination with the shorter spans provides for cost-effective bridges which meet project design requirements.

The conceptual bridge design for the BNSF Railroad crossing of 120th Avenue is a two-span, prestressed box girder bridge, with a center pier comprised of two oval columns. Side-by-side precast prestressed concrete box girders, with a ballasted deck, have repeatedly been the structure type of choice by the railroads. Due to their cost effectiveness and ease of construction this structure type was chosen for the conceptual design.

2.4.2.7 Retaining Wall Structures

A number of retaining walls are planned to accommodate the construction of the Preferred Alternative. Retaining walls would range from less than 5-feet in height to over 20-feet in height. Proposed wall types include Mechanically Stabilized Earth (MSE), caisson, or cast-in-place concrete. Panel faced soil nail walls also may be used in certain excavation conditions. Retaining walls proposed for this project include:

- **120th Avenue under BNSF Railroad:** Caisson walls are proposed to minimize impacts to adjacent commercial and residential properties.
- **Bridge structures:** Walls are proposed adjacent to certain bridges depending on bridge abutment types and conflicts between adjacent roadway slopes.

2.4.2.8 Right-of-Way

The 120th Avenue Connection project would require acquisition of approximately 51 acres of new right-of-way for the construction of the Preferred Alternative. This includes full parcel acquisition, partial parcel acquisition and right-of-way that may be required for utility easements.

Based on the current design, right-of-way from 29 parcels would be required in part or in whole to construct the Preferred Alternative. Parcel land uses are divided into commercial, residential, vacant and public lands. The majority of residential and commercial relocations required by right-of-way needs are located along the 120th Avenue Connection east of US 36 and at the intersection proposed between Vance and Upham Streets. The required public land parcels are owned by the Regional Transportation District (RTD) and the Jefferson County Airport. None of the public lands needed for right-of-way are parkland. All right-of-way needs would be updated as design plans are finalized.

2.4.2.9 Pedestrian and Bike Facilities

The Preferred Alternative would include pedestrian and bicycle facilities along the new 120th Avenue Connection. Improvements include four-foot bike lanes and six-foot sidewalks on both sides of the roadway. The re-aligned Allison Street would include a three-foot on-street bike lane, which is consistent with City and County of Broomfield standards. The Allison Street bike lane also would provide access to the park-n-Ride. **Figure 2-6** illustrates the bike lane configurations.

This project recognizes the possibility for the future development of a regional bikeway adjacent to the US 36 Corridor through the study area. The 120th Avenue Connection project would not preclude a future regional bikeway along US 36.

2.5 OTHER TRANSPORTATION PROJECTS IN THE STUDY AREA

2.5.1 RTD park-n-Ride Relocation

The existing RTD Broomfield park-n-Ride is located in the study area, at the southeast corner of the intersection of Wadsworth Parkway and SH 128. RTD has identified the need for relocation and expansion of this park-n-Ride facility based on usage and operational considerations. A comprehensive study of alternative locations for an expanded facility was conducted in coordination with the *US 36 Wadsworth Broomfield Interchange Feasibility Study*. The location for the relocated Broomfield park-n-Ride is anticipated to be on both sides of US 36 between 119th Avenue and 116th Avenue. The exact size and location would be identified by RTD. RTD plans to connect the two park-n-Ride lots with a pedestrian crossing.

The improvements proposed and evaluated in this EA for the 120th Avenue Connection have been developed in a manner that would not preclude the proposed park-n-Ride facilities or access to these transit facilities. The park-n-Ride improvements are recognized as a separate project that is planned to occur within the area.

2.5.2 US 36 Corridor EIS

Following the completion of the *US 36 MIS* in 2001, the current phase in the analysis of the US 36 Corridor is the preparation of an EIS. Preparation of the US 36 Corridor EIS began in 2003. The purpose of the EIS is to identify multi-modal transportation improvements between Denver and Boulder, a 25-mile long corridor. The improvements being considered in the 120th Avenue Connection study area include widening of US 36, redesign/reconstruction of the Wadsworth/US 36 Interchange and increased train operations on the BNSF railroad line. The EIS is evaluating the following four build alternatives as packages of improvements (Package 1 is the No-Action Alternative):

- Package 2: transportation management, express toll or high occupancy toll (HOT) lanes, and bus rapid transit (BRT).
- Package 3: transportation management, general purpose lane additions, and BRT.
- Package 4: transportation management, general purpose lanes, BRT and /or high occupancy vehicle (HOV) lanes, and regional rail.
- Package 5: transportation management, general purpose lanes, HOV and express bus, and regional rail.

Improvements to the Wadsworth/US 36 Interchange are included as part of the EIS. A Draft EIS is expected in spring 2005. Since the design and construction of the 120th Avenue Connection would likely precede the completion of the US 36 Corridor EIS, it is essential that the proposed improvements do not restrict consideration of alternatives for the US 36 Corridor. In order to ensure that the 120th Avenue Connection would not preclude options for the US 36 Corridor, the following steps were taken:

- Close coordination has been maintained between the project teams preparing the 120th Avenue Connection EA and the US 36 Corridor EIS.
- The 120th Avenue Connection bridge over US 36 would be designed to accommodate the maximum width for all US 36 improvement options being considered in the US 36 Corridor EIS.
- Operational analysis performed for 120th Avenue and for access points along the 120th Avenue Connection included anticipated US 36 ramp connections to 120th Avenue.

2.5.3 SH 128/SH 121 Intersection Improvements

A Categorical Exclusion is currently being completed by CDOT for the State Highway 128/SH 121 (Wadsworth Parkway) intersection. The existing intersection will be shifted approximately 300 feet to the south. The intersection improvements will modify access to the existing Broomfield park-n-Ride. Other improvements, including adding turn lanes and improving access to the existing frontage road along US 36, adding left turn lanes from northbound Wadsworth Parkway and adding right turn lanes for eastbound and westbound traffic on State Highway 128 are proposed. The reconstruction of this intersection anticipates completion of the 120th Avenue Connection project, but does not extend SH 128 east of Wadsworth Parkway.

2.5.4 Northwest Corridor EIS

The Northwest Corridor EIS began in the fall of 2003. This study will determine if transportation improvements are needed between the western terminus of the Northwest Parkway on the north and the C-470/I-70 Interchange on the south. The range of alternatives under consideration includes freeway alternatives with transit, regional arterial alternatives, toll-way alternatives with transit, and transit alternatives. None of the alternatives under consideration would preclude construction of the 120th Avenue Connection. A Draft EIS is expected in 2005.

2.6 INDEPENDENT UTILITY

Due to the proximity of the US 36 Corridor EIS project and the SH 128/SH 121 Intersection Improvements Categorical Exclusion project, an independent utility analysis was prepared for the 120th Avenue Connection. The purpose for the analysis was to determine whether or not the proposed 120th Avenue Connection project can satisfy four criteria set forth in FHWA's 1993 *Guidance on the Development of Logical Project Termini*. These criteria are:

- Connects logical termini and is of sufficient length or scope for environmental evaluation.
- Is a reasonable expenditure of funds even if no other transportation improvements are made in the area.

- Does not restrict consideration of alternatives for other reasonably foreseeable transportation projects.
- Does not irretrievably commit federal funds for closely related projects to justify the present project.

The 120th Avenue Connection is proposed to connect SH 128 from the west to 120th Avenue (US 287) to the east. These termini logically define a project that can be constructed alone and that would serve a significant purpose without requiring implementation of other future transportation projects. The alignments identified for the connection have been found to be compatible with all reasonably foreseeable alternatives being considered for future improvements to the Wadsworth/US 36 Interchange and to US 36. The project is not dependent upon those improvements, nor would it restrict the consideration of alternatives for those improvements. The bridge span for the 120th Avenue Connection is sufficient to accommodate any of the identified and anticipated alternatives for the US 36 project.

The analysis concluded that completion of an environmental assessment for this project can proceed without irretrievably committing funds for other closely related projects. The 120th Avenue Connection can accommodate the reasonably foreseeable maximum envelope for future US 36 improvements, thus avoiding the risk of having to commit future federal funds to later reconstruct the interchange to accommodate those improvements. In addition, since this proposed connection can function fully without any requirements for other improvements, its implementation would not irretrievably commit federal funds for other related projects.

The Federal Highway Administration concurred with a finding of independent utility for the 120th Avenue Connection project. A copy of the coordination letter is included in **Appendix B**.

2.7 FUNDING AND IMPLEMENTATION

2.7.1 Funding

The 120th Avenue Connection is included in the recently adopted 2030 Regional Transportation Plan (RTP) as one of the highest priority projects for funding. The project is also identified in the 2005-2010 TIP, however it is not fully funded.

2.7.2 Conceptual Preliminary Assumptions of Costs

The following preliminary assumptions of costs have been developed for the 120th Avenue Connection improvements based on the conceptual designs prepared for this Environmental Assessment. The costs include earthwork, new roadway construction, bridges, retaining walls and noise walls, drainage, traffic signals, lighting, utilities, contingencies, urban design and landscaping, construction signing, force account items, engineering, mobilization, and right-of-way and easements. Cost assumptions for the 120th Avenue Connection are presented in **Table 2-2**.

Table 2-2
Preliminary Assumptions of Costs

	120th Avenue Connection
Earthwork	$2,550,000
New Roadway Construction	$4,544,800 - $4,782,000
Bridges	$8,866,050 - $10,468,050
Retaining Walls	$3,265,300 - $3,407,800
Signing/Striping	$537,059 - $607,970
Drainage	$724,240
Traffic Signals/Lighting	$1,050,000
Major Utilities/Railroad	$1,350,000
Contingencies/Unlisted Items	$3,502,559 - $5,066,418
Urban Design/Landscaping	$1,000,000
Construction Signing/Traffic Control	$2,685,295 - $3,039,851
Force Account Items	$4,183,474 - $4,735,844
Engineering (Design/Construction)	$11,374,674 - $12,876,542
Mobilization	$2,105,271 - $2,383,243
Right-of-way/Easements	$9,000,000
Total Rounded Cost (2004 dollars)	$56,700,000 - $63,000,000

2.7.3 Construction Phasing

It is anticipated that the 120th Avenue Connection project would be constructed in phases, due to funding constraints and the complexity of the improvements. Individual components of the Preferred Alternative may require staged construction in which smaller or less costly elements of the entire improvement are put into place prior to completion of all parts of the improvement.

A staged or phased construction would not diminish the need to provide these improvements. Similarly, the need to build the project over time is not expected to result in any direct, indirect or cumulative impacts of an adverse nature that would change the recommendations for these improvements.

2.7.4 Schedule

The schedule for the project is dependent upon funding, which at this time is not specifically identified. As each phase is identified, a schedule will be developed for that phase and will be included in the environmental decision document. An estimate for completion assuming full funding is identified includes:

- Final Design/Right-of-Way Acquisition—18 to 28 months
- Construction—18 months

Chapter 3.0: Impacts and Mitigation

3.1 LAND USE AND ZONING

3.1.1 Existing Conditions

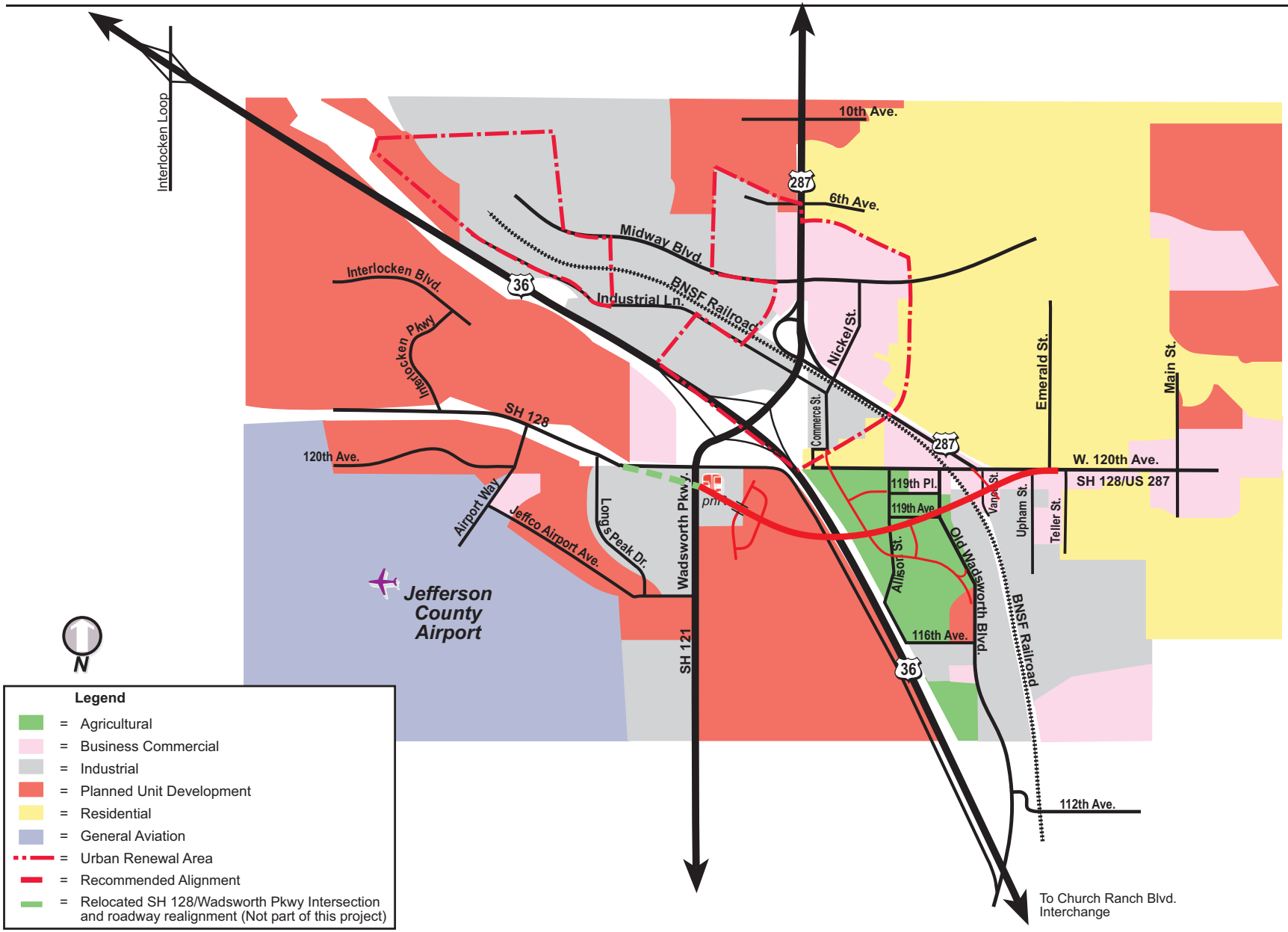
In November 2001 the City and County of Broomfield was established becoming Colorado's 64th county. Prior to this, the City fell under the jurisdiction of four counties, Adams, Boulder, Jefferson and Weld. In 1961 the City was incorporated when the population grew to 6,000. By 1998, the City's population had grown to 36,790 spanning nearly 28 square miles. According to the Broomfield Chamber of Commerce, the City and County of Broomfield (Broomfield) now covers approximately 34 square miles. By the end of the Year 2003, the population was approximately 44,000. Broomfield is currently undergoing substantial growth and development and this trend is expected to continue in the future. Statistics show that the number of new homes in Broomfield increased seven percent between 2001 and 2002 (from 15,127 to 16,284 units), making Broomfield among the ten fastest growing counties in the nation.

Broomfield's Master Plan (1995) describes zoning categories across the city and county. Zoning categories within the study area include Agricultural, Business and Commercial, Industrial, Planned Unit Development, Low Density Residential, and General Aviation (Jefferson County Airport). Industrial and Business districts are further classified into general or limited categories. General uses apply to larger, more intensive areas, which serve highway users while limited uses apply to smaller commercial and industrial establishments. **Figure 3-1** shows the existing zoning in the study area.

General land use within the study area includes a mix of light industrial, suburban residential, and commercial. West of Wadsworth Parkway, the Ball Corporation and Jefferson County Airport are situated with primary access onto SH 128. The Jefferson County Airport covers approximately 1,700 acres to the southwest of the Wadsworth/US 36 Interchange along SH 128. The airport is owned and operated by Jefferson County and services primarily corporate travelers. The area west of the airport has experienced substantial growth in recent years, including additions to large employment centers such as the Interlocken Business Park and Flatirons Crossing retail area.

The Ridge Apartments and Level 3 Communications are properties zoned PUD located south of SH 128 and west of the JeffCo Airport. Plans for the Ridge include approximately 50,000 square feet (6 acres) of industrial development and 370,000 square feet (28 acres) of office development. Plans also include the construction of 350 apartment units and a 3,500-square-foot clubhouse on 24 acres. As of June 2004, 60 of the 350 units were under construction.

South of the Ball Corporation and Jefferson County Airport, the JeffCo Business Center is currently under construction. The Business Center is located at 116 Circle Drive off Wadsworth Parkway. When completed, the business center will cover 25 acres and will include 8 buildings. Building uses will include a combination of office, retail and light industrial with approximately 272,000 total square feet of building area. Two access points off of Wadsworth Parkway will be



Source: City and County of Broomfield Community Development

Study Area Zoning

Figure 3-1

located at 116 Circle Drive. The development is approximately 0.2 miles south of the Wadsworth/SH 128 intersection, across from the planned Broomfield Urban Transit Village (Transit Village).

Between Wadsworth Parkway and US 36 south of the Wadsworth/US 36 Interchange, development has begun on the Transit Village. The Transit Village will be a 240 acre mixed-use, pedestrian friendly development. Transit Village plans include a mix of land uses, such as residential, commercial, and open lands within easy walking distance from transit. The mix of uses creates a "village-like" neighborhood where people can live, work and play. The project site plan was approved by Broomfield in August 2001. Access to the Transit Village will be provided from the proposed 120th Avenue Connection and from Wadsworth Parkway.

The area between the existing section of 120th Avenue and US 36 is referred to as " Original Broomfield or Old Broomfield." This area includes approximately 45 homes, a 40-unit mobile home park and light industrial operations. The BNSF Railroad crosses north/south through the study area east of Old Broomfield. This portion of Broomfield was originally part of Jefferson County. The Broomfield Master Plan history is described further in Section 3.1.2. Existing land uses within the study area are shown in **Figure 3-2**.

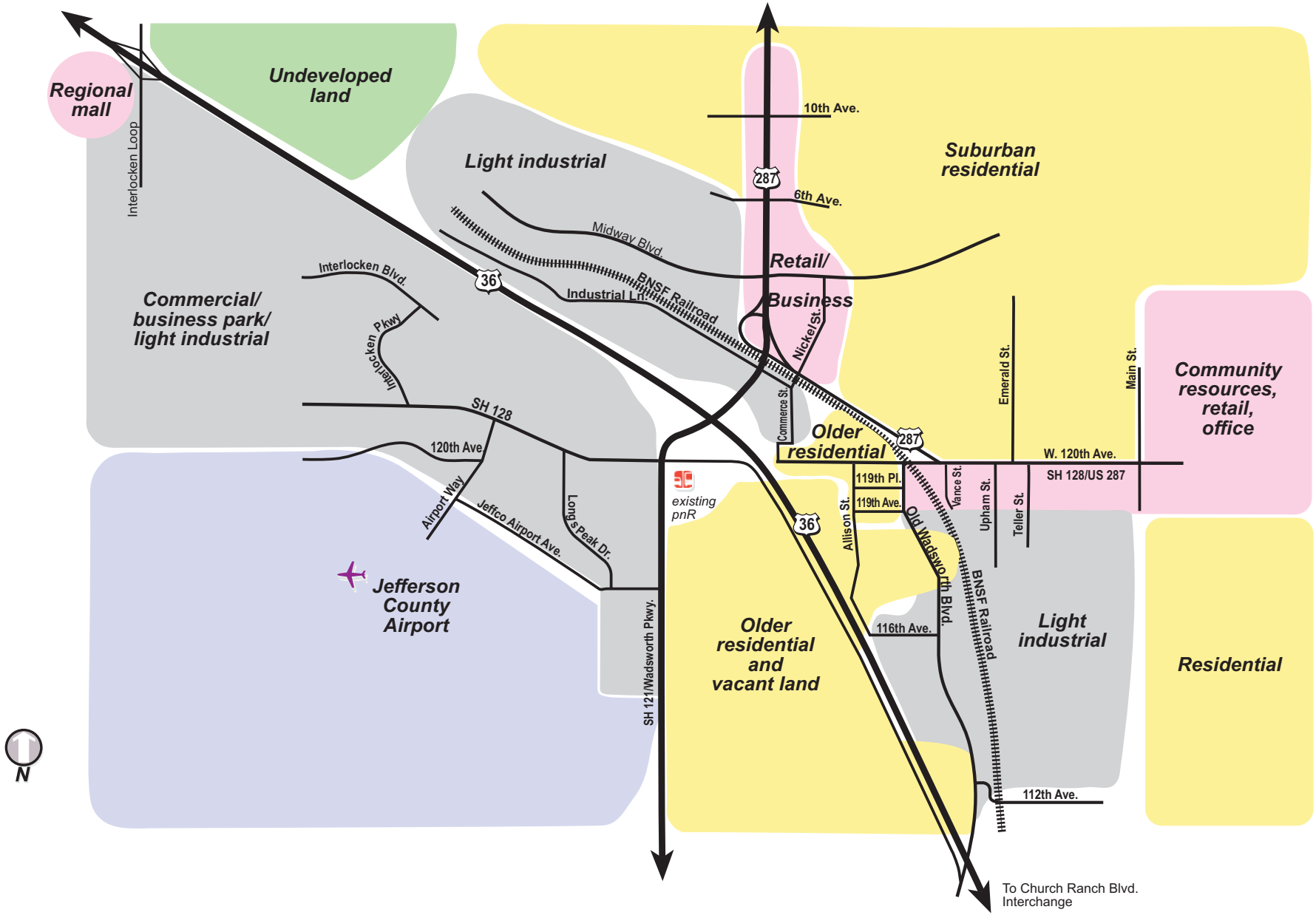
3.1.2 Future Land Use

Broomfield and surrounding municipalities have a number of land use plans and future studies underway that may pertain to the 120th Avenue Connection study area. This section provides an overview of the various land use plans and project timelines. **Figure 3-3** shows future land use in the study area.

Several land use plans provide general guidance for future development and growth in the study area and include:

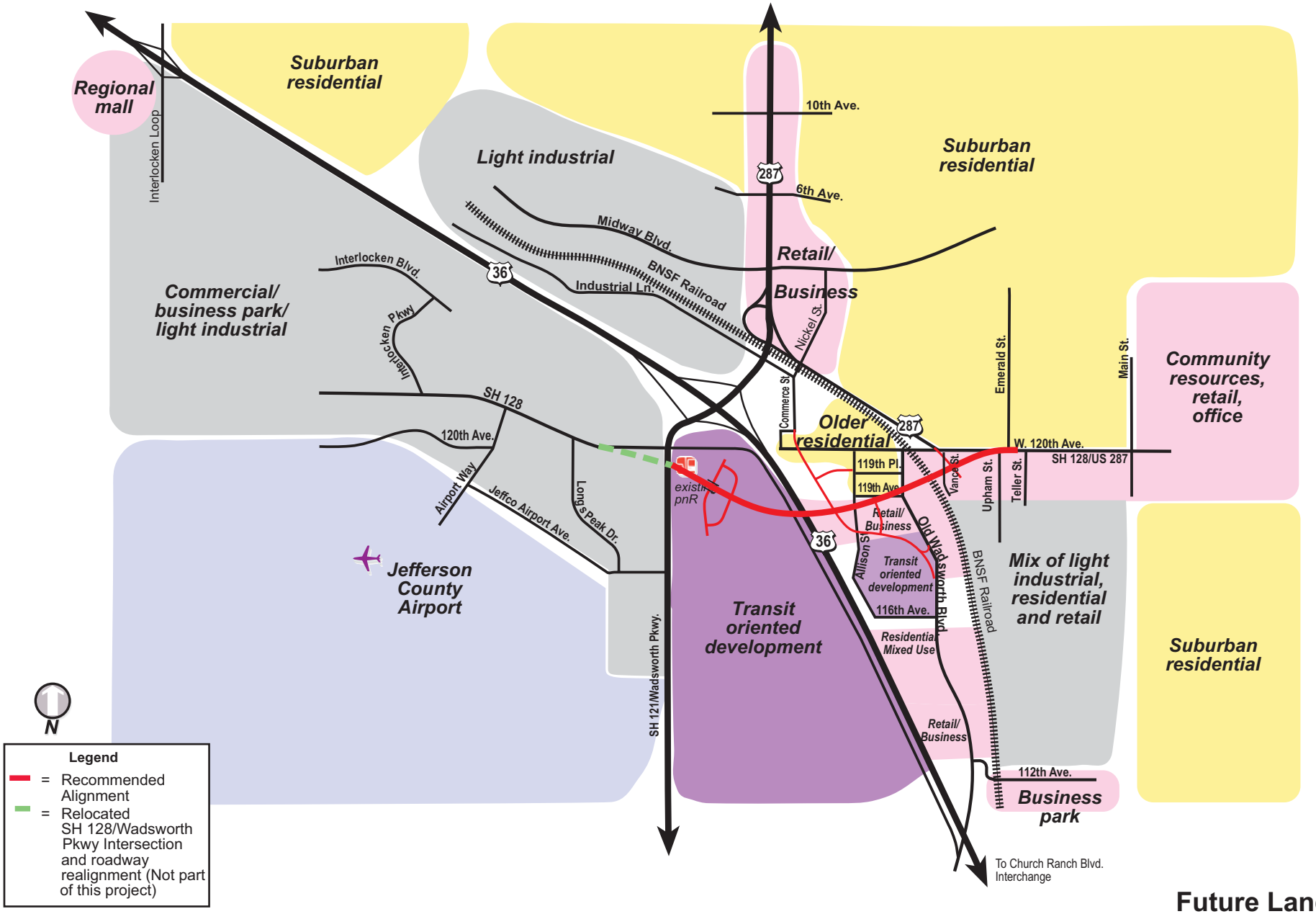
- *Draft Original Broomfield Neighborhood Plan*, 2004
- *Draft West 120th Avenue Corridor Sub Area Planning Study*, 2004
- *1995 Broomfield Master Plan*, amended 1996 through 2001
- *Broomfield Strategic Plan*, 1998
- *Boulder County Comprehensive Plan*, 1999
- *Westminster Comprehensive Land Use Plan,* 2004 Update

The *Draft Original Broomfield Neighborhood Plan* was undertaken by the City and County of Broomfield to address future plans regarding transportation, land use, quality of life, residential viability, economic development, zoning and the gateway image of Broomfield. The boundaries for the Plan study area are Main Street (east boundary), West 112th Avenue (south boundary), US 36 (west boundary) and West 120th Avenue/US 287 (north boundary). The *Draft Original Broomfield Neighborhood Plan* Land Use Map designates existing and future land uses for the area and includes the extension of 120th Avenue across US 36. Future land use in the area around the Connection (east of US 36) includes open lands, residential mixed use, residential live/work, and business/commercial. Public meetings have been held throughout the process. The Plan's completion is expected in 2005.



Existing Land Use

Figure 3-2



Future Land Use

Figure 3-3

The *Draft West 120th Avenue Corridor Sub Area Planning Study* provides a land use plan for a two-mile segment of 120th Avenue between Main Street and Lowell Boulevard. Main Street is located approximately ¼ mile east of Teller Street, which marks the east boundary of the 120th Avenue Connection study area. Lowell Boulevard is located approximately two miles east of Main Street along 120th Avenue. The Sub-Area Plan focuses on commercial, office, industrial and civic properties and includes an enhanced streetscape along 120th Avenue, with two full movement intersections proposed between Main and Lowell. A Draft of the Sub-Area Plan was made public in August 2004.

City and County of Broomfield goals and policies for future growth were developed for the *Broomfield Master Plan, 1995*. The Plan was approved by the Broomfield City Council in 1995. The 1995 Plan has been amended and updated eight different times between 1996 and 2001. The policies in the 1995 Plan included the need to provide appropriate roadway improvements and connections to facilitate safe travel throughout Broomfield. Within the Infrastructure Section of the *Broomfield Master Plan*, the need for more adequate east-west connections through Broomfield is cited as a category of concern. The Plan states that there is currently only one access that connects the Interlocken Business Park and the Jefferson County Airport to the core of Broomfield. Thus, congestion has resulted at key intersections and along major arterials in Broomfield. As stated in the Plan: "Additional east-west collector and arterial roadways are necessary to link the community together and reduce existing circulation problems" (*Broomfield Master Plan*, 1995).

A committee has been organized by the City and County of Broomfield to draft an update to the *1995 Broomfield Master Plan*. A timeframe for the Plan Update is not yet known.

The *Broomfield Strategic Plan* outlines implementation strategies for the Broomfield Master Plan goals and policies. This plan includes recommended action steps for all facets of city life, including economic development, parks and recreation, education and transportation. The transportation element of the Strategic Plan states the following: "Broomfield residents require an efficient multi-modal transportation network that connects residents both within the city and throughout the region while protecting our neighborhoods." Subsequent recommendations include the support of existing transportation plans in the City and County and the larger region, and giving high priority to improvement of arterials within and surrounding the Wadsworth/US 36 Interchange. The plan states that congestion in the area impacts the larger transportation system and will worsen in the future, thus providing a choice of travel options is a priority for Broomfield. One of the Strategic Plan transportation recommendations involves the provision of cost effective alternative modes of travel including pedestrian and bicycle trails, commuter rail, high occupancy vehicle lanes and bus service.

The *Boulder County Comprehensive Plan* separates land areas into subregions. The 120th Avenue Connection EA study area falls within the Southeast subregion. *Boulder County Comprehensive Plan* maps classify the study area as an incorporated area within the City and County of Broomfield. Therefore, the *Broomfield Master Plan* takes precedence over Boulder County plans. Communication with the Boulder County Planning Department verified that there are no projects scheduled in Boulder County that would affect the study area.

The *Westminster Comprehensive Land Use Plan 2004 Draft Update* describes existing and future land use plans for the City of Westminster, which borders Broomfield to the southeast. The existing land use pattern in Westminster is primarily suburban development, including both low-density single-family subdivisions and some multi-family developments. Approximately 2,800 acres (14 percent of the city's land area) remains vacant with development potential. The remainder of the lands in Westminster have reached build out or are part of the 6,000 acres of green space in the city. The 120th Avenue corridor from Sheridan Boulevard east to I-25 falls within the City of Westminster. Lands adjacent to 120th Avenue in this area include primarily residential, retail/commercial and industrial areas.

According to the *Westminster Comprehensive Land Use Plan 2004 Draft Update*, the Jefferson County Airport will impact the future development of areas that are within the Airport Influence Area and Airport Critical Zone. The *Airport Master Plan* recommends that within the Airport Influence Area, aviation easements be required of all new development. An aviation easement allows aircraft to fly over a property. In addition, the Plan states that all public buildings within the Airport Influence Area need to be designed to achieve an inside noise level reduction of 25 dBA from outside noise levels. Airport Critical Zones are located at each end of the Airport runways. The Plan states that all residential and public buildings should be prohibited from locating in Airport Critical Zones.

3.1.3 Land Use Impacts

No-Action Alternative. Substantial growth and development is expected to continue in the study area in the future, regardless of this project. The land use character of the area would continue to change from rural to urban. Increased residential and commercial development would lead to increased congestion and travel time delays along 120th Avenue, Wadsworth Parkway, SH 128 and the Wadsworth/US 36 Interchange. Travel to residential, commercial and industrial locations in the area would become more difficult as congestion increases over time. The *Broomfield Master, Transportation, and Strategic Plans* identify the need to relieve congestion on area roadways and provide a connection to existing and planned developments. Therefore, the No-Action Alternative is not compatible with City and County of Broomfield land use and master plans, in that no improvements are planned on area roadways that meet these objectives.

Preferred Alternative. Construction of the Preferred Alternative would result in a direct conversion of land to a transportation use. Several properties would be impacted for right-of-way purposes, resulting in a direct conversion of land for right-of-way acquisition (see Section 3.4).

Indirectly, the Preferred Alternative could encourage development in currently undeveloped areas to which access would be improved. However, undeveloped lands immediately adjacent to the study area are already planned for future development, including the study area and the Transit Village. These developments would proceed regardless of the 120th Avenue Connection project, although timing could be accelerated. Access to these developments from the 120th Avenue Connection provides a necessary link to the wider Broomfield community and to US 36. Broomfield has coordinated with developers of properties in the study area through the zoning

and approvals process to link the 120th Avenue Connection with planned development. The 120th Avenue Connection is not anticipated to accelerate growth at a regional level.

The Preferred Alternative is consistent with *Broomfield Master, Transportation, and Strategic Plans*. The Preferred Alternative would respond to transportation needs through improvements to overall accessibility, mobility and safety within the area. According to Broomfield Planning Department estimates, the population of Broomfield is expected to grow approximately 88 percent by the year 2030. This means that additional transportation facilities, housing, infrastructure, and community services would be needed. Communication with developers of area business parks indicated the need for additional roadways and connections to commercial centers in the area.

3.1.4 Land Use Impact Mitigation

No mitigation is required for direct or indirect land use impacts. Property owners with lands impacted directly by the Preferred Alternative have been contacted by City and County staff and through project newsletters. These properties are described further in Section 3.4, Right-of-Way.

3.2 FARMLAND

3.2.1 Existing Conditions

The U.S. Department of Agriculture (USDA) defines Prime Farmland as having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique farmland is described as land other than Prime Farmland that is used for the production of specific high value food and fiber crops. Farmland of Statewide and Local Importance is defined as land which is being used for or has the potential for the production of food, feed, fiber, forage, and oilseed crops, but has not been identified as being Prime or Unique by USDA.

The USDA Natural Resources Conservation Service soil survey maps and soil descriptions were collected for the study area. Coordination with the Natural Resources Conservation Service (NRCS) field offices in Longmont and Lakewood, Colorado, was conducted to determine the type of soils that are considered to be Prime and Unique or of Statewide or Local Importance in the study area.

There are four types of Prime Farmlands in the study area; all are classified as Prime Farmland if irrigated. Two of the soil types are located in portions of Broomfield which were once a part of Boulder County and two of the soil types are located in areas which were once a part of Jefferson County. Both Prime Farmland soils in Boulder County also are Farmlands of Statewide Importance. Of the Prime Farmlands in Jefferson County, only one of the two (Standley-Nunn Gravelly Clay Loam) classifies as Farmland of Statewide Importance. **Table 3-1** lists the Prime Farmland soil types and the number of acres of each within the study area.

Table 3-1
Prime Farmland Soil Types Found within the Study Area

Symbol	County	Soil Type	Approximate Acres*
NuB	Boulder	Nunn Clay Loam, 1 to 3 pct slopes**	10
NuC	Boulder	Nunn Clay Loam, 3 to 5 pct slopes**	20
149	Jefferson	Standley-Nunn Gravelly Clay Loam, 0 to 5 pct slopes**	14
162	Jefferson	ULM-Urban Land Complex, 3 to 5 pct slopes	7
		Total	51

Source: U.S. Department of Agriculture, Natural Resources Conservation Service
*Values rounded to the nearest acre.
** Also Farmlands of Statewide Importance

3.2.2 Farmland Impacts

No-Action Alternative. The No-Action Alternative would have no direct or indirect impacts to soils classified as Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance in the study area. However, conversion of farmland may continue to occur in the study area as new residential and commercial development takes place.

Preferred Alternative. The Preferred Alternative would have no direct impact to soils classified as Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance in the study area. There are 4.5 acres of soils classified as farmland within the proposed construction footprint. Approximately 1.2 acres of soil classified as Prime and Farmland of Statewide Importance (NuC) are located at the Wadsworth/US 36 eastbound off-ramp portion of the Preferred Alternative and approximately 3.3 acres of soil classified as Prime and Farmland of Statewide Importance are located at the west side access portion of the Preferred Alternative. However, both these locations are zoned other than agriculture or lie within property approved for development as part of the Broomfield Urban Transit Village.

No indirect impacts to farmlands are anticipated as part of the Preferred Alternative since a majority of the undeveloped properties within the study area have been approved for development prior to this project.

In July 2004 a coordination letter was sent to the NRCS Longmont Field Office identifying an impact to 4.5 acres of Farmland. However, the area identified to be impacted by the Preferred Alternative is already planned for development and is compatible with the Preferred Alternative. No response has been received.

3.2.3 Farmland Impact Mitigation

No mitigation is required. Therefore, the possibility of acquiring agricultural property to offset impacts in the study area was not examined. Local planning boards can implement measures

to limit the conversion of farmland to development, through zoning designations, open space purchase, or creation of growth boundaries.

3.3 SOCIAL

3.3.1 Existing and Forecasted Conditions

The study area is primarily an older residential neighborhood in what was once an agricultural community. Houses and older commercial buildings are located along 120th Avenue between US 36 and Old Wadsworth Boulevard in the area known as "Old Broomfield." East of Old Wadsworth Boulevard, the development is largely light industrial with the BNSF Railroad traversing through it. A mobile home park is located within this light industrial zone, west of and adjacent to the Railroad.

Since the 2000 Census preceded the creation of the City and County of Broomfield, statistics were derived from the City of Broomfield and surrounding county data. The study area is located in parts of the City and County of Broomfield that fell predominantly within Boulder and Jefferson Counties, and this is reflected in the following information.

The area included within Broomfield has experienced rapid population growth over the past decade. According to data from the City and County of Broomfield Community Development Planning Division, Broomfield increased in population approximately 55 percent between 1990 and 2000. This trend is expected to continue in the future. The rates of growth anticipated for Broomfield are higher than those predicted for the surrounding counties and the state as a whole. **Table 3-2** shows current and projected population statistics for the state of Colorado, Jefferson County, Boulder County and the City and County of Broomfield.

Table 3-2
Current and Projected Population Statistics

	1990[1]	2000[1]	2025[2]	2030[2]	% Change, 2000-2030
Colorado	3,304,042	4,324,920	6,652,082	7,156,422	65%
Jefferson County	439,885	529,956	680,573	709,958	34%
Boulder County	226,014	292,890	362,643	377,396	29%
City and County of Broomfield	24,638	38,272	66,973	71,984	88%

Source: 1) City and County of Broomfield Community Development, Planning Division, 2003
2) Colorado Demography Section, Department of Local Affairs (DOLA), June 2003

3.3.1.1 Community Facilities

The Boulder Valley School District serves portions of Broomfield north of 120th Avenue while Jefferson County School District serves portions of Broomfield south of 120th Avenue. There are eight private and special needs schools serving Broomfield. The Westwood College of Aviation

Technology is located adjacent to the Jefferson County Airport south of SH 128. The nearest higher education facilities are the Front Range Community College in Westminster, Regis University Extension at JeffCo Business Park, University of Colorado at Denver and at Boulder, Metropolitan State College at Denver and the Community College of Denver. Meritor Academy is the only school within the study area, a private grade school located at the northeast corner of 120th Avenue and Emerald Street.

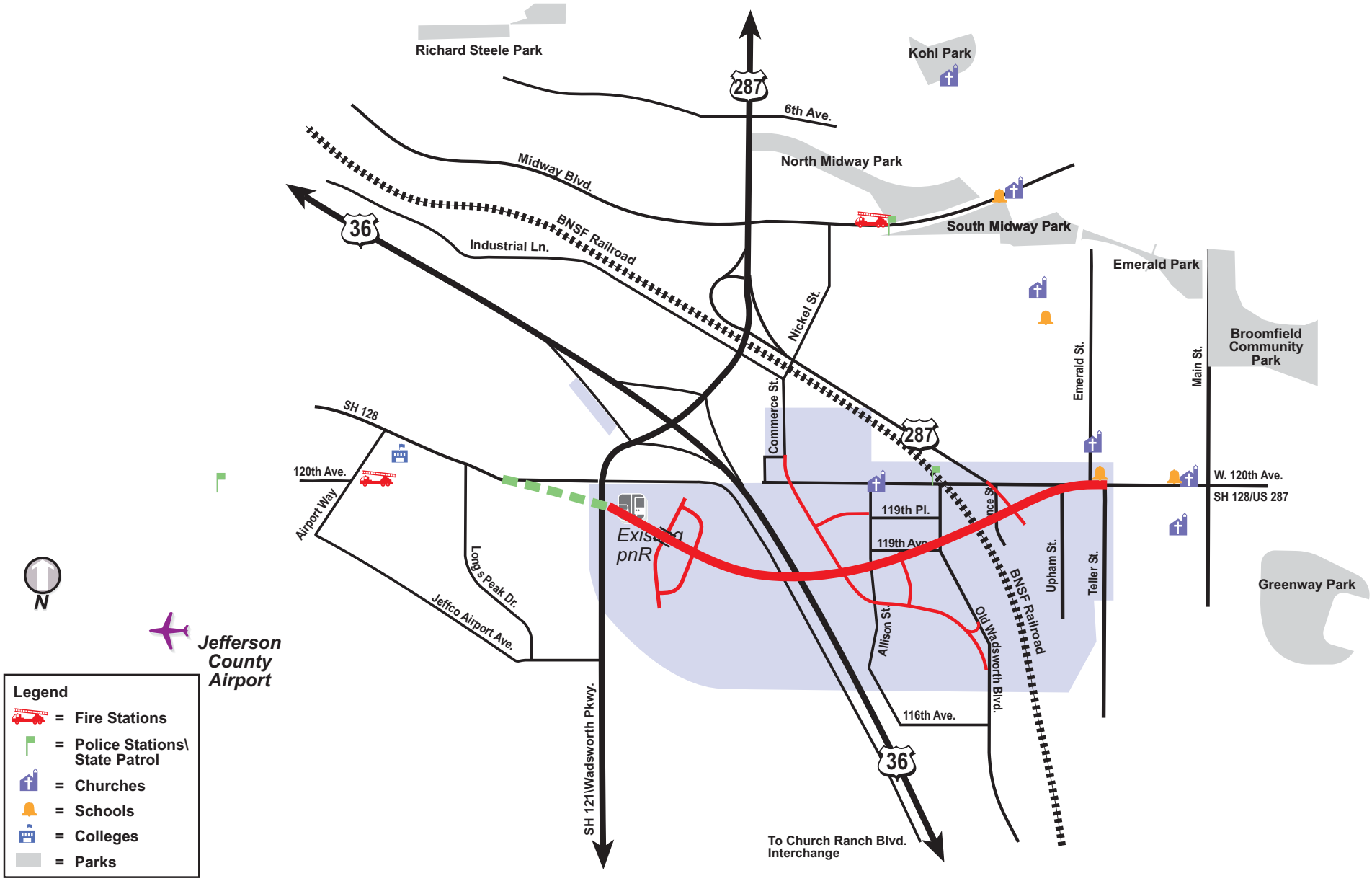
There are more than two-dozen churches in the City and County of Broomfield, primarily in the residential and commercial sectors of Broomfield. The only church in the study area is the Church of Christ at 7901 West 120th Avenue.

Avista Hospital, located approximately four miles northwest of the study area in Louisville, is the main hospital for a majority of emergency medical runs in Broomfield. Coordination with Broomfield Emergency Medical Services indicated that two other area hospitals are utilized for emergency services in addition to Avista Hospital. These hospitals are St. Anthony's North on W. 84th Avenue in Westminster (southeast of the study area) and North Suburban Medical Center on Grant Street in Thornton (east of the study area). In addition, a new hospital is being constructed approximately five miles north of the study area in Lafayette on US 287.

The North Metro Fire Rescue District in Broomfield provides fire protection. There are three fire stations within the City and County of Broomfield; they include Station 61 at 1275 Midway Boulevard, Station 64 at 13515 Lowell Boulevard, and Station 65 at 9900 W. 120th Avenue at the entrance to the Jefferson County Airport. The Broomfield Police Department currently operates facilities across the County. The main station is located in City Hall on Descombes Drive and a second station is located at the Flatirons Crossing retail area off of US 36. In addition, the Colorado State Patrol has an office located directly north of 120th Avenue between Allison Street and Old Wadsworth Boulevard. Communication with emergency service providers indicated that response times are hindered by existing congestion at the Wadsworth/US 36 Interchange and on surrounding roadways. **Figure 3-4** shows the locations of these community facilities.

3.3.1.2 Study Area Housing

The demand for housing in Broomfield has increased over the past few decades. This growth is expected to continue over time. Although Broomfield has a young population overall (median age of 30.9 years), the elderly population over age 64 is increasing rapidly. This growth will increase demand for suitable housing for the elderly; both in terms of smaller single-family units and elderly care facilities. The largest age group (25 to 44) consists of women of childbearing age, which correlates to an increase in the number of children. The average household size has decreased since 1960, but is expected to level off in the future. **Table 3-3** shows the number of households, annual growth rate and average household size within Broomfield since 1960.



Source: Broomfield Community Information, US Census Tiger Data, 2000

Community Facilities

Figure 3-4

Table 3-3
Residential Growth Statistics
City and County of Broomfield

Year	Households	Annual Growth Rate	Average Household Size
1960	6,868	--	3.02
1990	8,721	2.4%	2.83
2000	13,842	4.7%	2.76
2003	15,800	4.9%	2.77

Source: Denver Regional Council of Governments

The number of housing units located within the City of Broomfield as of 2000 is shown in **Table 3-4**. The projected increase in the number of housing units in the future is expected to place additional pressure on area roadways, many of which are currently over capacity.

Table 3-4
Year 2000 Census Housing Characteristics
City of Broomfield

	Number	Percent
Total Housing Units	14,322	100%
-Occupied Housing Units	13,842	96.6%
---Owner-Occupied	10,636	76.8%
---Renter-Occupied	3,206	23.2%
-Vacant Housing Units	480	3.4%

Source: Year 2000 U.S. Census Bureau

3.3.2 Social Impacts

No-Action Alternative. The No-Action Alternative would not change population growth trends or development patterns within the study area. Demand for community facilities, services, and housing would continue to increase in response to the projected population growth. The location of facilities would generally follow development and land use plans already identified by Broomfield.

As shown in **Table 3-2**, forecasts for Broomfield predict an 88 percent increase in population between the Years 2000 and 2030. Assuming this growth rate, increased congestion along major transportation corridors as well as local connectors is expected. The No-Action Alternative would not provide improved access to and from community facilities and housing in these areas. It would be increasingly difficult for pedestrians, bicyclists, and emergency response vehicles to cross US 36 and maneuver along 120th Avenue.

The No-Action Alternative does not address safety and operating deficiencies on study area roadways. Therefore, the deficiencies related to congestion, and safety and accident issues would likely worsen with increasing population growth.

Preferred Alternative. The proposed 120th Avenue Connection would improve traffic flow and connectivity between the residential and commercial areas of Broomfield and to existing regional transportation corridors such as 120th Avenue, Wadsworth Parkway, US 287 and SH 128. In the long term, access to school, fire, police and other services would be enhanced through a more direct east-west connection. Communication with emergency service providers in Broomfield confirmed that the Preferred Alternative improvements would reduce response times and alleviate delays along study area roadways.

The 120th Avenue Connection alignment would require changes to the local street network, particularly along Old Wadsworth Boulevard and on Allison Street. Old Wadsworth would be bisected by the 120th Avenue Connection, forming cul-de-sacs on either side of the Connection. Residences and businesses affected by the change in access from the closure at Old Wadsworth would have replacement access provided at the re-aligned Allison Street. The re-aligned Allison Street would replace the north/south movements currently served by Old Wadsworth. Since Old Wadsworth would be closed at the 120th Avenue Connection, out of direction travel would be required to access 120th Avenue from Old Wadsworth Boulevard. The slight increase in travel time would not be as substantial as the travel delays that currently exist on study area roadways.

The 120th Avenue Connection would be aligned between the Broomfield Mobile Home Park to the south and the older residential area to the north. Approximately 11 acres of residential land use including five residential relocations would be required for right-of-way purposes (see Section 3.4). None of the residential relocations involve the mobile home park or minority or low-income populations (see Section 3.3.5). This improvement would alter the character of the immediate area along 119th Avenue with the addition of the 120th Avenue Connection. At the same time, Broomfield has selected this area for future neighborhood planning and is currently drafting guidelines for future changes in land use. A land use map displayed as part of the *Draft Original Broomfield Neighborhood Plan* (February 2004) shows a combination of mixed-used and neighborhood commercial developments north of the 120th Avenue Connection, and Office/Light Industrial south of the 120th Avenue Connection and east of the BNSF Railroad. West of the BNSF Railroad near US 36, RTD and Broomfield worked together on a plan for transit-oriented development uses surrounding a relocated park-n-Ride lot. Thus the zoning, general land use and character of the area would transition over time, and the Preferred Alternative would be compatible with the future transportation needs of the area.

Changes in travel patterns for pedestrians and bicyclists would be required with the Preferred Alternative. Sidewalks and bike lanes planned as part of the Preferred Alternative are described in Section 3.7. Additional pedestrian and bicycle access would be provided along the 120th Avenue Connection and Allison Street.

3.3.3 Social Impact Mitigation

Residential and commercial areas that experience a change in access will be provided with alternate access through the 120th Avenue Connection and re-aligned Allison Street. Short-term temporary impacts would occur during construction (see Section 3.20). During construction, CDOT will continue its public outreach program with the communities and residents regarding road delays, access and special construction activities. Radio and public announcements, newspaper notices, and on-site signage may be used.

All residential and business acquisitions and relocations will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (Public Law 91-646), as amended, which contains specific requirements that govern the manner in which a government entity acquires property for public use. In addition to full compliance with these laws, CDOT will provide assistance to any eligible owner or tenant in relocating their business or residence at the time of displacement. Relocation resources are available to all residents and businesses without discrimination (see Section 3.4.3).

The project will comply with 23 CFR 771.105(f), which states, "No person, because of handicap, age, race, color, sex, or national origin, be excluded from participating in, or denied benefits of, or be subject to discrimination under any Administration program or procedural activity required by or developed pursuant to this regulation."

3.3.4 Environmental Justice (EJ)

In February 1994 President Clinton issued Executive Order (EO) 12898 requiring federal agencies to incorporate consideration of environmental justice into the National Environmental Policy Act (NEPA) evaluation process. In April 1997, the United States Department of Transportation issued DOT Order 5610.2 to summarize and expand upon the requirements of EO 12898. The order describes the process for incorporating environmental justice principles into all DOT programs, policies and activities. In December 1998, the FHWA issued guidance (FHWA Order 6640.23) to implement and expand upon the directives of EO 12898 and DOT Order 5610.2 by incorporating environmental justice principles in all FHWA programs, policies and activities.

The above regulations and orders direct federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" on minority and low-income populations as a result of federal actions. *Adverse effects* are all significant individual or cumulative human health or environmental effects, including interrelated social and economic effects. If such effects are predominantly borne by a minority population or low-income population, or if those populations would suffer greater or more severe impacts than others, then the effects are disproportionately high and adverse. This EA has been carried out in accordance with the definitions and guidance provided in Executive Order 12898, DOT Order 5610.2 and FHWA Order 6640.23.

The first step in environmental justice analysis is to identify whether minority or low-income populations are present in the study area. For this EA, identification is based on Year 2000 US

Census data for Jefferson and Boulder Counties, DRCOG statistics, and communication with the Broomfield Planning and Zoning Department.

3.3.4.1 Minority Populations

Minority populations include people of all races other than white (Black or African American, American Indian and Alaska Native, Asian, and Native Hawaiian and Other Pacific Islander), as well as people who identify themselves as Hispanic or Latino ethnicity (Hispanic and Latino are classified as ethnic categories rather than race categories and, along with race, are part of the minority community). According to the Year 2000 Census, 12 percent of Boulder County residents and 9 percent of Jefferson County residents categorized themselves as minorities. The City of Broomfield (prior to the formation of Broomfield City and County boundaries) showed a minority population of 11 percent.

Census blocks represent the smallest geographic area that displays minority population data. There are five census blocks in the study area with a higher percentage of minority populations than the rest of Broomfield. The data for these census blocks are shown in **Table 3-5**, and their locations are shown in **Figure 3-5**.

Table 3-5
US Census Minority Population Data

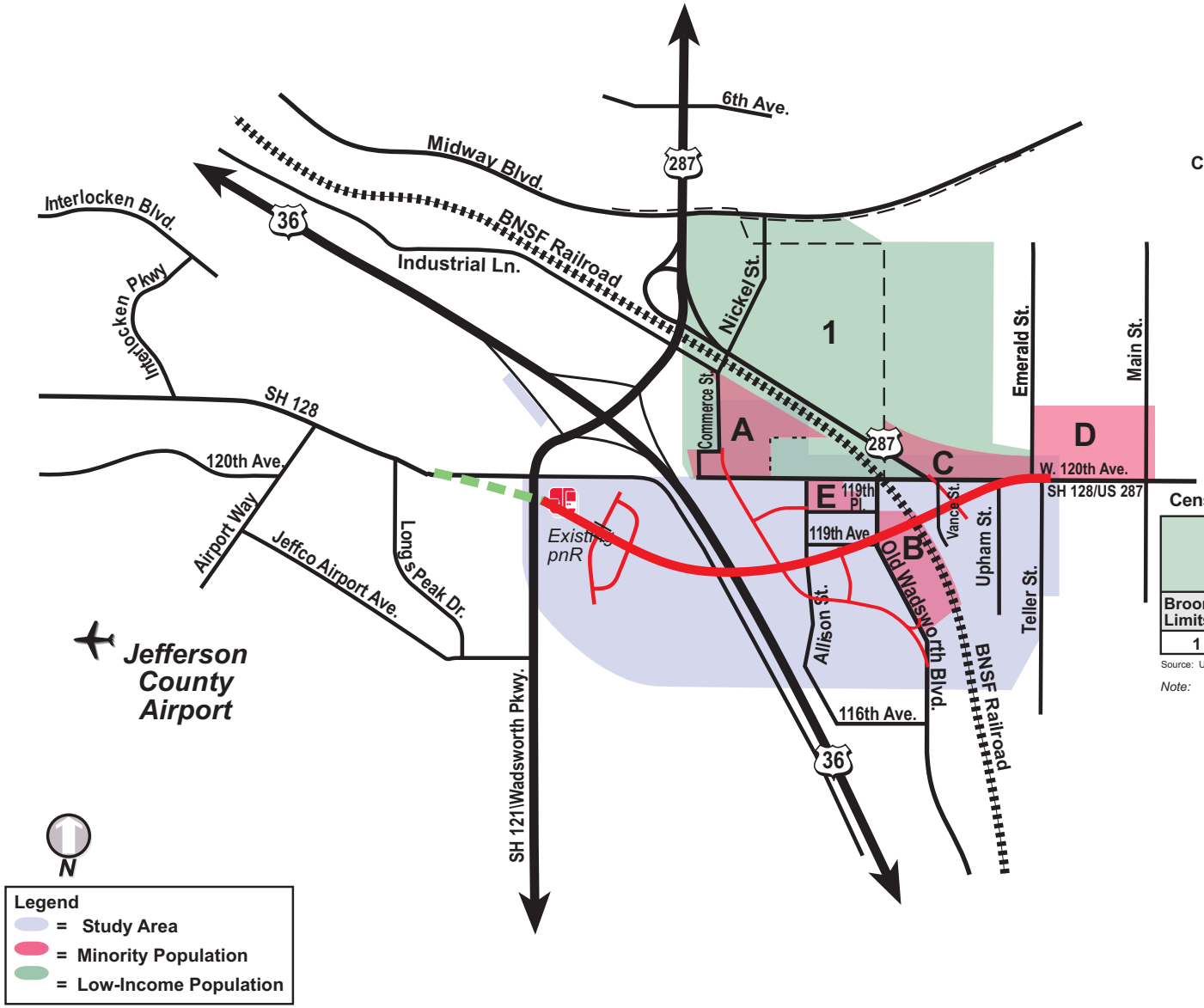
Map ID	Census Tract/ Block	County	Land Use	Total Population	Minority Population	% Minority
A	131.10/1012	Boulder	Residential	19	6	31.6%
C	131.10/1026	Boulder	Residential/ Commercial	65	18	27.7%
D	131.10/2021	Boulder	Residential	243	110	45.3%
E	98.25/1014	Jefferson	Residential	20	4	20.0%
B	98.25/1016	Jefferson	Residential/ Commercial	98	20	20.4%

U.S. Census Bureau, Year 2000

In the census blocks identified in **Table 3-5** as A, B, C and E, Hispanic or Latino people make up the predominant minority population. Among the 243 people in block D, 61 identified themselves as Hispanic or Latino, 6 as Black or African American, 8 as American Indian or Alaskan Native, 23 as Asian, 30 as Some other race, and 12 as Two or More races.

3.3.4.2 Low-Income Populations

In addition to minority populations, regulatory guidelines require identification of any low-income populations in the study area. DOT Order 5610.2 defines low income as "...a person whose median household income is at or below the US Department of Health and Human Services (HHS) poverty guidelines." These guidelines provide a formula based on the number



2000 Census Information

Minority Population Data for Census Blocks Above City & County Percentage

	Total Persons	Minority Population*	% Minority
Broomfield Limits	38,297	6,249	16.3%
A	19	6	31.6%
B	98	20	20.4%
C	65	18	27.7%
D	243	110	45.3%
E	20	4	20.0%

Source: Census 2000 Data
* Minority includes Racial and Ethnic Minorities

Low-Income Population Data Census Block Groups Above City & County Percentage

	Total Households	# of Households Below $20,000 Annual Household Income	% Below $20,000 Annual Household Income
Broomfield Limits	13,833	1,107	8%
1	564	61	10.8%

Source: U.S. Census Block Groups

Note: Geographic areas shown are determined by the Census Bureau.

Low-Income and Minority Populations

Figure 3-5

of persons in a household or family and their annual income. The 2004 national poverty level, according to the Department of HHS, was reported to be $18,850 for a family of four.

US Census data for income are released only down to the Census Block Group level (larger than a Census Block) for reasons pertaining to confidentiality. Income statistics for the Census Block Groups within the study area were collected based on annual household income for the year 1999. The Census divides household income into increments of $5000. Households with an income less than $19,999 were recorded since this census division is closest to the recommended figure of $18,850 discussed above.

US Census data showed that the City of Broomfield contained 13,833 households in the year 2000. Eight percent of these households had incomes below $19,999. One block group in the study area contained a higher percentage of households with an annual household income below $19,999 than for Broomfield as a whole. Census Tract 131.01, Block Group 1, is located north of 120th Avenue, between Wadsworth Parkway and Emerald Street. In this Block Group, 10.8 percent of the households had an annual household income below $19,999, as shown in **Figure 3-5**.

Although it does not qualify under Census Bureau statistics, based on contact with City and County of Broomfield planners, the Block Group with the 40-unit Broomfield Mobile Home Park is considered a low-income area. Conversations with the owner of the Broomfield Mobile Home Park indicated that approximately 25 percent (8 to 12) of the 40 mobile homes are owner occupied and the remainder rent from the owner. The mobile home park is located in Census Block B in **Figure 3-5**.

3.3.4.3 Specialized Environmental Justice Outreach

Specialized outreach to minority populations, low-income populations and those people who may be relocated has been conducted as part of this project as well as previous transportation improvement projects undertaken in the study area. Discussions within the community, including residents and business owners in the study area, have been ongoing since the *Feasibility Study* began in 1998.

In advance of the open house held June 10, 2004, copies of the newsletter were hand delivered to residents in the Broomfield Mobile Home Park. Direct contact with both the owner and resident manager of the Broomfield Mobile Home Park was made to describe the project and to encourage attendance by the residents at project meetings. Additional outreach included separate meetings with individual residential and commercial business property owners to discuss the project. No unusual circumstances or special concerns were identified in these meetings.

3.3.5 Environmental Justice Impacts

Environmental justice impacts are assessed in terms of potential property acquisitions or relocations, changes in access to employment areas, destruction or disruption of community cohesion or a community's economic vitality, and changes in low-income and minority

communities/neighborhoods due to changes in the physical environment such as increases in noise levels, air pollution levels, and the presence or introduction of hazardous materials. Right-of-way acquisitions, and residential and business relocations are more fully discussed in Section 3.4.

As described in Sections 3.3.4.1 and 3.3.4.2, Census blocks with minority and Hispanic populations are located both north (A, C and D) and south (B and E) of 120th Avenue and east of US 36 (see **Figure 3-5**). The Census Block Group (Block Group 1) with a higher percentage of low-income households than the remainder of Broomfield as a whole is located north of 120th Avenue. All of the 120th Avenue Connection alignments evaluated traversed the residential areas near 120th Avenue and east of US 36, and therefore, none of them completely avoided minority and low-income areas.

In the *Feasibility Study* and the draft *Wadsworth/US 36 Interchange EA*, which assessed the 120th Avenue Connection alignment (see Section 1.3), adjustments were made to avoid or minimize impacts to minority and low-income neighborhoods. The Preferred Alternative alignment runs just north of the Broomfield Mobile Home Park and avoids relocation of mobile homes, but does require the relocation of some single-family homes north of 119th Avenue. At the request of the residents north of 119th Avenue, an alternative alignment further south was investigated. This alternative resulted in a greater number of residential and commercial relocations, greater impacts to a minority neighborhood (the mobile home park), and required a difficult transition back to 120th Avenue east of the BNSF Railroad. For these reasons, this alternative was not carried forward.

No-Action Alternative. Traffic congestion would worsen on existing study area roadways with the No-Action Alternative. This congestion could hinder access to housing, businesses, community facilities and the provision of emergency services for minority and low-income populations, as well as the overall community.

In addition to congestion, the No-Action Alternative would include noise and air quality impacts to minority and low-income populations along the US 287 diagonal and 120th Avenue. Noise levels here are expected to increase due to a projected increase in traffic volumes between existing levels and the 2025 No-Action Alternative. In addition, higher traffic volumes and congestion would result in increased air pollution, including air toxics. Therefore, the No-Action Alternative would impact minority and low-income populations, as well as the overall community.

Preferred Alternative. In the final analysis, the Preferred Alternative had the least impact to minority and low-income populations compared to the other alignments analyzed in the *Feasibility Study* and draft *Wadsworth/US 36 Interchange EA* for the reasons listed below:

- The other alignments considered along 120th Avenue (see **Figure 2-1**) would result in greater impacts to residential neighborhoods and commercial properties located along 120th Avenue (south of the US 287 diagonal). Of all the alignments, the Preferred Alternative had the least impact to residences and businesses. Of the residences impacted by the Preferred

Alternative, none are minority or low-income. The Preferred Alternative impacted the fewest number of businesses overall, with two minority-owned businesses to be relocated.

- Census Bureau 2000 statistics documented minority blocks both north and south of West 120th Avenue. The other alignments considered would have a greater impact on these residential areas. In addition, a block group that contains low-income populations above the countywide average extends from 120th Avenue north to Midway Boulevard. The Preferred Alternative avoids this area, but the other alignments considered would impact this area directly.

Impacts of the Preferred Alternative are primarily located along the proposed alignment as it crosses through the residential/commercial/industrial area south of the existing 120th Avenue and east of US 36. Census blocks with minority and low-income populations are located in different neighborhoods in and around the study area and all but one are avoided with the Preferred Alternative. Access to community facilities from these neighborhoods would not change substantially with the proposed 120th Avenue Connection, while east-west traffic would be greatly improved. The 120th Avenue Connection alignment would facilitate enhanced traffic flow and would ease congestion in the study area.

Construction of the Preferred Alternative would require full or partial acquisition of 29 parcels (approximately 51 acres) within the study area (see Section 3.4). Of the 29 parcels affected by right-of-way acquisition, 13 parcels are commercially zoned, of which 6 parcels are minority owned. Of the 13 commercially zoned parcels, 8 have active businesses, 2 have closed businesses and one has no business. Two minority-owned businesses out of 8 total businesses would need to be relocated. All 8 of the businesses that would be relocated are located south of 120th Avenue between Old Wadsworth Boulevard and Teller Streets. This information is summarized in **Table 3-6**. In the short term, the loss of businesses within this area of 120th Avenue would impact some business patrons, however there are similar types of businesses in the area. At the same time, discussion with business owners and preliminary research conducted as part of this project shows that industrial and commercial zoned properties are available in the study area and would provide suitable relocation options. Thus, the businesses could relocate within the study area and would be available for employees, local residents and patrons.

Table 3-6
Summary of Impacts to Minority-owned Businesses and Properties

Business Name/Address	Minority-owned Business	# of Employees	# of Minority Employees	Lease/Own Property	Minority-owned Property
Peerless Tyre Co. 11985 Teller Street	No	3	2	Own	No
Front Range Auto 7270 W. 120th Ave.	Yes	10	4	Own	Yes

continued

Table 3-6 (continued)
Summary of Impacts to Minority-owned Businesses and Properties

Business Name/Address	Minority-owned Business	# of Employees	# of Minority Employees	Lease/Own Property	Minority-owned Property
Hail & Dent Center 7230 W. 120th Ave.	No	2	0	Lease	Yes
Elite Auto Service Center 7300 W. 120th Ave.	Yes	6	4	Lease	Yes
Massa Auto Pawn 7350 W. 120th Ave.	No	3	1	Lease	Yes
Meineke 7370 W. 120th Ave.	No	2	1	Lease	No
Advance Towing Corner of Upham and 119th Place	No	8	1	Lease	No
Arapahoe Roofing & Sheet Metal 11936 Wadsworth Blvd.	No	150	105	Lease	No

In terms of impacts to surrounding businesses with the proposed commercial relocations, CDOT would work with the local community to maintain access and visibility for these businesses wherever practicable during the construction phase of the project. Existing businesses would benefit in the long-term from improved traffic flow and ease of congestion within the study area.

The existing roadway network would be reconfigured with the Preferred Alternative. The alignment of the 120th Avenue Connection would require the closure of Old Wadsworth north of 119th Place and just north of the entrance to the Broomfield Mobile Home Park. Cul-de-sacs would be installed both north and south of the Connection along Old Wadsworth Boulevard. The re-aligned Allison Street would provide north/south access, reducing existing traffic volumes along Old Wadsworth. This decrease in traffic levels would lower noise levels for residences along Old Wadsworth. Overall, the placement of cul-de-sacs at Old Wadsworth is not anticipated to disproportionately impact access for minority and low-income populations.

North of the Broomfield Mobile Home Park, the Preferred Alternative is planned to descend to approximately 30 feet below-grade to run beneath the existing BNSF Railroad. The proximity of the alignment to the mobile home park would result in a small increase in air pollution, including an eight percent increase in CO concentrations (see Section 3.8.4). The Preferred Alternative also would result in noise impacts to some residents of the mobile home park. To reduce these noise impacts, a noise wall will be built along the northern edge of the Broomfield Mobile Home Park (see Section 3.9). Noise and vibration impacts may occur at this location

from the potential rail alternative under consideration in the US 36 Corridor EIS. These impacts and all others associated with the US 36 Corridor improvements will be fully evaluated in the US 36 Corridor EIS.

The Preferred Alternative would result in a substantial decrease in traffic volumes along the US 287 diagonal. This decrease in traffic volumes would result in lower noise and air pollution levels, including urban air toxics. As discussed with the No-Action Alternative, areas adjacent to the diagonal have minority and/or low-income populations. Therefore, the Preferred Alternative would positively affect minority and low-income populations along the diagonal, and would provide a benefit in this location.

3.3.6 Environmental Justice Impact Mitigation

In summary, the Preferred Alternative would not cause disproportionately high and adverse impacts to minority and low-income populations due to acquisition of 6 minority-owned commercially zoned parcels out of 29 total parcels and relocation of 2 minority-owned businesses out of 8.

All right-of-way acquisition and relocation of businesses and residences will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (Public Law 91-646), as amended, which contains specific requirements that govern the manner in which a government entity acquires property for public use. In addition to full compliance with these laws, CDOT will provide assistance to any eligible owner or tenant in relocating their business or residence at the time of displacement. Relocation resources are available to all residents and businesses without discrimination (see Section 3.4.4).

3.4 Right-of-Way and Relocations

3.4.1 Existing Conditions

Real property in the study area is currently owned by CDOT, RTD, Jefferson County, Broomfield and private entities. Right-of-way would need to be acquired for the project from RTD, Jefferson County and certain private entities for construction of the Preferred Alternative.

3.4.2 Right-of-Way Impacts

No-Action Alternative. The No-Action Alternative would not require any right-of-way or relocations.

Preferred Alternative. The Preferred Alternative would require acquisition of approximately 51 acres of new right-of-way for construction of the proposed alignment. This figure includes full parcel acquisition, partial parcel acquisition and right-of-way that may be required for utility easements.

Based on the current design, right-of-way from 29 parcels would be required in part or in whole to construct the Preferred Alternative. None of the partial acquisitions would affect residential or business parking. Modifications of access to these parcels, if any, would be limited. Parcel land uses are divided into commercial, residential, vacant and public lands. **Table 3-7** lists the land use, number of parcels, acres of right-of-way that would be required, and impacts. All right-of-way needs would be updated during final design. Property acquisitions that would displace persons or businesses thereby requiring relocation are listed in **Table 3-8** and **Table 3-9**.

Table 3-7
Right-of-Way Impacts

Land Use	Number of Parcels	Acres of Right-of-Way Required	Type of Impact
Commercial	13	7	11 full takes; 2 partial takes, 8 relocations
Residential	7	11	5 full takes, 2 partial takes, 5 relocations
Vacant	4	1	1 full take, 3 partial takes
Public*	5	32	5 partial takes
Total	29	51	

*The required public land parcels are owned by the Regional Transportation District (RTD) or Jefferson County.

3.4.3 Relocations

Five residences and 8 businesses would be relocated with the Preferred Alternative. The majority of residential and business relocations are located along the 120th Avenue Connection east of US 36 to Teller Street. Potential residential relocations are shown in **Table 3-8**. The acquisition of property related to these relocations consists of approximately 3 acres.

Table 3-8
Potential Residential Relocations

Property Location	Structure Type
11830 Allison Street	Ranch
11905 Wadsworth Boulevard	Multi-Story
11975 Vance Street	Ranch
11805 Wadsworth Boulevard	Ranch
7655 West 119th Avenue	Ranch

Potential business relocations are shown in **Table 3-9**. The businesses to be relocated are primarily located along 120th Avenue in an older industrial area. Several of the businesses and properties have been identified as minority-owned (see Section 3.3.5). No unusual circumstances related to relocation have been identified by the property owners where the

businesses are located or by the business owners. The acquisition of property related to the business relocations comprises approximately 6 acres.

Table 3-9
Potential Business Relocations

Business Name	Location
Peerless Tyre Company	11995 Teller Street
Advance Towing	Corner of Upham and 119th Place
Hail & Dent Center	7230 W. 120th Avenue
Front Range Auto	7270 W. 120th Avenue
Elite Auto Service	7300 W. 120th Avenue
Massa Auto Pawn	7350 W. 120th Avenue
Meineke Discount Mufflers	7370 W. 120th Avenue
Arapahoe Roofing	11936 Wadsworth Blvd

3.4.4 Right-of-Way Impact Mitigation

For those property owners affected by acquisition of private land, the acquisition process will be negotiated in a fair and equitable manner, using market values determined by expert appraisers as required. Acquisition of these properties and relocation of displaced persons and businesses will be in full compliance with all federal and state requirements, including the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended. The purpose of these requirements includes providing for fair and equitable treatment of all persons displaced from their homes, businesses or farms. The law is designed to ensure just compensation for all acquired properties. Relocation benefits are available to all eligible residents and businesses without discrimination.

All qualified relocatees are eligible to receive monetary payments, which may include payments for moving expenses, business in lieu payments, rent supplements, down payments and increased interest payments. No person shall be displaced from their residence by this project unless and until adequate replacement housing has been offered to such person regardless of race, color, religion, sex or national origin. In addition to full compliance with the Acts, assistance will be provided to any eligible owner or tenant in relocating their business or residence at the time of displacement. Benefits under the Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail in addition to information regarding their financial options.

Based on contacts with local realtors and the Broomfield Economic Development Corporation, there is housing available within the study area that matches the size and price range of the acquired properties. Prior to commencement of the formal acquisition/relocation process, a study will be conducted to inventory the characteristics and needs of potential displaced persons and businesses, survey the real estate market to determine the inventory of available

relocation properties, determine any anticipated relocation problems and propose solutions to such problems.

3.5 ECONOMIC

3.5.1 Existing and Forecasted Conditions

The City and County of Broomfield is located strategically within the Denver-Boulder corridor, with easy access to service, technology, and economic resources. Substantial growth is expected in the northern portion of the Denver metropolitan area in the future. Current statistics show that over 1.5 million people live within a 20-mile commuting distance of Broomfield. Broomfield's economy is diverse with employment in manufacturing, industry, retail and wholesale trade, and government. The study area includes a combination of commercial/business, light industrial, older residential and undeveloped land. Based on current zoning and planned unit development (PUD) approval, much of the undeveloped land will be developed into mixed-use commercial and medium to high-density residential.

According to the *Broomfield Economic Development Corporation Annual Report of 2000*, office space in Broomfield had an occupancy rate of 99 percent. Additions to businesses at Interlocken and other corporate centers such as Sun Microsystems and Level 3 Communications are continuing to build the economic vitality of the region. The largest employer in the year 2000 was the new Flatirons Crossing retail area, which created 1.5 million square feet of new shopping space and approximately 3,000 jobs. The City of Broomfield gained 6,639 new jobs in 2000, as compared to 3,506 new jobs in 1999. The annual employment growth rate grew 17 percent from 1990 to 2000, with an increase of 13,739 jobs in the same period.

Recent employment statistics for the City and County of Broomfield and the State of Colorado were compiled through the Colorado Department of Labor and Employment. Preliminary data for March 2004 indicates that Broomfield had an unemployment rate of 5.3 percent, compared to 5.2 percent for the State of Colorado. The labor force in Broomfield is composed of 23,349 persons, with 22,104 persons employed and 1,245 unemployed. Economic projections show that the unemployment rates in the state and metropolitan area are expected to decline and level off to approximately 3.8 percent by the year 2025.

The statistics shown in **Table 3-10** show a comparison of labor force numbers, mean travel time to work, median household income, and per capita income for the City and County of Broomfield, the state of Colorado and the United States.

Table 3-10
Year 2000 Labor Force Statistics

	Broomfield	Colorado	United States
In Labor Force*	21,451	2,331,898	138,800,000
Mean Travel Time to Work (minutes)	27.4	24.3	25.5
Median Household Income	$63,903	$47,203	$41,994
Per Capita Income	$26,488	$24,049	$21,857

*Population aged 16 or over
Source: Year 2000 U.S. Census Bureau

Plans for high-density residential and commercial development, mixed-use and transit oriented development within the study area have been developed, particularly in the area known as Old Broomfield. As described in Section 3.1 Land Use, this area is primarily commercial and light industrial, with some single-family residential. The *Draft Original Broomfield Neighborhood Plan* Land Use Map shows updated zoning classifications for properties located between US 36 and Old Wadsworth Boulevard. The *Original Broomfield Neighborhood Plan,* currently being prepard by the Broomfield Community Development Department, will provide the contextual support for the Map. The Plan should be completed by 2005.

The Transit Village is planned for the area south of the existing Wadsworth/US 36 Interchange between Wadsworth Parkway and US 36. The project includes approximately 177 acres of developable land, 28 acres of open lands and 37 acres for right-of-way. The plan incorporates a future park-n-Ride site west of US 36 with high-density transit oriented development surrounding the transit facility. Plans for the Old Broomfield area and the Transit Village constitute the bulk of new development planned within the study area. Development at Interlocken and surrounding employment centers north of the study area is expected to continue in the future.

3.5.2 Economic Impacts

No-Action Alternative. The No-Action Alternative would not change regional or local economic growth trends or development patterns. Existing commercial and industrial sites within the study area would be affected by the increased traffic, decreased level of service, and increased delays projected on area roadways in the future. Commuters that need to travel through the area in an east-west direction would experience frustration and travel time delays if conditions remain.

Preferred Alternative. The Preferred Alternative is expected to have some economic impacts in the study area. Eight businesses would potentially be relocated (see Section 3.4) due to right-of-way needs associated with construction of the Preferred Alternative. Each of these businesses has been contacted. Within the study area, there are currently suitable commercial/industrial relocation sites. Businesses along 120th Avenue and in the area surrounding the 120th Avenue Connection would experience some negative short-term impacts

through a loss of revenue due to temporary changes in travel direction and accessibility. However, project construction would lead to a short-term increase in the number of construction jobs in the area and would likely add to personal income levels for these workers. In the long-term, the 120th Avenue Connection would improve access and visibility and would ease roadway congestion, producing a positive effect on area businesses. Additionally, improved access provided by the new alignment may lead to a long-term increase in property values for those parcels with favorable access. The proposed transportation improvements would reduce circulation problems and would enhance the economic vitality of the community.

As part of the Preferred Alternative, the US 287 diagonal would experience a substantial decrease in traffic volumes. Motorists traveling east-west through the area would bypass the US 287 diagonal and the Wadsworth/US 36 Interchange by utilizing the 120th Avenue Connection. Businesses located along the diagonal (primarily fast food restaurants, a small commercial strip, and industrial businesses) would suffer in the long-term from less drive-by traffic.

3.5.3 Economic Impact Mitigation

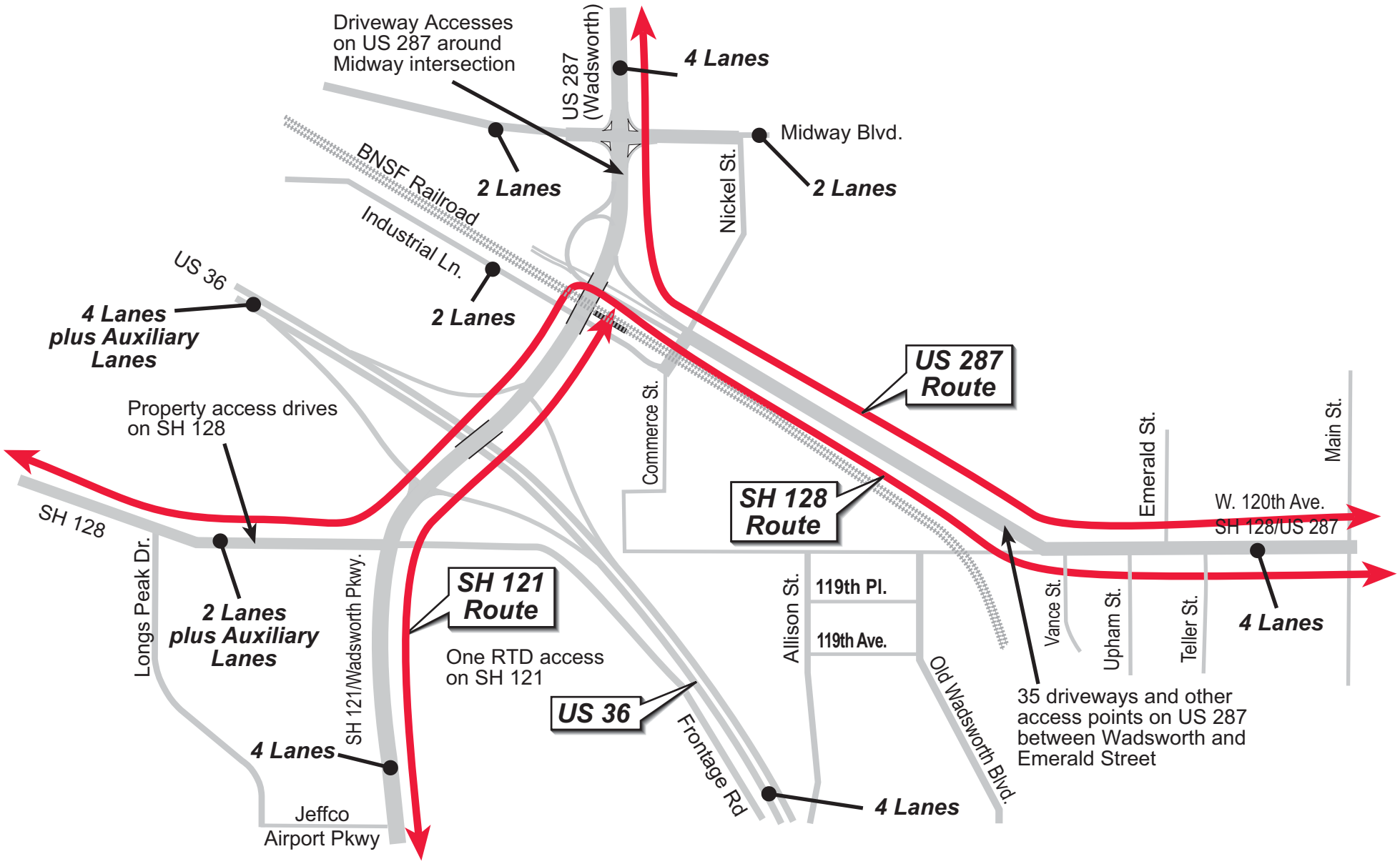
Impacts of the Preferred Alternative would not result in substantial adverse economic impacts to the overall community. While some businesses would experience a decrease in drive-by traffic, congestion levels would decrease as part of the Preferred Alternative, which could improve mobility and visibility for all businesses in the area. Impacts to businesses along the US 287 diagonal would not be substantial compared to the overall benefits that the community would experience in terms of decreased congestion and improved mobility.

The Preferred Alternative would potentially require the relocation of eight businesses covering approximately six acres. All of the businesses that would require relocation are located south of 120th Avenue between Old Wadsworth Boulevard and Teller Street. The loss of businesses within this area of 120th Avenue would impact business patrons, however, the area has many similar type businesses. Preliminary research has shown that suitable relocation sites are available for businesses that require relocation as part of the Preferred Alternative. Relocation of businesses will be completed pursuant to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (see Section 3.4).

3.6 TRANSPORTATION

3.6.1 Study Area Roadways

Regional roadways in the study area include US 36, US 287, SH 121 (Wadsworth Parkway), SH 128, and 120th Avenue and are depicted in **Figure 3-6**. US 36 is primarily a four-lane freeway connecting Denver and Boulder that divides the study area. The roadway designation of SH 121 (Wadsworth Parkway) changes to US 287 north of the Wadsworth/US 36 Interchange. SH 121 and US 287 make up the primary north-south arterial in the study area. The Wadsworth arterial begins on the south end of metro Denver and continues north as US 287 through Longmont, Loveland, and Ft. Collins. Recent and continuing projects would result in at least



Regional Roadway Network

Figure 3-6

four lanes on this arterial for almost 80 miles. SH 128 is an east-west arterial that begins at SH 93 near the foothills at the west end and continues east as 120th Avenue to a point east of Denver International Airport where it ends. The only gaps in this arterial are at US 36 (this study area) and at the South Platte River, where SH 128 is under construction to close the gap. Currently, travelers wishing to continue on SH 128 to 120th Avenue and vise versa must use the existing Wadsworth bridge over US 36. This jog directs through traffic on SH 128 and 120th Avenue onto Wadsworth Parkway for approximately 3/8 mile in both directions.

In addition to regional roadways, there are several local roadways that serve the land uses within the study area. Industrial Lane/US 36 frontage road (west frontage) and Old Wadsworth Boulevard (east frontage) provide access on either side of US 36. Local streets primarily serving residential neighborhoods in the study area are located on the east side of US 36 and include portions of Teller, Upham, Vance, Allison, Commerce, Carr, 119th Avenue and 119th Place.

3.6.1.1 Existing and Forecasted Traffic Volumes

The majority of the information presented in this EA was completed in 2002 for the *Draft Wadsworth/US 36 Interchange EA*, when the available DRCOG model for use on the project was the 2025 fiscally constrained Regional Transportation Plan (RTP) sketch model. The DRCOG 2030 fiscally constrained RTP model became available in early 2005 during the final review process for this EA. A comparison of 2025 to 2030 forecasts is provided below, including differences in the model assumptions between 2025 and 2030 that need to be noted:

- The 2025 daily volume forecast on 120th Ave. was about 55,000 to 60,000vpd. The 2030 daily forecast is 45,000 to 50,000vpd, the lower forecasts are explained by the remaining bullets.

- The 2025 RTP had no improvements assumed on US 36. The 2030 RTP includes an additional lane each way on US 36 plus an HOV lane each way, so substantially more freeway capacity. Previous sensitivity analysis in this area found that an increase in freeway capacity would lower arterial volumes (fewer drivers using arterials as an alternative to a congested freeway).

- The 2025 model did not include 120th Avenue or any changes in the US 36/Wadsworth area. 120th Avenue was added for the analysis, with no connection to US 36. The 2030 RTP has the full interchange area rebuilt, including both Wadsworth and 120th Avenue connections to US 36.

The conclusion is that even with the differences in forecasted roadway networks between the 2025 and 2030 modeling timeframes, the volumes forecasted on 120th Avenue are similar and are still within the appropriate range for a six-lane facility as determined in the EA.

Analysis of traffic operations is based on the weekday peak hour traffic patterns at the key intersections within the study area and surrounding the proposed 120th Avenue Connection.

Turning movement counts were taken at the key intersections for the AM and PM peak hours in 2002/2003. These turning volumes and movements are shown in **Figure 3-7**.

Field observations confirm that the peak period in the AM and PM lasts up to two hours, with long queues of vehicles on many of the approaches to intersections. Year 2025 Peak hour traffic volumes and turning movements were calculated based on a combination of the peak hour output from the model and the existing travel pattern characteristics collected in the field. The 2025 No-Action peak hour turning movements are shown in **Figure 3-8**. The 2025 Preferred Alternative peak hour turning movements are shown in **Figure 3-9**. The 2025 peak hour traffic forecasts were used to complete detailed LOS analysis to compare the No-Action Alternative and the Preferred Alternative.

3.6.2 Regional Traffic Conditions

Year 2002/2003 daily traffic volumes on the major study area roadways are shown in **Figure 3-10**. Many of the roadways surrounding the proposed 120th Avenue Connection currently have daily traffic volumes considered to be at or above capacity for their laneage configuration.

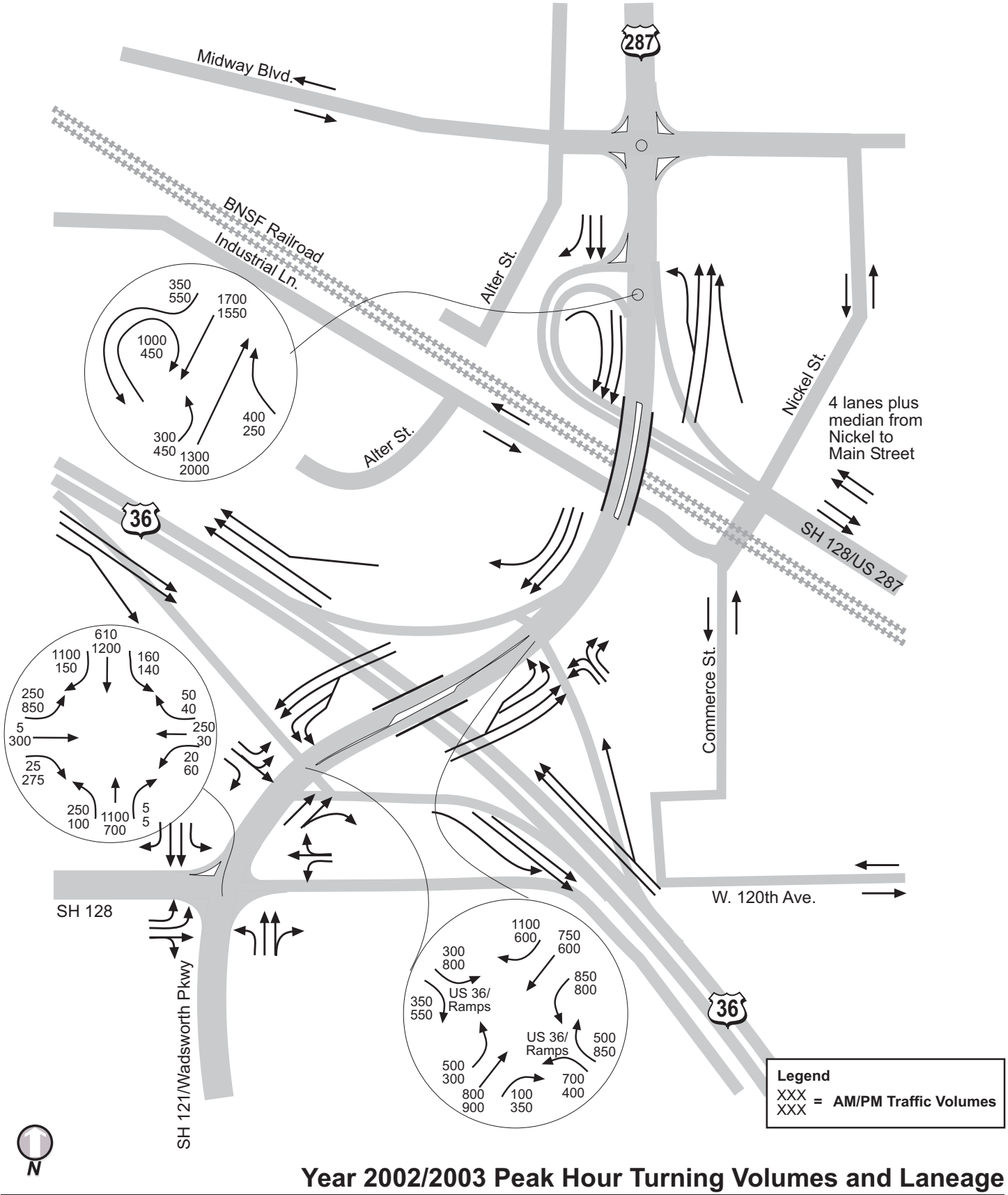
Year 2025 daily traffic forecasting was done using the DRCOG 2025 Regional Sketch Plan Model (the Model). This model represents the DRCOG 2025 Interim Regional Transportation Plan (RTP). The future roadway network assumed in the 2025 Interim RTP and the model has only two roadway network improvements occurring near the study area by 2025:

- Widening of Wadsworth Parkway (SH 121) from four to six lanes south of the proposed SH 128/SH 121 intersection.
- Widening of SH 128 from two to four lanes (plus auxiliary lanes) west of the existing SH 128/SH 121 intersection.

These two roadway improvements will connect at a new intersection at SH 128 and SH 121. This new intersection will have improved turn lanes and auxiliary lanes to access the Wadsworth/US 36 Interchange.

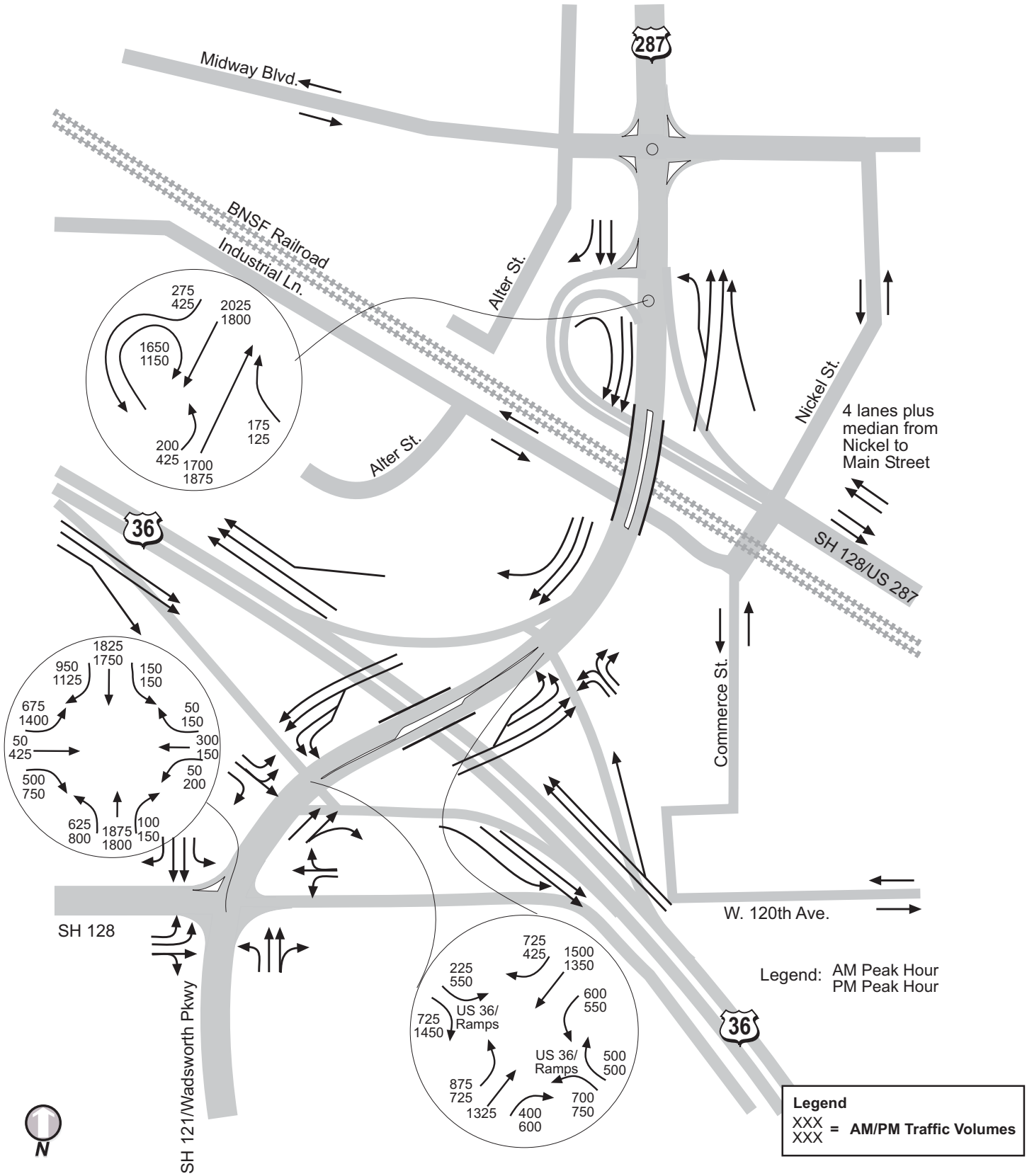
These roadway improvements define the “No-Action” scenario in the 2025 model. The connection of SH 128 and 120th Avenue was added to the roadway network in the model to obtain 2025 traffic forecasts for the “Build” scenario. It is important to note that no improvements to US 36 were included in the 2025 Interim RTP, and therefore the modeled impact from US 36 has the same laneage as the existing US 36 in both the No-Action and Build scenarios. The forecasted range of 2025 daily traffic volumes is shown in **Figure 3-11**.

A comparison of traffic volume demand to capacity is another method of evaluating how well an intersection operates. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio between 0.0 and 1.0 indicates that volume is less than capacity. When the v/c capacity is low, nearer to 0.0, traffic conditions are generally free flowing with little congestion and low



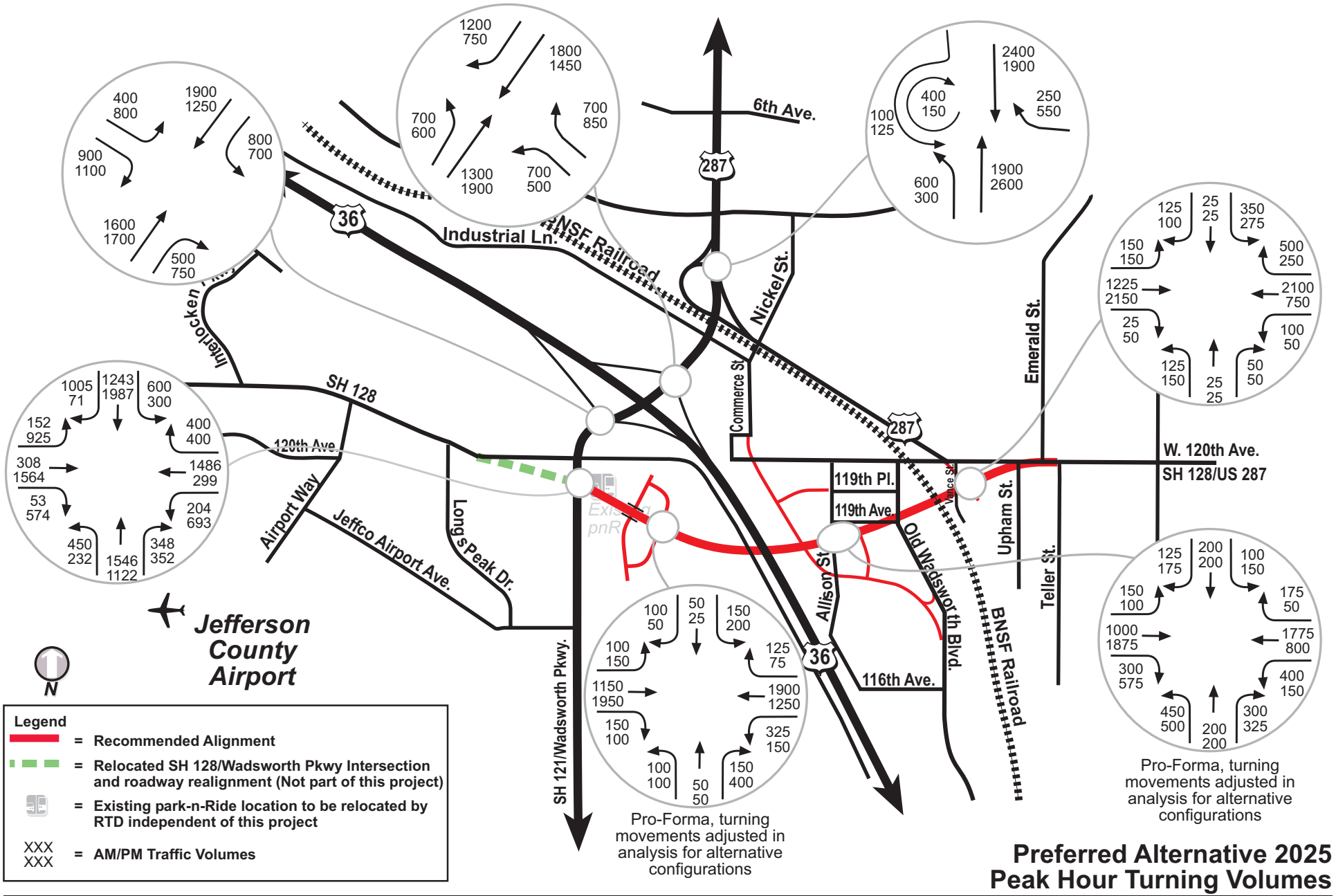
Year 2002/2003 Peak Hour Turning Volumes and Laneage

Figure 3-7



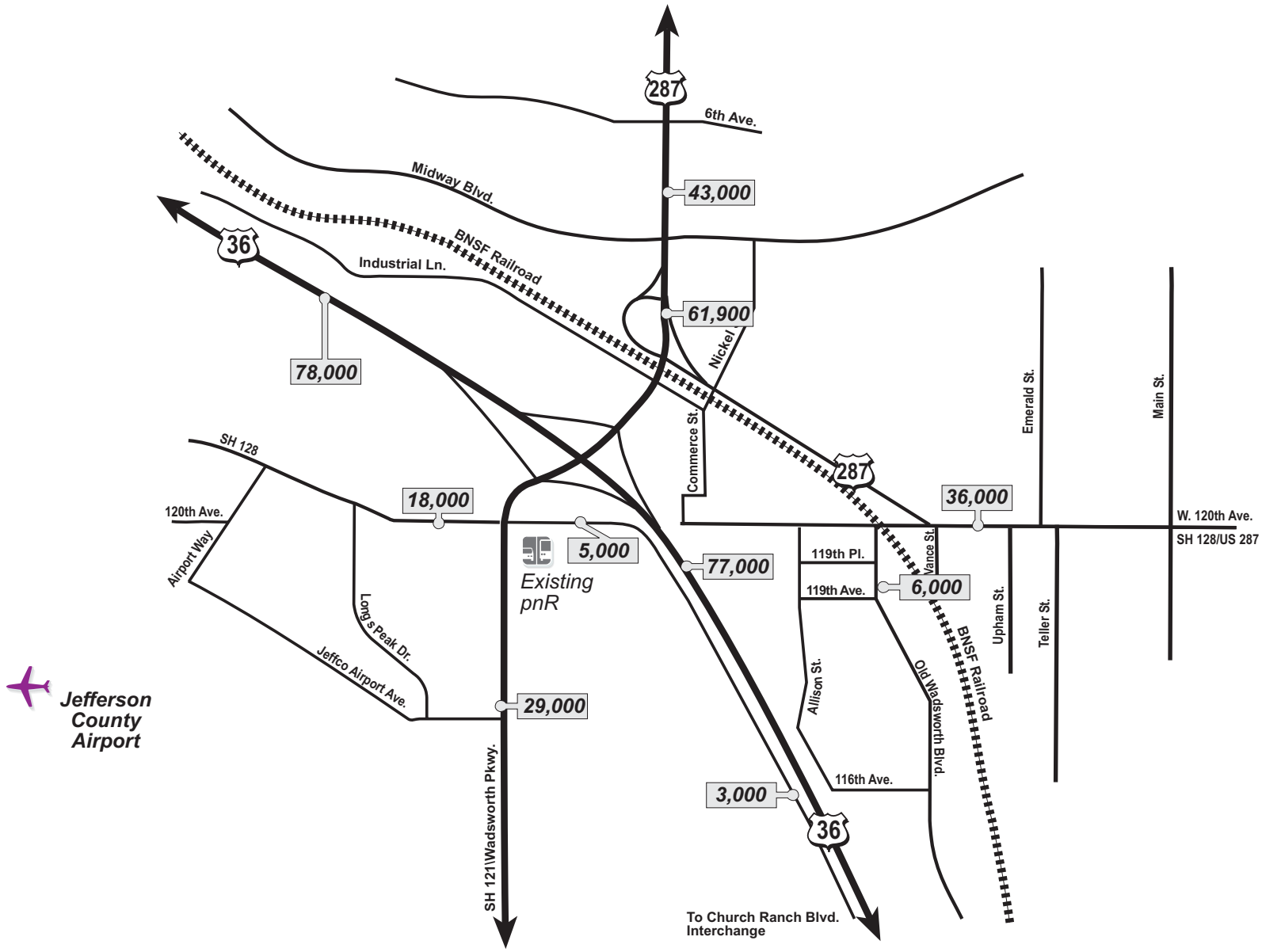
No-Action 2025 Peak Hour Turning Volumes and Laneage

Figure 3-8



Preferred Alternative 2025 Peak Hour Turning Volumes

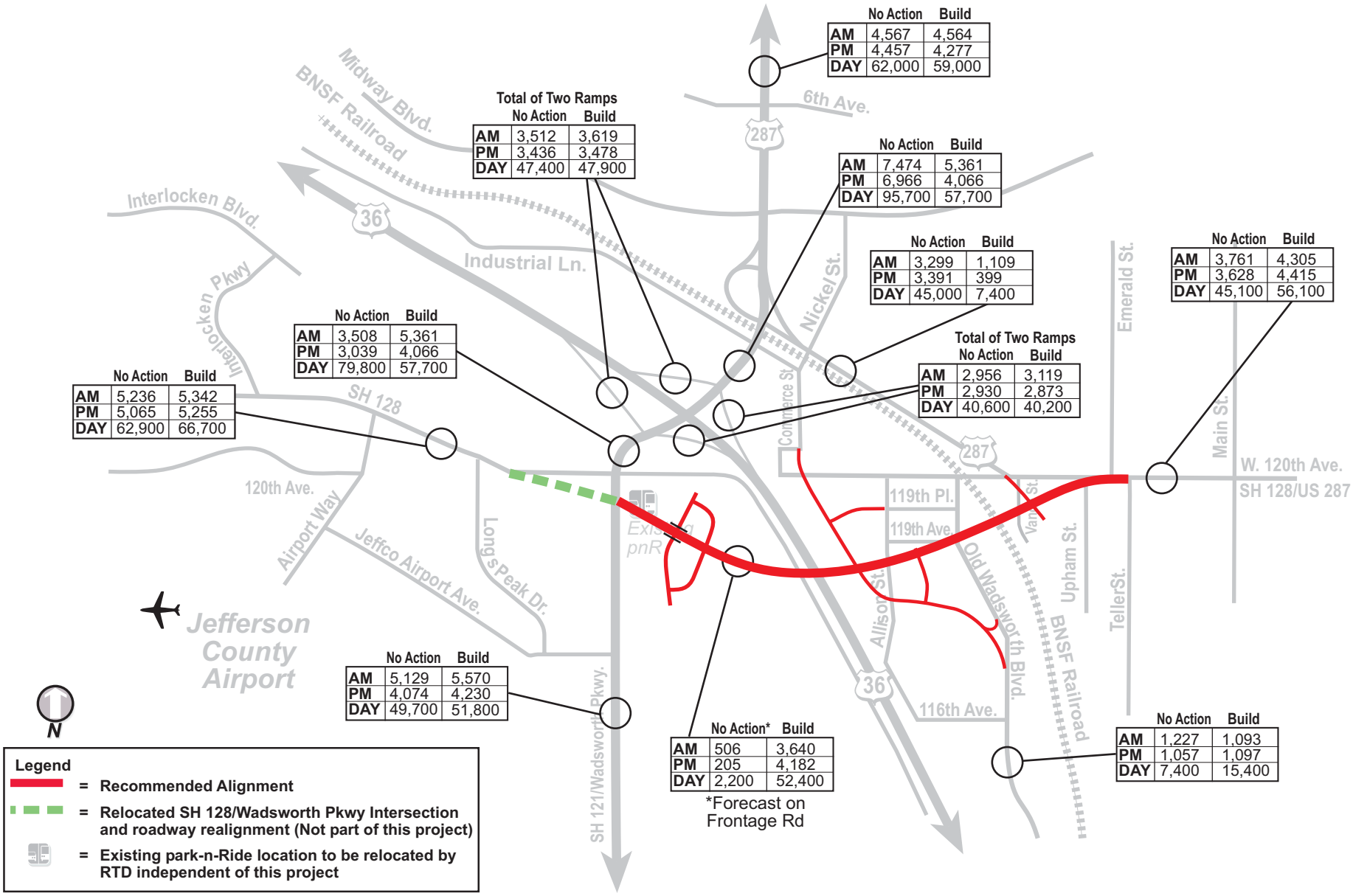
Figure 3-9



Source: Broomfield and CDOT

Year 2002/2003 Daily Traffic Volumes

Figure 3-10



	No Action	Build
AM	4,567	4,564
PM	4,457	4,277
DAY	62,000	59,000

Total of Two Ramps

	No Action	Build
AM	3,512	3,619
PM	3,436	3,478
DAY	47,400	47,900

	No Action	Build
AM	7,474	5,361
PM	6,966	4,066
DAY	95,700	57,700

	No Action	Build
AM	3,299	1,109
PM	3,391	399
DAY	45,000	7,400

	No Action	Build
AM	3,761	4,305
PM	3,628	4,415
DAY	45,100	56,100

	No Action	Build
AM	3,508	5,361
PM	3,039	4,066
DAY	79,800	57,700

Total of Two Ramps

	No Action	Build
AM	2,956	3,119
PM	2,930	2,873
DAY	40,600	40,200

	No Action	Build
AM	5,236	5,342
PM	5,065	5,255
DAY	62,900	66,700

	No Action	Build
AM	5,129	5,570
PM	4,074	4,230
DAY	49,700	51,800

	No Action*	Build
AM	506	3,640
PM	205	4,182
DAY	2,200	52,400

	No Action	Build
AM	1,227	1,093
PM	1,057	1,097
DAY	7,400	15,400

Source: DRCOG 2025 Sketch Travel Model

2025 Daily Traffic Volumes

Figure 3-11

delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested with longer delays.

3.6.2.1 Existing Conditions

Year 2002/2003 turning volumes in the study area are shown in **Figure 3-7**. The confined laneage in the study area, especially at the Wadsworth/US 36 Interchange, results in poor LOS for several signal approaches. The gap in 120th Avenue is apparent when viewing the existing turning movements and LOS results. The left-turn or loop volumes on the eastbound and westbound approaches to the Wadsworth/US 36 Interchange are made up of a large number of vehicles desiring to make an east-west connection. These vehicles are required to make multiple turns and share the north-south arterial crossing of US 36 on Wadsworth Parkway. The Wadsworth Parkway/US 287 north-south corridor currently has a coordinated signal system that attempts to optimize through traffic flow, yet even this system cannot accommodate the high traffic demand at peak periods.

3.6.2.2 Forecasted Conditions

The 2025 No-Action turning movements were applied to the No-Action roadway network, which is nearly the same as the existing network. The combination of the traffic demand of two arterials plus interchange ramp traffic crossing US 36 at the existing interchange results in substantial delays and poor LOS for nearly all movements. The traffic operations analysis for the Preferred Alternative was conducted based on procedures outlined in the *Highway Capacity Manual* (Transportation Research Board, 1998). The areas of greatest concern include:

- Operation of closely spaced signals on Wadsworth Parkway.
- Operation of proposed local access intersections.
- Potential queuing of vehicles in turn lanes on all approaches.

Table 3-11 outlines the results of the intersection LOS-based traffic analysis for the Preferred Alternative. The results show that the weighted average 2025 peak hour delay LOS would be most critical at the new SH 128/SH 121 intersection. In addition, the two US 36 ramp terminal signals on Wadsworth Parkway would be operating at capacity. The v/c ratios for the 2025 Build AM and PM peak hour volumes approach 1.0 on both Wadsworth Parkway and 120th Avenue except at the US 287 diagonal and Emerald Street. At the US 287 diagonal and Emerald Street, the v/c ratios are closer to 0.50.

Table 3-11
Intersection LOS-based Traffic Analysis for the Preferred Alternative

Main Street	Cross Street	2025 Build AM Peak			2025 Build PM Peak		
		Delay(s)	v/c	LOS	Delay(s)	v/c	LOS
Wadsworth Parkway	WB 36 off-ramp	104.4	1.32	F	38.3	1.00	D
Wadsworth Parkway	EB 36 off-ramp	33.9	0.98	C	55.9	1.04	E
Wadsworth Parkway	SH 128/120th Avenue	33.4	0.86	C	50.7	0.93	D
Triple lefts all directions							
120th Avenue	Access (RIRO*)						
120th Avenue	Allison connector	43.6	0.82	D	17.9	0.87	B
120th Avenue	US 287 diagonal	27.0	0.51	C	28.0	0.55	C
120th Avenue	Emerald Street	28.0	0.50	B	24.0	0.50	A

* RIRO = right-in/right-out access point. The proposed design of these RIRO accesses allows essentially free-rights into and out of the access. A LOS analysis is not applicable to free right movements.

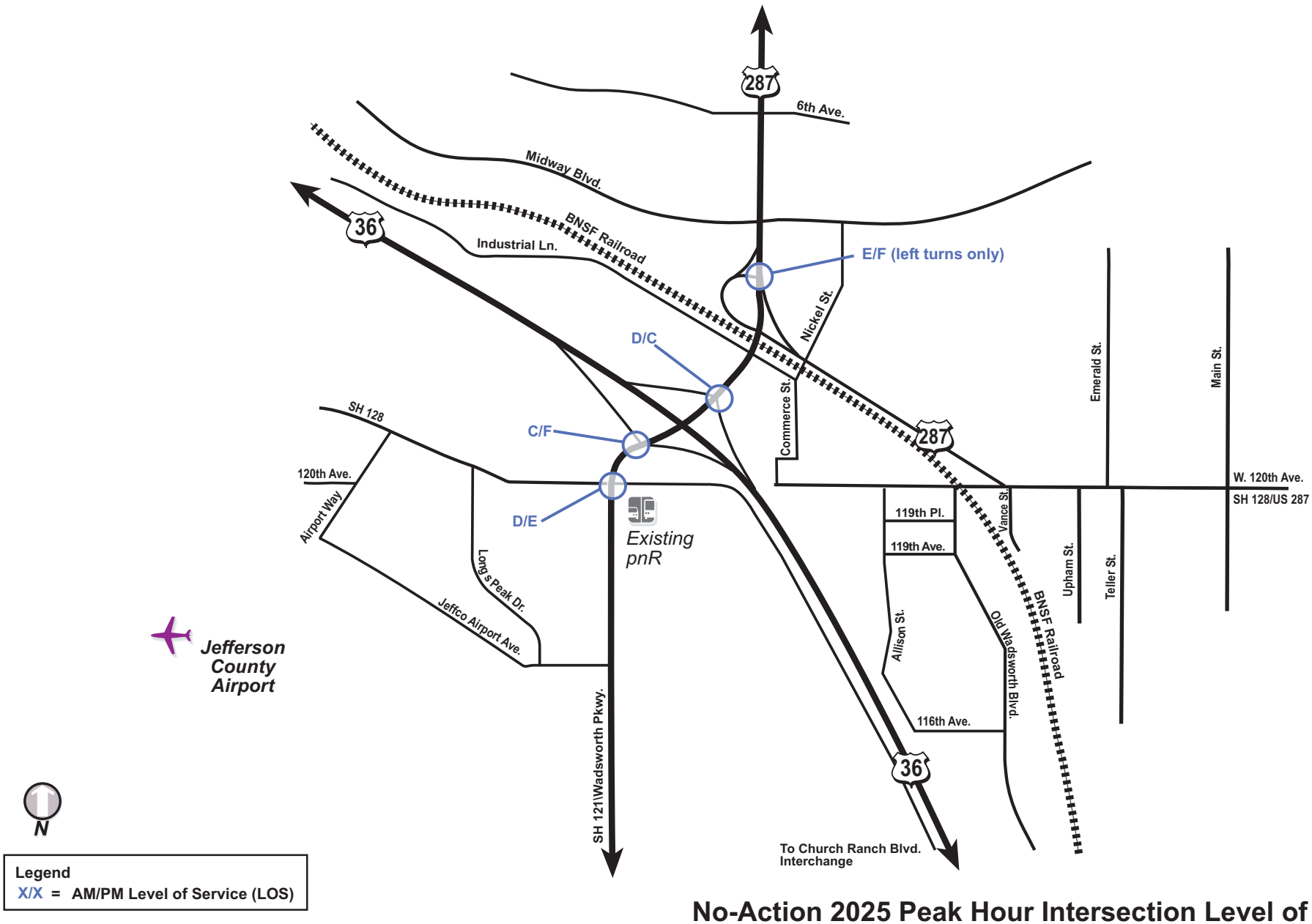
Figure 3-12 shows the 2025 peak hour intersection LOS for the No-Action Alternative. **Figure 3-13** shows the 2025 peak hour intersection LOS for the Preferred Alternative.

3.6.3 Laneage

The laneage at intersections within the study area were determined through an iterative process where reasonable combinations of through and turning lanes were evaluated. The goal was to select combinations that provide acceptable LOS at an intersection. The ability to have laneage consistent with the existing or planned laneage on roadways approaching the connection area also was an important consideration.

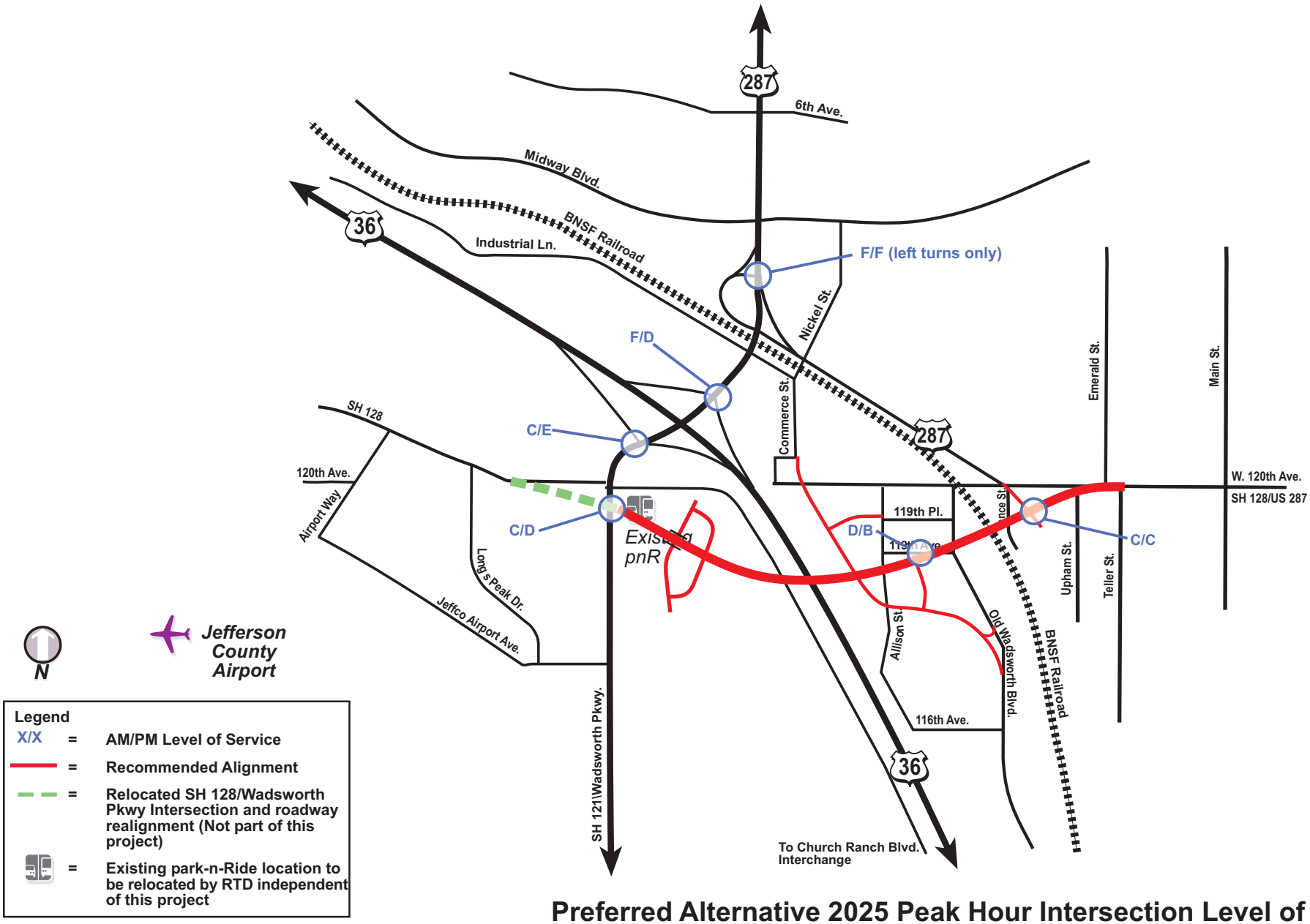
The resulting recommended laneage for the Preferred Alternative is shown in **Figure 3-14**. The testing of different laneage combinations determined that the use of triple left turn lanes at the intersection of Wadsworth Parkway and SH 128 would be appropriate. The space in the median would be provided in all four directions so triple-left turns can be easily accommodated, and final design of the 120th Avenue Connection should not preclude this laneage. The intersection be initially striped with only double-left turns, with triple-lefts incorporated as traffic volumes warrant.

The new 120th Avenue Connection would shift travel patterns in the area as drivers use the new connection to cross US 36 rather than use the existing Wadsworth crossing. The LOS analysis showed that all of the planned roadways could accommodate this shift in patterns. One location, the eastbound US 36 off-ramp turning right onto southbound Wadsworth Parkway would see a substantial increase in traffic volume. Many of the drivers turning right onto Wadsworth Parkway would need to immediately turn left at the new SH 128 intersection to access the 120th Avenue Connection. To eliminate the issues created by this potential weave and to provide additional capacity, the turn laneage approaching the signal on the eastbound off-ramp needs to be modified. The proposed modification would change the current single



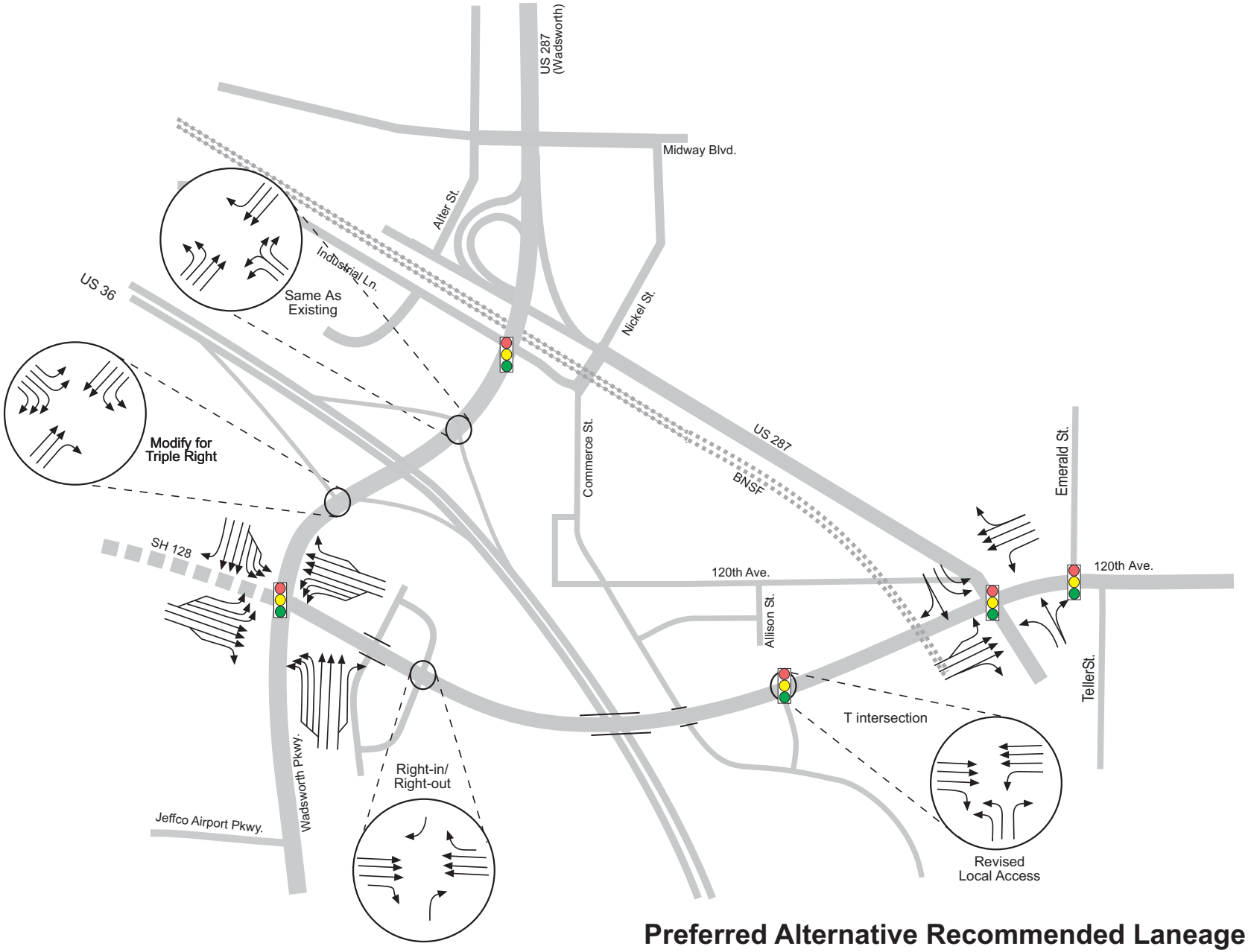
No-Action 2025 Peak Hour Intersection Level of Service

Figure 3-12



Preferred Alternative 2025 Peak Hour Intersection Level of Service

Figure 3-13



Preferred Alternative Recommended Laneage

Figure 3-14

lane free-right movement into a signalized triple-right. The LOS analysis in the previous section assumes this improvement.

3.6.4 Local Access and Planned Improvements

3.6.4.1 Existing Conditions

Access points are critical on the new 120th Avenue Connection since most of the roadways are state highway routes with high regional connectivity. The existing access points on the state highway designated roadways are shown in **Figure 3-6**.

3.6.4.2 Forecasted Conditions

The current US 287 route uses a diagonal road (parallel to the BNSF railroad) and low-speed ramps to transition from an east-west to a north-south route. It is anticipated that this diagonal road would be transferred to Broomfield when the east-west 120th Avenue Connection is made. At that time, the US 287 route would change from east-west to north-south at the SH 128/SH 121 intersection. US 287 is classified by CDOT as an NR-A (Non-Rural, Arterial) category facility, meaning it is intended to have moderate traffic speeds, moderate to high traffic volumes, and medium to short travel distances. It is anticipated that the new east-west connection of 120th Avenue would be similarly classified. There are some access connections to the proposed 120th Avenue for local roadways that would be necessary to provide local access to public streets, but there are no private property accesses proposed as part of the project.

For proposed access control in the study area, most access points would be consolidated to the new intersections. Broomfield approved initial development plans for the Transit Village for the land on either side of the 120th Avenue Connection between Wadsworth and US 36. This area is planned to be an important component in the improved US 36 Corridor transit plan proposed by RTD.

It is proposed that the Transit Village would be accessed by two right-in/right-out accesses on either side of the 120th Avenue Connection, with an underpass connecting the two accesses to the local road network, effectively creating a low-speed full-movement intersection at 120th Avenue.

The access proposed for Allison Street at 120th Avenue to the east of US 36 would be a signalized “T” intersection connecting to the local road network to the south. A new local collector connection of Old Wadsworth Boulevard to Commerce Street (Allison Bypass) would pass under 120th Avenue. Wadsworth Boulevard would be bisected by the Connection, forming cul-de-sacs on either side of the Connection.

Access configurations would be altered within the area of 120th Avenue and the US 287 diagonal. The old diagonal portion of US 287 would be converted to a local roadway and re-aligned to intersect with the 120th Avenue Connection between Vance and Upham Streets. A majority of the local businesses on the south side of 120th Avenue that remain under the Preferred Alternative would maintain their current access points to 120th Avenue. Businesses

located along 119 Place would not be able to access 120th Avenue via Upham Street. An alternate access to 120th Avenue would be provided through a full movement intersection off of the 120th Avenue Connection alignment. The commercial establishment (Consolidated Hardwoods) located south of the proposed 120th Avenue Connection alignment on Vance Street would have an alternate access to 120th Avenue via 119th Place.

Emerald Street may potentially be signalized at 120th in the future if traffic volumes warrant. A signal at Emerald Street and 120th Avenue would not be part of this project.

3.6.5 Transit

3.6.5.1 Existing Conditions

The study area has a fixed-route public bus service provided by RTD. There is currently an RTD park-n-Ride lot with approximately 900 spaces located on the west side of US 36, directly east of the intersection of SH 128 and Wadsworth Parkway. This park-n-Ride is accessed by regional buses serving Boulder-Denver (Routes B, DD, and S) and Boulder-Denver Tech Center (Route T). The park-n-Ride also is accessed by several local feeder routes including 76 (Wadsworth Crosstown), 120 (120th Avenue Crosstown), 128 (Broomfield/Wagon Road), 228 (Louisville-Broomfield), and RTD's Broomfield call-n-Ride. **Figure 3-15** depicts the existing transit system in and around the study area.

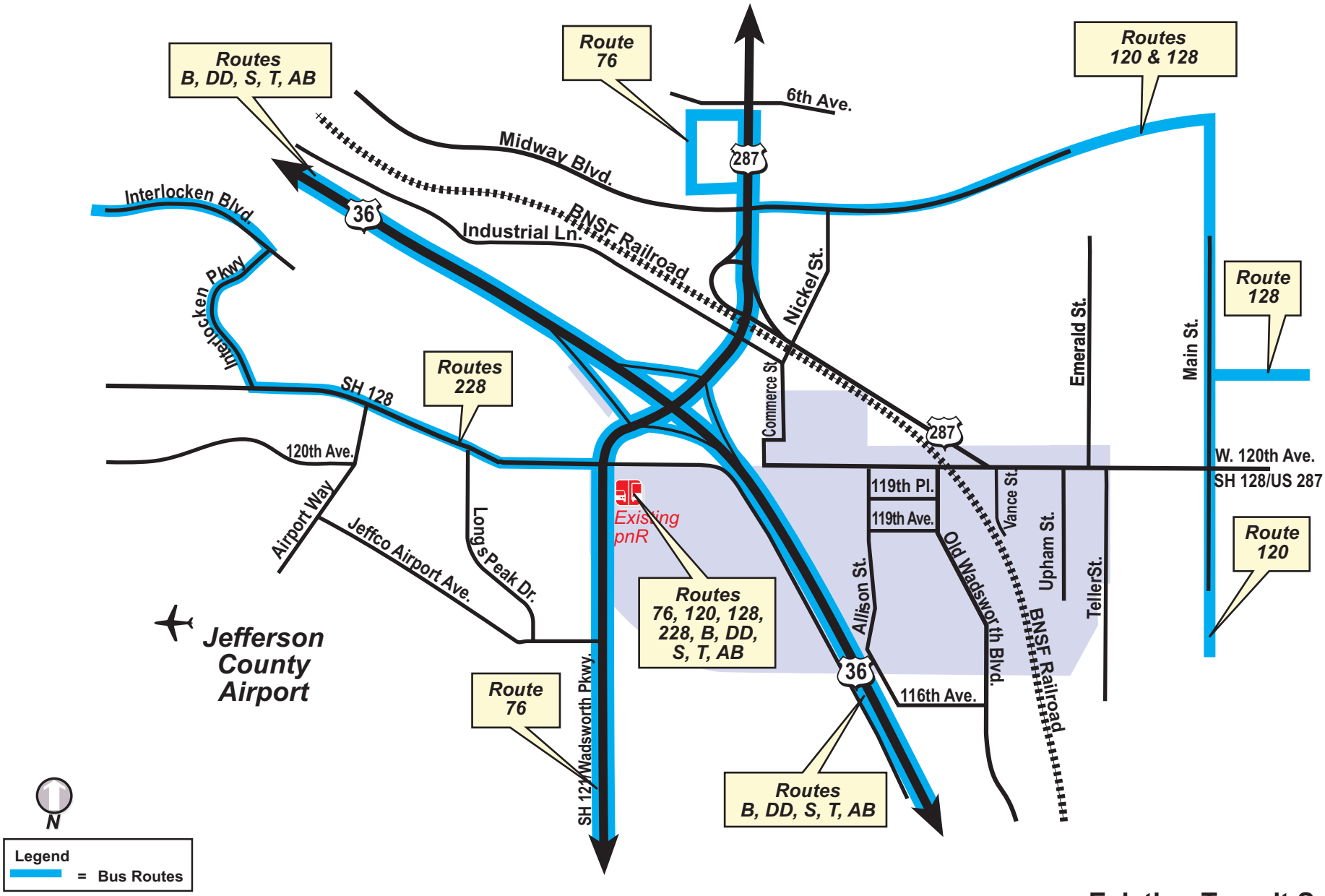
RTD is relocating and expanding the park-n-Ride lot along the proposed 120th Avenue Connection to reduce bus delays and improve service. Currently, regional buses must exit US 36 and travel through the congested Wadsworth/US 36 Interchange to reach the park-n-Ride. Local crosstown buses (Routes 120 and 128) experience similar delays as they must negotiate the same intersection to reach the park-n-Ride. The operational deficiencies at the interchange hinder the efficient movement of buses to and from the park-n-Ride. This additional movement for the buses routinely takes over five extra minutes for eastbound buses and ten extra minutes for westbound buses.

3.6.5.2 Forecasted Conditions

RTD either owns or is pursuing purchase of land on both sides of US 36 south of the proposed 120th Avenue Connection to be used for the relocated and expanded park-n-Ride facilities. RTD has been working with adjacent landowners and developers to incorporate an improved regional bus transit stop along US 36 as well as local feeder routes along the proposed 120th Avenue Connection. RTD continues to coordinate with Broomfield and CDOT during evaluation of the proposed 120th Avenue Connection to ensure that the proposed alignment would accommodate bus transit needs. RTD has included funding for design of the new park-n-Ride lot in the 2003-2008 TDP.

3.6.6 Transportation Impacts

No-Action Alternative. The No-Action Alternative would result in substantial peak hour delays along the SH 128 and 120th Avenue, which overlaps and double-loads Wadsworth



Existing Transit System

Figure 3-15

Parkway. In addition, queues of vehicles approaching the Wadsworth/US 36 Interchange would continue to increase in length and duration, which would impact freeway traffic operations. The number of drivers who avoid the area by using alternate routes, including local and residential roadways such as Midway Boulevard, would increase. The relocation of the park-n-Ride would occur as a separate project and would substantially improve transit travel time in the study area, reducing travel for buses by five to ten minutes.

Preferred Alternative. The Preferred Alternative is designed to provide east-west continuity in the region and provide a separate crossing of US 36 other than the current route passing through the Wadsworth/US 36 Interchange. The Preferred Alternative would eliminate out-of-direction travel and improve access to the surrounding land uses. The current double loading across the Wadsworth bridge would be alleviated by the direct east-west connection of 120th Avenue. The Preferred Alternative would provide improved access to the planned RTD park-n-Ride lots and would not preclude any reasonably foreseeable multi-modal improvements in the US 36 Corridor. An additional grade-separated crossing of the BNSF railroad would be constructed that would likely reduce the amount of traffic crossing the railroad at-grade.

The Preferred Alternative accommodates east-west travel demand and improves north-south travel, while also allowing future multi-modal improvements anticipated in the US 36 Corridor to occur. Access to transit hubs by all modes would be improved with the Preferred Alternative.

3.6.7 Transportation Impact Mitigation

LOS on study area roadways would not worsen with the Preferred Alternative and therefore no mitigation is required. One off-ramp from eastbound US 36 to Wadsworth Parkway would have additional turn lanes constructed as part of the 120th Avenue Connection to accommodate the shift in travel patterns. The 2025 daily forecast volumes do not show a discernable difference in LOS between the No-Action Alternative and the Preferred Alternative on roadways and intersections outside of the immediate study area. The levels of service within the interchange area itself would be improved with the Preferred Alternative.

3.7 Pedestrian and Bicycle Facilities

3.7.1 Existing Conditions

Existing pedestrian and bicycle facility descriptions are compiled from regional, local and state planning sources including Broomfield, the US 36 Transportation Mobility Organization (TMO), DRCOG and CDOT. Several of these planning documents note the lack of continuous trail facilities in the study area and identify the need missing links.

The types of existing pedestrian and bicycle facilities in the area include sidewalks, on-street bike lanes, off-street bike lanes, multi use paths, off-street trails, regional links and informal bike routes. On-street bike lanes typically include signing and striping to separate bicycles from vehicular traffic. Off-street bike lanes, which include regional links, are designed to promote local trip cycling, regional commuting, recreational use, and connections to trails. Informal bikeways represent roadway shoulders that are not designated as pathways but are used by

bicyclists and pedestrians. Existing study area pedestrian and bicycle facilities are shown in **Figure 3-16**.

The existing Wadsworth/US 36 Interchange and 120th Avenue lack continuous pedestrian facilities and there are few sidewalks or designated street crossings for pedestrians in the area. The multi-use paths in the area allow for pedestrian use; however, these paths are not connected to a network that is useful to pedestrians.

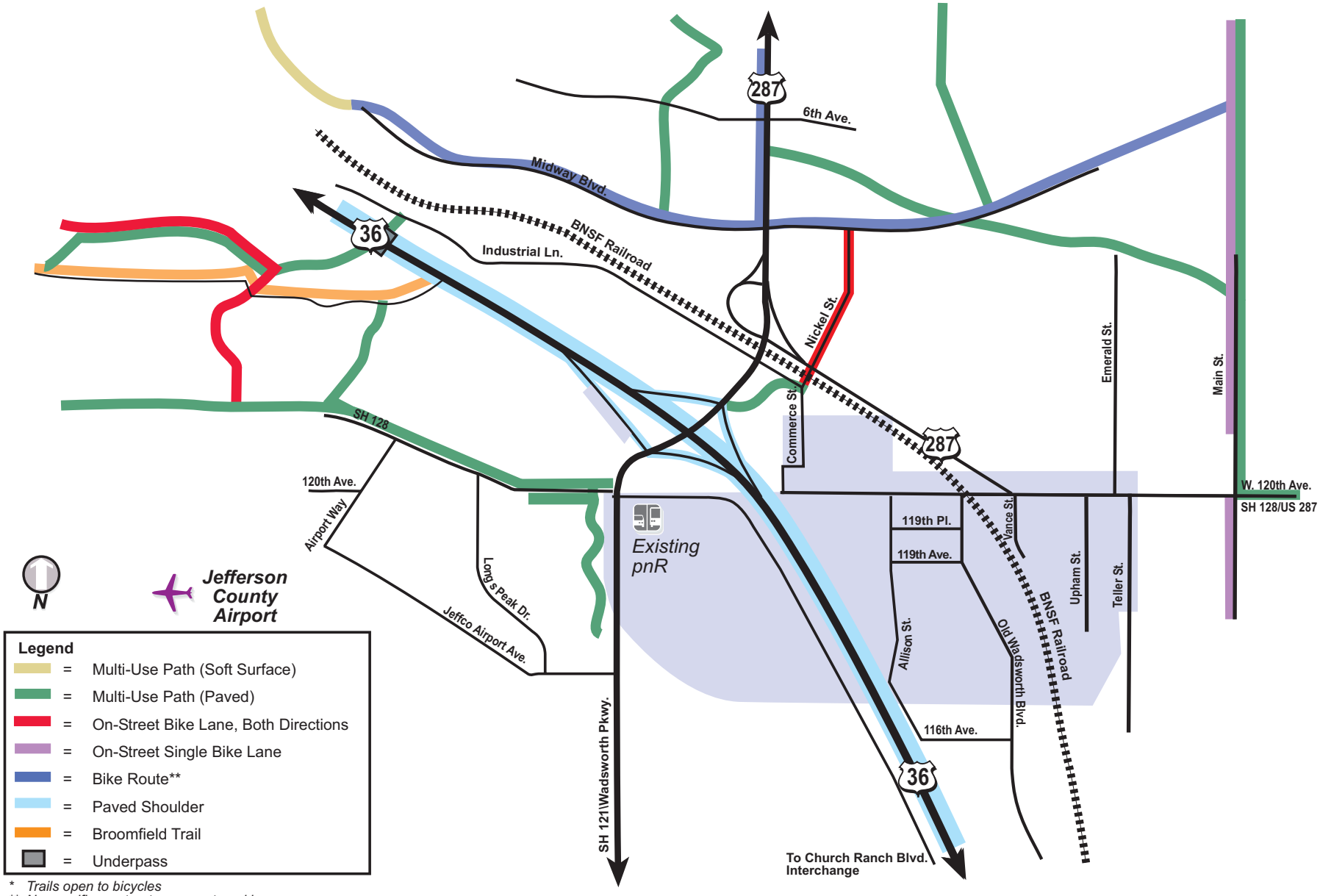
Bicycle advocacy groups, including Build the Bikeway and Bicycle Interlocken, have identified areas where bicycle paths can be built to link the system together along SH 128 and 120th Avenue. RTD allows bicycles at all facilities and on all buses serving the Broomfield RTD park-n-Ride; however, there is not an adequate network that connects the park-n-Ride with area residences and businesses.

3.7.2 Pedestrian and Bicycle Plans

A number of trails, both on and off-street, have been proposed in the study area and surrounding region. **Figure 3-17** shows these planned pedestrian and bicycle facilities. These trails are planned independent of other area improvements. The following paragraphs identify pedestrian and bicycle plans, ranging from the regional level improvements to suggested improvements along the proposed 120th Avenue Connection.

Broomfield Open Space, Parks, Recreation and Trails Master Plan (2005). This plan provides guidance for the next 20 years and implementation strategies for achieving the vision for Broomfield established in the 1995 Master Plan. One of the primary goals of the Plan is to create an interconnected open lands system that links to the community trails system. Plan recommendations for the trails system includes developing designated safe bicycling routes and regional trail connections along Northwest Parkway and US 36. Trail connections should provide safe access to and from parks, community centers, open space and employment areas. The trails system should also serve a variety of users, minimize conflicts between the different users and offer a good alternative to driving. The Master Plan maps indicate existing and planned local trails, proposed major community and regional links, and community and regional missing links in the Broomfield area. Several improvements in the Master Plan include, on-street bike lanes along 120th Avenue, US 287, Wadsworth Parkway and the Wadsworth/US 36 Interchange. A regional bikeway is proposed along US 36. Broomfield maps of missing and proposed links further depict a potential bike and pedestrian link along the proposed 120th Avenue Connection alignment.

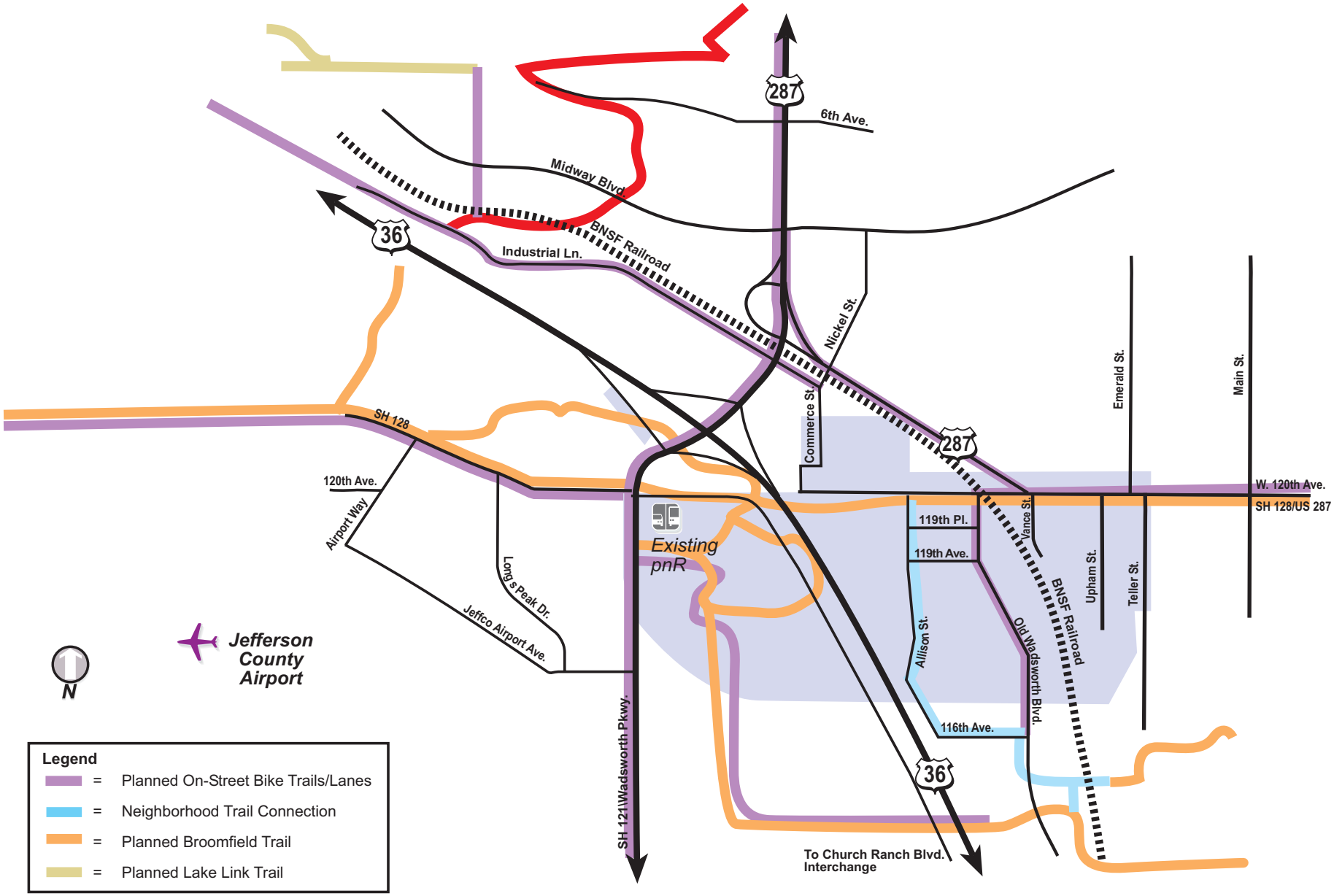
As part of the effort to prepare the Master Plan, Broomfield conducted an *Open Space, Trails, Parks and Recreation Needs Assessment Survey* in 2002. Final results of the survey indicated that both on and off-street trail options are preferred by the community. Commuters tend to prefer on-street routes that are more direct, while recreational bikers prefer separated, off-street routes that avoid close proximity to high-speed traffic. The assessment includes the need for connectivity of the trail to the Broomfield RTD park-n-Ride. The assessment also identified the SH 128 to 120th Avenue Connection as a missing community and regional trail link.



* Trails open to bicycles
** No specific on-street pavement markings
Source: BikeLinks 36 Regional Bicycle Map 2004, City and County of Broomfield, Open Space, Parks, Recreation and Trails Master Plan Map, 2005

Existing Pedestrian and Bicycle Facilities

Figure 3-16



Source: City and County of Broomfield, Open Space, Parks, Recreation and Trails Master Plan Map, 2005
City of Broomfield Transportation Plan (1996)

Planned Pedestrian and Bicycle Facilities

Figure 3-17

Broomfield Transportation Plan. This plan, adopted by the City of Broomfield in 1996 to accompany the overall Master Plan, states that the basic elements of a pedestrian and bicycle trail system are currently in place. Broomfield would need to link disconnected trail segments and add to the trail system as new development is proposed in order to achieve the goals of this plan. The plan identified pedestrian and bicycle trail needs within the study area and called out the lack of pedestrian and bicycle access from residences and businesses to the Broomfield RTD park-n-Ride as a particular concern. This need for access has been partially alleviated by the recent construction of two concrete paths between Nickel Street and Wadsworth Parkway at the US 36 exit ramp intersection. In addition, the sidewalk on the bridge across US 36 is inadequate (four feet wide), and lacks splash protection from adjacent traffic. Suggestions in the plan to improve local and regional access are focused on the bridge over US 36 and connections both north and south of the bridge.

DRCOG Pedestrian and Bicycle Element of the Regional Transportation Plan. This plan, adopted in July 1994, describes existing conditions and proposed policies for bicycle facilities throughout the metro Denver region. The Regional Bicycle System constitutes the entire network of streets and roadways in the metro area. To enhance connectivity between regional streets, the Plan identified regional bikeway corridors. Four routes are designated as regional corridors in the study area: SH 128 from the Wadsworth/US 36 Interchange area east to I-25, SH 128 from the interchange area west to SH 93, Wadsworth/SH 121 from US 36 south to 80th Avenue, and US 287 from US 36 north to Dillon Road/144th Avenue.

US 36 MIS. As described previously, the *US 36 MIS* was initiated in early 1998 by RTD and CDOT. This study entailed a collaborative process to identify potential solutions to long-term transportation needs in the corridor, including bikeways. A Locally Preferred Alternative (LPA) was identified with a multi-modal package of improvements, including bus rapid transit, high occupancy vehicle lanes, roadway widening, bikeways, intelligent transportation systems, and travel demand management measures. During the US 36 MIS process, several bicycle organizations voiced support for a US 36 Corridor bike route paralleling the turnpike. A final decision for that bikeway will be made as part of the US 36 EIS process now underway. The 120th Avenue Connection project would not preclude the development of a future bike corridor along US 36.

Bike Links 36. The Bike Links 36 project team consists of a project advisory committee, including representatives of jurisdictions along US 36, and a transportation consultant. The goal of Bike Links 36 is to facilitate bicycle travel and coordinate bicycle facility planning with communities along the US 36 Corridor. The 120th Avenue Connection project addresses some of the important missing links in the existing system and the opportunities for new facilities, which are concerns of Bike Links 36.

3.7.3 Pedestrian and Bicycle Impacts

No-Action Alternative. Figure 3-16 and **Figure 3-17** depict the existing pedestrian and bicycle facilities and those that are currently planned in the vicinity of the study area that would occur under the No-Action Alternative. However, the No-Action Alternative would result in continued exacerbation of inadequate conditions for pedestrians and bicyclists in the study area

due to increased congestion and accident potential. Pedestrians and bicyclists would continue to experience unsafe conditions attempting to access the RTD park-n-Ride and crossing US 36.

Preferred Alternative. In response to comments received at public workshops and in meetings with the bike community, the need for multiple types of bike facilities was identified. The bike community expressed the need for both commuter and recreational user facilities in the study area.

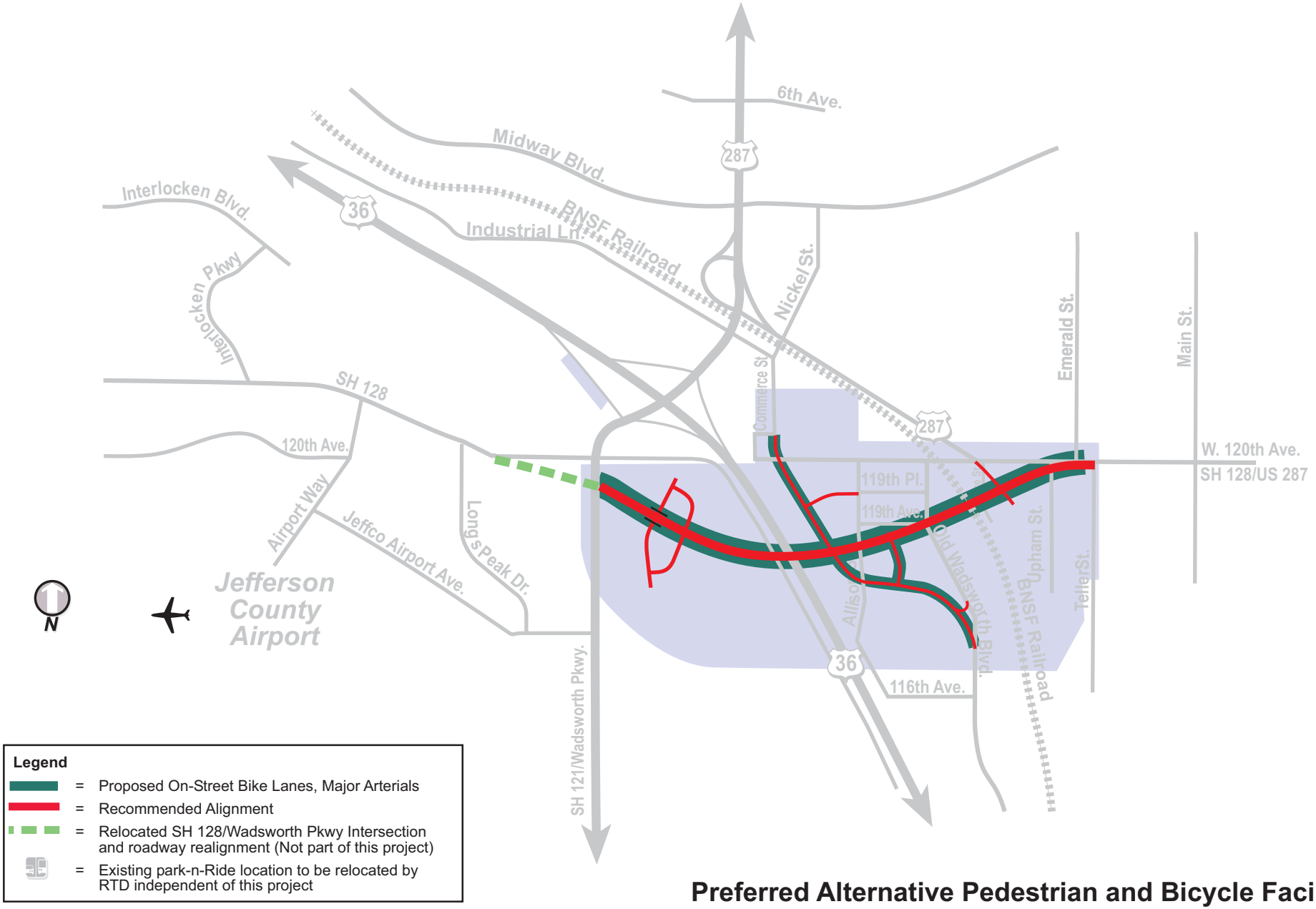
During the EA process and alternatives screening, various options for pedestrian and bicycle connections along the 120th Avenue Connection were analyzed. Both a ten-foot sidewalk and a four-foot bike lane/six-foot sidewalk were analyzed. The Preferred Alternative includes four-foot on-street bike lanes and six-foot sidewalks on both sides of 120th Avenue. **Figure 2-6** depicts the typical cross section for the pedestrian and bicycle facilities planned under the Preferred Alternative. **Figure 3-18** shows the facilities planned under the Preferred Alternative. These improvements fulfill some of the needs identified by the bike community for on-street facilities and access to the Broomfield park-n-Ride.

Under the Preferred Alternative, the re-aligned Allison Street would include a three-foot on-street bike lane, which is consistent with City and County of Broomfield standards. With these proposed improvements, conditions would be safer than at present, and mobility, ease of travel, and direct trail connections would be improved. Furthermore, pedestrians and bicyclists attempting to access the RTD park-n-Ride would have a much safer route of travel.

There are no existing pedestrian or bicycle trails in the study area that would be permanently impacted by the Preferred Alternative. The shoulders along US 36 used by bicyclists will pass beneath the 120th Avenue Connection. Use of the shoulders would be temporarily interrupted during construction of the overpass structure.

3.7.4 Pedestrian and Bicycle Impact Mitigation

Impacts of the Preferred Alternative would not result in adverse impacts to pedestrian and bicycle facilities in the vicinity of the study area. Rather, the Preferred Alternative would compliment regional and local trail system planning efforts by providing safer and easier trail connections across US 36 and to RTD park-n-Ride facilities. The bike community will be informed regarding the temporary impacts to the shoulders along US 36 and a detour route provided.



Legend

- = Proposed On-Street Bike Lanes, Major Arterials
- = Recommended Alignment
- = Relocated SH 128/Wadsworth Pkwy Intersection and roadway realignment (Not part of this project)
- = Existing park-n-Ride location to be relocated by RTD independent of this project

Preferred Alternative Pedestrian and Bicycle Facilities

Figure 3-18

3.8 AIR QUALITY

3.8.1 Existing Conditions

The geographical and meteorological characteristics of the Denver metropolitan area are a major cause of the air quality conditions that exist within the study area. The study area is located within the valley of the South Platte River, making the region susceptible to temperature inversions during the winter months. However, local winds in Broomfield can gust strongly as they move off the mountains to the west.

The U.S. Environmental Protection Agency (EPA) has designated the Denver metropolitan area as an attainment/maintenance area for fine particulate matter less than ten microns in diameter (PM_{10}), for carbon monoxide (CO) and for the one-hour ozone (0_3) standard. The 120th Avenue Connection study area is within the Denver metropolitan attainment/maintenance area.

In 1997, EPA established a new, more stringent 8-hour standard for ozone. During the past several years, public education, outreach and voluntary measures have been implemented in the Front Range area as ozone concentrations have approached and occasionally exceeded the value permitted by the 8-hour ozone National Ambient Air Quality Standard (NAAQS). Based on the 2000-2002, 3-year average, the Denver metro region demonstrated compliance with the 8-hour ozone NAAQS. In summer 2003, elevated values of eight-hour ozone caused the Denver metro region three-year average to violate the standard. As a result, EPA designated much of the Front Range area as non-attainment for the eight-hour standard in April 2004, including the study area. However, because of the expected designation for non-attainment, state agencies had entered into an Early Action Compact (EAC) with EPA. The Regional Air Quality Council, the Colorado Department of Public Health and Environment, the Colorado Department of Transportation, the Air Quality Control Commission, and the Denver Regional Council of Governments signed the EAC in December 2002. The U.S. EPA signed the agreement on December 31, 2002.

The EPA's EAC allows a region to submit an enforceable State Implementation Plan outlining steps the region will take to maintain compliance with the ozone standard. In return, the EPA will defer any potential non-attainment designation and give the area until 2007 to demonstrate attainment of the standard. The EAC Ozone Action Plan was approved in March 2004. EPA also mandated that Maintenance Plans be prepared and approved by the EPA for the Denver metropolitan area CO, O_3 (1-hour standard), and PM_{10} maintenance areas. The Colorado Department of Health and Environment, Air Pollution Control Division oversees the process to determine air quality impacts. The process includes both regional and project level air quality analysis. The EPA evaluates projects on a regional level to assure they do not have a negative impact on air quality, and the air quality impacts fit into the regional emissions budget established by the EPA. Projects that meet these criteria (and are financially constrained) are included in a current Regional Transportation Plan (RTP) and Transportation Improvement Plan (TIP). Projects are also evaluated on a project level to determine impacts related to carbon monoxide concentrations.

3.8.2 Transportation Conformity

The transportation conformity regulations of August 1997 require that regionally significant, and/or federally funded transportation projects demonstrate conformity to State Implementation and Maintenance Plans. The 120th Avenue Connection project would be federally funded, is considered a regionally significant project and is included in the conforming 2030 Regional Transportation Plan adopted on January 19, 2005. The transportation conformity regulations require that:

1. The project is included in a conforming *Regional Transportation Plan* (RTP).
2. The project is included in a conforming *Transportation Improvement Program* (TIP).
3. The project does not cause or contribute to any new or existing violations of NAAQS.

3.8.3 Interagency Consultation Team

An Interagency Consultation team met as part of this project to provide direction regarding the scope of the air quality analysis and to review the results. This team consisted of representatives from the Colorado Department of Public Health and Environment, Air Pollution Control Division, the Colorado Department of Transportation, and the project consultant. The team decided that a hot-spot analysis for carbon monoxide and a qualitative analysis for PM_{10} should be performed.

3.8.4 Air Quality Impacts

3.8.4.1 Carbon Monoxide

The results of the CO "hot-spot" analysis for the proposed intersection of the 120th Avenue Connection and Wadsworth Parkway show that no violations of one-hour or eight-hour standards for CO concentrations would occur in the year 2025. The results were similar for both AM and PM peak hour traffic volumes, with eight-hour average concentrations of 6.0 and 6.1 ppm (parts per million) respectively. The eight-hour standard is 9.0 ppm.

In order to determine the air quality impacts to residents in the mobile home park along the proposed 120th Avenue Connection alignment, the Preferred Alternative and the No-Action Alternative were modeled for CO. With the Preferred Alternative, the results of the CO dispersion model showed there would be an eight percent increase in CO concentrations in this location, but would not result in any violations of the NAAQS.

3.8.4.2 Particulate Matter

A qualitative analysis of PM_{10} emissions was conducted for the study area. Vehicle emissions and re-entrained road dust are the primary source of PM_{10} emissions, creating a background concentration of 45 ug/m^3 (micrograms per cubic meter). According to the Colorado Air Quality Control Commission Report to the Public, 2001-2002, there are no monitors in the study area to

provide PM_{10} air quality data; so actual levels of this pollutant in the study area are not available.

As part of conformity and the implementation and maintenance plan development process, an emissions budget for PM_{10} is established for attainment and maintenance areas to meet the NAAQS. Because the US EPA classifies the Denver metropolitan area as an attainment/maintenance area for PM_{10}, projected emissions of the pollutant resulting from projects in the TIP or RTP must not exceed the emissions budget set forth in the plan. This project is included in the recently adopted 2030 RTP.

The PM_{10} Attainment/Maintenance Plan, recently approved by the EPA, estimates through dispersion modeling the effect of 2005, 2010 and 2015 emissions to demonstrate continued maintenance of the standard during this time period. The emissions budget for motor vehicles, utilized to assess the conformity of transportation plans, TIPs and projects, set the 24-hour PM_{10} concentration allowed at 150 ug/m^3 for the Denver Metropolitan area for the year 2015 and beyond. The modeling domain for regional PM_{10} concentrations, described in the Technical Support Document to the Maintenance Plan, shows that the highest modeled concentration nearest to the study area is 137 ug/m^3, below the 150 ug/m^3 standard.

After modeling the Preferred Alternative improvements with the regional MINUTP traffic demand model, VMT is expected to be slightly reduced regionally. Under the No-Action Alternative, the model predicted that Year 2025 VMT would be 97,020,326. With the Preferred Alternative, the model predicted that Year 2025 VMT would be 97,000,603. Because VMT would not increase, overall PM_{10} emissions are not expected to increase.

Based on a review of regional PM_{10} concentrations modeled for the year 2015, and the reduction in VMT regionally, the Interagency Consultation team concluded that there would be no impact on PM_{10} emissions or concentrations associated with the Preferred Alternative.

3.8.4.3 Urban Air Toxics

EPA has established a list of 33 urban air toxics, also known as hazardous air pollutants, that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. Most air toxics originate from human-made sources, including road mobile sources (e.g. cars, trucks, buses), non-road mobile sources (e.g. airplanes, lawnmowers, etc.) and stationary sources (e.g. factories, refineries, power-plants), as well as indoor sources (e.g. building materials). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires.

These pollutants are in our atmosphere as a result of our industrialized society and science has been providing more evidence about the risks they pose to human health. The health risks for people exposed to urban air toxics at sufficiently high concentrations or lengthy durations include an increased risk for getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive, developmental, respiratory and other health problems.

To better understand the harmful effects road sources of urban air toxics have on human health, EPA developed a list of 22 mobile source air toxics (MSAT) in 1996, and assessed the risks of various kinds of exposures to these pollutants on human health. In July 1999, the EPA published a strategy to reduce urban air toxics and in March 2001, issued regulations for the producers of urban air toxics to decrease the amounts of these pollutants by target dates in 2007 and 2020. Under these regulations, between 1990 and 2020, on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde would be reduced by 67 to 76 percent, and on-highway diesel particulate matter emissions would be reduced by 90 percent. These reductions are due to the impacts of national mobile source control programs, including the reformulated gasoline program, a new cap on the toxics content of gasoline, the national low emission vehicle standards, the Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and the heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. These are net emission reductions, that is, the reductions that would be experienced even after growth in VMT is taken into account.

The EPA has not yet determined how best to evaluate the impact of future roads and intersections on the ambient concentrations of urban air toxics. There are no standards for MSATs and there are no tools to determine the significance of localized concentrations of MSATs or increases or decreases in emissions. Without the necessary standards and tools, the specific impacts of this project cannot be analyzed in a meaningful way. With the information currently available, all that can be concluded is that, 1) there would likely be localized concentrations of air toxics along the 120th Avenue Connection that are similar to those experienced by existing residences at similar distances from other similar arterial corridors, and 2) regardless of the alternative chosen, emissions in the study area would decrease over time due to EPA's national control programs.

3.8.5 Air Quality Impact Mitigation

No mitigation for air quality is necessary for direct impacts of this project because the project would not result in any exceedance of the NAAQS. Implementing techniques to control dust will minimize dust emissions during construction. Practical measures to control dust, such as watering of construction areas, will be incorporated into the plans and specifications for the construction phase of the project (see Section 3.20).

3.9 NOISE

The Federal Highway Administration (FHWA) has established national criteria by which to determine the impacts of traffic noise to certain types of land uses. These are shown in **Table 3-12.** The noise abatement criteria (NAC) are typically applied to outdoor areas of use. For residences, this area is usually described as a ground-level outdoor patio/deck/yard area. If a project would result in noise levels above these criteria thresholds, noise mitigation would need to be considered as a part of the project.

Table 3-12
CDOT and FHWA Noise Abatement Criteria

Category	L_{eq}(h)—dB(A) *		Description of Activity Category
	CDOT	FHWA	
A	56 Exterior	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 Exterior	67 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	71 Exterior	72 Exterior	Developed lands, properties or activities not included in Categories A or B above.
D	--	--	Undeveloped lands.
E	51 Interior	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

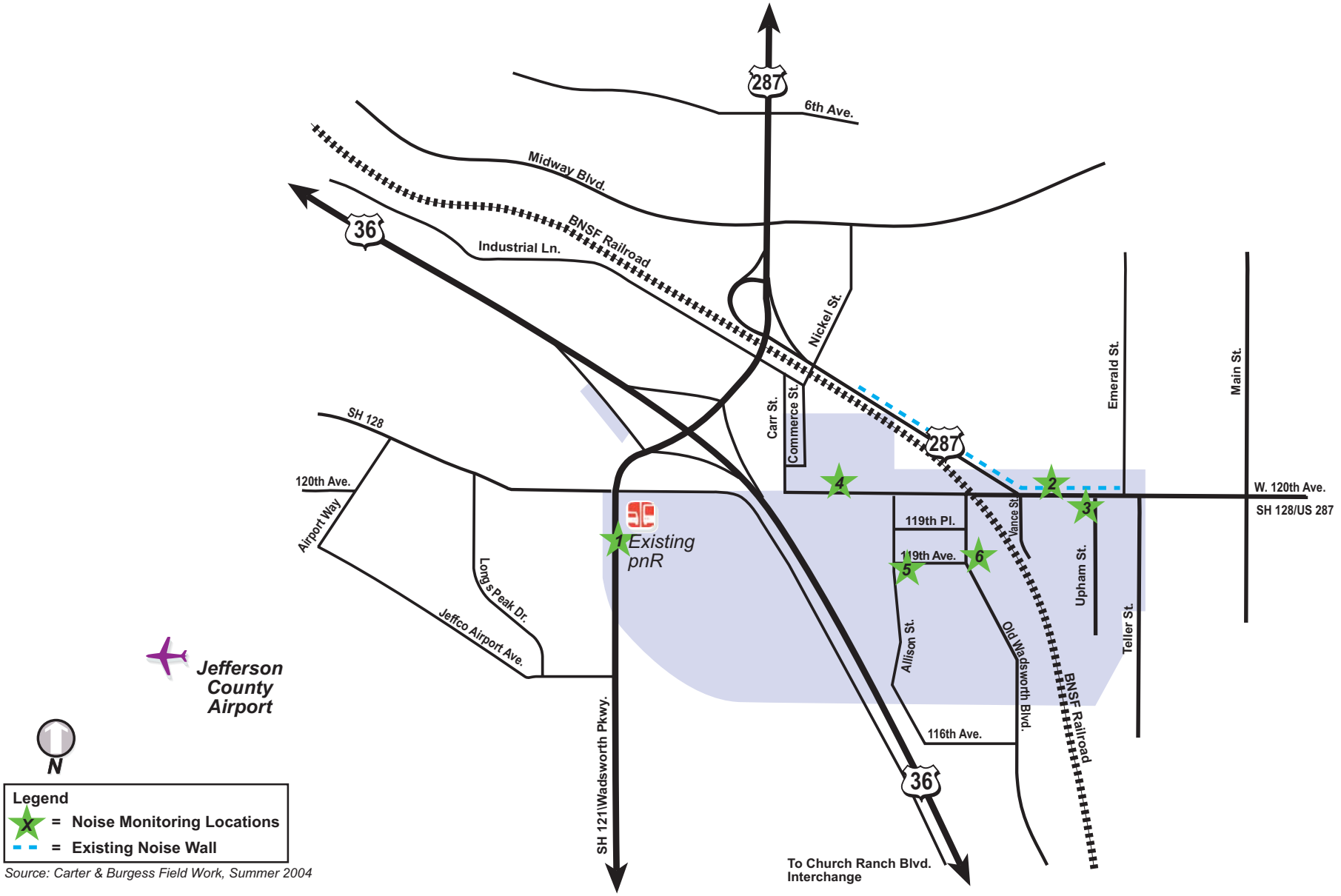
*L_{eq}(h) describes the hourly value of L_{eq}. L_{eq} is the mean noise level during the peak traffic period. dB(A) is the weighted decibels by which noise levels are measured.

In addition to the federal criteria the Colorado Department of Transportation (CDOT) has established a 1.0 dB(A) approaching criteria (both shown in **Table 3-12**), meaning noise impacts and abatement measures are considered if a project would cause noise levels to be within 1.0 dB(A) of the NAC. For example, in a residential area (Category B), a noise impact would occur if the project results in a noise level of 66 dB(A) or greater. FHWA has adopted this standard for transportation projects in Colorado. In addition, a noise impact is considered to occur if construction of the project would result in a noise increase of 10 dB(A) or greater over existing noise levels (*CDOT Noise Analysis and Abatement Guidelines, 2002*). An increase of 3 to 5 dB(A) is noticeable to the human ear, and an increase of 10 dB(A) is perceived as a doubling of noise levels to the human ear.

3.9.1 Existing Conditions

Land uses in the study area are primarily transportation, commercial, residential and light industrial, with some undeveloped land and agricultural uses. “Noise-sensitive” land uses, including a mobile home park and numerous single-family residential units, are present in the study area. In addition, much of the current undeveloped land is planned for development in the future. None of the planned development is permitted to build yet, so it does not qualify for evaluation under CDOT guidelines.

Existing noise measurements were taken at six locations around the study area to represent the receptors within the proposed project corridor (see **Figure 3-19**). Field measurements at the



Source: Carter & Burgess Field Work, Summer 2004

Noise Monitoring Locations

Figure 3-19

six monitoring locations were generally taken at the closest point of the structure or closest outdoor use area to the roadway without trespassing on private property. Existing noise levels for the six monitored sites are shown in **Table 3-13**. For more detailed information, please refer to the *Noise Analysis Technical Memorandum* prepared for this project.

Table 3-13
Existing Noise Monitoring Results

Site ID	Activity Category	Location	Monitored Noise Level During PM Peak Hours
1	C	Southwest corner of park-n-Ride lot at southeast corner of Wadsworth Parkway and US 36	63.1 dB(A)
2	B	Corner of 1st Avenue and Garnet Street	57.1 dB(A)
3	B	Corner of 119th Place and Upham Street	61.4 dB(A)
4	B	Corner of 120th Avenue and Emerald Lane	59.3 dB(A)
5	B	8100 block of 119th Avenue	50.4 dB(A)
6	B	Corner of 119th Avenue and Old Wadsworth Boulevard	68.3 dB(A)

The conditions that were observed during the above measurements were input to the STAMINA noise model for validation purposes. Initial existing conditions model runs resulted in noise levels within 3 decibels of most of the field measurements, within the acceptable range set by CDOT guidelines. At Site # 5, the 8100 block of 119th Avenue, the field measurements were approximately 5 decibels lower than the noise level predicted by the model. Although for this location the model tended to over predict noise levels, overall the noise model was found to perform acceptably for this project.

The existing noise levels approach or exceed the CDOT NAC, as defined in **Table 3-12**, at one of the monitoring locations, Site # 6. This site falls under Activity Category B and represents many of the residences in the Broomfield Mobile Home Park. These field measurements were also used to verify the model of existing noise levels for all receivers in the study area, using the STAMINA software according to CDOT noise modeling guidelines. Receptors were placed in the model to represent locations where actual outdoor activities might be affected by noise conditions. According to the existing conditions noise model, the existing noise levels approach or exceed the NAC at two mobile homes on the west edge of the Broomfield Mobile Home Park (Receptor ID 6 and 10b). Noise from Old Wadsworth Boulevard creates the impact. The other is located where the existing 120th Avenue ends at Carr Street (Receptor ID 1c), where noise from US 36 creates the impact. **Table 3-14** lists the noise levels for these three locations.

Table 3-14
Existing Noise Levels Approaching or Exceeding the CDOT NAC
(According to Noise Modeling Results)

Activity Category	Receptor ID	Location	Modeled Noise Level During PM Peak Hours
B	6	Broomfield Mobile Home Park	66.7 dB(A)
B	10b	Broomfield Mobile Home Park	66.6 dB(A)
B	1c	8375 120th Avenue	67.3 dB(A)

3.9.2 Noise Impacts

Future traffic volumes and future roadway alignments were modeled to determine future noise levels with the Preferred Alternative. Receptors were placed in the model to represent potentially impacted sites within the study area to determine future noise levels and impacts with both the No-Action Alternative and the Preferred Alternative. Predicted 2025 noise levels at nine impacted locations are listed in **Table 3-15**. Noise impacts were not calculated for properties identified as probable right-of-way acquisitions, and not subject to abatement evaluation.

Table 3-15
Predicted Noise Levels at Impacted Locations

Receptor ID	Site Address	Existing Noise Levels During Peak PM Hours	No-Action Alternative Predicted Noise Levels During 2025 Peak PM Hours	Preferred Alternative Predicted Noise Levels During 2025 Peak PM Hours
1	11910 Allison Street	57.4 dB(A)	59.6 dB(A)	66.4 dB(A)
6	Broomfield Mobile Home Park	66.7 dB(A)	69.5 dB(A)	66.0 dB(A)
36	Broomfield Mobile Home Park	65.7 dB(A)	68.5 dB(A)	60.0 dB(A)
48	11925 Wadsworth Boulevard	63.4 dB(A)	66.2 dB(A)	63.8 dB(A)
1b	Broomfield Mobile Home Park	64.0 dB(A)	66.8 dB(A)	65.6 dB(A)
10b	Broomfield Mobile Home Park	66.6 dB(A)	69.5 dB(A)	62.0 dB(A)

continued

Table 3-15 (continued)
Predicted Noise Levels at Impacted Locations

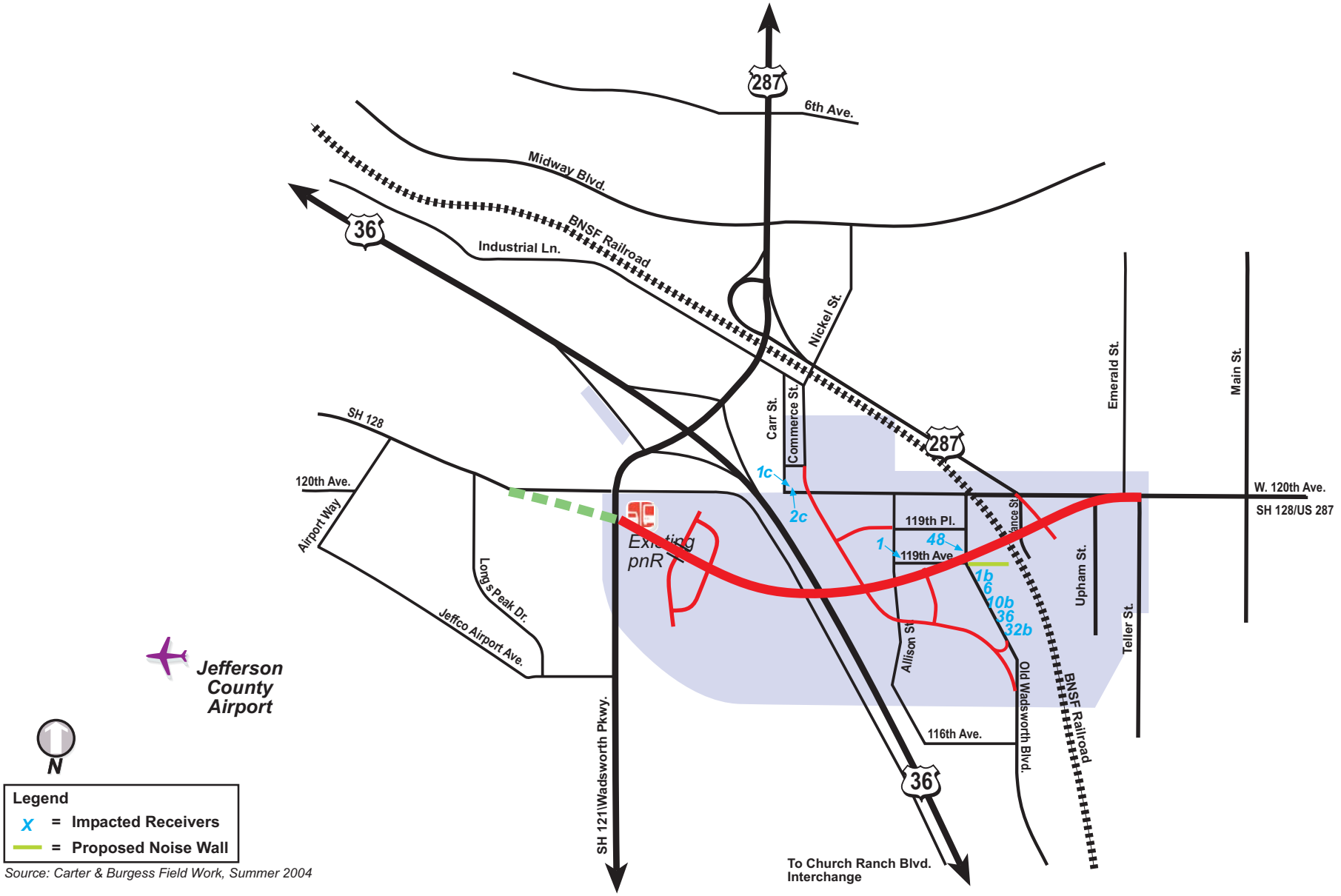
Receptor ID	Site Address	Existing Noise Levels During Peak PM Hours	No-Action Alternative Predicted Noise Levels During 2025 Peak PM Hours	Preferred Alternative Predicted Noise Levels During 2025 Peak PM Hours
32b	Broomfield Mobile Home Park	64.6 dB(A)	67.5 dB(A)	60.6 dB(A)
1c	8375 120th Avenue	67.3 dB(A)	68.6 dB(A)	68.8 dB(A)
2c	8357 120th Avenue	65.0 dB(A)	66.4 dB(A)	66.7 dB(A)

No-Action Alternative. Substantial noise increases are not expected with the No-Action Alternative, however nine locations would experience noise levels at or above the approach criteria of 66 dB(A) for Category B. Noise levels throughout the study area would increase from 1 to 3 dB(A), an amount that is below the level most people are able to detect. These nine locations are listed in **Table 3-15** and shown in **Figure 3-20.**

Preferred Alternative. All of the modeled locations throughout the study area would experience a change with the Preferred Alternative. Four residences would experience noise levels above the approach criteria of 66 dB(A). Of these four, two are located where the existing 120th Avenue ends at Carr Street, one is north of the new 120th Avenue Connection near Allison Street, and one is located in the Broomfield Mobile Home Park (see **Figure 3-20**). None of the residences would exceed the 10 dB(A) substantial increase threshold; however, 17 locations would experience an increase in noise of 5 dB(A) or more. More specifically, these locations are at the north end of the Broomfield Mobile Home Park and in the neighborhood between Allison Street and Old Wadsworth Boulevard, north of the proposed 120th Avenue Connection.

Twenty-one locations, including a mixture of commercial and residential sites located near the existing 120th Avenue and along Old Wadsworth Boulevard, are projected to experience decreases in noise levels. Only 12 of these locations would experience a change noticeable to human ears. These locations are projected to experience decreases from existing noise levels because traffic is expected to decrease by 69 percent in these portions of the study area under the Preferred Alternative by the year 2025.

Thirty-eight mobile homes in the mobile home park would experience increases in noise levels with the Preferred Alternative. While two locations currently exceed the NAC, the model showed that projected noise levels would exceed the NAC at one additional location (Receptor ID 6). Due to the high density of the mobile home park residences and the close proximity of these residences to the proposed 120th Avenue Connection alignment, mitigation will be considered for this site.



Source: Carter & Burgess Field Work, Summer 2004

Proposed Noise Wall and Impacted Receiver Locations

Figure 3-20

Ten residences just north of the proposed 120th Avenue Connection alignment would experience an increase of five to 9 dB(A) with the Preferred Alternative, but the increases are below the 10 dB(A) threshold for impact. The noise level at only one of these residences (Receptor ID 1, 11910 Allison Street) would exceed the 66 dB(A) approach standard as shown in **Table 3-15**. Due to this impact, mitigation will be considered for this site.

Two residences on 120th Avenue near Carr and Commerce Streets would experience noise levels above the NAC impact threshold with the Preferred Alternative. One of these already experiences noise levels above the impact threshold. For this reason, mitigation will be considered for this site.

3.9.3 Noise Impact Mitigation

Once a noise impact is determined to result from the proposed improvements, an analysis must be conducted to determine if mitigation is warranted at these locations. All possible noise abatement measures for reasonableness and feasibility must be considered. These include noise barriers or walls, earth berms, creating buffer zones of undeveloped land, planting vegetation, traffic management, installing noise insulation on buildings, and relocating the highway.

According to FHWA and CDOT, a noise analysis needs to consider the "feasibility and reasonableness" of mitigation for all locations that are projected to experience noise impacts. The feasibility analysis of mitigation considers such factors as the effectiveness of noise reduction in predicted future noise levels, construction, engineering, maintenance, or other design issues. Mitigation measures are considered feasible if they can reduce noise by a minimum of 5 dB(A) for at least one receiver, and they should not create any unacceptable safety or maintenance problems. Noise mitigation is considered reasonable if it meets certain criteria, such as the cost per receiver per decibel of noise reduction and type of land use protected. For example, business districts typically do not receive noise mitigation, as noise barriers would block the view of businesses from motorists.

Relocating the highway, creating buffer zones, constructing earth berms and planting vegetation are not feasible in this situation because these abatement measures require large amounts of land to achieve the necessary noise reductions. The surrounding land use in the study area prohibits acquiring the space needed for these abatement measures. Traffic management, such as limiting truck traffic on the highway, is not feasible because of the status of SH 128 and US 287 as major highways. Because of the high cost, installing noise insulation on buildings is usually reserved for public buildings such as schools or hospitals. For these reasons, noise barriers seem to be the most appropriate noise abatement measure for this project.

Noise mitigation is usually accomplished through construction of either wooden or masonry noise walls or earth berms that divert the path of noise from the source to the receiver. CDOT no longer constructs wooden barriers at new noise mitigation locations. Noise mitigation is rendered less effective if it is not continuous or has gaps that accommodate driveways or sidewalks.

Mitigation measures were analyzed for all three of the identified impact areas. The results of the mitigation analyses conducted for each area are described below and summarized in **Table 3-16**. Note that a unit noise wall cost of $30 per square foot was used in all of the calculations of cost per receiver per dB(A) of noise reduction, per CDOT guidelines.

Table 3-16
Noise Barrier Analysis Results

Receptor ID	General Location	Height/ Length	Benefited Receivers	Total Noise Reduction	Estimated Cost per dB(A) reduction
6	Broomfield Mobile Home Park	6/340	6	22.4	$2,716
1	Residences at 119th Avenue/Allison Street	6-10/ 9,940	12	42.1	$11,000
1c, 2c	Residences at 120th Avenue/Carr Street	15/330	0	1	$148,500

Broomfield Mobile Home Park

Along the northern perimeter of the Broomfield Mobile Home Park, a noise barrier was considered. A six-foot high noise wall located along the northern boundary of the mobile home park would provide sufficient decreases in noise levels and could be safely and easily constructed. In addition to the six-foot wall, noise walls were considered at both eight and ten feet but results did not decrease future noise levels sufficiently to justify the increased cost. The noise study found the proposed noise wall at this location would cost approximately $2,700 per receptor per decibel of reduction, which is well within CDOT's $4,000 cost per receptor per decibel of reduction limit. Given these results, a 340 foot noise wall is planned along the north property line of the mobile home park property and is shown in **Figure 3-20**.

Residences at 119th Avenue/Allison Street

In the 8100 block of 119th Avenue and the 11900 block of Allison Street, a noise barrier was modeled with various configurations, heights and locations. The best performing, least expensive noise barrier obtained the minimum 5 decibel decrease required by CDOT noise abatement guidelines. However, because of the position of the new 120th Avenue alignment relative to the position of the impacted residences, the barrier would have to be almost 10,000 feet long along the north edge of the pavement of the new roadway to achieve the minimum noise reduction. This barrier would cost approximately $11,000 per receptor per decibel of reduction, well above the $4,000 limit set by CDOT guidelines. Therefore, a noise wall is not recommended at this location.

Residences at 120th Avenue/Carr Street

In the 8300 block of 120th Avenue, a noise barrier was modeled with various configurations, heights and locations along the new Allison Street alignment. Noise impacts in this area are

caused by both US 36 and the new Allison Street alignment to the east. Because of the noise from US 36, barriers along the new Allison Street alignment would not be effective in the reduction of noise at the impacted residences. It is not reasonable to judge the feasibility of noise barriers along US 36 and Allison Street at this time because the US 36 Corridor EIS study is considering future improvements to the highway. Therefore, a noise wall is not recommended at this location.

The noise analysis was based on traffic volumes and patterns from the 2025 fiscally constrained RTP. Information from the recently completed 2030 fiscally constrained RTP shows that the volumes along the 120th Avenue Connection would be slightly lower. Therefore, this study presents a worse-case scenario and noise levels are expected to be the same as, or perhaps even slightly lower than, the noise levels produced from the model runs completed for this analyis.

The locations of the noise walls examined for this project were determined based on preliminary design information. As the project progresses through final design, it is likely that adjustments will need to be made to the noise wall design. Minor adjustments should still achieve the noise mitigation levels determined in the technical report. If substantial changes to the location or height of the noise walls are required, or the project geometry during design is substantially altered from what was analyzed at this time, the noise model will be updated to reflect those changes.

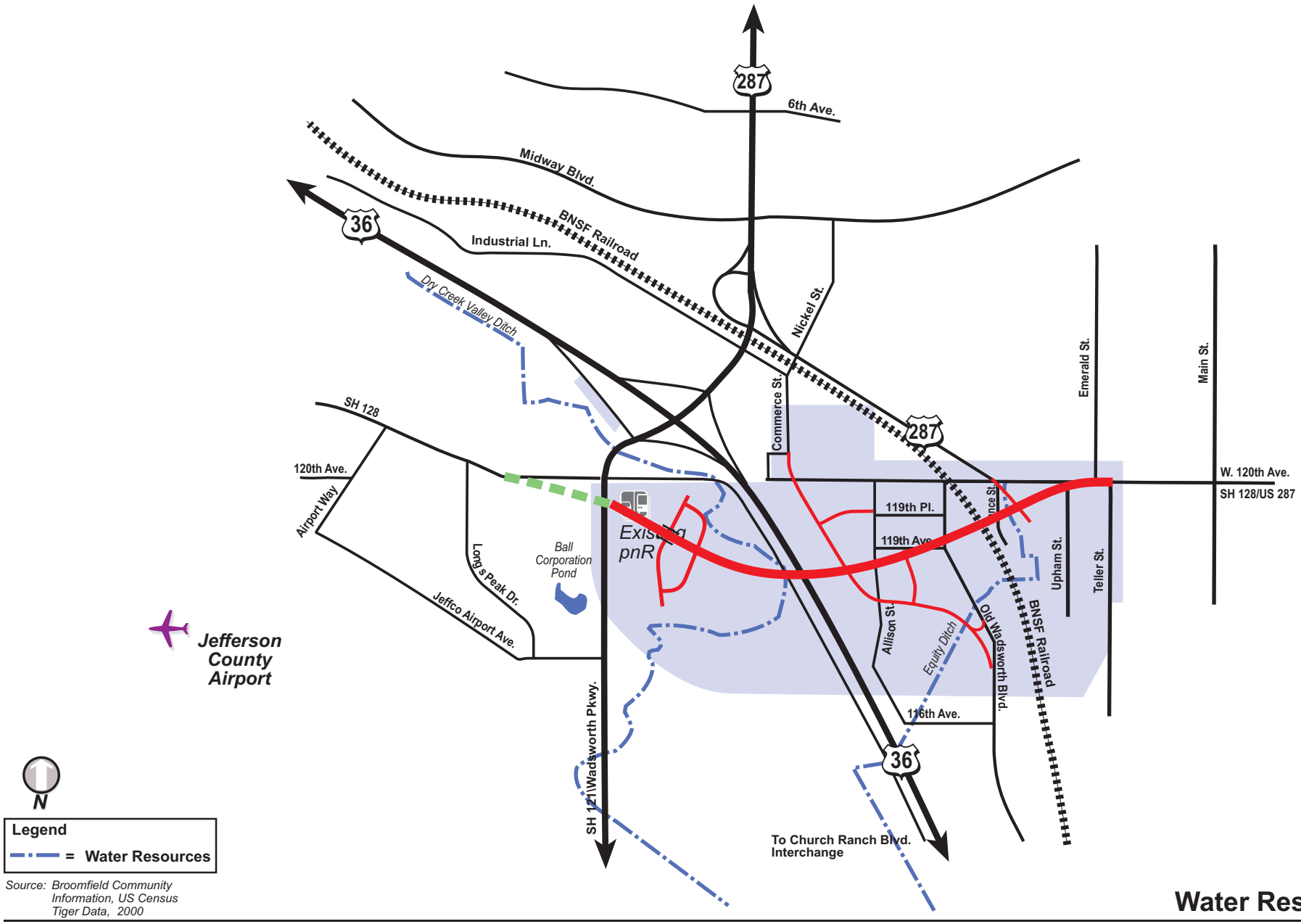
3.10 WATER RESOURCES AND WATER QUALITY

3.10.1 Existing Conditions

The study area falls within the Big Dry Creek watershed (see **Figure 3-21)**. The Big Dry Creek watershed originates in unincorporated Jefferson County at the mouth of Coal Creek Canyon. The watershed drains easterly from the headwaters area across Rocky Flats, where several tributaries form including Walnut Creek, Woman Creek and Upper Big Dry Creek. The flow in Big Dry Creek is heavily regulated by releases from Standley Lake reservoir. From Standley Lake, Big Dry Creek flows in a northeast direction to its confluence with the South Platte River near Fort Lupton in Weld County. The total drainage area at the confluence is approximately 110 square miles with a 42-mile length. Significant portions of the watershed are currently undergoing rapid urban development, transitioning from agricultural uses to include a mixture of residential, commercial and industrial uses.

3.10.1.1 Surface Water

There are no major surface water resources or tributaries to the Platte River or Big Dry Creek within the study area. Within the boundaries of the study area there are two man-made surface water resources; Dry Creek Valley Ditch and Equity Ditch. These two surface water ditches do not link directly to the South Platte River and are isolated water bodies.



Source: Broomfield Community Information, US Census Tiger Data, 2000

Water Resources

Figure 3-21

Dry Creek Valley Ditch
The Dry Creek Valley Ditch is located between Wadsworth Parkway and US 36. The ditch crosses through the proposed Transit Village property near the existing RTD park-n-Ride and feeds into Community Ditch north of the study area. Broomfield owns and uses Dry Creek Valley Ditch to deliver untreated water to the Interlocken Greenway Golf Course when excess water is available. Water runs through the ditch and laterals infrequently and there is no set schedule for running water through the ditch. When water is present, the ditch may provide habitat for amphibians and aquatic insects, however, detailed water quality information for the ditch is not available because it is only utilized for irrigation purposes.

Equity Ditch
The Equity Ditch crosses through the eastern portion of the study area, however the ditch has been abandoned for over 10 years. The State of Colorado and the Equity Ditch Company adopted Articles of Dissolution in March of 1991, officially dissolving the ditch property (see **Appendix A**). Equity ditch serves only to intercept storm water runoff, but is not part of the storm water system.

3.10.1.2 Groundwater

According to the *Soil Survey of the Boulder County Area, Colorado* (U.S. Department of Agriculture, 1975) and the *Soil Survey of the Golden Area, Colorado* (U.S. Department of Agriculture, 1980), the soils in the study area are mostly clay loams. The permeability of these soils is slow. Runoff and erosion hazards escalate with an increase in surface slope. The shallow groundwater within the study area is expected to flow in the general direction of the surface topography. An evaluation of groundwater data for the study area has not been performed, and thus a definitive assessment of the condition or flow direction of the groundwater immediately beneath the study area cannot be determined.

3.10.2 Water Quality

Information concerning the existing conditions of the water resources in the study area is limited since these resources are irrigation ditches. Water quality standards are not established by the Colorado Department of Public Health and Environment (CDPHE) for ditches or canals. However, irrigation ditches may have degraded water quality from high sediment loading and high nutrient content including nitrogen and phosphorus.

Broomfield recently began a Water Reclamation System program which takes effluent from the Wastewater Treatment Plant, treats it and reuses it for irrigation purposes. This project began in 1994, and recent completion of the distribution system now allows reuse water to be used in local parks, landscaped areas and at Interlocken. Over 1,200 acres would be irrigated with the reuse water. At capacity, the program would yield 3,100 acre-feet of water annually.

3.10.3 Water Resource and Water Quality Impacts

No-Action. No impacts to water resources or water quality are expected to occur as a result of the No-Action Alternative. However, the Transit Village may have impacts to Dry Creek Valley

Ditch. Runoff from impervious surfaces would continue to increase in the future as Broomfield continues to grow and develop.

Preferred Alternative. The expansion of impervious surface area contributes to an increase in the amount of highway runoff into surrounding waters, including study area ditches. This could directly impact water quality through higher sediment loads and the accumulation of metals and other roadway pollutants from winter sanding, chemical deicing, and normal traffic operations. Indirect impacts could result from a greater amount of rainwater running off of surface roadways and being directed into sewer systems, instead of filtering slowly into surface waters and/or recharging groundwater resources. The Preferred Alternative would result in an increase of impervious surface area by approximately 30 acres due to the connection of 120th Avenue and accompanying access points.

A portion of Dry Creek Valley Ditch south and west of US 36 would need to be relocated from the existing channel bed to the west to accommodate the bridge abutment locations for the 120th Avenue Connection across US 36. At this location, approximately 300 feet of the Dry Creek Valley Ditch would need to be enclosed in a linear pipe and another 520 lineal feet of the Ditch would need to be rerouted on either side of the enclosed Ditch. The segments north and south of the pipe enclosure would be within an open channel and would not be enclosed. The final design shall satisfy the requirements of the Dry Creek Valley Ditch Company such as freeboard, access for maintenance and ditch riders, safety, trash racks, if any, and the hydraulic performance.

No impacts to the Equity Ditch are anticipated with the Preferred Alternative. In the area where the Preferred Alternative crosses over Equity Ditch, it has been abandoned since 1991 and is not part of the storm water system. Furthermore, in the study area, the ditch is enclosed in many locations, while in others it is an open channel.

3.10.4 Water Resource and Water Quality Impact Mitigation

Without proper planning, adverse water quality impacts may occur during construction. One such problem is accelerated soil erosion, which could result in contamination of wetlands and waterways. The primary pollutant of soil erosion is sediment, and sediment discharged into receiving waters increases turbidity, heightens costs for water treatment, and affects aquatic plant and wildlife species. In addition to impacts during construction, impacts from highway operations may affect water resources. Traffic characteristics, climatic conditions, maintenance practices, and vegetation types on the right-of-way, among others, determine the types and concentrations of highway pollutants. To minimize water quality impacts, recommended mitigation measures are described in this section.

The use of standard erosion and sediment control best management practices (BMPs) in accordance with *Erosion Control and Storm Water Quality Guide*, CDOT, 2002 will be included in the final design plans. A conceptual drainage report was prepared in October 2002 ensuring that new drainage facilities are compatible with adjacent facilities. All work on this project will be in conformity with Section 107.25 and Section 208 of the *CDOT Standard Specifications for*

Road and Bridge Construction. The design shall comply with the policy of Executive Order 11990 regarding impacts to wetlands.

Water quality mitigation will adhere to the *CDOT MS4 Permit New Development and Redevelopment Program*, January 2003. CDOT's MS4 (Municipal Separate Storm Sewer System) includes both Phase I and Phase II Stormwater Regulations. In 1990, the US EPA implemented Phase I Stormwater Regulations, which require a permit for all stormwater discharges from storm sewer systems within cities or counties with a population greater than 100,000 persons. The permit is also required for construction activities with an area of disturbance greater than five acres. In 1999, permit coverage was expanded to include smaller municipalities. The Phase II Stormwater Permit requires coverage for municipalities with a population greater than 50,000. The Phase II requirements reduce the minimum size of the construction area from five to one acres. Both of these requirements will apply to the 120th Avenue Connection project.

Under Phase II, Broomfield is required to obtain permit coverage under the Stormwater Discharge General Permit and must develop, implement, and enforce a Stormwater Management Program designed to reduce the discharge of pollutants. As part of the Stormwater Management Program, BMPs will be established for each of the required six minimum control measures: public education and outreach; public involvement/participation; illicit discharge detection and elimination; construction site stormwater runoff control; post-construction stormwater management; and pollution prevention/good housekeeping.

The following specific BMPs from the *Erosion Control and Storm Water Quality Guide* and the *CDOT MS4 Permit New Development and Redevelopment Program*, will be applied during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality as appropriate:

- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction.
- Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.
- Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained.
- Temporary erosion control blankets will have flexible natural fibers.
- Erosion bales, erosion logs, silt fence or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways and at inlets where appropriate.

- To minimize the loss of sand from the road surface during winter sanding operations, sediment catch basins will be included during construction and put in place permanently with continual maintenance.
- Where appropriate, slope drains will be used to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment.
- Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.
- Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.
- Disturbance to vegetated areas will be minimized.
- Temporary retention ponds (during construction) will be used to allow sediment to settle out of runoff before it leaves the construction area. These ponds may be combined with permanent detention ponds.
- Structural BMPs may include extended detention basins with sediment forebays, grass swales and grass buffers to retain sediment and roadway pollutants resulting from winter sanding, chemical deicing, and normal traffic operations.
- Non-structural BMPs may include litter and debris control, and landscaping and vegetative practices.
- Settling ponds for effluent from dewatering operations, if needed.

Construction will be planned during the non-irrigation season, when no flows are present in the Dry Creek Valley Ditch. If this is not possible, the hydraulic integrity of the ditch will be maintained through the use of temporary systems. During design, the CDOT region hydraulic engineer will review the project plans and provide comments related to water quality at that time.

The 120th Avenue Connection project is not expected to result in depletion of water in the South Platte Drainage Basin. Water utilized for construction and/or irrigation will be derived through Broomfield Municipal sources. Therefore, allocations will not exceed the South Platte Drainage Basin threshold.

If contaminated groundwater is encountered during the dewatering process, mechanisms will be in place to analyze groundwater for contaminants and effectively treat this groundwater pumped discharge, as necessary per the Phase II requirements (see Section 3.22, Permits).

3.11 FLOODPLAINS

3.11.1 Existing Conditions

Based on a review of National Flood Insurance Plan (NFIP) maps, no Federal Emergency Management Agency (FEMA) delineated floodplains are present in the study area. The project is located outside of the 100-year floodplain boundary as designated by the City and County of Broomfield Planning Department, Boulder and Jefferson County Planning Departments, and FEMA.

3.11.2 Floodplain Impacts

No-Action Alternative. The No-Action Alternative would not impact floodplains.

Preferred Alternative. The Preferred Alternative would have no encroachment onto or impacts to floodplains.

3.11.3 Floodplain Impact Mitigation

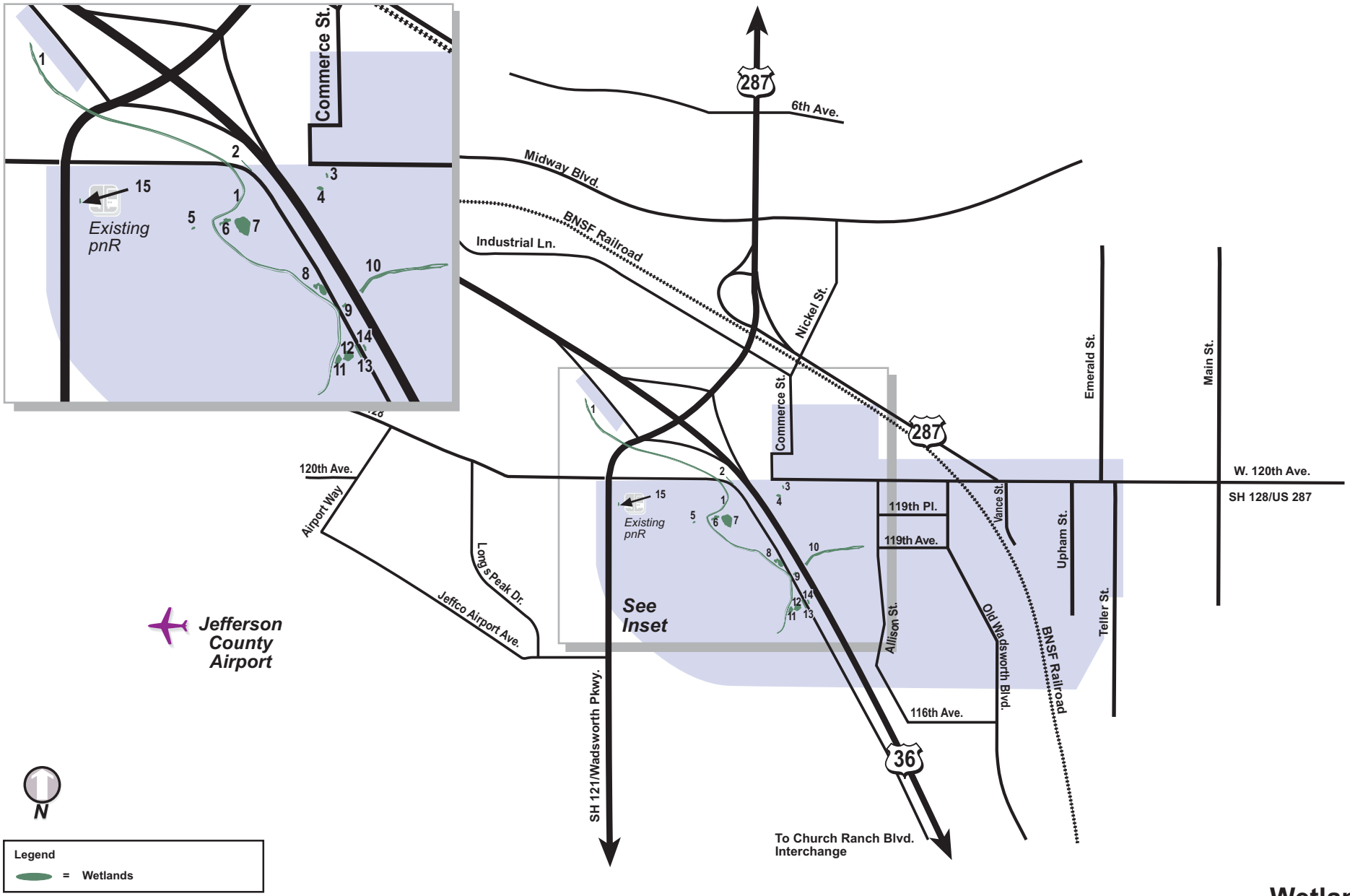
No mitigation is required for floodplains for construction of the Preferred Alternative.

3.12 WETLANDS

This section describes existing wetland resources in the study area, which was surveyed for wetlands in late spring and summer 2002 and reviewed in September 2003. Information about wetland type, size, distribution, soils, hydrology and plant species within the study area was collected during the survey. Wetlands were delineated following Executive Order 11990 and the guidelines and criteria of the U.S. Army Corps of Engineers (USACE) *1987 Wetlands Delineation Manual* (Environmental Laboratory 1987) using characteristics of vegetation, soils, and hydrology to make wetland determinations. According to the 1987 Manual, wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances/conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands types are described in detail in the Wetland Finding (**Appendix C**) prepared for this project.

3.12.1 Existing Conditions

As shown in **Figure 3-22**, there are 15 wetland sites within the study area totaling approximately 1.23 acres. As determined by the USACE, no jurisdictional wetlands are present within the study area (Correspondence from the USACE in **Appendix A**). **Table 3-17** lists the wetlands and their size and type.



Source: Carter & Burgess Wetland Delineations, 2002 and 2003

Wetlands

Figure 3-22

Table 3-17
Study Area Wetlands

Site ID	Acres within Study Area	USACE Jurisdictional?	Wetland Type*	Comments
1	0.44	No	Palustrine emergent	Dry Creek Valley Ditch banks
2	<0.01	No	Palustrine emergent	Roadside ditch
3	<0.01	No	Palustrine emergent	Minor swale
4	0.02	No	Palustrine emergent	Ponded area
5	<0.01	No	Palustrine emergent	Minor depression
6	0.04	No	Palustrine emergent and scrub-shrub	Shallow drainage
7	0.24	No	Palustrine emergent and scrub-shrub	Ponded area
8	0.08	No	Palustrine emergent and scrub-shrub	Dry Creek Valley Ditch seepage area
9	0.01	No	Palustrine emergent	Lateral ditch seepage area
10	0.20	No	Palustrine emergent and scrub-shrub	Lateral ditch from Dry Creek Valley Ditch
11	0.04	No	Palustrine emergent and scrub-shrub	Dry Creek Valley Ditch seepage area
12	0.09	No	Palustrine emergent	Probably Dry Creek Valley Ditch seepage area
13	0.02	No	Palustrine emergent	Probably Dry Creek Valley Ditch seepage area
14	0.01	No	Palustrine emergent	Roadside ditch
15	<0.01	No	Palustrine emergent	Storm drain basin
Total	1.23			

* Cowardin, L.M. et al. 1979. Classification of Wetland and Deepwater Habitats of the United States. United States Fish and Wildlife Service, Biological Services Program; FWS/OBS-79/31

Wetlands within the study area are generally small and scattered. Nearly all wetlands are associated with the artificially constructed Dry Creek Valley Ditch and other roadside ditches. The major wetland type within the study area is palustrine emergent with some areas of scrub-shrub wetland. Wetland vegetation includes cattail, sedges, spikerush, grasses and forbs. Wetland functions and values include bank stabilization, sediment/toxin retention, nutrient removal/transformation, food chain support, wildlife habitat, and visual quality. The wetlands are approximately 70 percent palustrine emergent persistent and non-persistent and 30 percent palustrine scrub-shrub. Due to the recent drought, the study area should be resurveyed for wetlands prior to construction.

3.12.2 Practicable Alternatives

In order to the meet purpose and need for the project, the study area includes only the area within which a connection of 120th Avenue and SH 128 could be constructed. Within that area, the wetlands are either associated with Dry Creek Valley Ditch, which extends through much of the study area or with numerous roadside ditches. None of the wetlands are jurisdictional. Several configurations for an east-west extension of 120th Avenue were examined, but since the irrigation ditch extends north-south through much of the study area, avoidance of all wetlands is not practicable.

Refinement of the design plans to further minimize impacts to wetlands will occur throughout the final design process and during construction. Where feasible, surface flows will be directed into areas of the abandoned ditch to maintain wetland bands. Mitigation measures to offset unavoidable impacts to wetlands are discussed in Section 3.12.4.

3.12.3 Wetland Impacts

No-Action Alternative. Impacts to wetlands may occur as the planned growth and development takes place under the No-Action Alternative. One such development is the Transit Village located between Wadsworth Parkway and US 36, which may impact wetlands in that portion of the study area. Since wetlands in the study area are isolated and non-jurisdictional, impacts to regulated wetlands are not likely to occur.

Preferred Alternative. Wetland impacts are based on Year 2002 wetland delineations. Based on these boundaries and preliminary design plans, the Preferred Alternative would permanently impact approximately 0.07 acre of non-jurisdictional wetlands (see **Table 3-18**). No jurisdictional wetlands would be impacted since no jurisdictional wetlands are present in the study area.

Table 3-18
Impacted Wetlands in the Study area

Site ID	Acres within Study Area	Impacted Acres	USACE Jurisdictional?	Wetland Type	Comments
1	0.44	0.02	No	Palustrine emergent	Dry Creek Valley Ditch banks
10	0.20	0.04	No	Palustrine emergent and scrub-shrub	Lateral ditch from Dry Creek Valley Ditch
15	<0.01	< 0.01	No	Palustrine emergent	Storm drain basin
Total	0.65	0.07			

Wetland impacts would be located at Dry Creek Valley Ditch (Wetland 1) underneath the 120th Avenue Connection and at Wetlands 10 and 15 (see **Figure 3-23**). Protection of water flow and water quality would consist of enclosing a portion of the ditch under the roadway southwest of US 36 in a four-foot diameter pipe. The ditch would remain as open channel flow both north and south of the new 120th Avenue Connection on the west side of US 36. The piping of Dry Creek Valley Ditch at this location would permanently impact approximately 0.02 acre of wetlands, but would reduce entry of road sand and gravel into ditch flows.

In addition, a portion of a side ditch from Dry Creek Valley Ditch (Wetland 10) east of US 36 would be impacted by the reconfigured Allison Street connection with Commerce Street. This crossing would impact approximately 0.04 acre of wetlands. The third wetland to be impacted, Wetland 15, consists of two small wetland areas in a storm drain basin encompassing an area less than 0.01 acre. These wetlands are located between the existing RTD park-n-Ride lot and Wadsworth Parkway. The proposed 120th Avenue Connection project would impact Wetland 15 east of the tie-in to the relocated SH 128/SH 121 (Wadsworth Parkway) intersection and roadway realignment (not part of this project).

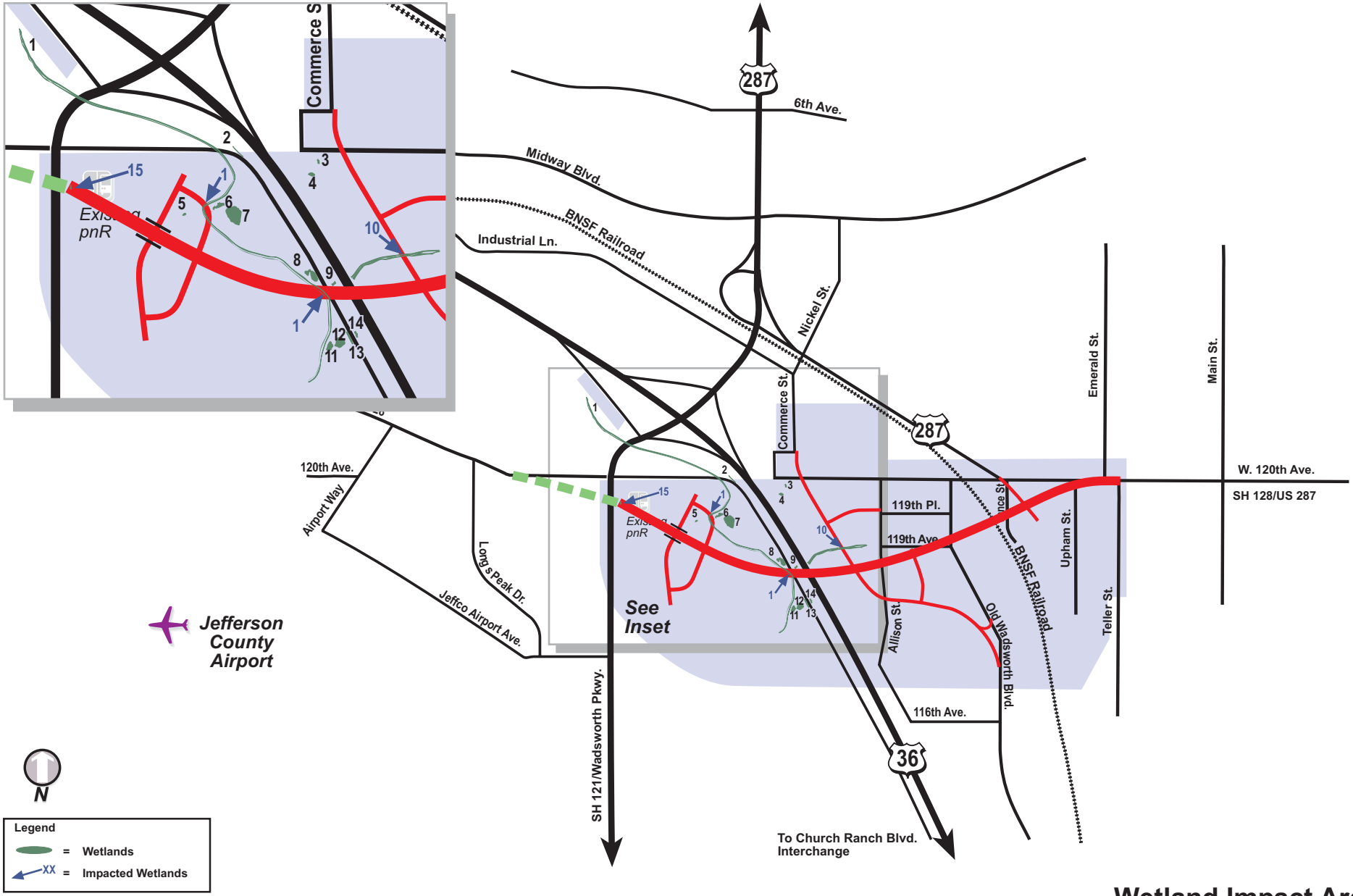
Construction work areas could result in temporary impacts to non-jurisdictional wetlands totaling less than 0.01 acre. It is possible that other temporary and indirect impacts could also result from construction and operation activities, and include sedimentation from erosion during earth moving, fuel spills in construction staging areas and winter sanding operations. Measures to reduce impacts are discussed in further detail in Section 3.12.4.1.

3.12.4 Wetland Impact Mitigation

3.12.4.1 Impact Minimization Measures

The roadway design includes avoidance and minimization of impacts to most study area wetlands. Impacts to wetlands will be avoided and minimized as much as practical during the final design process. The design shall comply with the policy of Executive Order 11990 regarding impacts to wetlands. The following specific BMPs from the *Erosion Control and Storm Water Quality Guide*, CDOT, 2002 will be required during construction to reduce the potential for wetlands to be indirectly affected by sedimentation from accelerated erosion or by hazardous materials (e.g., fuel, equipment lubricants):

- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction.
- Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.
- Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained.



Source: Carter & Burgess Wetland Delineations, 2002 and 2003

Wetland Impact Areas

Figure 3-23

- Temporary erosion control blankets will have flexible natural fibers.
- Erosion bales, erosion logs, silt fence or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways and at inlets where appropriate.
- To minimize the loss of sand from the road surface during winter sanding operations, sediment catch basins will be included during construction and put in place permanently with continual maintenance.
- Where appropriate, slope drains will be used to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment.
- Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.
- Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.
- To return temporarily impacted areas to their preconstruction condition, the sites will be regraded to original contours and replanted with appropriate wetland species.

Additionally, the following BMPs to minimize wetland impacts during construction will be employed:

- All wetland areas and water bodies not impacted by the project will be protected from unnecessary encroachment by temporary fencing. Sediment control such as silt fence or erosion logs, will also be used where needed to protect the area from sediment. Siltation control devices (e.g., fences) will be placed on the down-gradient side of construction areas to prevent soil from entering wetland areas.
- No staging of construction equipment, equipment refueling or storage of construction supplies will be allowed within 50 feet of a wetland or any water-related area.
- Standard erosion control measures will be observed and an erosion control plan will be developed prior to and for inclusion in the construction bid plans. All bare fill or cut slopes adjacent to streams or intermittent drainages will be stabilized as soon as practicable.
- No fertilizers, hydrofertilizers, or hydromulching will be allowed anywhere on the project.
- Work areas will be limited as much as possible to minimize construction impacts to wetlands.
- Standard erosion control measures will be observed and an erosion control plan will be developed prior to construction advertisement for inclusion in the bid plans.

3.12.4.2 Wetland Creation/Restoration

Wetlands as well as their associated functions permanently impacted by the Preferred Alternative will be mitigated at a 1:1 ratio within the study area by wetland creation/restoration at study area sites recommended by the City and County of Broomfield and approved by the CDOT landscape architect and a CDOT wetland biologist, and, if necessary, by purchase of credits at a wetland mitigation bank within the primary service area. Wetland impacts will be reduced as much as possible during final design. Specific strategies include steepening embankment slopes and piping only selected portions of irrigation ditches. Replaced wetland functions and values are anticipated to include bank stabilization, sediment/toxin retention, nutrient removal/transformation, food chain support, wildlife habitat, and visual quality.

Final selection of preferred wetland mitigation sites will be determined on the basis of stable hydrology, availability of water rights, construction feasibility, and overall potential for successful wetland creation. Wetland mitigation design will be coordinated with CDOT, Broomfield and local property owners. All wetland mitigation sites will be guaranteed in writing to remain wetland in perpetuity. Wetland mitigation concepts, species lists, and seeding and planting methods will be included in the engineering plans and coordinated with the contractor prior to construction.

Table 3-19 lists wetland plant species suitable for wetland mitigation sites.

Table 3-19
Wetland Plant Species Suitable for Wetland Mitigation Sites

Common Name	Scientific Name	Wetland Indicator Status
Alkali bulrush	*Bolboschoenus maritimus* subsp. *paludosus*	Obligate
Arctic rush	*Juncus arcticus*	Facultative Wetland
Blue vervain	*Verbena hastate*	Facultative Wetland
Creeping spikerush	*Eleocharis palustris*	Obligate
Hardstem bulrush	*Schoenoplectus lacustris* subsp. *acutus*	Obligate
Mannagrass	*Glyceria striata*	Obligate
Nebraska sedge	*Carex nebrascensis*	Obligate
Prairie cordgrass	*Spartina pectinata*	Facultative Wetland
Sandbar willow	*Salix exigua*	Obligate
Softstem bulrush	*Schoenoplectus lacustris* subsp. *creber*	Obligate
Threesquare bulrush	*Schoenoplectus pungens*	Obligate

A tree and shrub wetland buffer zone (see **Table 3-20**) will be planted, as appropriate, on slopes above wetland mitigation sites.

Table 3-20
Tree and Shrub Species Suitable for Wetland Buffer Zones

Common Name	Scientific Name	Wetland Indicator Status
Chokecherry	*Padus virginiana* subsp. *Melanocarpa*	Facultative Upland
Currant	*Ribes aureum*	Not an Indicator
Plains cottonwood	*Populus deltoids*	Facultative
Snowberry	*Symphoricarpos oreophilus*	Not an Indicator
Wild plum	*Prunus Americana*	Upland
Wood's rose	*Rosa woodsii*	Facultative Upland

Where possible, wetland topsoil will be stockpiled on site for use in wetland creation areas. Only topsoil free from viable noxious weed seeds will be stockpiled. Wetland areas temporarily impacted by construction activities will be replanted as soon as possible following completion of the activity, if needed.

Since all wetlands are non-jurisdictional, application to the USACE for a 404 permit will not be necessary.

3.12.4.3 No Practicable Alternative Finding

As determined in the Wetland Finding (**Appendix C**), there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

3.13 VEGETATION, WILDLIFE AND AQUATIC RESOURCES

Two site visits to the study area were conducted, one in spring 2002 and again in spring 2004. The study area covers approximately 250 acres. Existing environmental conditions such as vegetation communities, bird nests, wildlife use areas, and wildlife species were documented in the draft Wildlife Assessment prepared in April 2004. The site visits were conducted at a reconnaissance level of detail and focused on mapping and identifying major habitat areas, where possible. Formal presence/absence surveys were not conducted. Private land was not accessed during the site visits, but rather habitat was surveyed from property boundaries and by reviewing aerial photographs.

3.13.1 Vegetation Existing Conditions

Highly altered since European settlement, the study area is dominated by non-native, mostly weedy species (see Section 3.13.1.1); approximately 1 to 3 percent of the existing vegetation cover is comprised of native grassland species. The study area includes developed areas of residential properties with landscaped vegetation and business properties mainly in the eastern portion. Fields are present on both sides of US 36. Adjacent to the US 36 southbound off-ramp, plant species include blue grama (*Chondrosum gracile*), sideoats grama (*Bouteloua*

curtipendula), western wheatgrass (*Pascopyrum smithii*), tall wheatgrass (*Elytrigia elongata*), slender wheatgrass (*Elymus trachycaulus*), crested wheatgrass (*Agropyron cristatum*), Canada bluegrass (*Poa compressa*), and smooth brome (*Bromopsis inermis*) as well as weedy species. In the open fields on the west side of US 36 south of 120th Avenue, most species are invasive weeds although some areas retain remnant native grassland species including purple three awn (*Aristida purpurea*), blue grama, and yucca (*Yucca glauca*) as well as areas of introduced smooth brome. Where sufficient water is provided by proximity to Dry Creek Valley Ditch or the two small, disused reservoirs, native cottonwood (*Populus deltoides* subsp. *monilifera*), box-elder (*Negundo aceroides*), and/or peach-leaved willow (*Salix amygdaloides*) are present. In the fields between US 36 and Allison Street south of 120th Avenue, the dominant species are weeds especially kochia (*Bassia sieversiana*). Very small patches of blue grama are present, and cottonwood and poplar (*Populus alba*), and willow (*Salix exigua*) are present in areas of higher soil moisture or adjacent to an incised feeder ditch. Stalks of kochia are evident in the recently plowed field between Allison Street and Wadsworth Boulevard.

3.13.1.1 Noxious Weeds

Noxious weeds are invasive, non-native plants introduced to Colorado by accident or which spread after being planted for another purpose and which result in lands with decreased economic and environmental value. The Colorado Noxious Weed Act of 2003 (35-5.5-101 through 119, C.R.S.) recognizes that, "certain undesirable plants constitute a present threat to the continued economic and environmental value of the lands of the state and if present in any area of the state must be managed." The legislation places all public and private lands in Colorado under the jurisdiction of local governments to manage noxious weeds. According to the Act, a noxious weed meets one or more of the following criteria:

- Aggressively invades or is detrimental to economic crops of native plant communities
- Is poisonous to livestock
- Is a carrier of detrimental insects, diseases, or parasites
- Has direct or indirect effects that are detrimental to the environmentally sound management of natural or agricultural ecosystems.

Under the Noxious Weed Act, the State of Colorado Noxious Weed lists are categorized by control priority:

- **High Priority (List A):** Rare noxious weeds and all County noxious weeds in dispersal conduits. High priority species are targeted for eradication or suppression.
- **Medium Priority (List B):** Well established noxious weeds with discrete statewide distributions.
- **Low Priority (List C):** Extensive, well-established infestations for which control is recommended but not required

The City and County of Broomfield abides by all State of Colorado mandated regulations. A draft Noxious Weed Ordinance is undergoing an approval process. Currently, the Broomfield Parks Department handles weed control on public areas and will assist code enforcement on private lands. CDOT has developed a Top Twenty-five Noxious Weeds list of species and managed by CDOT crews at the nine manintenance sections.

A weed survey of the study area was conducted in October 2004. Nearly all vegetation cover in the study area is by non-native species although not all these species are currently listed as weeds. A map of high and medium priority species locations, details on weed species, and a commitment to prevent further establishment of noxious weeds during and following project construction are presented in the Integrated Weed Management Plan (see **Appendix F**).

No weed species from the State of Colorado High Priority List (List A) were noted in the study area during weed surveys. Weed species from the State Medium Priority List (List B), Low Priority List (List C) and CDOT's Top 25 List were observed in the study area during the surveys. These weed species are listed in **Table 3-21**.

Table 3-21
State of Colorado and Broomfield Listed Weed Species Observed in the 120th Avenue Connection Study Area

Common Name	Species	Broomfield Weed List*	CDOT Weed List**	State Noxious Weed List***
Canada thistle	*Cirsium arvense*	B	X	B
Common mullein	*Verbascum thapsus*	C		C
Dalmatian toadflax (broad-leaved)	*Linaria dalmatica*	B	X	B
Diffuse knapweed	*Centaurea diffusa*	B	X	B
Downy brome	*Bromus tectorum*	C		C
Field bindweed	*Convolvulus arvensis*	C	X	C
Musk thistle	*Carduus nutans*	B	X	B
Perennial sowthistle	*Sonchus arvensis*	C		C
Poison hemlock	*Conium maculatum*	C		C
Quackgrass	*Elytrigia repens*	B		B
Redstem filaree	*Erodium cicutarium*	B		B
Russian-olive	Elaeagnus angustifolia	B	X	B
Scotch thistle	Onopordum acanthium, O. tauricum	B	X	B

*From lists of Noxious Weeds known to be present in the City and County of Broomfield.
**From CDOT Noxious Weed Management Plan top 25 weed species to be mapped.
***Colorado Department of Agriculture Plant Industry Noxious Weeds Website, including 2003 Revised Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act (8 CCR 1203-19), includes County lists. State management plans include the following designations: A = species to be eradicated, B = stop continued spread, and C = species left to local jurisdictions and use of integrated weed management controls supported.

Weeds not currently listed by the State of Colorado or by CDOT noted in the study area were barnyard grass (*Echinochloa crus-galli*), Japanese brome (*Bromus japonicus*) kochia (*Bassia sieversiana*), prickly lettuce (*Lactuca serriola*), and Russian thistle (*Salsola iberica*).

3.13.2 Vegetation Impacts

No-Action Alternative. As planned development continues in the study area, impacts would continue to occur to vegetation.

Preferred Alternative. Direct impacts to vegetation would occur from clearing, excavation and grading for the proposed improvements. The Preferred Alternative affects 51 acres of land in the study area. However, there are no conservation sites or sensitive plant communities within the study area. While the Preferred Alternative passes through a field with remnant grassland vegetation on the west side of US 36, impacts to native vegetation are anticipated to be minimal since the entire undeveloped portion of the study area is dominated by weedy species. It is anticipated that several mature trees, mainly cottonwood, would be removed prior to construction.

3.13.2.1 Noxious Weed Impacts

No-Action Alternative. Construction of projects under the No-Action Alternative would disturb areas that are already inhabited by weeds and would disturb areas that are currently weed free, resulting in the potential for the introduction of weeds into those areas.

Preferred Alternative. Construction of the Preferred Alternative would disturb areas that are already inhabited by weeds and would disturb areas that are currently weed free, resulting in the potential for the introduction of weeds into those areas. Temporary work areas would also be susceptible to weed invasion. **Appendix F** contains the Integrated Weed Management Plan for this project.

Soil disturbance associated with construction of the Preferred Alternative is anticipated to provide further conditions for invasion of noxious weeds. Nearly all of the study area is vegetated by non-native, highly invasive species; however, the listed noxious weed species known in the study area which are most likely to spread to construction sites include redstem filaree, diffuse knapweed, musk thistle, and Scotch thistle.

3.13.3 Vegetation Impact Mitigation

All CDOT revegetation BMPs and guidelines will be followed to ensure adequate revegetation of the study area. All disturbed areas will be seeded in phases throughout construction. Although specific BMPs to be used in the study area will not be determined until final design, mitigation measures are anticipated to include:

- Minimize the amount of disturbance and limit the amount of time that disturbed areas are allowed to be non-vegetated.

- Implement the project Integrated Weed Management Plan.
- Avoid existing trees, shrubs and vegetation, to the maximum extent possible, especially wetlands and riparian plant communities.
- Salvage weed free topsoil for use in revegetation.
- Implement temporary and permanent erosion control measures to limit erosion and soil loss. Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained.
- Time tree removal for outside of nesting season per the Migratory Bird Treaty Act (MBTA).
- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction.
- Removed trees, shrubs and vegetation will be replaced on a 1:1 basis, if practicable, as required by Region 6.

Since soil disturbance with accompanying invasion by noxious weed species can be associated with highway construction, the Integrated Weed Management Plan will be incorporated into the project design and implemented during construction. Specific best management practices (BMPs) will be required during construction to reduce the potential for introduction and spread of noxious weed species and include:

- Mapping will be included in the construction documents along with appropriate control methods for noxious weeds.
- Highway right-of-way areas will periodically be inspected by the city or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds.
- As detailed in the Integrated Weed Management Plan (**Appendix F**), weed management measures will include removal or burial of heavily infested topsoil, chemical treatment of lightly infested topsoil, limiting disturbance areas, phased seeding with native species throughout the project, monitoring during and after construction, other chemical and/or mechanical treatments.
- Use of herbicides will include selection of appropriate herbicides and timing of herbicide spraying, and use of a backpack sprayer in and adjacent to sensitive areas such as wetlands and riparian areas.
- Certified weed-free hay and/or mulch will be used in all revegetated areas.
- No fertilizers will be allowed on the project site.
- Supplemental weed control measures may be added during design and construction planning.
- The removal of trees will be scheduled to avoid the breeding season of birds from April 1 to August 31.

Preventative Control Measures for project design and construction may include:

- Native Plants: Use of native species in revegetation sites.
- Weed Free Forage Act: Materials used for the project will be inspected and regulated under the Weed Free Forage Act, Title 35, Article 27.5, CRS.
- Topsoil Management: When salvaging topsoil from on-site construction locations, the potential for spread of noxious weeds will be considered. Importing topsoil onto the project site willl not be allowed.
- Equipment Management: Equipment will remain on designated roadways and stay out of weed- infested areas until the areas are treated. All equipment will be cleaned of all soil and vegetative plant parts prior to arriving on the project site.

3.13.4 Wildlife Existing Conditions

The study area is primarily urban in nature and is fragmented by current roadways, residences and industrial areas. In general, the study area provides some breeding and foraging habitat of low to moderate quality for songbirds and small mammals. Wildlife species found in the study area are generally common and widespread species. No significant wildlife corridors are present in the study area due to the extensive habitat fragmentation resulting from area development. The vegetation communities within the study area provide habitat for several common species including coyote (*Canis latrans*), red fox (*Vulpes vulpes*) and raccoon (*Procyon lotor*). These species are likely to occur within the study area and a red fox was observed east of the RTD park-n-Ride lot during one of the site visits. The grasslands in the study area provide habitat for numerous small mammals such as desert cottontail rabbit (*Sylvilagus audubonii*), deer mouse (*Peromyscus maniculatus*) and striped skunk (*Mephitis mephitis*). Desert cottontails were observed using vacated prairie dog burrows in the study area.

Many species of birds occur in the grasslands and cultivated areas of the study area. In addition, a number of abandoned farm buildings on the east side of the study area and silos along the BNSF Railroad provide potential habitat for nesting birds, including owls. Western meadowlark (*Sturnella neglecta*) and horned lark (*Eremophila alpestris*) are especially common in the grasslands. Other bird species observed during fieldwork included vesper sparrow (*Pooecetes gramineus*), starling (*Sturnus vulgaris*), rock dove (*Columba livia*), redwing blackbird (*Agelaius phoeniceus*), American robin (*Turdus migratorius*), western kingbird (*Tyrannus verticalis*), black-billed magpie (*Pica pica*), killdeer (*Charadrius vociferous*), northern flicker (*Colaptes auratus*), mallard (*Anas platyrhynchos*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), cliff swallow (*Petrochelidon pyrrhonota*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*). The western meadowlark, horned lark, vesper sparrow, American robin, black-billed magpie, mourning dove, and killdeer probably nest in the study area. The starling, rock dove, and house sparrow are species commonly associated with urban or suburban areas and likely nest in the study area. Mallard and American crow were typically observed in flight above the study area and are unlikely to nest there.

During site visits, no active raptor nests were observed within their respective buffer distances from the study area (1/4 to ½ mile). Several large cottonwoods along the Community Ditch (north of the study area) provide excellent roosting and nesting habitat for raptors, which hunt in the prairie dog colony and surrounding agricultural lands. Several bird nests were observed in the trees scattered throughout and along the Community Ditch, but none appeared to be raptor nests. One raptor nest site is located 2,000 feet south of the study area. During a site visit, a red-tailed hawk was observed perched on this nest. The occupied nest is on the proposed Transit Village site, but located outside the 120th Avenue Connection Study area.

Section 3.14 provides a discussion of federal, state and local threatened, endangered and sensitive species in the study area.

3.13.5 Wildlife Impacts

No-Action Alternative. As planned development occurs in the study area, impacts to wildlife species and habitat, including the black-tailed prairie dog, would continue.

Preferred Alternative. For construction of the Preferred Alternative, 51 acres is required of which 1.2 acres is prairie dog habitat (see Section 3.14). Of the 51 acres impacted, approximately 32 acres are vacant lands planned for development and 19 acres are already developed. The vacant land provides low quality habitat fragmented by area development. As part of the Preferred Alternative all construction activity could result in direct wildlife mortality; primarily to those species with limited mobility and/or those that could conceivably be occupying their burrows or nests at the time of construction (e.g., mice, rabbits, young birds). More mobile species, such as fox, coyote, raccoon, and most adult birds, would be able to avoid direct mortality by moving into adjacent habitat if available. Indirect impacts to wildlife include fragmentation of existing low to moderate quality habitat.

3.13.6 Wildlife Impact Mitigation

Several conservation measures will be incorporated with the Preferred Alternative to reduce impacts to wildlife and may include:

- Minimizing disturbance to native plant communities.
- Minimizing tree removal.
- Restricting tree removal during breeding season (April 1 – August 31) in compliance with the Migratory Bird Treaty Act or a depredation permit from USFWS will be obtained. If construction is to commence between April 1 and August 31, a ground nesting survey will be completed by a wildlife biologist.
- Erosion control techniques such as silt fence or erosion logs will be used to protect surrounding areas from construction related erosion.
- Noxious weeds will be spot sprayed. In locations where spot application is not practicable a wildlife biologist will inspect the area prior to spraying to ensure crucial habitat will not be impacted.

- Temporary erosion control blankets will have flexible natural fibers.

3.13.7 Aquatic Resources Existing Conditions

There are no fisheries in the study area since no aquatic resources with suitable fish habitat are present.

3.13.8 Aquatic Resources Impacts

No-Action Alternative. No impacts to fisheries would occur, as none are present in the study area.

Preferred Alternative. No impacts to fisheries would occur, as none are present in the study area.

3.13.9 Aquatic Resources Impact Mitigation

No mitigation is required for aquatic resources.

3.14 THREATENED AND ENDANGERED SPECIES

3.14.1 Threatened and Endangered Wildlife

An assessment of wildlife and wildlife habitat was conducted for the study area in July 2002 and April 2004. The site visits were conducted to determine if potential habitat for federal threatened, endangered and candidate wildlife species and state endangered, threatened and species of special concern existed in the study area. Threatened and endangered species habitat was identified at an appraisal level. Formal presence/absence surveys were not conducted.

3.14.1.1 Federal Species

Federal threatened, endangered, and candidate wildlife species (USFWS 2003) listed as potentially occurring in Broomfield are listed in **Table 3-22**.

Table 3-22
Federally Listed Species with Potential to Occur in the Study Area

Common Name	Scientific Name	Occurrence within Study Area	Federal Status
Bald eagle	*Haliaeetus leucocephalus*	Potential to occur	Threatened
Black-footed ferret	*Mustela nigripes*	Not likely	Endangered
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Not likely	Threatened

Bald Eagle (*Haliaeetus leucocephalus*)
The bald eagle is a large North American bird with a historical distribution throughout most of the U.S. The bald eagle was listed as an endangered species in 1978. Population declines are attributed to habitat loss, the use of organochlorine pesticides, and mortality from shooting. Since listing, the population trend for the bald eagle has been increasing. The bald eagle was downlisted from endangered to threatened in 1995 and the USFWS is proposing to de-list the bald eagle due to population recovery. If the bald eagle is removed from the list of threatened and endangered species, it will continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Bald eagles are primarily winter residents in Colorado, although nesting along the Colorado Front Range has increased in recent years. Most nesting in Colorado occurs near lakes or reservoirs or along rivers. Typical bald eagle nesting habitat consists of forests or wooded areas that contain many tall, aged, dying and dead trees.

Potential Habitat within the Study Area
No designated critical or essential eagle habitat occurs in the study area and no bald eagles were observed in the study area during fieldwork. However, due to the abundance of small mammalian prey in the area, bald eagles could occasionally forage in the study area.

Black-footed Ferret (*Mustela nigripes*)
Black-footed ferrets historically have been found in association with prairie dog colonies in short and mid-grass prairies. Currently they are known only from a remnant restored population in Wyoming and efforts are underway to restore the black-footed ferret to selected sites. Changes in land use practices and poisoning programs over the last century have reduced prairie dog distribution substantially in the western US. As a result, all active prairie dog towns, or a complex of towns, large enough to support ferrets, are considered potential black-footed ferret habitat. Current USFWS criteria for defining potential black-footed ferret habitat consist of any black-tailed prairie dog town or complex greater than 80 acres in area. A block clearance area where black-footed ferret surveys are not required has been established for parts of the Denver-Boulder metropolitan area.

Potential Habitat within Study Area
The study area does not meet the criteria for black-footed ferret habitat. Although black-tailed prairie dogs colonies occur within the study area, no colony or complex of colonies is greater than 80 acres in area. In addition, the study area is within the Block Clearance area for black-footed ferrets.

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)
The Preble's meadow jumping mouse (PMJM) is listed as threatened under the ESA. Typically, PMJM is located in low undergrowth consisting of grasses and forbs, in open wet meadows, riparian corridors near forests, or where tall shrubs and low trees provide adequate cover. Along Colorado's Front Range, PMJM is found below 7,500 feet in elevation, generally in lowlands with medium to high moisture along permanent or intermittent streams and irrigation canals.

Potential Habitat within the Study Area
The study area falls within the Preble's Meadow Jumping Mouse Block Clearance Zone for the Denver metropolitan area. A Block Clearance Zone is an area established by the USFWS that has been determined unlikely for the species in question to exist. The Block Clearance Zone suspends the requirement for habitat assessments and trapping surveys of potentially suitable habitat for compliance with the ESA.

3.14.1.2 State Species

There are numerous species in Broomfield considered state sensitive or rare and imperiled by the Colorado Division of Wildlife (CDOW) and the Colorado Natural Heritage Program (CNHP). A search of the CNHP Biological and Conservation Database did not show any sensitive species known to occur within the study area. According to the CDOW list of endangered, threatened and wildlife species of special concern, the following species could potentially occur in the study area:

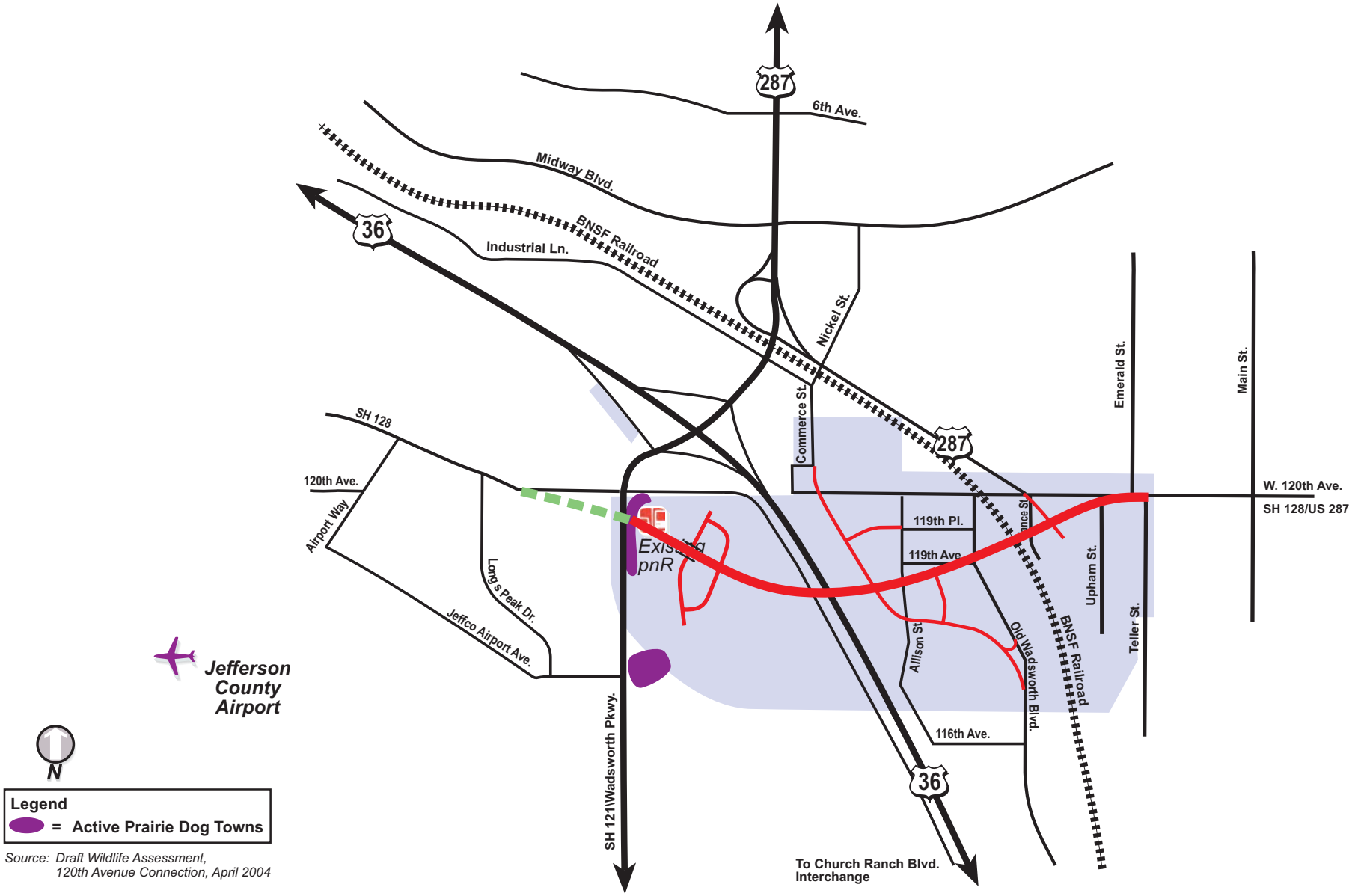
- Black-tailed prairie dog—state special concern
- Burrowing owl—state threatened
- Mountain plover—state special concern
- Swift fox—state special concern
- Ferruginous hawk—state special concern

It should be noted that the category of state special concern is not a statutory classification. Descriptions of each species and their potential for presence in the study area are discussed below.

Black-Tailed Prairie Dog (*Cynomys ludovicianus*)
Black-tailed prairie dogs are social animals that occur in large colonies or "towns" formed by a series of burrows. Species such as black-footed ferret, burrowing owl (*Athene cunicularia*), prairie rattlesnake (*Crotulus viridis*), and mountain plover (*Charadrius montanus*) are closely linked to prairie dog burrow systems for food and/or cover. Prairie dogs provide an important prey resource for numerous predators including american badger (*Taxidea taxus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and other raptors.

Potential Habitat within the Study Area
There are approximately 2.4 total acres of prairie dog habitat in the study area. Prairie dog locations in the study area are shown in **Figure 3-24**. Black-tailed prairie dogs are present on the west side of the study area near the RTD park-n-Ride facility and along the southwest boundary of the study area on the Transit Village property just east of Wadsworth Parkway.

Burrowing Owl (*Athene cunicularia*)
The burrowing owl is a small migratory owl that occupies prairie dog towns in Colorado during the summer breeding season and is a state threatened species. The owl is active during the day and uses abandoned prairie dog burrows for nesting and roosting. Burrowing owls nest in sparsely vegetated areas on the plains (typically prairie dog towns in eastern Colorado). When



Source: Draft Wildlife Assessment, 120th Avenue Connection, April 2004

Prairie Dog Locations

Figure 3-24

plague or poisoning kills off the prairie dogs in a colony or when the grass around their burrows gets more than ankle high, burrowing owls will abandon their nest burrows. Burrowing owl breeding in Colorado occurs from early May to late August. The owls are typically present in Colorado until late October, when they migrate south to Mexico and Central America. Federal and state laws including the Migratory Bird Treaty Act prohibit the killing or harassing of burrowing owls.

Potential Habitat within the Study Area

While prairie dog burrows within the study area provide potential habitat for burrowing owls, no burrowing owls or signs of burrowing owls (droppings, pellets, and prey remains) were observed in the study area. It is not likely that burrowing owls are in the study area.

Mountain Plover (*Charadrius montanus*)

The mountain plover is classified as a species of "State Special Concern," which is not a statutory category. The mountain plover inhabits dry tablelands and the Colorado Plateau. This species nests primarily in shortgrass prairie sites used historically by prairie dogs, bison, and pronghorn. The mountain plover's habitat requirements generally consist of open, flat tablelands and short, intensively grazed grasslands. Plovers typically nest in areas with at least 30 percent bare ground and are often found in disturbed habitats, burned prairies, fallow agricultural fields, and prairie dog towns. This species avoids hillside areas and vegetation over 6 inches tall.

Potential Habitat within the Study Area

Small amounts of potentially suitable mountain plover habitat occur in the prairie dog towns and disturbed agricultural lands in the study area. Known mountain plover nesting sites occur at the Pawnee National Grasslands in eastern Colorado, in South Park, and in southeastern Colorado. There are no recent records of breeding mountain plovers in the Broomfield area.

Swift Fox (*Vulpes velox*)

The swift fox is classified as a species of "State Special Concern," which is not a statutory category. The distribution of the swift fox includes the grasslands of eastern Colorado. Dens are usually located on sites dominated by native shortgrass prairie species such as blue grama and buffalo grass. Swift foxes are sometimes associated with prairie dog towns although they generally excavate their own dens. The Colorado Natural Diversity Information Source lists swift fox as "casual/accidental" in Boulder County and does not list the species as present in Jefferson County. There are no known occurrences of the swift fox in Broomfield.

Potential Habitat within the Study Area

Areas of native shortgrass prairie that could provide habitat for swift fox are extremely limited in the study area. In addition, the presence of coyotes in the study area may prevent swift foxes from occurring, because swift foxes have been reported to be uncommon in areas with high coyote density. No swift foxes were observed in the study area.

Ferruginous Hawk (*Buteo regalis*)

The ferruginous hawk is the largest hawk in North America and is a state species of special concern. This species inhabits open prairie and desert habitats and is strongly associated with primary prey species such as ground squirrels and jackrabbits. Ferruginous hawks are relatively

common winter residents in eastern Colorado, particularly in association with the black-tailed prairie dog. This species has been known to breed in scattered locations in eastern Colorado but not near the study area. There are currently no nesting ferruginous hawks known to occur in the study area.

Potential Habitat within the Study Area
A survey of potential raptor nesting sites in the study area did not find any nests of this species. The prairie dog towns, however, provide a potential food source for ferruginous hawks, and they are potential winter visitors to the study area.

3.14.2 Threatened and Endangered Plants

Pursuant to the Endangered Species Act of 1973, the U.S. Fish and Wildlife Service has listed as Threatened Species the Ute ladies'-tresses orchid (*Spiranthes diluvialis* Sheviak; Federal Register 57:2048, January 17, 1992) and the Colorado butterfly plant (*Gaura neomexicana* subsp. *coloradensis*; Federal Register 65:62302, October 18, 2000). The Threatened status provides protection for plant species that are threatened with extinction throughout all or a significant portion of their ranges.

A Ute ladies'-tresses orchid and Colorado butterfly plant survey was completed for the study area. The survey was conducted in July 2002. Wetland habitats of the study area were evaluated and searched in accordance with U.S. Fish and Wildlife Service Interim Survey Requirements of *Spiranthes diluvialis*, published November 23, 1992. No survey requirements have been published for the Colorado butterfly plant.

Ute Ladies'-Tresses Orchid (*Spiranthes diluvialis*)
No individuals of Ute ladies'-tresses orchid were observed in the study area. Associate species were a minor component of the study area vegetation community. Area soils are predominantly clay, which is not suitable soil for the Ute ladies'-tresses orchid.

Colorado Butterfly Plant (*Gaura neomexicana* subsp. *coloradensis*)
No individuals of Colorado butterfly plant were observed in the study area. Associate species were a minor component of the study area vegetation community. Area soils are clay (not suitable soil for the Colorado butterfly plant) and the Tertiary White River, Arikaree, and Oglalla Formations (suitable soil) are not present in the study area.

3.14.3 Threatened and Endangered Species Impacts

No-Action Alternative. As development continues to occur in the study area, the No-Action Alternative may impact the black-tailed prairie dog. The No-Action Alternative would not impact federally listed species since no designated critical habitat exists in the study area.

Preferred Alternative. A letter from the U.S. Fish and Wildlife Service dated February 24, 2005, states that impacts resulting from the proposed project are not likely to **adversely affect** the continued existence of bald eagle, black-footed ferret, Preble's meadow jumping mouse, Ute ladies'-tresses orchid, or Colorado butterfly plant (**Appendix A**). No designated

critical habitat for any federal threatened, endangered or candidate species exists in the study area. The only state identified species known to occur in the study area is the black-tailed prairie dog. The Preferred Alternative would impact the 1.2-acre prairie dog colony on the far western side of the study area. This prairie dog town is located adjacent to Wadsworth Parkway and 120th Avenue, near the RTD park-n-Ride facility. The proposed 120th Avenue Connection would pass through this colony.

3.14.4 Threatened and Endangered Species Impact Mitigation

Prior to construction, a survey of the impacted prairie dog town will be conducted to determine size and population density. A survey also will be conducted to determine burrowing owl presence in the construction area. Based on that information, CDOT, in cooperation with Broomfield, will identify appropriate relocation sites. Broomfield will identify general potential relocation sites during review of their Prairie Dog policy. CDOT will follow the Interim Region 6 Prairie Dog Policy (1999) and will coordinate with Broomfield and other appropriate entities in the mitigation effort.

3.14.4.1 Prairie Dogs

The City and County of Broomfield Council adopted *Policies for Prairie Dog Conservation and Management* on May 27, 2003. The plan strongly encourages that private development and City and County projects utilize relocation if possible. If relocation to alternative sites is not practicable, the policy recommends that euthanized prairie dogs be donated to the USFWS black-footed ferret recovery program. Extermination is considered the last resort for prairie dog mitigation. Currently, relocation to other counties in Colorado is limited due to Colorado Senate Bill 99-111, which prohibits transportation of prairie dogs across county lines without the permission of the Board of County Commissioners of the receiving county.

In conjunction with development of the *Policies for Prairie Dog Conservation and Management*, the City Open Space and Trails Department and the Open Space and Trails Advisory Committee have identified potential short-term, mid-term, and long-term prairie dog release sites on Broomfield open space. According to the *Policies for Prairie Dog Conservation and Management*, currently suitable release sites on City and County open space could accommodate up to 580 prairie dogs on approximately 100 acres over the short-term to mid-term, assuming that Great Western Reservoir property boundaries will be expanded. Additionally, approximately 200 acres of potential long-term release sites on open space or private land are potentially available for relocation.

3.14.4.2 Burrowing Owls and Raptors

The Migratory Bird Treaty Act (MBTA) protects all migratory birds, their nests and eggs. Most bird species that could occur within the study area, including burrowing owl, red-tailed hawk, swallows, and songbirds are protected under the MBTA. If avoidance is not possible, the removal of any active migratory bird nests will require consultation with the USFWS and a Migratory Bird Depredation Permit prior to the removal of the nests. For most, if not all species, including raptors, no permits will be issued for the removal of an active nest unless a human

health or safety issue can be demonstrated. However, the removal of inactive nests does not require coordination or permits from either the USFWS or CDOW unless the nest is used by bald or golden eagles or a relocation of a nest is desired. Migratory bird surveys should be conducted prior to construction.

CDOW guidelines limit human encroachment on active nest sites for various raptor species during nesting and breeding seasons. No active raptor nests were observed in the study area.

3.15 HISTORIC AND ARCHAEOLOGICAL PRESERVATION

3.15.1 Existing Conditions

Historic and archaeological resource surveys and reports were completed in 2002 as part of the Wadsworth/US 36 Interchange EA. These surveys were all updated and amended in 2004 for the 120th Avenue Connection EA. Eighty-two historic properties were examined, including 45 properties that contain buildings or other resources that are, or were believed to be, more than 40 years old. The archaeological survey resulted in identification of one site and one isolated find that were newly recorded, and one site that was revisited and given a permanent site number. No further work was recommended for the archaeological sites. The following sections describe the resource survey reports in further detail.

3.15.1.1 Historic Properties

The structures in the 120th Avenue Connection study area and surrounding areas reflect Broomfield's progression from pastoral isolation to suburban development. Buildings include residences and commercial structures dating in some cases from the 1910s and the 1920s, but the area is dominated by post-1960 residences, offices, warehouses, workshops, retail stores, and restaurants related to the general suburban development of recent decades.

An initial survey of potential historic resources was conducted between June and December 2002. The purpose of this investigation was to determine whether any historic properties exist within the study area, and, if possible, to determine whether any identified properties are eligible for inclusion on the National Register of Historic Places (NRHP). A literature review of the study area and an on-site reconnaissance study of 82 properties was undertaken with 45 of those properties previously recorded. On March 27, 2003, the State Historic Preservation Officer (SHPO) reviewed the Historic Resources Survey Report prepared as part of the Wadsworth/US 36 Interchange EA and concurred with FHWA's determination that three properties within the Area of Potential Effect (APE) (including two segments of the Burlington Northern Railroad) were eligible for inclusion on the NRHP. These properties are listed in **Table 3-23**. A file search conducted for this area showed that two properties, the Colorado Milling and Elevator Company grain elevator (Site 5BF969) and the Burlington Northern Railroad (Site 5BF47.1 and 5Bf47.2), had been previously determined eligible for inclusion on the NRHP. In June 2004 an additional field survey and archival research were conducted for the 120th Avenue Connection EA.

Table 3-23
National Register Eligible Historic Properties in the Area of Potential Effect

Site Number	Address/Location	Description	Year Built	Eligibility Determination
5BF9	8375 W. 120th Avenue	Concrete block house – private residence	1900	Eligible for NRHP
5BF28	7420 W. 120th Avenue	Bungalow Style house/ commercial and wood frame house – private residence	1920	Eligible for NRHP
5BF969	11986 Wadsworth Boulevard	Colorado Milling and Elevator Company grain elevator	1916	Eligible for NRHP
5BF47.1	400 foot section in T2S, R69W, Section 2	Burlington Northern Railroad	1881	Eligible for NRHP
5BF47.2	1,600-foot section in T1S, R69W, Sections 34 and 35	Burlington Northern Railroad	1881	Eligible for NRHP

The following briefly describes these historic properties.

Site 5BF9—8375 West 120th Avenue
Built around 1900, this house is a single story hip-roofed structure. It is significant as one of the few remaining residences from the early period of Broomfield's history, reflecting the agricultural character of the area.

Site 5BF28—7420 West 120th Avenue
This property includes two residences, one of which has been converted into commercial use. As part of Coleman's Lakeview Subdivision, platted in the first decade of the 20th century, both properties retain very high exterior integrity and are architecturally significant in Broomfield.

Site 5BF969—Colorado Milling and Elevator Company Grain Elevator
This steel grain mill and storage bin were built in 1916 and operated until 1941 for the shipping and storage of grain. It is especially significant because it is one of the few steel grain elevators built. The property was determined to be eligible for inclusion on the National Register of Historic Places in 1994.

Site 5BF47.1 and Site 5BF47.2—Burlington Northern Railroad
The Burlington Northern Railroad (now the BNSF) was determined eligible for inclusion on the NRHP on March 14, 1990 under Criterion A for its importance in the history and development of Colorado. Two segments of the railroad (5BF47.1 and 5BF47.2) were surveyed for this project and contribute to its history.

The current study area does not contain and is not a part of a cultural landscape that might be eligible for nomination to the NRHP. The early community of Broomfield was not a designed landscape. It was originally open agricultural land in large farms and ranches, and then smaller

farms with a small agricultural community. After 1950, it was a residential and commercial suburban area.

3.15.1.2 Archaeological Properties

Centennial Archaeology, Inc. conducted an intensive archaeological properties inventory of the 120th Avenue Connection study area in 2002 and 2004. Centennial surveyed and recorded all prehistoric cultural resources with the exception of standing structures in June and July of 2002. Approximately 250 acres are within the study area, of which 85 were surveyed in 2002. About 98 acres are disturbed as a result of highway, residential and commercial development. In 2004 approximately 65 acres were surveyed for the 120th Avenue Connection EA. No National Register eligible prehistoric or historic archaeological resources were identified in the APE.

3.15.1.3 Native American Consultation

Under the provisions of Section 106 of the National Historic Preservation Act (as amended) and the revised Advisory Council on Historic Preservation regulations (36 CFR 800), 15 federally recognized Indian tribes with an established interest in Broomfield County, Colorado (formerly portions of Adams, Boulder, Jefferson and Weld Counties) were contacted in January 2003 (see **Appendix A**). Tribes invited via letter to participate as consulting parties included the following:

- Ute Mountain Ute Tribe
- Southern Ute Indian Tribe
- Ute Tribe of the Uintah and Ouray Agency (“ Northern " Ute)
- White Mesa Ute Tribe
- Apache Tribe of Oklahoma
- Cheyenne and Arapaho Tribes of Oklahoma
- Comanche Tribe of Oklahoma
- Kiowa Tribe of Oklahoma
- Cheyenne River Sioux Tribe
- Crow Creek Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe
- Standing Rock Sioux Tribe
- Northern Arapaho Tribe
- Northern Cheyenne Tribe

Four tribes responded in writing to the request for consultation: the Cheyenne and Arapaho Tribes of Oklahoma, the Comanche Tribe of Oklahoma, the Northern Ute Tribe and the Southern Ute Indian Tribe (see **Appendix A**). The Cheyenne and Arapaho, and Northern Ute Tribes indicated a desire to be considered consulting parties for the undertaking, whereas the Comanche and Southern Ute Tribes did not request consulting status. Neither of the consulting tribes indicated that the study area contains, or has the potential to contain, Traditional Cultural Properties or other sites considered important in a sacred or ceremonial context. The Comanche and Southern Ute tribes requested notification in the event that Native American

cultural remains are discovered during any construction associated with the project, but they are otherwise not formally regarded as consulting entities. The two consulting tribes will be kept apprised of the progress of the NEPA documentation and all subsequent construction, as appropriate.

By initiating and facilitating government-to-government consultation with interested Native American tribes, FHWA and CDOT have fulfilled their obligations and responsibilities as outlined in Section 106 of NHPA and the Advisory Council's revised regulations.

3.15.2 Historic Properties Impacts

No-Action Alternative. There would be no direct impacts to any of the historic properties or archaeological properties under the No-Action Alternative.

Preferred Alternative. With the Preferred Alternative the following determinations of effect have been made for the NRHP eligible properties. This information, along with the determinations of effect was contained in a letter to the SHPO dated August 9, 2004. In a response letter dated August 16, 2004, the SHPO concurred with the determinations and clarified one opinion. Copies of all correspondence with the SHPO are included in **Appendix A**.

Site 5BF9. The house at 8375 W. 120th Avenue which is eligible for inclusion on the NRHP would not be impacted as the nearest area of impact is approximately 400 feet to the east of this house. The SHPO concurred with FHWA's determination of *no historic properties affected* on August 16, 2004.

Site 5BF28. The Preferred Alternative would not directly impact the two buildings at 7420 W. 120th Avenue, which are also eligible for the NRHP. The western building is the closest to the impact area and it is about 70 feet to the southwest of the nearest area impacted by the proposed road improvements. The eastern building is about 100 feet away from the nearest area of impact. These buildings may experience temporary impacts from increased noise, dust and traffic during the construction process of the Preferred Alternative. A determination of *no adverse effect* was made by FHWA in consultation with SHPO on August 16, 2004.

Site 5BF969. The Colorado Milling and Elevator Company grain elevator at 11986 Wadsworth Boulevard is also eligible for inclusion on the NRHP. It is located about 400 feet to the north of the nearest area of impact so there would be no impact to this historic structure. The SHPO concurred with FHWA's determination of *no historic properties affected* on August 16, 2004.

Sites 5BF47.1 and 5BF47.2. The proposed roadway would cross the Burlington Northern Railroad about 400 feet south of 120th Avenue. The new 120th Avenue roadway would cross under the Burlington Northern Railroad tracks and a new bridge would be constructed to carry the current double railroad tracks above the depressed 120th Avenue roadway. Temporary relocation of the existing tracks would be required during construction of 120th Avenue but rail operations would not be interrupted. This crossing was reviewed by the SHPO on March 27, 2003 and SHPO concurred with FHWA's determination of *no adverse affect* on August 16, 2004.

3.15.3 Historic Properties Impact Mitigation

Since there is *no adverse effect* to any historic or archaeological property in the study area, no mitigation measures are required. In the event historic or prehistoric cultural remains are exposed during any phase of construction, all work in the vicinity of the find will cease and the CDOT Senior Staff Archaeologist will be contacted to evaluate the materials. Work will not resume until the archaeologist has completed necessary consultation with the SHPO and any other agencies or entities, as appropriate, and provided the Engineer with clearance to proceed.

3.16 PALEONTOLOGICAL RESOURCES

3.16.1 Existing Conditions

In August 2004, a paleontological survey was conducted on previously un-surveyed property within the 120th Avenue Connection study area. Rocky Mountain Paleontology conducted the original paleontological assessment for this study area in 2002. Prior to the field survey, literature and museum record searches were conducted in order to assess the paleontologic sensitivity of the study area and the geologic units present within it.

3.16.2 Paleontological Impacts

The 120th Avenue Connection study area contains four mapped geologic units. Surficial deposits include, from oldest to youngest, Pleistocene Verdos Alluvium, Pleistocene loess, and artificial fill. These units have low paleontological sensitivity. The Denver/Arapahoe Formation is the only bedrock geologic unit mapped as occurring within the study area, and it has moderate paleontological sensitivity.

No previously documented fossil occurrences from within the study area are recorded in the fossil locality databases of the University of Colorado Museum and the Denver Museum of Nature and Science. However, fossils have been found in the same geologic units elsewhere in eastern Colorado, and 23 previously documented fossil localities occur within a five mile radius of the study area. No surface fossils were found near the 120th Avenue Connection study area during either of these surveys. However, during the 2002 survey, several small unidentifiable fragments of mineralized bone, which were presumably weathered out of Denver/Arapahoe Formation, were found near the Wadsworth/US 36 Interchange.

3.16.3 Paleontological Impact Mitigation

Paleontological clearance is recommended only for the surface of the study area. Although exposures of bedrock are few, fragments of Denver/Arapahoe Formation on the surface suggest that bedrock occurs at a shallow depth throughout much of the area. Because of its paleontologic sensitivity, monitoring of all areas where the Denver/Arapahoe Formation would be impacted during construction excavations is recommended. When the project design plans are finalized, the CDOT staff paleontologist will examine them in order to estimate the impact to

the Denver Formation and the scope of paleontological monitoring work, if any, which is required

It is possible that fossils could be present in Pleistocene-aged deposits within the study area, and that these could be impacted during ground-disturbance. Because Pleistocene-aged bones may be only partially mineralized and are often superficially similar to modern bones, they can be difficult to distinguish. If any sub-surface bones or other potential fossils are found anywhere within the study area during construction, the CDOT staff paleontologist will be notified immediately to assess their significance and make further recommendations.

3.17 HAZARDOUS WASTE

3.17.1 Existing Conditions

The potential for encountering hazardous waste and/or hazardous materials during project construction was evaluated for the 120th Avenue Connection project through an update of a *Modified Phase I Environmental Site Assessment* (MESA) performed by Carter & Burgess, Inc. in March 2002. The 2002 MESA was prepared for the draft *Wadsworth/US 36 Interchange EA*. The objective of the MESA was to identify recognized environmental conditions in connection with the properties adjacent to study area roadways.

In April and September 2004, Carter & Burgess' Denver Environmental Services group performed an update of the above mentioned MESA and found that, in our judgment, it meets or exceeds the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 1527-00 – *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.* Since the 120th Avenue Connection study area boundary falls entirely within the draft *Wadsworth/US 36 Interchange EA* study area the original report is considered adequate to address the new study area, as long as new regulatory data is obtained and a site visit is performed.

Since the March 2002 MESA, the study area has been changed and only includes the proposed connection of 120th Avenue and SH 128 across US 36. The 120th Avenue Connection study area was included in the March 2002 ESA prepared for the draft *Wadsworth/US 36 Interchange EA*. For the 120th Avenue Connection EA, the site was revisited in the field and new environmental regulatory data was reviewed with a focus on the proposed construction areas and existing conditions. This section provides a summary of the information obtained in the Updated MESA prepared for the 120th Avenue Connection EA in 2004.

The 120th Avenue Connection study area was revisited in April 2004 to update environmental regulatory data and document existing conditions. An update was conducted to evaluate the potential for encountering soil and/or groundwater contamination within the study area, and to highlight potential recognized environmental conditions or issues that may warrant further investigation. There were no sites with recognized environmental conditions listed in the database searches or observed during the field visit in the vicinity of the proposed access on

the west side of US 36, near the proposed Transit Village. The sites identified are all located on the east side of US 36.

Table 3-24 provides a summary of sites that were identified within and adjacent to the study area that have a history of environmental contamination or a potential for environmental contamination in the future based on existing operations.

Table 3-24
Potential Hazardous Waste Sites Within the Study Area

Site #	Ownership	Location	Status	Regulating Agency	Proximity to Study Area
1	Colorado State Patrol Maintenance Facility	7701 West 120th Avenue	Leaking underground storage tank (open case). A groundwater contamination plume from leaking UST is present. Active underground storage tank.	Colorado Division of Oil and Public Safety	Adjacent to study area—potential impact
2	Les Williams Electric/Stahl Roofing	7705 West 120th Avenue	Leaking underground storage tank (closed case). A groundwater contamination plume from leaking UST is present.	Colorado Division of Oil and Public Safety	Outside study area—no impact
3	Sill Terhar Ford	1480 W. 1st Avenue	Small quantity generator (no violations).	CDPHE	Outside study area—no impact
4	Private Residence	7380 West 120th Avenue	Small quantity generator (no violations). Recommend further investigation of history of the property.	CDPHE	ROW acquisition
5	Former Broomfield Conoco	SH 287/120th Avenue	Registered underground storage tanks. USTs were removed and site was closed.	Colorado Division of Oil and Public Safety	Adjacent to study area—potential impact
6	Elite Auto Service (formerly Jim Paris Tire City)	7300 West 120th Avenue	Leaking underground storage tank (closed case). Underground storage tank.	Colorado Division of Oil and Public Safety	Within study area—ROW acquisition—potential impact
7	Private Residence	7230 West 119th Place	Small quantity generator (no violations).	CDPHE	Within study area—no impact

continued

Table 3-24 (continued)
Potential Hazardous Waste Sites Within the Study Area

Site #	Ownership	Location	Status	Regulating Agency	Proximity to Study Area
8	Private Residence	11800 Old Wadsworth Blvd.	Small quantity generator (no violations).	CDPHE	Within study area—no impact
9	Private Residence	11800 Old Wadsworth #19	Former meth lab that underwent cleanup.	North Metro Drug Task Force	Within study area—no impact
10	Arapahoe Roofing & Sheet Metal	11936 Old Wadsworth Blvd.	Active underground storage tank. Building within construction footprint - probability of discovering contamination.	Colorado Division of Oil and Public Safety	Within study area—ROW acquisition—potential impact
11	Alexander Concrete & Construction	7715 North 119th Place	Active underground storage tank.	Colorado Division of Oil and Public Safety	Within study area—no impact
12	Private Residence	11900 Upham Street	Small quantity generator (no violations).	CDPHE	Within study area—no impact
13	Goodyear Auto Service Center	11811 Upham Street, Unit B	Listed as a treatment, storage, and disposal facility. Hazardous materials may have impacted groundwater. Small quantity generator (no violations).	CDPHE	Within study area—potential impact
14	Private Residence	11920 Upham Street	Small quantity generator (no violations).	CDPHE	Within study area—no impact
15	Custom Instruments	11880 Teller Street	Small quantity generator (no violations).	CDPHE	Adjacent to study area—no impact
16	Broomfield Mini Storage	11891 Teller Street	Small quantity generator (no violations).	CDPHE	Within study area—no impact
17	Chemical Handling Corporation	11811 Upham Street	Metals and volatile organic materials persist on the property. Potential for groundwater contamination. Groundwater flows towards the east-northeast across this site.	CDPHE	Within study area—potential impact

continued

Table 3-24 (continued)
Potential Hazardous Waste Sites Within the Study Area

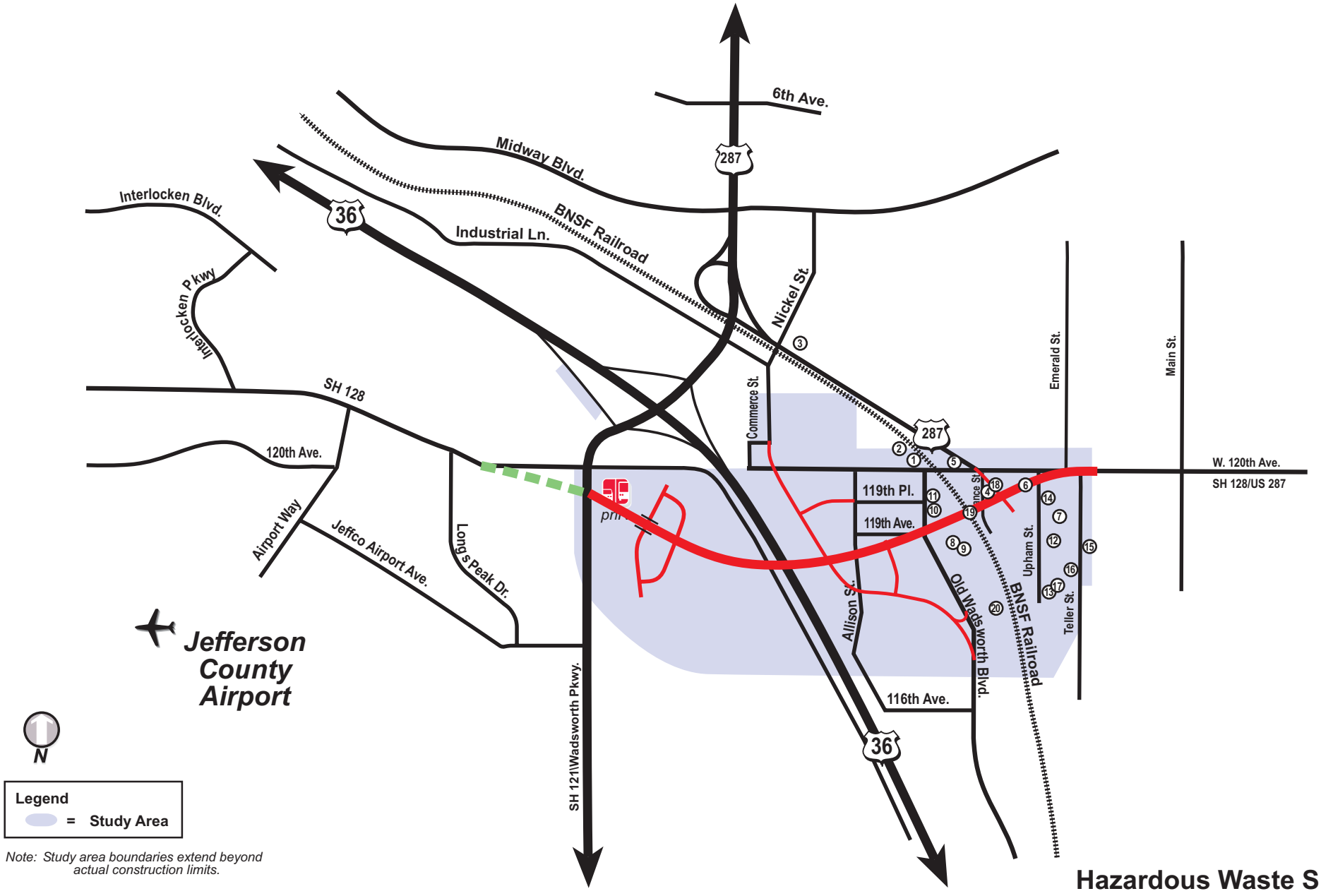
Site #	Ownership	Location	Status	Regulating Agency	Proximity to Study Area
18	Meineke Car Care Center	7370 West 120th Avenue	Building within construction footprint—probability of discovering contamination.	Not a listed site.	Within study area—ROW acquisition—potential impact
19	Burlington Northern Santa Fe Railroad (formerly Southern Pacific)	North of 119th Avenue between Old Wadsworth and Vance Street	Railroad right-of-way within construction footprint—probability of discovering contamination.	Not a listed site.	Within study area—potential impact
20	VSR Corp	11780 Old Wadsworth	Leaking underground storage tank (closed case). Active underground storage tank.	Colorado Division of Oil and Public Safety	Within study area—no impact

3.17.2 Hazardous Waste Impacts

No-Action Alternative. The No-Action Alternative would have no effect on hazardous waste sites or hazardous materials.

Preferred Alternative. While numerous potential sites were identified in the study area, most are not anticipated to cause impacts to the Preferred Alternative for the 120th Avenue Connection. In particular, sites that are listed as small quantity generators with no violations and sites with active underground storage tanks that are not LUST sites are not anticipated to impact the project if there is no indication that contamination has resulted from these operations. Sites with former leaking underground storage tanks that have been closed by the Colorado Division of Oil and Public Safety are assumed to have been cleaned up to state standards but may have residual contamination. Closed LUST sites may require further investigation prior to acquisition or construction. There is always the possibility of encountering unanticipated hazardous and non-hazardous chemical constituents in the soil and groundwater during the construction process and monitoring should be performed to detect environmental impacts. The Phase I MESA is part of the due-diligence process and does not represent all-inclusive information pertaining to each property within the study area. Prior to any acquisition of property with potential concern it is prudent to conduct a Phase II subsurface investigation.

The Preferred Alternative has the potential to be impacted by eight sites identified in the study area. The locations of these sites are depicted in **Figure 3-25** and include:



Note: Study area boundaries extend beyond actual construction limits.

Hazardous Waste Sites

Figure 3-25

- **Colorado State Patrol Maintenance Facility (#1)** at 7701 West 120th Avenue (leaking underground storage tank and groundwater contamination plume is present and extends to the adjacent property at 7705 W. 120th Avenue [site 2])
- **Former Broomfield Conoco (#5)** at Highway 287 and 120th Avenue (former underground storage tank site, actual address or UST closure documentation is unknown)
- **Elite Auto Services (former Jim Paris Tire City) (#6)** at 7300 W 120th Avenue (former leaking underground storage tank site)
- **Arapahoe Roofing & Sheet Metal (#10)** at 11936 Old Wadsworth Boulevard (building within construction footprint - probability of discovering contamination)
- **Goodyear Auto Service Center (#13)** at 11811 Upham Street, Unit-B (hazardous materials may have impacted groundwater)
- **Chemical Handling Corporation (#17)** at 11811 Upham Street (potential groundwater contamination)
- **Meineke Car Care Center (#18)** at 7370 West 120th Avenue (building within construction footprint - probability of discovering contamination)
- **Burlington Northern Railroad (#19)** (railroad right-of-way within construction footprint—probability of discovering contamination)

Although the Colorado State Patrol Maintenance Facility is located just north of the study area boundary, it is listed as an open leaking underground storage tank case with a groundwater contamination plume present and therefore, has the potential to impact the project. Similarly, the Goodyear Auto Service Center and the Chemical Handling Corporation, which are both located at the southeast boundary of the study area, have the potential to impact the project if contaminated groundwater flows in a direction that would intersect the construction area. File review indicated that the groundwater flows east and northeast across this site.

The three remaining sites, Arapahoe Roofing & Sheet Metal, Meineke Car Care Center, and Burlington Northern Railroad, may impact the project because of their close proximity to the construction footprint. While there is no direct evidence of historical contamination from these sites, historical operations increase the likelihood of discovering contamination during excavation activities. Each of these sites should be addressed with a Phase II subsurface investigation prior to acquisition or construction.

The proposed depressed roadway beneath the Burlington Northern-Santa Fe Railroad presents a risk of encountering soil and/or groundwater contamination from surrounding properties. Soil and groundwater sampling are recommended in this area prior to acquisition or construction.

In summary, there appears to be a potential to encounter contaminated soil and groundwater during construction of the 120th Avenue Connection. The *Modified Phase I ESA Update*

indicates a medium environmental risk due to the proximity of sites and facilities with the potential to have recognized environmental conditions within the construction area. A medium risk rating means that there are suspected or known environmental concerns that would warrant further investigation. The amount of further environmental investigation would depend on the extent of the construction disturbance and property acquisition created by the Preferred Alternative.

3.17.3 Hazardous Waste Impact Mitigation

Further environmental investigation of potentially contaminated properties, including Phase II texting to determine any groundwater contamination, is recommended once the final design is completed and the final construction footprint is identified. The following actions will aid in planning the construction process in areas with potential environmental impacts:

- Soil and/or Groundwater Sampling. Sampling of soil and groundwater adjacent to each of the listed sites may help determine the possibility of encountering contaminated soil and/or groundwater from historical releases. For example, soil and groundwater sampling adjacent to the railroad right-of-way, where the depressed roadway is planned, could determine if contamination exists prior to excavation work on this property. Soil and groundwater sampling will determine whether dewatering or special handling of soil will be requried during construction or long-term.

- Formal Asbestos and Lead Based Paint Sampling. Sampling of suspected asbestos containing and lead based paint material should be performed prior to demolition or renovation of any structures.

Potential impacts to human health and safety will be minimized through proper identification and management of contaminated media in accordance with local, state and federal regulations. If contaminated soil and/or groundwater are encountered during construction, the contamination will be properly managed in accordance with the requirements set forth in *CDOT Colorado Highway Specifications*. In addition, the implementation of a *Materials Management Plan* will facilitate proper handling of anticipated and unanticipated contaminated materials during the construction phase of the project. The development of a project *Health and Safety Plan* will address the health and safety of all workers involved in construction of the project. Any excavation, pumping, and/or dewatering activities will require proper treatment and disposal of contaminated materials.

3.18 VISUAL RESOURCES

3.18.1 Existing Visual Quality

Visual resources are defined as those physical features that make up the visible landscape, including land, water, vegetative, and manmade elements. Visual resources are not limited to those features of outstanding visual quality. A location in the environment can have visual values attributed to it by its viewers regardless of the quality. Environmental regulations (e.g.,

NEPA, CEQ) identify aesthetics as one of the elements in the human environment which must be considered in determining the impacts of a project. FHWA guidance (August 1986) provides recommendations for the assessment of visual quality.

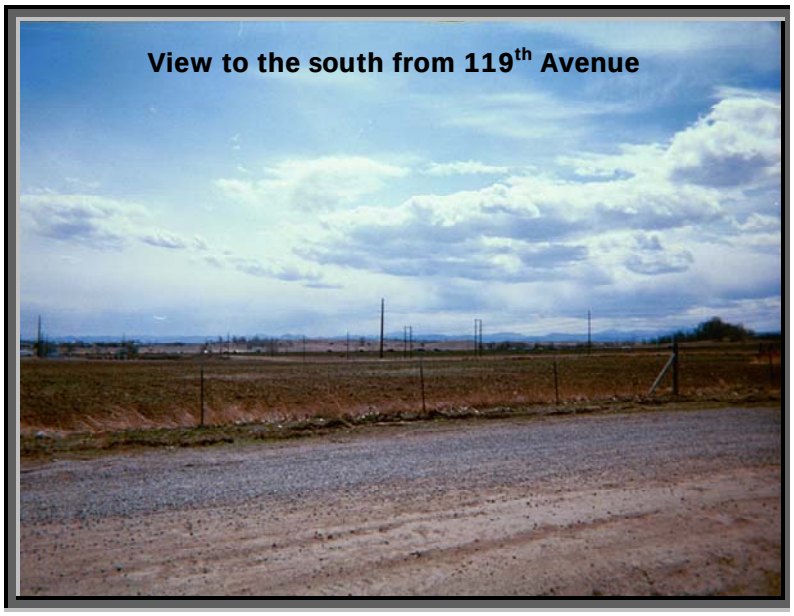
A visual assessment of the study area was completed in May 2004. The visual assessment included a landscape inventory and review of existing visual elements in the study area. For purposes of this analysis, the visual resources are separated into foreground, middleground and background elements.

The existing landscape could predominantly be described as a mixture of low-density industrial, commercial, older suburban residential and tracts of undeveloped land. The BNSF Railroad line and US 36 run northwest/southeast through the study area. The views vary depending on the land use type and degree to which the surrounding area has been developed.

Foreground landscape units are those immediately visible both to and from the roadway. They are created and influenced by such factors as the type of adjacent land use, the width of area roadways, roadway elements, and the character of the adjacent vegetation. Below is a description of some of the typical foreground and middleground landscape units included within the study area.

US 36 is the primary roadway feature through the study area and is visible from many viewpoints. Currently, US 36 is two lanes in each direction with a standard shoulder.

The foreground and middleground views from the older suburban neighborhoods within Old Broomfield include a mix of light industrial operations, scattered single-family housing and open lands. Farming equipment and associated outbuildings are visible from Old Wadsworth and smaller connector streets such as 119th Avenue.



Views from the property located between Wadsworth Parkway and US 36 (site of the planned Transit Village) include a mix of grass and weed species along gently sloping land. Utility poles run north/south through the Transit Village property. From the proposed Transit Village location, views to the east include US 36 in the middleground and Old Broomfield neighborhoods/ commercial areas in the background.

A stretch of West 120th Avenue is included within the study area. This area is primarily older commercial and light industrial along the south edge of the right-of-way and residential on the north side of the right-of-way. Foreground views from West 120th Avenue to the south include parking lots, utility poles and storefronts. The businesses along 120th Avenue include vehicle repair shops, tire stores, restaurant/bar establishments and an auto sales center. Billboard signs and store signage are visible from the roadway. Residential properties to the north are hidden from view by a noise wall and mature trees.

View west along West 120th Avenue

The most scenic of views in the study area are to the west. Background views from the Transit Village property to the west include the Rocky Mountains and the Flatirons, which lie west of Boulder. Overall, the study area does not exhibit strong visual quality. The land uses are fragmented and dominated by light industrial and highway-oriented commercial properties.

3.18.2 Visual Impacts

No-Action. Substantial development, both transportation and land development-related, will occur in the study area in the future. It is likely that US 36 will be widened in the future, with additional pavement and other elements associated with transportation improvements. Much of the undeveloped land both east and west of US 36 within the study area has been approved for future development. Thus, the foreground and middleground views will change to a more urbanized look.

Preferred Alternative. The Preferred Alternative would alter the visual landscape in the study area. The 120th Avenue Connection would be apparent to passing motorists, residents, and owners of commercial and industrial properties. Motorists traveling westbound on US 36 would have a view of the 120th Avenue Connection bridge over US 36. Mountain views to the west may be slightly restricted in some areas due to the bridge. However, views are currently restricted by the Wadsworth/US 36 Interchange bridge. Motorists traveling eastbound on US 36 would have a view of the bridge after crossing under the existing Wadsworth/US 36 Interchange bridge, but the bridge is not anticipated to disrupt scenic views toward Denver.

Most of the residential development is located to the east of US 36 in Old Broomfield. The elevated portions of the 120th Avenue Connection would be visible from this area. Middleground and background views will be partially obstructed for some residences due to the new roadway.

The 120th Avenue Connection will cross under the existing BNSF Railroad tracks east of Old Wadsworth near 119th Avenue. This depression will be 30 feet below grade at its lowest point, and will include retaining walls on either side of the roadway. The walls will be nearest the roadway at the railroad bridge location but are designed to widen out as the roadway climbs back to grade. The purpose of the design is to avoid an enclosed tunnel feel at this location.

Short-term visual impacts that motorists, local residents and business owners may experience include:

- Equipment and excavated material associated with construction in the staging areas.
- Dust and debris associated with construction activity.

Long-term visual impacts associated with the Preferred Alternative include:

- A general increase in pavement, structures and lighting in the area.

Overall, substantial visual impacts are not anticipated. The project would not disrupt significant feature views or adversely affect any viewscapes of historic properties of national or state significance.

3.18.3 Visual Impact Mitigation

The following measures will reduce impacts to the existing visual landscape:

- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction.
- Efforts to reduce construction-related visual impacts as detailed in Section 3.20.

3.19 PARKS AND RECREATION PROPERTIES

3.19.1 Existing Conditions

There are no designated open space areas or park or recreation properties within the study area. In addition, there are no planned parks in the study area. The Broomfield Open Space and Trails Department maintains a list of existing parks and has created a Potential Parks Concept for future acquisitions of parks and open space. The Parks Concept shows an open space area planned as part of the Transit Village, on property located between US 36 and Wadsworth Parkway.

3.19.2 Parks and Recreation Properties Impacts

No-Action Alternative. The No-Action Alternative would have no direct effect on existing parks, recreational facilities or open space areas. However, increased traffic and congestion in the study area would create additional noise, emissions from vehicles, and accident potential that could impact the experience of users traveling to the parks and recreational facilities in the community.

Preferred Alternative. The Preferred Alternative would not permanently impact parks, recreational facilities or open space areas. Access to the area parks and recreational sites in the community would be improved for vehicles, bicyclists and pedestrians with the completion of the 120th Avenue Connection. Open space areas planned as part of the Transit Village would not be impacted by the Preferred Alternative. Temporary impacts to existing bicycle facilities are described in Section 3.7.3.

3.19.3 Parks and Recreation Properties Impact Mitigation

Since the Preferred Alternative would not impact any park or recreational properties, no mitigation is required.

3.20 SECTION 6(f) COORDINATION

Section 6(f). Section 6(f) applies to public recreational areas developed with partial or complete funding provided through the Land and Water Conservation Fund Program, Assistance to States and Urban Parks (LWCF). The LWCF program was established by the LWCF Act of 1965 (P.L. 88-578) which is now codified at 16 U.S.C. 460. Under this act, the Secretary of Interior provides funds to the states to plan, acquire or develop outdoor recreation facilities.

Based on coordination with Colorado State Parks, no sites have been identified in the study area that were purchased with LWCF funds. The Section 6(f) coordination letter is included in **Appendix A**.

3.21 CONSTRUCTION

3.21.1 Roadway Construction Methods

The contractor would determine construction methods during or after development of the final design and construction plans. In general, roadway construction could likely involve the following types of action: bridge construction, excavation and grading, utility adjustments, placement of retaining walls, storm sewers and pavement. Sequencing and the overall timeframe of construction have not been determined and would be based upon minimization of construction impacts, funding constraints, and coordination with other jurisdictions.

3.21.2 Construction Impacts

This section discusses construction impacts that may occur with the Preferred Alternative. Construction along 120th Avenue, Allison Street and at the two access points presents the potential for decreased mobility during construction, dust, noise, runoff, traffic congestion, temporary restricted access to residences and businesses, and visual intrusions to motorists and residents. Additionally, construction presents the potential for the accidental spill of hazardous materials, such as fuel or oil.

Construction delays are expected to create short-term impacts to local and regional traffic circulation and congestion. The traveling public and emergency service vehicles would experience delays, and study area residents would be inconvenienced. Reduced speed limits, short-term travel on unpaved surfaces, and temporary lane closures on 120th Avenue could be expected during construction activities.

No-Action Alternative. The No-Action Alternative involves no additional construction over what is currently programmed, approved and funded by CDOT and the City and County of Broomfield.

Preferred Alternative. The Preferred Alternative construction activities could include grading, pile driving, paving, and compaction. Construction of the 120th Avenue Connection project would require construction phasing, staging areas, and detours, as well as temporary interruption of traffic along major arterials including Wadsworth Parkway and West 120th Avenue, as well as local streets including Old Wadsworth Boulevard, Commerce Street, 119th Avenue, Allison Street and others in the vicinity south of 120th Avenue. There may be temporary access restrictions to commercial properties along 120th Avenue. Retaining walls may need to be constructed in order to keep the improvements within CDOT right-of-way. This may cause noise and fugitive dust impacts to nearby businesses and residences along 120th Avenue.

The Preferred Alternative would include a new bridge over US 36 and a crossing under the Burlington Northern Railroad tracks. Construction activities for the bridge and underpass could include grading, pile driving, and compaction. Temporary relocation of the existing tracks will be required during construction, and rail operations may be temporarily interupted. Noise or fugitive dust impacts would be minimal. There could be traffic impacts related to residential and commercial access in the eastern section of the study area.

3.21.3 Construction Impact Mitigation

Mitigation for direct impacts will include implementation of some or all of the following measures during construction:

- Construction of noise walls (determined to be feasible and reasonable during design stages) prior to construction.
- Maintain access to local businesses and residences, especially along 120th Avenue.

- Coordinate detour routes to avoid overloading local streets.
- Minimize construction duration in residential areas, as much as possible.
- Avoid nighttime activities in residential areas, as much as possible.
- Re-route truck traffic away from residential streets, where possible.
- Combine noisy operations to occur in the same period.
- Conduct pile driving and other high-noise activities during daytime construction, where possible.
- Develop traffic management plans.
- Maintain traffic flow during peak travel times by minimizing lane closures, if possible.
- Coordinate with emergency service providers to minimize delays and ensure access to properties.
- Use signage, T.V. and radio announcements to announce and advertise timing of road closures.
- During peak travel times, keep as many lanes as possible open by temporarily shifting lanes within the existing framework of the roadway.

3.22 PERMITS

The following permits or coordination may be required for the Preferred Alternative and will be obtained prior to construction:

- **National Pollution Discharge Elimination System (NPDES)**, issued by the Colorado Department of Public Health and Environment (CDPHE). This storm water discharge permit is required to assure the quality of storm water runoff.
  - ◊ **Municipal Separate Storm Sewer System (MS4) permit** issued by CDPHE. The study area falls within the CDPHE Phase II Storm Water Regulations "Urbanized Areas," and therefore will follow the requirements of CDOT's Municipal Separate Storm Sewer System discharge permit.
  - ◊ **Section 402: Construction Dewatering Permit** issued by CDPHE-Water Quality Control Division (WQCD) is required for dewatering of construction areas, if necessary. In addition, if contaminated groundwater were anticipated, an **Individual Construction Dewatering Permit** is required wherever construction dewatering could potentially strike contaminated groundwater.
- **Nest Take Permit**, issued by the U.S. Fish and Wildlife Service (USFWS) if active nests are to be removed or if the nest is a raptor nest, active or not.
- **Prairie Dog Relocation or Removal Permit**, issued by the Colorado Division of Wildlife (CDOW). This permit will be required for relocation or removal of prairie dogs from private or public land. Prairie dog relocations from private lands also requires a permit issued by the City and County of Broomfield. In conformance with state law, prairie dogs shall not be

relocated to other counties without the prior approval of the County Commissioners of that county.

- **Fugitive Dust Permit** will be required if more than 25 acres of land is impacted and/or project duration is longer than six months.
- **State Access Permit**, issued by CDOT.
- **Construction Access Permits** from CDOT and the City and County of Broomfield for detours and lane closures along West 120th Avenue.
- **Access Permits** and authorizations as required by CDOT.
- **Other Local Permits**, such as railroad, building, utility or survey.

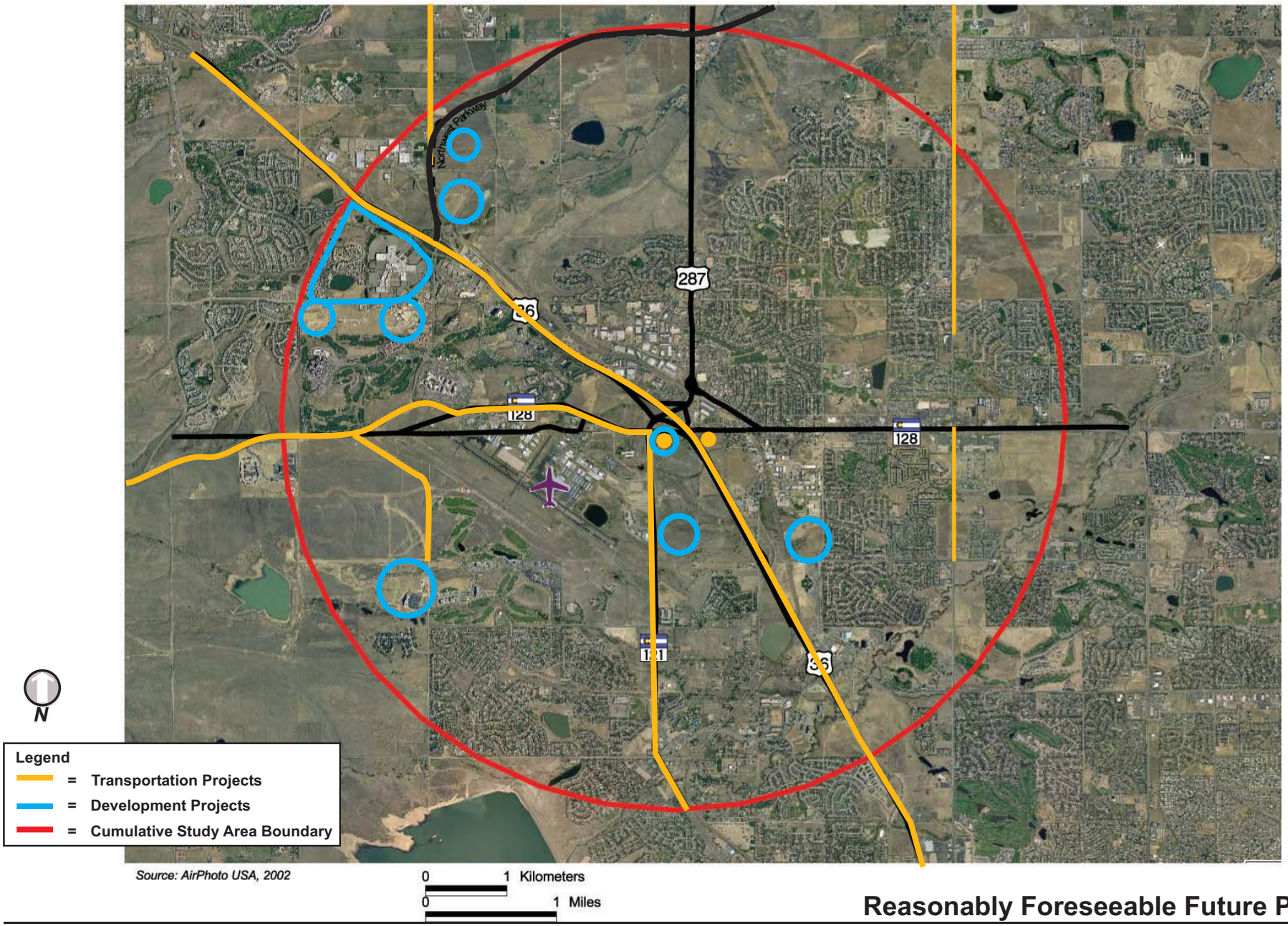
3.23 CUMULATIVE IMPACTS

3.23.1 Methodology

This section addresses the cumulative impacts associated with the Preferred Alternative. Cumulative impacts are defined as "impacts which result from the incremental consequences of an action when added to other past, present and reasonably foreseeable future actions" (40 CFR 1508.7). In order to identify cumulative impacts, a baseline is established including actions from a specified period of time for past actions, added to present and reasonably foreseeable future actions. This baseline establishes the impacts, which have or would occur without the project. The impacts associated with the project are the "incremental impacts". The effects of the addition of the incremental impacts to the baseline is used to assess the cumulative impacts.

The cumulative impacts study area covers a radius of three miles from the proposed 120th Avenue Connection alignment and is shown in **Figure 3-26**. The geographic limits chosen are larger than the area immediately influenced by the project to encompass those projects or actions that may have some impact on resources within the alignment corridor. This boundary also extends beyond the area of influence for development associated with this proposed improvement. There are no major topographic features in this area that would establish a particular resource boundary.

The resources identified for analysis within the cumulative impacts discussion are based on those which are impacted by the project and which are also of concern for cumulative effects based on scoping comments, other comments, or environmental analysis. For this project, the resources that have been identified for cumulative effects analysis are land use, air quality, wetlands and wildlife. Impacts to these resources were assessed on a qualitative basis, and potential mitigation is identified, where appropriate and feasible. The past, present and reasonably foreseeable future projects in the study area are described in the following sections.



Reasonably Foreseeable Future Projects

Figure 3-26

3.23.2 Past and Existing Conditions

A picture of past land use within the 120th Avenue Connection study area was derived through aerial photography and historical data. The City of Broomfield was founded in the late nineteenth century and began as an agrarian community on 4,000 acres. The City and County of Broomfield now covers approximately 34 square miles. The cumulative study area covers approximately 28 square miles (18,000 acres) within portions of Broomfield, Boulder and Jefferson Counties. At this time, over three-quarters of the land area (13,500 acres) has been converted to development or dedicated to open space (Rock Creek Preserve).

Broomfield experienced a boom in residential and commercial growth beginning in the 1950s. Single-family residential tract housing north of 120th Avenue along Midway Boulevard was built in the early to mid-1950s. Business parks (Interlocken) adjacent to the airport and industrial and commercial buildings (Flatirons Crossing) to the northwest of the area were constructed during the 1980s and 1990s.

A history of area roadways began with construction of the Boulder Turnpike (US 36) in the 1950s, which was a toll road and one of the first paved roads in the area. The Boulder Turnpike stretched from Denver to Boulder. The Wadsworth bridge over US 36 was built in the 1960s, and the Wadsworth/US 36 Interchange ramps were reconstructed from cloverleaf to diamond configuration when tolls were removed in 1967. In the early 1960s, US 287 was a two-lane road, ending at 120th Avenue and the Wadsworth/US 36 Interchange. Both State Highways 128 and 121 were built in the 1970s. Transit evolved with the Broomfield park-n-Ride directly south of the interchange. This park-n-Ride was opened in 1975 by RTD.

3.23.3 Reasonably Foreseeable Future Projects

Reasonably foreseeable future projects were determined based on the current fiscally constrained long range plan, Transportation Improvement Plan (TIP), Transit Development Program (TDP), Broomfield Capital Improvement Program (CIP), and proposed developments within the study area. The *Broomfield Transportation Plan* (1996) describes the existing transportation system and lists important short and long-term improvements to the roadway network within the City and County. This plan was referenced for proposed transportation projects in the area. **Figure 3-26** depicts the locations of reasonably foreseeable future projects.

3.23.3.1 Transportation Projects

Transportation actions within the cumulative impacts area defined for this Environmental Assessment include:

- **US 36 Corridor EIS:** FHWA and the Federal Transit Administration (FTA), in cooperation with CDOT and RTD, are jointly preparing an EIS to identify multi-modal improvements for the US 36 Corridor. The EIS includes development and evaluation of alternatives for the US 36 Corridor from downtown Denver to Boulder. Five transportation packages, including the No-Action Alternative, have been identified (as of August 2004). The components of the

transportation packages include a combination of transportation management, general-purpose lanes, BRT, regional rail on the BNSF railroad, HOV lanes, and express tolling and HOT lanes. The project team is in the process of evaluating the alternatives in detail and a Draft EIS is anticipated in the spring of 2005.

- **Simms Realignment: 112th Avenue to SH 128:** Design has been completed for a realignment of Simms Street from 112th Avenue to SH 128. The study area begins at the intersection of 112th and Simms and crosses through the Jefferson County Airport property to align with SH 128.

- **Northwest Corridor EIS:** The Northwest Corridor EIS began in the fall of 2003. This study would determine if transportation improvements are needed between the western terminus of the Northwest Parkway on the north and the C-470/I-70 interchange on the south. None of the alternatives under evaluation will preclude construction of the 120th Avenue Connection. A Draft EIS is expected in 2005.

- **Sheridan Boulevard:** Sheridan Boulevard is listed as a STP-Metro Funded Improvement from 113th Avenue to 120th Avenue and as a 100 percent Locally Funded Roadway Improvement from 9th Avenue in Broomfield to 144th Avenue.

- **State Highways 128 and 121:** State Highways 128 and 121 have been identified by CDOT for roadway improvements. CDOT is currently designing an improved and relocated intersection for the connection of SH 121 and SH 128. This project should be completed by fall 2005.

- **Broomfield RTD park-n-Ride Plan:** The existing park-n-Ride along Wadsworth Parkway would be relocated and replaced by lots on both sides of US 36, south of the proposed 120th Avenue Connection alignment. Funding for design of the park-n-Ride lots, including a pedestrian crossing, is included in the Regional Transportation District's 2003-2008 TDP.

- **JeffCo Airport Master Plan**: The *JeffCo Airport Master Plan*, completed in 2000, outlines existing development and expansion needs as well as goals and objectives for the future. As part of the plan, a development program outlining improvements for the next 20 years was developed. The plan states that existing runway lengths will be retained and in the long-term, an extension of the crosswind runway is programmed. Over the course of the 20-year period, $50 million in capitol improvements are planned.

3.23.3.2 Development Projects

Future land use plans include primarily employment, commercial, residential and mixed-use development. The developments described below are mostly private developer actions, and either all or a portion of the development is within the cumulative study area where the land is zoned, or zoned and approved for development but may or may not be under construction. Broomfield planning regulations state that residential development must set aside a public land dedication (open space) according to a density based formula. The formula is: density (units

per gross acre) x 2 + 5 = percent of site. Therefore, a 3.5-unit-per-acre project on 100 acres would dedicate approximately 12 acres to open space.

- **Broomfield Urban Transit Village:** Between Wadsworth Parkway and US 36 south of the Wadsworth/US 36 Interchange, development has begun on the Transit Village. The Transit Village will be a mixed-use, pedestrian friendly development on 240 acres of undeveloped land. Transit Village plans include a mix of land uses, such as residential, commercial, and open space within easy walking distance from transit. The mix of uses creates a "village-like" neighborhood where people can live, work and play. This area is planned to include a mix of high density residential over retail, with a concentration of commercial development to the north closest to the 120th Avenue Connection alignment. The development would include a 37-acre office park on the southwest portion of the site and would be designed to promote transit, bike, and pedestrian movement between the Transit Village and office area. The PUD has been approved and includes approximately 28 acres of open space within the Transit Village. Broomfield has approved the plat for approximately 2,250 residential units. According to the Broomfield Planning Department, construction would be phased over time.

- **Interlocken Business Park, Sun Option and Interlocken Commons:** The Interlocken Business Park is a 963-acre development to the west and north of the Wadsworth/US 36 Interchange along US 36. Currently, there are 6 to 7 million square feet of development on the property. The park includes a 27-hole golf course, the 390-room Omni Interlocken Resort, the Flatirons Crossing retail area, and a number of other retail and commercial uses. According to the Broomfield Land Use Accounting Summary of 2002, the retail, office and industrial establishments of Interlocken employ over 20,000 people. Approximately 7.8 million square feet of additional development is planned over the next decade.

  Sun Option and Interlocken Commons are located within the Interlocken Business Park. The Sun Option parcel is a Planned Unit Development located east of Network Parkway. The office buildings would expand on the existing Sun Microsystems Office Park located to the west of Network Parkway. Two new buildings with 368,000 square feet have been approved; development could expand to 862,000 square feet. The Interlocken Commons is an approved mixed-use development planned for 175,000 square feet. Development plans include 140,000 square feet of retail and commercial use and 45,000 square feet of office space. The property covers 8 acres east of the Interlocken Loop.

  There are approximately 70 acres of open space located at the southeast corner of Interlocken. The property is zoned Planned Unit Development. Proposed roadway development includes an extension of Interlocken Boulevard down to Interlocken Loop and SH 128.

- **MidCities:** The MidCities development is generally located south and east of Flatiron Crossing and north of the Interlocken golf course. The property is zoned mixed-use commercial and covers approximately 146 acres. Approved development plans include a 150,000-square-foot plaza, a hotel, retail, and the Summit, which would include approximately 500 high-density residential units and 180,000 square feet of office space.

To date, approximately 103 acres of MidCities has been developed or are under construction, including 500 residential units at the west end of the development. Approximately 42 acres remains to be developed. A 206,000 square foot Wal-Mart Store is expected to open in late 2004 southeast of Summit Boulevard.

Heritage Place, at the southwest corner of Interlocken Loop and Interlocken Boulevard (west of Interlocken Commons), is approved for 320,000 square feet of mixed use including 75 multi-family residential units. The timeframe for development is not yet known.

- **Jefferson County Business Center:** The Jefferson County Business Center is currently under construction at West 116th Avenue and SH 121 (Wadsworth Parkway). The property covers approximately 25 acres. Plans were approved for three office buildings, with a total of approximately 109,000 square feet.

- **Great Western Park/McDATA:** The McDATA campus (100 acres) is part of Great Western Park, which covers 386 acres in southwest Broomfield. The Park is located to the east of the Great Western Reservoir, and is bordered to the north by 112th Avenue and to the east by Simms Street. The Great Western Park plan includes approximately 2.8 million square feet of development with primarily office space and residential use. McDATA has been approved for 1.5 million square feet of development, primarily employment use with 100,000 square feet of manufacturing. The timeline for full build-out of the McDATA campus is 2010.

- **Broomfield Corporate Center:** This project includes two new buildings and is located at the southwest corner of Main Street and 116th Avenue.

- **Interpark:** Interpark is a property zoned as General Business and located immediately south of the Broomfield Corporate Center. There may be development in the future within this parcel. Broomfield has proposed to purchase part of the property east of the Burlington Northern Railroad to install three baseball fields.

- **Parkway Circle:** This project includes a new mixed-use development covering 60 acres located at the northeast corner of the 96th Street/ US 36 Interchange. The project received approval in April of 2002 for 532 multi-family residential units. This project incorporates roadway improvements and a new roadway, Via Varra, which would connect from Carbon Road to South 96th Street.

- **The Overlook District:** This development is a 33-acre mixed-use planned unit development at the northeast corner of 96th Street and Carbon Road (directly to the north of the Parkway Circle development). Two new buildings with a total of 520,000 square feet have been approved but are not yet built. Property directly to the north of the Overlook is zoned Business Planned Unit Development (BPUD) and may be developed over the next decade.

- **The Ridge Apartments and Level 3 Communications:** The Ridge Apartments and Level 3 Communications are properties zoned PUD located south of SH 128 and west of the

JeffCo Airport. Plans for the Ridge include approximately 50,000 square feet (6 acres) of industrial development and 370,000 square feet (28 acres) of office development. Plans also include the construction of 350 apartment units and a 3,500-square-foot clubhouse on 24 acres. As of June 2004, 60 of the 350 units were under construction.

3.23.4 Environmental Consequences and Mitigation

The 120th Avenue Connection would serve to accommodate and enhance vehicular, bicycle, and pedestrian circulation in the area. The proposed alignment would provide improvements to circulation, accessibility, and safety for all users of surrounding corridors.

Historically, the area has experienced a conversion of use from primarily agricultural and low-density residential to suburban residential, and mixed-use light industrial/commercial developments. This trend is expected to continue as population and employment increase in Broomfield and surrounding cities. Transportation enhancements along the alignment are designed to serve the present and future land use and transportation needs of the area.

The cumulative impacts discussion includes the following environmental resources within the cumulative study area: land use, air quality, wetlands and wildlife.

3.23.4.1 Land Use

Past actions have resulted in a conversion of land use from agricultural to urban/suburban in this area. Broomfield anticipates a population increase of approximately 88 percent by the year 2030. Reasonably foreseeable future developments within the cumulative study area will likely effect approximately 1,900 additional acres. The Preferred Alternative would require approximately 51 acres of right-of-way for construction, converting existing land uses to a transportation use.

The City and County of Broomfield is easily accessible from the Denver and Boulder metropolitan areas by existing transportation facilities including I-25 and US 36. Over the past fifty years, land use has been steadily changing from rural development to urban and suburban development in Broomfield and surrounding municipalities. The Broomfield Master Plan calls for future land use in the study area to be PUD, commercial, mixed-use residential, light industrial, and retail. The Master Plan also identifies a need to direct future growth in a way that considers the relationship between neighborhoods and areas of open space, including wetlands, floodplains, productive agricultural lands, and historic locations.

Overall, the project is responding to the existing and proposed land use and the associated transportation needs. Provision of a direct east-west connection over US 36 may accelerate the developments that are already planned or approved, but it is not anticipated to stimulate unplanned growth in the area.

Mitigation

The City and County planning process controls the type and rate of growth through Master Plan and zoning regulations. Broomfield has an adopted policy concerning the amount of open

space that is required to be set aside as a public land dedication for new developments. This requirement utilizes a density-based formula. Land obtained from the public land dedication may be used for parks, open space, public facilities such as a fire station, or elementary school sites. The incremental effects of this project when added to the baseline that includes the other area projects, is not expected to be substantial and is expected to be consistent with adopted land use plans.

3.23.4.2 Air Quality

The air quality cumulative impacts from transportation-related past, present and reasonably foreseeable future projects are accounted for during the conformity analysis of the RTP. A transportation plan or RTP is the official intermodal metropolitan transportation plan that is developed through the planning process for the metropolitan planning area. It covers a time period of approximately 20 years. A TIP is a staged, six-year, intermodal program of transportation projects covering the metropolitan planning area, which is consistent with the metropolitan transportation plan. A TDP is a similar five-year program for transit projects. The RTP, TIP, and TDP account for the vast majority of the transportation projects that will be funded in the future. When planning for and approving these transportation projects, air quality is taken into consideration and modeled to show whether projects would have an adverse affect on air quality. In turn, the RTP and TIP are then tested for conformity with the SIP (State Implementation Plan), which not only includes the transportation-related emissions but also includes all other sources of emissions related to the future growth of a region.

Mitigation
This project is currently listed in the fiscally constrained 2030 RTP adopted on January 19, 2005. A conformity analysis was completed on the 2030 RTP. This project would not result in any exceedance of the NAAQS.

3.23.4.3 Wetlands

Cumulative impacts to wetlands have occurred, and are occurring, in the cumulative study area due to land conversion and development. Future land development and transportation projects may cause additional wetland impacts. For example, the Northwest Parkway Preferred Alternative impacts included 1.4 acres of jurisdictional wetlands, 0.67 acre of non-jurisdictional wetlands, and 2.6 acres of other jurisdictional Waters of the US. Wetland impacts for that project, both jurisdictional and non-jurisdictional, were mitigated at a 1:1 ratio. The 120th Avenue Connection project does not add to the cumulative loss of wetlands in the area. Wetland impacts as a result of the proposed project consist of impacts to 0.07 acre of non-jurisdictional wetlands. These wetlands are man-made and are not part of the larger watershed or connected to other area wetlands or major surface water resources.

Mitigation
CDOT is committed to avoidance, minimization, and compensatory wetland mitigation resulting in no net loss and a requirement for mitigation of all impacts, regardless of jurisdiction, at a 1:1 ratio. This project, when added to the baseline that includes past, present and reasonably

foreseeable future projects, is not expected to result in a substantial loss of wetlands in this area.

3.23.4.4 Wildlife

Potential impacts to wildlife include direct habitat loss and fragmentation, displacement, mortality, and human presence. Cumulative impacts to wildlife occur primarily as a loss of habitat and habitat fragmentation. Past, present, and reasonably foreseeable future development may eventually cause a shift in species composition from the existing grassland specialists such as ferruginous hawks and red-tail hawks, to suburban generalists such as European starlings and raccoons. This type of shift can lead to a loss in regional biodiversity.

Black-tailed Prairie Dog (*Cynomys ludovicianus*)
The black-tailed prairie dog is listed as a Colorado State Species of Concern and was removed on August 12, 2004 as a candidate species for federal protection under the ESA. The black-tailed prairie dog once ranged over 100 to 250 million acres of grasslands across the western United States. According to a study conducted by the US Fish and Wildlife Service in 1999, entitled, "Endangered and Threatened Wildlife and Plants; 90-day Finding for a Petition to List the Black-tailed Prairie Dog as Threatened," prairie dog populations have been reduced by 99 percent due to intentional poisoning, outbreak of plague, unregulated shooting, and conversion of habitat to farmland or development. Further habitat fragmentation through development may lead to further degradation of prairie dog colonies.

The Revised Final Draft of the *City and County of Broomfield Policies for Prairie Dog Conservation and Management,* (May 2003) outlines policies pertaining to prairie dogs on city lands or for city projects (see **Appendix E)**. The plan strongly encourages that private development and city projects utilize relocation if possible. A prairie dog census conducted in June 2001 showed that prairie dog habitats were located on approximately 118 acres of prairie and pastureland and 387 acres of private or public land within Broomfield. In conjunction with development of the *Broomfield Policies for Prairie Dog Conservation and Management*, the City Open Space and Trails Department and the Open Space and Trails Advisory Committee have identified potential short-term, mid-term, and long-term prairie dog release sites on City Open Space. Preliminary identified, currently suitable release sites on City Open Space could accommodate up to 580 prairie dogs on approximately 100 acres over the short-term to mid-term, assuming that Great Western Reservoir property boundaries are expanded. Additionally, approximately 200 acres of potential long-term release sites on open space or private land include: 1) areas of city open space that currently are unsuitable but could potentially be made suitable by converting existing agricultural land to mixed grassland, and 2) areas that currently are suitable but not owned by the City.

Black-tailed prairie dogs are present on the west side of the study area near the RTD park-n-Ride facility. This area encompasses approximately 1.2 acres and would be impacted by the Preferred Alternative. An additional colony is located along the southwest boundary of the study area on the Transit Village property just east of Wadsworth Parkway. This habitat area also encompasses approximately 1.2 acres, but would not be impacted by the Preferred Alternative. This site may be impacted by the proposed Transit Village.

Transportation and private development projects within the City and County of Broomfield are encouraged to pursue avoidance/relocation in accordance with Broomfield policies. State and federally funded highway projects are completed in accordance with CDOT policies and procedures.

Raptors

Although raptors are difficult to accurately map due to migration patterns, fieldwork conducted in summer 2002 and in spring 2004 showed a Swainson's hawk nest near US 287 approximately 3 miles north of the study area and a Red-tailed hawk next west of US 36 and 2,000 feet south of the study area in the proposed Transit Village site. No designated critical or essential bald eagle habitat occurs in the study area. Several large cottonwoods that could provide perching or roosting sites occur along Community Ditch (north of the study area). With the area development over the past four to five decades, there are few mature trees providing raptor habitat. No bald eagles were observed in the study area during fieldwork in 2002 and 2004. However, due to the abundance of small mammalian prey in the area, bald eagles and other raptors could occasionally forage in the study area.

Extensive prairie dog colonies throughout the area once used as hunting areas for wintering and nesting raptors have been removed through urban development. Construction of the ramps for the Northwest Parkway at the US 287 and Dillon Road interchange and the northwestern ramp on 160th Avenue passed within the CDOW recommended buffer zones of raptors. The Preferred Alternative is not expected to impact raptor nest sites.

Mitigation

The State of Colorado has entered into a Memorandum of Understanding with ten other state and federal agencies for the conservation of black-tailed prairie dogs. In the January 2002 Memorandum "Black-tailed Prairie Dog Relocation Guidelines," CDOT created guidelines for addressing black-tailed prairie dogs affected by department projects and stated the importance of adopting a statewide strategy for prairie dogs. Black-tailed prairie dog mitigation will follow guidelines as directed by CDOT. CDOT Region 6 has developed a policy dated December 1999 entitled *Interim Region 6 Prairie Dog Policy*. The policy includes the following:

A) Projects should be designed and constructed in such a way as to avoid and minimize impacts to black-tailed prairie dog towns or colonies.

B) Black-tailed prairie dogs adversely affected by projects should be trapped and relocated consistent with relevant Memorandums of Understanding, and applicable state laws and regulation.

C) Black-tailed prairie dogs in impacted colonies that cannot reasonably be relocated should be euthanized and donated to the USFWS for use in the black-footed ferret reintroduction program or an equivalent program.

D) When black-tailed prairie dog towns cannot be avoided, CDOT should ensure that only minimal impacts to black-tailed prairie dogs and surrounding habitats occur.

E) Relocations shall be conducted in accordance with CRS 35-7-203, as well as any other applicable law or regulation.

F) Efforts should be made to cooperate with other public and private agencies to minimize the fiscal impact of relocation/reintroduction activities to CDOT.

CDOT will coordinate with Broomfield for mitigation efforts. Relocation is the mitigation option of first choice, if available.

3.23.5 Conclusion

In summary, the incremental impacts of the Preferred Alternative, when added to past, present and reasonably foreseeable future projects, would not result in significant cumulative impacts. This is based on the following information:

- Land development is anticipated to proceed in an around the study area with or without the construction of the Preferred Alternative.
- Based on current modeling statistics, air quality is not to expected deteriorate substantially at a regional level as a result of this project.
- Wetland impacts as a result of the proposed project consist of impacts to 0.07 acre of non-jurisdictional wetlands. These wetlands are man-made and are not part of the larger watershed or connected to other area wetlands or major surface water resources.
- Past and present development in the study area and wider cumulative study area has fragmented habitat for wildlife species. The projected 1.2-acre impact to black-tailed prairie dog colonies from the Preferred Alternative is relatively small and would not affect populations within the cumulative study area.

Mitigation measures identified for each resource will be followed during implementation of the 120th Avenue Connection project.

Both the No-Action Alternative and the Preferred Alternative may affect environmental resources not regulated at the federal, state, or local level. Such impacts can include the consumption of natural resources such as fossil fuels and raw materials like gravel. The type of alternative selected may also affect social resources such as landfill capacity. In most cases such impacts cannot be quantified, and cannot be avoided. It is recognized that these impacts should be minimized to the extent practicable. Sustainable practices incorporated into the project planning, construction, and maintenance can minimize impacts. As part of its environmental ethic and policy, CDOT encourages its staff, consultants, and contractors to identify opportunities and methods to reduce the impact of projects and programs on environmental resources through innovative programs and by providing flexibility in project planning and construction for the use of sustainable processes and materials. This may include such concepts as: natural resource conservation, waste minimization, materials reuse, minimal use of native virgin materials, conservation and efficient use of water and energy, air pollution prevention, preference for “green” purchasing including recycled and minimally-processed items, and reference for locally-available resources. CDOT encourages the identification and

incorporation of proven materials that are longer-lasting, and require less maintenance as long as such materials do not impact of the Departments ability to meet its primary obligations for providing a safe and efficient transportation system. Alternative materials and practices must meet the performance goals of CDOT construction specifications, demonstrate legitimate expenditure of public funds, and comply will all other applicable laws and regulations.

3.24 SUMMARY OF IMPACTS

Table 3-25 provides a summary of the impacts of the No-Action Alternative and Preferred Alternative as evaluated in Chapter 3.0.

3.25 SUMMARY OF MITIGATION MEASURES

Table 3-26 provides a summary of mitigation measures for the Preferred Alternative as discussed in Chapter 3.0.

Table 3-25
Summary of Impacts

Category	No-Action	Preferred Alternative
Land Use and Zoning	• Current growth trends would continue, creating increased congestion and travel delays on study area roadways. • Not consistent with area plans.	• Construction would result in a direct conversion of land (approximately 51 acres) to a transportation use. • Indirectly, the Preferred Alternative could encourage development in currently undeveloped areas to which access would be improved. • Consistent with Broomfield Master, Transportation, and Strategic Plans. • Provides improvements to overall accessibility, mobility and safety within the area.
Farmland	• No impact. However, conversion of farmland may continue to occur in the study area as new residential or commercial development takes place.	• No direct or indirect impacts to Prime Farmland or Farmland of Statewide Importance.
Social	• Demand for community facilities, services, and housing would continue to increase in response to the projected population growth. • Does not address safety and operating deficiencies on study area roadways. • Deficiencies related to congestion, and safety and accident issues would likely worsen. • Traffic congestion would worsen along existing study area roadways, including access to housing, businesses and community facilities.	• Would improve traffic flow and connectivity, and would enhance access to school, fire, police and other services through a more direct east-west connection. • Would require changes to the local street network, particularly along Old Wadsworth Boulevard and on Allison Street. • Out of direction travel would be required in some areas to access 120th Avenue. The slight increase in travel time would not be as substantial as the travel delays that currently exist on study area roadways. • Relocation of 5 residences, none are minority or low-income.

continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Environmental Justice	• Traffic congestion would worsen, hindering access to housing, businesses, community facilities and provision of emergency services for minority and low-income populations. • Noise and air quality impacts to minority and low-income populations anticipated along the US 287 diagonal.	• Relocation of 2 minority-owned businesses. Acquisition of 6 minority-owned parcels (zoned commercial). • Would improve traffic flow and ease congestion within the study area, benefiting existing businesses in the long-term. • Small increase in air pollution, including an 8% increase in CO concentrations and noise impacts to the mobile home park. • Substantial decrease in traffic volumes along the US 287 diagonal, lower noise and air pollution levels in this area.
Right-of-Way and Relocations	• No impact.	• Approximately 51 acres of right-of-way is required for construction of the Preferred Alternative affecting 29 parcels (6 parcels are minority-owned). • Approximately five residences and eight businesses (2 businesses are minority-owned) would need to be relocated.
Economic	• Existing commercial and industrial sites within the study area would be affected by the increased traffic, decreased level of service, and increased delays projected on area roadways in the future. Commuters that need to travel through the area in an east-west direction would experience frustration and travel time delays if conditions remain.	• Eight business relocations are anticipated. • Businesses along 120th Avenue and in the area surrounding the 120th Avenue Connection would experience some negative short-term impacts through a loss of revenue due to temporary changes in travel direction and accessibility. • Short and long-term increase in jobs and income. • Would improve access and visibility and ease roadway congestion. • Would reduce circulation problems and enhance the economic vitality of the community. • The US 287 diagonal would experience a substantial decrease in traffic volumes. Businesses located along the diagonal would suffer in the long-term from less drive-by traffic.

Continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Transportation	• Substantial peak hour delays. • Congestion and travel delays would continue to worsen on study area roadways.	• Would provide east-west continuity in the region, would eliminate out-of-direction travel and improve access to the surrounding land uses, and would provide improved access to the planned RTD park-n-Ride lots. • Would accommodate east-west travel demand and improve north-south travel, while also allowing future multi-modal improvements anticipated in the US 36 Corridor to occur. • Access to transit hubs by all modes would be improved.
Pedestrian and Bicycle Facilities	• Would exacerbate inadequate conditions for pedestrians and bicyclists in the study area due to increased congestion and accident potential. • Pedestrians and bicyclists would continue to experience unsafe conditions attempting to access the RTD park-n-Ride and crossing US 36.	• Four-foot on-street bike lanes and six-foot sidewalks would be included on both sides of the 120th Avenue Connection. • The re-aligned Allison Street would include a three-foot on-street bike lane, which is consistent with Broomfield standards. • With these proposed improvements, conditions would be safer than at present, and mobility, ease of travel, and direct trail connections would be improved. • Safer route to access the RTD park-n-Ride. • Use of the US 36 shoulders by bicyclists would be temporarily interrupted during construction of the overpass structure.
Air Quality	• Increased air pollution due to increased congestion.	• CO and PM_{10} emissions would not exceed current NAAQS. • Results of CO dispersion model showed an 8 percent increase in CO concentrations near the mobile home park.

continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Noise	• Nine locations would experience noise levels at or above the CDOT NAC approach criteria of 66 dB(A) for Category B.	• Four residences would experience noise levels above the approach criteria of 66 dB(A). • Twenty-one locations, including a mixture of commercial and residential sites located near existing 120th Avenue and along Old Wadsworth Boulevard, are projected to experience decreases in noise levels. • Thirty-eight mobile homes in the mobile home park would experience increases in noise levels, one would exceed the NAC. • Ten residences just north of the proposed 120th Avenue Connection alignment would experience an increase of 5 to 9 dB(A). • Two residences on 120th Avenue near Carr and Commerce Streets would experience noise levels above the NAC impact threshold.
Water Resources and Water Quality	• No impact. Runoff from impervious surfaces would continue to increase in the future as Broomfield continues to grow and develop. • The Transit Village may have impacts to the Dry Creek Valley Ditch.	• Impervious surface area would increase by approximately 30 acres due to transportation improvements. • A portion of Dry Creek Valley Ditch, southwest of US 36, would need to be moved from the existing channel bed to the west to accommodate the bridge abutment locations for the 120th Avenue Connection. • Approximately 300 feet of the Dry Creek Valley Ditch southwest of US 36 would need to be enclosed in a linear pipe and another 520 lineal feet would need to be rerouted on either side of the enclosed ditch. The segments north and south of the pipe enclosure would be within an open channel and would not be enclosed.

Continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Floodplains	• No impact.	• No impact.
Wetlands	• Impacts to wetlands may occur as the planned growth and development takes place.	• Permanent impacts to approximately 0.07 acre of isolated, non-jurisdictional wetlands. Temporary impacts total <0.01 acre.
Vegetation, Wildlife and Aquatic Resources	• As planned development continues, impacts would continue to occur to vegetation and wildlife, including the black-tailed prairie dog. • Construction of projects under the No-Action Alternative would disturb areas that are already inhabited by weeds and would disturb areas that are currently weed free, resulting in the potienal for introduction of weeds into those areas.	• Direct impacts to vegetation would occur from clearing, excavation and grading for the proposed improvements. The Preferred Alternative affects 51 acres of land in the study area. However, there are no conservation sites or sensitive plant communities within the study area. The construction process would remove existing vegetation leaving those areas bare. • Impacts to 1.2 acres of prairie dog habitat (see Section 3.14). Of the 51 acres impacted, approximately 32 acres are vacant lands planned for development and 19 acres are developed. Construction activity could result in direct wildlife mortality. • No impacts to fisheries would occur, as none are present in the study area. • Construction of the Preferred Alternative would disturb areas that are already inhabited by weeds and would disturb areas that are currently weed free, resulting in the potential for the introduction of weeds into those areas. Temporary work areas would also be susceptible to weed invasion. Nearly all of the study area is vegetated by non-native, highly invasive species; however, the listed noxious weed species known in the study area which are most likely to spread to construction sites include redstem filaree, diffuse knapweed, musk thistle, and Scotch thistle.

continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Threatened and Endangered Species	• No impact.	• No impact to federally listed species. • Impact to 1.2 acres of black-tailed prairie dog habitat; a state species of special concern.
Historic and Archaeological Preservation	• No impact.	• Determinations of *no adverse effect* and *no historic properties affected*.
Paleontological Resources	• No impact.	• No previously documented fossil occurrences were recorded or observed.
Hazardous Waste	• No impact.	• Potential impacts from 8 sites identified in the study area.
Visual Resources	• No impact.	• Substantial visual impacts are not anticipated, nor would the project disrupt significant feature views or adversely affect any viewscapes of historic properties of national or state significance.
Parks and Recreation Properties	• No impact.	• No impact.
Section 6(f) Coordination	• No impact.	• No impact.
Construction	• No impact.	• Potential for decreased mobility during construction, dust, noise, runoff, traffic congestion, temporary restricted access to residences and businesses, and visual intrusions to motorists and residents. • Rail operations may be temporarily interrupted.

continued

Table 3-25 (continued)
Summary of Impacts

Category	No-Action	Preferred Alternative
Cumulative Impacts	• No impact.	• The incremental impacts of the Preferred Alternative, when added to past, present and reasonably foreseeable projects would not result in a significant cumulative impact. • Land development is anticipated to proceed in an around the study area with or without the improvements proposed. • Based on current modeling statistics, air quality is not expected to deteriorate substantially at a regional level as a result of this project. • The 120th Avenue Connection project does not add to the cumulative loss of wetlands in the area. Wetland impacts as a result of the proposed project consist of impacts to 0.07 acre of non-jurisdictional wetlands. These wetlands are man-made and are not part of the larger watershed or connected to other area wetlands or major surface water resources. • Past and present development occurring in and around the study area has fragmented habitat for wildlife species. The projected 1.2 acre impact to a black-tailed prairie dog colony is relatively small and would not affect populations within the cumulative study area.

continued

Table 3-26
Summary of Mitigation Measures

Category	Mitigation Measures
Land Use and Zoning	• No mitigation is required. • Property owners with lands impacted directly by the Preferred Alternative have been contacted by City and County staff and through project newsletters.
Farmland	• No mitigation is required.
Social	• Residential and commercial areas that experience a change in access will be provided with alternate access through the 120th Avenue Connection and relocated Allison Street. • All residential and business acquisition and relocations will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended. • During construction, good communication will be maintained with the communities and residents regarding road delays, access and special construction activities. • The project will comply with 23 CFR 771.105(f).
Environmental Justice	• All right-of-way acquisition and relocation of businesses and residences will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970,* as amended. • CDOT will provide assistance to any eligible owner or tenant in relocating their business or residence at the time of displacement. Relocation resources are available to a residents and businesses without discrimination.
Right-of-Way and Relocations	• The acquisition process will be negotiated in a fair and equitable manner, using market value determined by expert appraisers as required. • Right-of-way acquisition and relocation of displaced persons and businesses will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended. • All qualified relocatees are eligible to receive monetary payments. • No person shall be displaced from their residence by this project unless and until adequate replacement housing has been offered to such person regardless of race, color, religion, sex or national origin.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Economic	• Impacts of the Preferred Alternative would not result in substantial adverse economic impacts to the overall community. • Relocation of businesses (8) will be completed pursuant to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended.
Transportation	• No mitigation is required.
Pedestrian and Bicycle Facilities	• The bike community will be informed regarding the temporary impacts to the shoulders along US 36 and a detour route provided.
Air Quality	• No mitigation is required.
Noise	• A noise wall will be included to minimize noise impacts along the north edge of the Broomfield Mobile Home Park.
Water Resources and Water Quality	The use of standard erosion and sediment control BMPs in accordance with CDOT's *Erosion Control and Storm Water Quality Guide* will be included in the final design plans. All work on the project will be in conformity with Section 107.25 and Section 208 of the CDOT *Standard Specifications for Road and Bridge Construction*. Water quality mitigation will adhere to the CDOT MS4 Permit New Development and Redevelopment Program, Phase I and II. The following specific BMPs from the *Erosion Control and Storm Water Quality Guide* and the *CDOT MS4 Permit New Development and Redevelopment Program* will be applied during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality as appropriate: • All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction. • Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion. • Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained. • Temporary erosion control blankets will have flexible natural fibers.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Water Resources and Water Quality (cont'd.)	• Erosion bales, erosion logs, silt fence or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways and at inlets where appropriate. • To minimize the loss of sand from the road surface during winter sanding operations, sediment catch basins will be included during construction and put in place permanently with continual maintenance. • Where appropriate, slope drains will be used to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment. • Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain. • Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales. • Disturbance to vegetated areas will be minimized. • Temporary retention ponds (during construction) will be used to allow sediment to settle out of runoff before it leaves the construction area. These ponds may be combined with permanent detention ponds. • Structural BMPs may include extended detention basins with sediment forebays, grass swales, and grass buffers to retain sediment and roadway pollutants resulting from winter sanding, chemical deicing and normal traffic operations. • Non-structural BMPs may include litter and debris control, and landscaping and vegetative practices. • Settling ponds for effluent from dewatering operations, if needed. • Construction will be planned during the non-irrigation season. If this is not possible, the hydraulic integrity of the ditch will be maintained through the use of temporary systems. • If contaminated groundwater is encountered during the dewatering process, mechanisms will be in place to analyze groundwater for contaminants and effectively treat this groundwater pumped discharge, as necessary per the Phase II requirements.
Floodplains	No mitigation is required.
Wetlands	The roadway design includes avoidance and minimization of impacts to most study area wetlands. Impacts to wetlands will be avoided and minimized as much as practical during the final design process. The design shall comply with Executive Order 11990. Wetlands as well as their associated functions permanently impacted by the

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Wetlands (cont'd.)	Preferred Alternative will be mitigated at a 1:1 ratio within the study area by wetland creation/restoration at study area sites recommended by the City and County of Broomfield and approved by the CDOT landscape architect and a CDOT wetland biologist, and, if necessary, by purchase of credits at a wetland mitigation bank within the primary service area. Wetland impacts will be reduced as much as possible during final design. Specific strategies include steepening embankment slopes and piping only selected portions of irrigation ditches. Replaced wetland functions and values are anticipated to include bank stabilization, sediment/toxin retention, nutrient removal/transformation, food chain support, wildlife habitat, and visual quality. Final selection of preferred wetland mitigation sites will be determined on the basis of stable hydrology, availability of water rights, construction feasibility, and overall potential for successful wetland creation. Wetland mitigation design will be coordinated with CDOT, Broomfield and local property owners. All wetland mitigation sites will be guaranteed in writing to remain wetland in perpetuity. Wetland mitigation concepts, species lists, and seeding and planting methods will be included in the engineering plans and coordinated with the contractor prior to construction. Table 3-19 lists wetland plant species suitable for wetland mitigation sites. A tree and shrub wetland buffer zone (see Table 3-20) will be planted, as appropriate, on slopes above wetland mitigation sites. Where possible, wetland topsoil will be stockpiled on site for use in wetland creation areas. Only topsoil free from viable noxious weed seeds will be stockpiled. Wetland areas temporarily impacted by construction activities will be replanted as soon as possible following completion of the activity, if needed. Since all wetlands are non-jurisdictional, application to the USACE for a 404 permit would not be necessary. The following specific BMPs from CDOT's *Erosion Control and Storm Water Quality Guide* will be required during construction to reduce the potential for wetlands to be indirectly affected by sedimentation from accelerated erosion or by hazardous materials (e.g., fuel, equipment lubricants):

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Wetlands (cont'd.)	• All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction. • Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier would be applied to prevent erosion. • Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained. • Temporary erosion control blankets will have flexible natural fibers. • Erosion bales, erosion logs, silt fence or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways and at inlets where appropriate. • To minimize the loss of sand from the road surface during winter sanding operations, sediment catch basins will be included during construction and put in place permanently with continual maintenance. • Where appropriate, slope drains will be used to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment. • Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain. • Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales. Additionally, the following BMPs to minimize wetland impacts during construction will be employed: • All wetland areas and water bodies not impacted by the project will be protected from unnecessary encroachment by temporary fencing. Sediment control such as silt fence or erosion logs, will also be used where needed to protect the area from sediment. Siltation control devices (e.g., fences) will be placed on the down-gradient side of construction areas to prevent soil from entering wetland areas. • No staging of construction equipment, equipment refueling or storage of construction supplies will be allowed within 50 feet of a wetland or any water-related area. • Standard erosion control measures will be observed and an erosion control plan will be developed prior to and for inclusion in the construction bid plans. All bare fill or cut slopes adjacent to streams or intermittent drainages will be stabilized as soon as practicable.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Wetlands (cont'd.)	• No fertilizers, hydrofertilizers, or hydromulching will be allowed anywhere on the project. • Work areas will be limited as much as possible to minimize construction impacts to wetlands. • Standard erosion control measures will be observed and an erosion control plan will be developed prior to construction advertisement for inclusion in the bid plans.
Vegetation, Wildlife and Aquatic Resources	The following BMPs will be used to mitigate impacts to vegetation associated with the Preferred Alternative. • Minimize the amount of disturbance and limit the amount of time that disturbed areas are allowed to be non-vegetated. • Implement the project Integrated Weed Management Plan. • Avoid existing trees, shrubs and vegetation, to the maximum extent possible, especially wetlands and riparian plant communities. • Salvage weed free topsoil for use in revegetation. • Implement temporary and permanent erosion control measures to limit erosion and soil loss. Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times and concrete washout contained. • Time tree removal for outside of nesting season per the Migratory Bird Treaty Act (MBTA). • All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction. • Removed trees, shrubs and vegetation will be replaced on a 1:1 basis, if practicable, as required by Region 6. Since soil disturbance with accompanying invasion by noxious weed species can be associated with highway construction, the Integrated Weed Management Plan will be incorporated into the project design and implemented during construction.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Vegetation, Wildlife and Aquatic Resources (cont'd.)	Specific BMPs will be required during construction to reduce the potential for introduction and spread of noxious weed species and include: • Mapping will be included in the construction documents along with appropriate control methods for noxious weeds. • Highway right-of-way areas will periodically be inspected by the city or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds. • As detailed in the Integrated Weed Management Plan (Appendix F), weed management measures will include removal or burial of heavily infested topsoil, chemical treatment of lightly infested topsoil, limiting disturbance areas, phased seeding with native species throughout the project, monitoring during and after construction, other chemical and/or mechanical treatments. • Use of herbicides will include selection of appropriate herbicides and timing of herbicide spraying, and use of a backpack sprayer in and adjacent to sensitive areas such as wetlands and riparian areas. • Certified weed-free hay and/or mulch will be used in all revegetated areas. • No fertilizers will be allowed on the project site. • Supplemental weed control measures may be added during design and construction planning. • The removal of trees will be scheduled to avoid the breeding season of birds from April 1 to August 31. Preventative Control Measures for project design and construction may include: • Native Plants: Use of native species in revegetation sites. • Weed Free Forage Act: Materials used for the project will be inspected and regulated under the Weed Free Forage Act, Title 35, Article 27.5, CRS. • Topsoil Management: When salvaging topsoil from on-site construction locations, the potential for spread of noxious weeds will be considered. Importing topsoil onto the project site will not be allowed. • Equipment Management: Equipment will remain on designated roadways and stay out of weed- infested areas until the areas are treated. All equipment will be cleaned of all soil and vegetative plant parts prior to arriving on the project site.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Vegetation, Wildlife and Aquatic Resources (cont'd.)	Several conservation measures will be incorporated with the Preferred Alternative to reduce impacts to wildlife and may include: • Minimizing disturbance to native plant communities. • Minimizing tree removal. • Restricting tree removal during breeding season (April 1 – August 31) in compliance with the MBTA or a depredation permit from USFWS will be obtained. If construction is to commence between April 1 and August 31, a ground nesting survey will be completed by a wildlife biologist. • Erosion control techniques such as silt fence or erosion logs will be used to protect surrounding areas from construction related erosion. • Noxious weeds will be spot sprayed. In locations where spot application is not practicable a wildlife biologist will inspect the area prior to spraying to ensure crucial habitat will not be impacted. • Temporary erosion control blankets will have flexible natural fibers. • No mitigation is required for aquatic resources.
Threatened and Endangered Species	• Prior to construction, a survey of the impacted prairie dog town will be conducted to determine size and population density. A survey also will be conducted to determine burrowing owl presence in the construction area. Based on that information, CDOT, in cooperation with Broomfield, will identify appropriate relocation sites. Broomfield will identify general potential relocation sites during review of their Prairie Dog policy. CDOT will follow the Interim Region 6 Prairie Dog Policy (1999) and will coordinate with Broomfield and other appropriate entities in the mitigation effort.
Historic Properties	• No mitigation is required. In the event historic or prehistoric cultural remains are exposed during any phase of construction, all work in the vicinity of the find swill cease and the CDOT Senior Staff Archaeologist will be contacted to evaluate the materials. Work will not resume until the archaeologist has completed necessary consultation with the SHPO and any other agencies or entities, as appropriate, and provided the Engineer with clearance to proceed.
Paleontological Resources	• Paleontological clearance is recommended only for the surface of the study area. Because of its paleontologic sensitivity, monitoring of all areas where the Denver/Arapahoe Formation would be impacted during construction excavations is recommended. When the project design plans are finalized, the CDOT

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Paleontological Resources (cont'd.)	staff paleontologist will examine them in order to estimate the impact to the Denver Formation and the scope of paleontological monitoring work, if any, which is required. • It is possible that fossils could be present in Pleistocene-aged deposits within the study area, and that these could be impacted during ground-disturbance. Because Pleistocene-aged bones may be only partially mineralized and are often superficially similar to modern bones, they can be difficult to distinguish. If any sub-surface bones or other potential fossils are found anywhere within the study area during construction, the CDOT staff paleontologist will be notified immediately to assess their significance and make further recommendations.
Hazardous Waste	• Further environmental investigation of potentially contaminated properties is recommended once the final design in completed and the final construction footprint is identified. • Contamination will be properly managed in accordance with the requirements set forth in *CDOT Colorado Highway Specifications*. • The implementation of a *Materials Management Plan* (CDOT Standard Specifications Section 250) will facilitate proper handling of anticipated and unanticipated contaminated materials during the construction phase of the project. • The development of a project *Health and Safety Plan* (CDOT Standard Specifications Section 250) will address the health and safety of all workers involved in construction of the project. • Any excavation, pumping and/or dewatering activities of contaminated soils or waters will require proper treatment and disposal.
Visual Resources	• All disturbed areas will be revegatated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction. • Efforts to minimize visual impacts associated with construction will be made.
Parks and Recreation Properties	No mitigation is required.
Section 6(f) Coordination	No mitigation is required.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Construction	Mitigation for direct impacts could include implementation of the following measures during construction: • Construction of noise walls (determined to be feasible and reasonable during design stages) prior to construction. • Maintain access to local businesses and residences, especially along 120th Avenue. • Coordinate detour routes to avoid overloading local streets. • Minimize construction duration in residential areas, as much as possible. • Avoid nighttime activities in residential areas, as much as possible. • Re-route truck traffic away from residential streets, where possible. • Combine noisy operations to occur in the same period. • Conduct pile driving and other high-noise activities during daytime construction, where possible. • Develop traffic management plans. • Maintain traffic flow during peak travel times by minimizing lane closures, if possible. • Coordinate with emergency service providers to minimize delays and ensure access to properties. • Use signage, T.V. and radio announcements to announce and advertise timing of road closures. • During peak travel times, keep as many lanes as possible open by temporarily shifting lanes within the existing framework of the roadway.
Permits	The following permits or coordination may be required for the Preferred Alternative and will be obtained prior to construction: • National Pollutant Discharge Elimination System (NPDES), issued by the Colorado Department of Public Health and Environment (CDPHE). This storm water discharge permit is required to assure the quality of storm water runoff. ◊ Municipal Separate Storm Sewer System (MS4) permit issued by CDPHE. The study area falls within the CDPHE Phase II Storm Water Regulations "Urbanized Areas," and therefore would follow the requirements of CDOT's MS4 permit.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Permits (cont'd.)	◊ Section 402: Construction Dewatering Permit issued by CDPHE-Water Quality Control Division (WQCD) would be required for dewatering of construction areas, if necessary. In addition, if contaminated groundwater is anticipated, an Individual Construction Dewatering Permit would be required wherever construction dewatering could potentially strike contaminated groundwater. • Nest Take Permit, issued by the U.S. Fish and Wildlife Service (USFWS) if active nests are to be removed or if the nest is a raptor nest, active or not. • Prairie Dog Relocation or Removal Permit, issued by the Colorado Division of Wildlife (CDOW). This permit will be required for relocation or removal of prairie dogs from private or public land. Prairie dog relocations from private lands also would require a permit issued by the City and County of Broomfield. In conformance with state law, prairie dogs shall not be relocated to other counties without the prior approval of the County Commissioners of that county. • Fugitive Dust Permit is required if more than 25 acres of land is impacted and/or project duration is longer than six months. • State Access Permit, from CDOT. • Construction Access Permits from CDOT and the City and County of Broomfield for detours and lane closures along West 120th Avenue. • Access Permits and authorizations as required by CDOT. • Other Local Permits, such as railroad, building, utility or survey.
Cumulative Impacts	The City and County planning process controls the type and rate of growth through Master Plan and zoning regulations. Broomfield has an adopted policy concerning the amount of open space that is required to be set aside as a public land dedication for new developments. This requirement utilizes a density-based formula. Land obtained from the public land dedication may be used for parks, open space, public facilities such as a fire station, or elementary school sites. The incremental effects of this project when added to the baseline that includes the other area projects, is not expected to be substantial and is expected to be consistent with adopted land use plans.

continued

Table 3-26 (continued)
Summary of Mitigation Measures

Category	Mitigation Measures
Cumulative Impacts (cont'd.)	This project is currently listed in the fiscally constrained 2030 RTP adopted on January 19, 2005. A conformity analysis was completed on the 2030 RTP. This project would not result in any exceedance of the NAAQS. CDOT is committed to avoidance, minimization, and compensatory wetland mitigation resulting in no net loss and a requirement for mitigation of all impacts, regardless of jurisdiction, at a 1:1 ratio. This project, when added to the baseline that includes past, present and reasonably foreseeable future projects, is not expected to result in a substantial loss of wetlands in this area. The state of Colorado has entered into a Memorandum of Understanding with ten other state and federal agencies for the conservation of black-tailed prairie dogs. In the January 2002 Memorandum "Black-tailed Prairie Dog Relocation Guidelines," CDOT created guidelines for addressing black-tailed prairie dogs affected by department projects and stated the importance of adopting a statewide strategy for prairie dogs. Black-tailed prairie dog mitigation will follow guidelines as directed by CDOT. CDOT Region 6 has developed a policy dated December 1999 entitled *Interim Region 6 Prairie Dog Policy*. CDOT will coordinate with the City and County of Broomfield for mitigation efforts. Relocation is the mitigation option of first choice, if available.

Chapter 4.0: Comments and Coordination

4.1 PUBLIC INVOLVEMENT ACTIVITIES

Discussions with the community, including residents and business owners in the study area, have been ongoing since the Wadsworth/US 36 Interchange Feasibility Study began in 1998. Coordination for this EA has involved meetings and communication with concerned citizens, property owners, businesses, advocacy groups and the general public. These include phone calls, newsletters, emails, one-on-one meetings, small group meetings, and open houses.

Mailing List. The Project Team maintained a mailing list for newsletter distribution and announcements. The list included names and businesses obtained from the City and County of Broomfield. In addition, the list included members of the public that requested to be on the mailing list or signed in at public meetings. As of October 2004 the list had approximately 630 names.

Newsletters. Two project newsletters were created and mailed to individuals on the project mailing list. Broomfield representatives distributed newsletters door-to-door at the Broomfield Mobile Home Park located within the study area. The first newsletter was distributed in May 2004 and the second in April 2005.

The focus of the first newsletter included the following:

- Described the project history and status
- Announced the upcoming Open House to be held June 10th, 2004
- Described the recommended alignment for the 120th Avenue Connection
- Provided project contact information

The second newsletter was sent to those on the mailing list on April 1, 2005, prior to the EA Public Hearing. The newsletter included the following information:

- Description of the Preferred Alternative
- Availability of the EA for public review and comment
- Date, location and time for the public hearing
- Provided project contact information for submitting comments on the EA and for asking questions

Media Communication. Advertisements were placed in the Broomfield Enterprise newspaper prior to the Open House in June 2004. The newspaper advertisement ran twice. A copy of the advertisement is included in **Appendix D**. Similar advertisements will be run just prior to the April 2005 Public Hearing.

Specialized Environmental Justice Outreach. Specialized outreach to minority and low-income populations has been conducted as part of this project and previous transportation improvement projects undertaken in the study area. In advance of the Open House held June 10, 2004, copies of the newsletter were hand delivered to residents in the study area

including all addresses in the Broomfield Mobile Home Park. Each newsletter included a line of text in Spanish that offered a contact name and phone number for further information. Direct contact with both the owner and resident manager of the Broomfield Mobile Home Park was made to describe the project and to encourage attendance by the residents at the project Open House. Similar coordination will occur prior to the Public Hearing. Additional outreach included separate meetings with individual residential and commercial business property owners to discuss the project. No unusual circumstances or special concerns were identified in these meetings.

4.2 PUBLIC MEETING

One public Open House was held early in the EA process to describe the project and gather comments on the recommended concept for the 120th Avenue Connection. The meeting was held on June 10th, 2004, from 4:00 to 6:30 p.m. at the Jeffco Airport Mt. Evans Room located in the main airport terminal. Twenty-three people signed the attendance roster. The meeting was held in an open house format –no formal presentations were given.

The purpose of the first Open House was to update the public on the new 120th Avenue Connection EA and gather public comments relative to the project. The history of the project and information on other area projects was provided. Existing environmental conditions were displayed through graphics. Updated traffic information, including level of service and existing traffic volumes, were also displayed.

There were numerous ways to provide comments, including:

- Asking questions or providing comments to project personnel.
- Filling out a comment sheet and putting it in the comment box or mailing it in at a later date.
- Visiting the City of Broomfield website at **www.ci.broomfield.co.us** for project information.
- Contacting project management personnel at the address provided in the newsletter and public meeting handouts.

Four public comments were received on comment sheets and an additional 11 were given to project personnel at the open house. All comments received supported the need for the 120th Avenue Connection. Access, community impacts, right-of-way, and pedestrian and bicycle facilities were the primary areas of interest.

4.3 AGENCY COORDINATION

Agency coordination was conducted to ensure a timely flow of project information between the three levels of agencies involved in the project (federal, state and local), and to ensure awareness of public issues and concerns identified during the process.

Agency Meetings. The following is a list of coordination meetings held with agencies that were involved with the EA process. These meetings included a discussion of anticipated project impacts and suggestions for mitigation.

- CDOT Environmental Programs Branch Scoping Meeting—April 22, 2004. Agencies in attendance: City and County of Broomfield and Colorado Department of Transportation. Minutes of the meeting are contained in **Appendix A**.

Scoping Letters. In May 2004, scoping letters were sent to the 16 agencies listed below describing the 120th Avenue Connection project and its relationship to the earlier Wadsworth/US 36 Interchange EA. Each agency had participated to varying degrees in the earlier study. The purpose and need for the new study was summarized in the scoping letter along with a brief description of the project boundaries. Letters were sent to the following agencies:

- Colorado Division of Wildlife
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Colorado Department of Public Health and Environment
- State Historic Preservation Office
- Public Utilities Commission
- Federal Highway Administration, Colorado Division
- Regional Transportation District
- Jefferson County Highways and Transportation
- Boulder County Transportation Department
- Denver Regional Council of Governments
- Burlington Northern Santa Fe Railroad
- Representative Mark Udall's Office
- The Ute Tribe of the Uintah and Ouray Agency
- The Cheyenne and Arapaho Tribes of Oklahoma.

4.4 PUBLIC HEARING

A Public Hearing has been scheduled for April 21, 2005, from 4:00 to 6:30 p.m. The purpose of this meeting is to receive comments from the public on the 120th Avenue Connection EA and the Preferred Alternative identified in the EA. Prior to the hearing, copies of the EA were made available on April 6, for public review at five locations. Display ads in local newspapers announced the availability of the EA for review and the date, time and location of the hearing. This information was also provided to the public in the project newsletter mailed out in March 2005.

Technical documents and engineering plan sheets prepared in support of this EA are available for review at the locations listed below. Copies of these items will be on display during the public hearing.

- City and County of Broomfield, Community Development
  One DesCombes Drive, Broomfield, CO 80020
- Mamie Doud Eisenhower Public Library
  3 Community Park Road, Broomfield, CO 80020
- CDOT Region 6 Office, Planning and Environmental Division
  2000 S. Holly Street, Denver, CO 80222
- Regional Transportation District
  1600 Blake Street, Denver, CO 80202
- Carter & Burgess
  707 17th Street, Suite 2300, Denver, CO 80202

Chapter 5.0: Section 4(f) Evaluation

Section 4(f) of the 1966 Department of Transportation Act (49 USC 303 and 23 USC 138) allows the Federal Highway Administration (FHWA) to approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if—

1) There is no prudent and feasible alternative to using that land; and
2) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

The Preferred Alternative for the 120th Avenue Connection project uses property from the eligible Burlington Northern Santa Fe Railroad (BNSF). This evaluation discusses alternatives to the proposed action, whether the alternatives are feasible and prudent, and possible planning to minimize harm to the Section 4(f) resource.

5.1 Project Purpose and Need

The current roadway network in the study area consists of discontinuous routes, generally in the east-west direction. Two primary east-west corridors, SH 128 and 120th Avenue, do not have a direct connection across US 36 which requires out-of-direction travel for east-west through traffic. SH 128 is discontinuous at Wadsworth Parkway where it jogs to the north about 0.62 mile to its intersection with the diagonal segment of US 287, and then follows the diagonal segment southeast to 120th Avenue.

Currently, the only two crossings of US 36 for east-west travel in this area are W. Midway Boulevard (approximately two miles north of the study area) and the Wadsworth/US 36 Interchange. As Broomfield and the surrounding area have grown, this lack of continuity in the roadway network and the convergence of traffic at the Wadsworth/US 36 Interchange have led to increased congestion and travel delays on surrounding roadways, as well as presenting safety concerns. The interchange currently serves three major regional corridors: US 36, the east-west 120th Avenue corridor, and the north-south Wadsworth Parkway corridor. Both east-west and north-south travel in the area have become increasingly more difficult with the convergence of through traffic and interchange traffic on the Wadsworth bridge over US 36. All east-west through traffic on SH 128 and 120th Avenue must use the heavily congested Wadsworth/US 36 Interchange to cross US 36 which results in congestion for those wishing to travel north-south through the interchange on SH 121 or SH 287.

The purpose of the 120th Avenue Connection project is to accommodate existing and forecasted east-west through traffic, reduce out of direction travel, and alleviate congestion along area roadways, including the Wadsworth/US 36 interchange. The needs, summarized for the proposed improvement, include:

- Correcting the discontinuity of both the SH 128 and 120th Avenue corridors for through traffic crossing US 36 to reduce out-of-direction travel. Those desiring to travel east-west on SH 128/120th Avenue must now travel through the heavily congested Wadsworth/US 36 Interchange.

- Relieving peak hour congestion along 120th Avenue, SH 128 and through the intersection. Both SH 128 and 120th Avenue are operating at capacity in the peak hours, and will be above their functional capacity during peak hours in the future without the 120th Avenue Connection. Traffic forecasts indicate at least a doubling in traffic over the next 20 years. Traffic volumes are increasing due to regional and local growth and development in the vicinity resulting in congested conditions and greater traffic delays.

- Providing improved access to proposed RTD Park-n-Ride facilities. RTD is planning to relocate the existing Broomfield Park-n-Ride to new locations on both sides of US 36 in the vicinity of this project.

- Providing congestion relief in the Wadsworth/US 36 Interchange by removing most east-west through traffic, thereby improving north-south traffic on US 287 and Wadsworth Parkway.

- Reducing accident rates within the study area which are currently above the statewide average for both US 287 and SH 121/Wadsworth Parkway.

- Providing improved access and safety for pedestrians and bicyclists.

The 120th Avenue Connection project would address the needs listed above by providing a crossing of US 36 for east-west vehicular, transit, pedestrian and bicycle traffic. Completion of this improvement would ease existing and forecasted traffic congestion on SH 128 and 120th Avenue and on other area roadways such as Wadsworth Parkway, Midway Boulevard, and US 287, as well as through the Wadsworth/US 36 Interchange.

There are no additional roadways planned in the study area in the near future that would provide a connection across US 36, although consideration is being given to extending 112th Avenue across US 36 further to the south. The US 36 Corridor Environmental Impact Statement (EIS), begun in late 2003, will evaluate transportation improvement alternatives along US 36 and interchanges with US 36, including the Wadsworth/US 36 Interchange. The EIS is a multi-year project, and any potential improvements to the Wadsworth/US 36 Interchange would be phased over time. The proposed 120th Avenue Connection would be designed to accommodate any reasonably foreseeable improvements that could be made to the Wadsworth/US 36 Interchange.

In March and April of 2004 a Citizen Survey of Broomfield residents was conducted. The survey compared current results to a baseline survey conducted in 2002. As in the 2002 survey, residents felt that the most serious problem was traffic congestion, particularly on roadways within the study area. Improvements to the Wadsworth/US 36 Interchange and 120th Avenue

corridor were two of the top project priorities expressed by area residents. Fire and ambulance services were deemed to be the most important services in Broomfield in both surveys.

5.2 SECTION 4(F) RESOURCES

There are no publicly owned lands used for recreation or park purposes that would be affected by the proposed project. There are four historic properties eligible for the National Register of Historic Places (NRHP) in the study area (see **Figure 5-1**). Three of these properties could have a use of the property by one or more of the alternatives. The rusticated concrete block house (5BF9) would have no use under any alternative.

5BF9—Rusticated concrete block house—residence
This property is located at 8375 W. 120th Avenue. Broomfield County Assessor's records indicate it was built around 1900. The property is significant as an example of ornamental concrete or rusticated concrete block buildings.

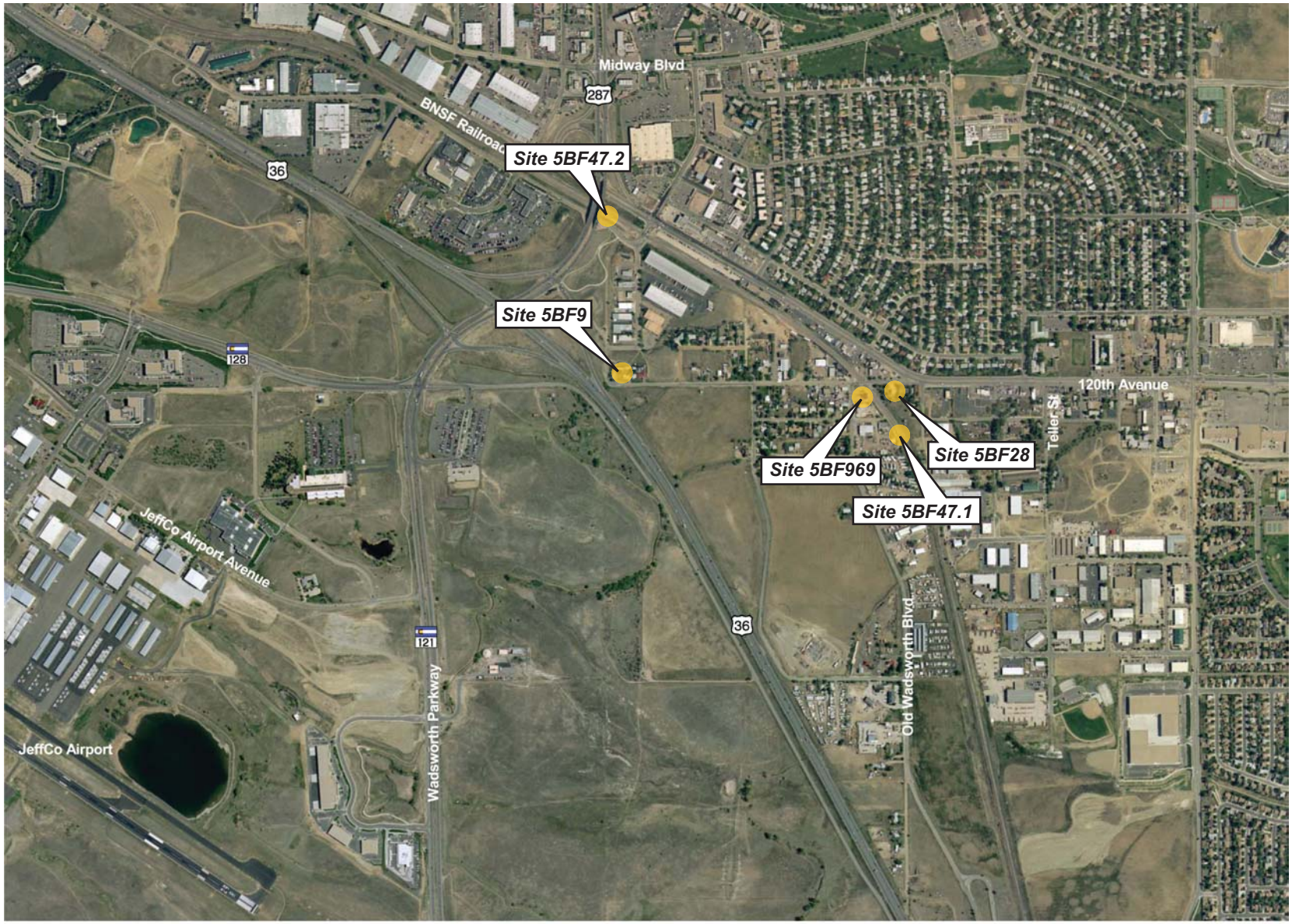
5BF28-Bungalow Style house/commercial and wood frame house—private residence
This property is located at 7420 W. 120th Avenue and appears to have been built in 1920. It includes two residences, one of which has been converted into commercial use. Both properties retain very high exterior integrity and are architecturally significant in Broomfield. They are part of Coleman's Lakeview Subdivision, one of the earliest in Broomfield and platted in the first decade of the 20th century.

5BF969-Colorado Milling and Elevator Company Grain Elevator
The Colorado Milling and Elevator Company Grain Elevator is located at 11986 Wadsworth Boulevard. This steel grain mill and storage bin held a prominent role in the early days of this settlement. Built in 1916, it operated until 1941 for the shipping and storage of grain produced by Adolph Zang on his nearby 4,000 acres and other local grain producers in the region. It is especially significant because it is one of the few steel grain elevators built. Most grain elevators were built of wood.

5BF47.1 and 5BF47.2-Burlington Northern Railroad
The Burlington Northern Railroad (now the BNSF) was initially recorded in 1981 and was determined officially eligible for inclusion on the NRHP on March 14, 1990 under criterion (a) for its importance in the history and development of Colorado. Two segments of the railroad (5BF47.1 and 5BF47.2) were surveyed for this project and contribute to the historical significance of the entire railroad. These railroad segments were built in 1881.

5.3 ALTERNATIVES

No-Action Alternative: Assumes that SH 128 and 120th Avenue would remain in their current configuration. The No-action alternative includes construction of the relocated SH 128/Wadsworth Parkway intersection and the relocation of the RTD park-n-Ride lots on both sides of US 36 to the south of 120th Avenue. The existing intersection of SH 128 and Wadsworth Parkway would be shifted approximately 300 feet south of its present location on



Aerial Source: AirPhotoUSA, 2002

Section 4(f) Properties

Figure 5-1

the west side of US 36, but the route of travel for east-west traffic along SH 128 and 120th Avenue over US 36 would be unchanged. The heavily used RTD park-n-Ride lots near the Wadsworth/US 36 Interchange will be moved to the south of their current location within the next five years. The poor traffic conditions would remain and would likely worsen as projected increases in traffic are realized as growth continues in the area. Traffic on other area roadways, including the Wadsworth/US 36 Interchange, also would worsen, resulting in significant delays. Peak hour conditions for the No-Action would have delays averaging 50 seconds per vehicle. The delay at the Wadsworth /US 30 Interchange would be over one minute, essentially metering traffic reducing the delay at some other intersections.

All Build Alternatives: The Build alternatives were developed based on the transportation needs for this project. Each build alternative includes six lanes, plus auxiliary lanes where needed, along with four-foot on-street bike lanes and six-foot sidewalks. The lane requirements were developed to provide an optimum balance of improvements along the 120th Avenue connection and the surrounding roadway network. The through lanes on the 120th Avenue connection were designed to be consistent with the existing or planned through lanes at both ends of the proposed roadway. Maintaining consistent lanes throughout is an important component of the proposed improvements due to the regional continuity of both SH 128 and 120th Avenue. **Figure 5-2** illustrates these alignments.

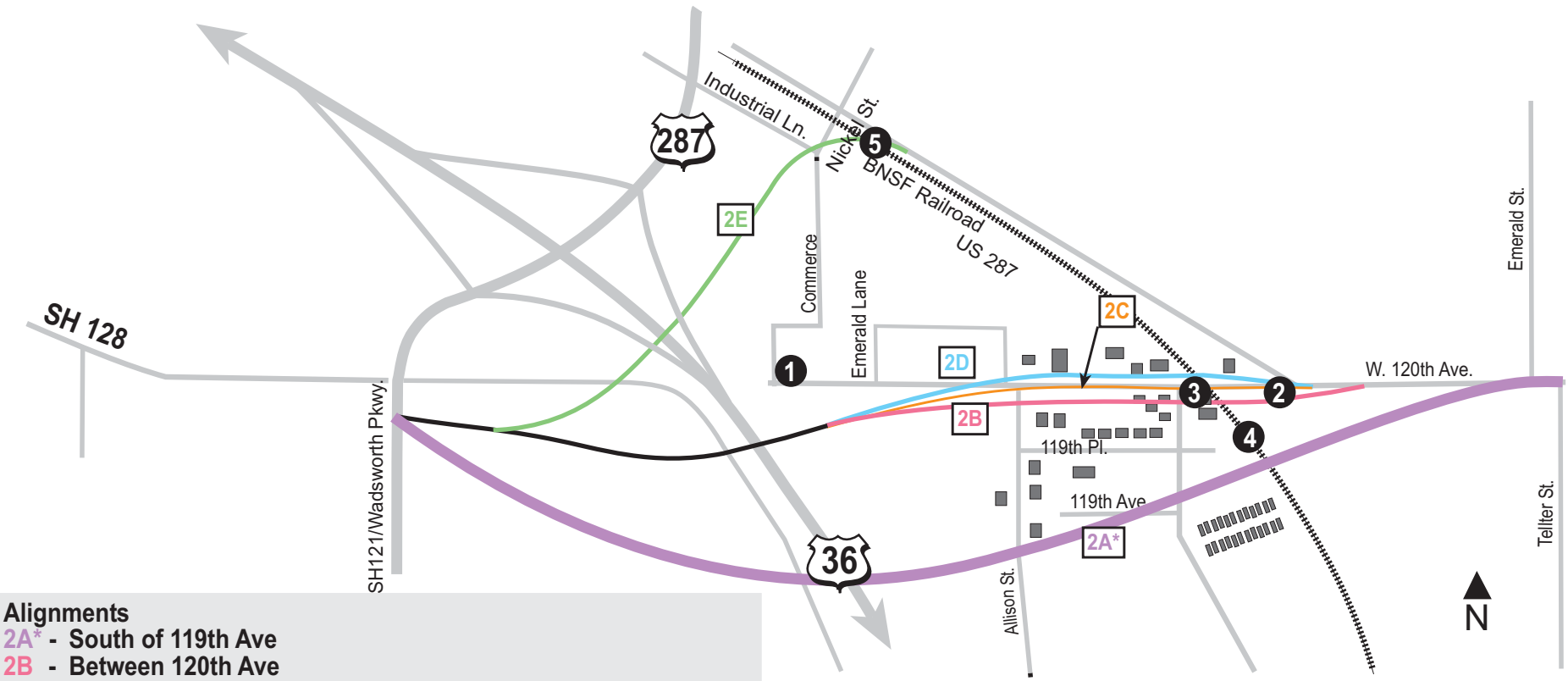
Alternative 2A (preferred): The new SH 128/120th Avenue connection would be on a new alignment to the south of the current 119th Avenue in an attempt to limit impacts to existing buildings and the established neighborhood. Alternative 2A would facilitate east-west movements, which are currently forced to go through the heavily congested Wadsworth/US 36 Interchange. 120th Avenue would be extended from Teller Street on the east to connect with the relocated SH 128 and Wadsworth intersection on the west. This alternative would drop below the BNSF Railroad.

Alternative 2B: The new SH 128/120th Avenue connection would be aligned just south of the existing two-lane section of 120th Avenue through Old Broomfield, leaving the existing two-lane road as a frontage road for buildings on the north side of existing 120th Avenue. This alternative would drop below the BNSF Railroad.

Alternative 2C: This alignment would widen the current two-lane section of 120th Avenue where possible and retain buildings on each side where access could be maintained before the alignment drops below the BNSF Railroad. This alignment would widen the current 120th Avenue on both sides of the street to a six lane facility.

Alternative 2D: The new SH 128/120th Avenue connection would be aligned just north of the existing two-lane section of 120th Avenue through Old Broomfield, leaving the existing two-lane road as a frontage road for buildings on the south side. This alignment would be widened to a six-lane cross-section. This alternative would drop below the BNSF Railroad.

Alternative 2E: This alignment does not go through Old Broomfield but stays on existing US 287 until about Marble Street (which is just east of Nickel Street). At that point the new 120th Avenue alignment would climb up and over the BNSF Railroad where the railroad crosses



Alignments

2A* - South of 119th Ave
2B - Between 120th Ave and 119th Place
2C - Center on 120th
2D - North of 120th
2E - Curve over at Nickel

*Note: Preferred Alignment

1. **5BF9** - Rusticated concrete Block House
2. **5BF28** - Bugalow Style House
3. **5BF969** - Colorado Milling and Elevator Company Grain Elevator
4. **5BF47.1 & 5BF47.2** - Burlington Northern Railroad
5.

Source: Wadsworth/US 36 Interchange Draft EA (Spring 2003)

120th Avenue Connection Alignments

Figure 5-2

Nickel Street. The new alignment would be nearly parallel with Wadsworth when crossing US 36, and then curve back to the west to meet the SH 128 alignment west of Wadsworth.

5.4 EVALUATION

5.4.1 Avoidance Alternatives

There are three alternatives that would avoid the use of all of the historic properties, the No-Action Alternative, Alternative 2E, and Alternative 2A with a bridge.

The No-Action Alternative would not meet the purpose and need for the project. It would not correct the discontinuity of both the SH 128 and 120th Avenue and reduce out-of-direction travel. Peak hour congestion along 120th Avenue, SH 128 and through the Wadsworth/US 36 Interchange would not be relieved. Access to the future RTD park-n-Ride facilities would be circuitous and disruptive for the community. Accident rates within the study area would not be reduced and improved access and safety for pedestrians and bicyclists would not be attained. Therefore, this alternative is not prudent and feasible.

Alternative 2E would partially meet the purpose and need by correcting the discontinuity of both the SH 128 and 120th Avenue corridors for through traffic crossing US 36. It would relieve congestion along 120th Avenue, SH 128 and through the Wadsworth/US 36 Interchange. The accident rates within the study area, which are currently above the statewide average for both US 287 and SH 121/Wadsworth Parkway would be reduced and there would be improved access and safety for pedestrians and bicyclists. However, this alternative would not provide improved access to the future RTD Park-n-Ride facilities, and there would be increased out-of-direction travel. This alternative may preclude interchange improvements being studied in the US 36 EIS. Therefore, this alternative is not prudent and feasible.

Alternative 2A with a bridge could avoid the use of the Section 4(f) resources. Please see the Bridge Alternatives discussion for the reasons why this alternative is not prudent and feasible.

Because these avoidance alternatives are not prudent and feasible, a least harm analysis is required.

5.4.2 Least Harm Analysis

Bridge Alternatives 2A, 2B, 2C, and 2D: All of the alternative alignments cross the BNSF railroad alignment nearly perpendicular to the proposed east-west roadway connection. Options of providing a clear span bridge over the railroad instead of an underpass were examined. Bridging over the railroad requires the road surface to be about 30 feet above the railroad grade in order to have sufficient clearance for freight operations. An underpass requires clearance for the roadway of about 23 feet below the railroad grade. Because the topography is generally sloping down from west to east, bridging the railroad would require 200- to 300-foot extension of the improvement to the east to “catch” the grade and connect to the existing 120th Avenue. This is a developed area and this extension would result in additional business

acquisitions and limiting access. Raising 120th Avenue would require the side streets also to be raised in order to connect with the new alignment causing more problems with driveways and other connections to access roads. Some connections would not be physically possible. Constructing a bridge over the railroad tracks would limit access to 120th Avenue and bisect much of the community causing more problems than currently exist. Construction costs would be increased due to the need for fill and retaining walls for the bridge over the railroad option. Visual impacts to the residential neighborhood and the mobile home park would be greater as the roadway would be elevated, and the area residents expressed preference for the underpass at the railroad crossing. Providing a clear span bridge over the railroad is not considered to be feasible and prudent for alternatives 2A, 2B, 2C or 2D

Alternative 2A (proposed action) would cross the railroad about 400 feet south of the existing at grade railroad crossing of 120th Avenue. The new roadway would cross under the tracks and a new bridge would be constructed to carry the current double railroad tracks above the depressed 120th Avenue roadway. Temporary relocation of the existing tracks is required during construction, but rail operations would not be interrupted. This alternative would require a permanent easement to go under the railroad and construct the retaining walls. No other historic properties would be affected.

Alternative 2B would have a use of three historic properties. Moving 120th Avenue to the south would put the footprint on the Bungalow Style house/commercial and wood frame house (5BF28) and the Colorado Milling and Elevator Company Grain Elevator (5BF969). The existing at grade intersection of the old 120th Avenue would remain and additional permanent easement would be required for the new road.

Alternative 2C would have a use of all historic properties. Widening 120th Avenue to the north and the south would put the footprint on the Bungalow Style house/commercial and wood frame house and the Colorado Milling and Elevator Company Grain Elevator although to a lesser extent than Alternative 2B. The existing at grade intersection of the old 120th Avenue would be replaced with an underpass and require additional permanent easement from the historic railroad for the new road.

Alternative 2D would have a use of one historic property, the historic railroad. It would avoid the use of the Colorado Milling and Elevator Company Grain Elevator and would avoid use of the Bungalow style house if a retaining wall were constructed at that location. An additional permanent easement would be required for the new road to go under the historic railroad.

5.4.3 Planning to Minimize Harm to the Historic Railroad

Alternative 2A and Alternative 2D use the historic railroad property in similar quantity. Because Alternative 2A and Alternative 2D are both the least harm alternatives, FHWA can choose either alternative. Alternative 2A has less indirect effects to the community, is less visually intrusive to the old town area of Broomfield, meets purpose and need, and is supported by the community. Alternative 2D is not supported by the community.

Alternative 2A would require a permanent easement across the railroad right-of-way. The railroad would be placed on structure, but rail use will be maintained, and there will be no disruption of service. The railroad will be restored to its original grade and alignment. The railroad will retain its integrity and will continue to convey its historic significance. These impacts were evaluated in consultation with the SHPO in March 2003, and resulted in a *no adverse effect* to the railroad.