SH 7

Cherryvale Rd. to 75th St.

State Highway 7 (Cherryvale Road to 75th Street) Environmental Assessment and Draft Section 4(f) Evaluation Boulder County, Colorado

U.S. Department of Transportation
Federal Highway Administration

Colorado Department of Transportation

May 2008

CDOT No. STA 0072-013
State Highway 7
(Cherryvale Road to 75th Street)
Environmental Assessment and
Draft Section 4(f) Evaluation
Boulder County, Colorado

Submitted Pursuant to
42 USC 4332(2)(c), 49 USC 303, 23 USC 138

by the
US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

and
THE COLORADO DEPARTMENT OF TRANSPORTATION

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Environmental Assessment Availability
Copies of the Environmental Assessment and 4(f) Evaluation are available in hard copy format for public review at the locations listed below and/or by request from CDOT Region 4. Plans of the Preferred Alternative are located in Appendix B:

- CDOT Headquarters
  Public Information Office
  4201 East Arkansas Avenue
  Denver, CO 80222
  (303) 757-9228

- CDOT Region 4 Headquarters
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  Boulder, CO 80302
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  12300 W. Dakota Ave., Suite 180
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- Boulder County Transportation Dept.
  Courthouse Annex
  2045 13th Street
  Boulder, CO 80302
  (303) 441-3900

- Boulder Public Library
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  Boulder, CO. 80302
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AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AMI	Area Median Income
APCD	Air Pollution Control Division
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe
BVCP	Boulder Valley Comprehensive Plan
BVSD	Boulder Valley School District
CBP	Colorado Butterfly Plant
CDBG	Community Development Block Grant
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CNHP	Colorado Natural Heritage Program
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
dB(A)	A-weighted decibels
DE	Diesel Exhaust
DOLA	Colorado Department of Local Affairs
DOT	US Department of Transportation
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Emergency Medical Services
EPA	US Environmental Protection Agency
ERM	EnviroClean Rocky Mountain
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System

HAP	Hazardous Air Pollutants
HCM	Highway Capacity Manual
HUD	US Department of Housing and Urban Development
IRIS	Integrated Risk Information System
Leq	The energy equivalent of steady-state sound level, over a period of time (usually an hour)
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MIS	Major Investment Study
MP	Milepost
MS4	Municipal Separate Storm Sewer System
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAICS	North American Industry Classification System
NDIS	Natural Diversity Information source
NEPA	National Environmental Policy Act
NLEF	National Low Emission Vehicle
NO_2	Nitrogen Oxide
NOX	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
OAHP	Office of Archaeology and Historic Preservation
OMB	Office of Management and Budget
Pb	Lead
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than 2.5 Microns in Diameter
PMJM	Preble's Meadow Jumping Mouse
R-A	Regional Highway
RFG	Reformulated Gasoline
RTD	Regional Transportation District
RTP	Regional Transportation Plan
RTTF	Regional Transportation Task Force
SH	State Highway
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan

SO_2	Sulfur Dioxide
SRHP	State Register of Historic Places
STIP	Colorado State Transportation Improvement Program
SWMP	Stormwater Management Plan
TCM	Transportation Control Measure
TIP	Transportation Improvement Plan
TSS	Total Suspended Solids
US	United States
ULTO	Ute Ladies'-Tresses Orchid
UNCC	Utility Notification Center of Colorado
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UST	Underground Storage Tank
VMT	Vehicle miles traveled
VOC	Volatile Organic Compounds
VoTec	Vocational and Technical Education Center
VPD	Vehicles Per Day
WQCD	Water Quality Control Division
WQCV	Water Quality Capture Volume

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Executive Summary

This Environmental Assessment (EA) evaluates the environmental, social, and economic impact of the proposed action for State Highway (SH) 7 between Cherryvale Road and 75th Street (approximately 2.2 miles). For this study, the lead federal agency is the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT) is the applicant.

This EA evaluates the impacts of the Preferred Alternative. This is compared against the No-Action Alternative.

This Executive Summary highlights the major findings of this EA related to:

- Purpose and Need
- Alternatives Evaluated
- Environmental Consequences
- Section 4(f)
- Public Participation

Purpose and Need

The primary purposes of improvements to SH 7 (Cherryvale Road to 75th Street) are to reduce congestion and enhance safety. The improvements are also intended to improve mobility for multiple modes of transportation. Refer to **Figure 1-1** and **Figure 1-2** for project location and study area.

Weekday daily traffic volumes on SH 7 range from near 19,300 vehicles per day (vpd) at the east end of the project near 75th Street to 25,000 vpd at the west end near Cherryvale Road. Traffic volumes are projected to increase in the future due to population and employment growth in the surrounding communities. The daily traffic forecast of 23,100 in 2030 is anticipated to result in two to three congested hours in each peak period. As traffic volumes increase, the two-lane corridor segments are anticipated to experience increasing congestion and will approach level of service (LOS) F during the peak hours. (Six levels of service are defined from A to F, with LOS A representing the best operating conditions and LOS F the worst. LOS E is generally considered to correspond to maximum capacity.) See **Figure 1-3**.

Traffic accidents related to substandard roadway conditions are occurring within the study area. Approach grades to Hoover Hill, in the middle of the project (adjacent to Legion Park) are steep and the sight distance over the hill is substandard. Existing paved shoulders are two to three feet in width. The roadway section provides little

room to pass an incapacitated vehicle or to easily maneuver past a turning vehicle. Right- and left-turn lanes are substandard or non-existent.

Existing conditions in the study area reduce the desirability for multiple modes of transportation. Buses utilize the same lanes as general traffic, and congestion along the corridor creates a reduced level of service for transit operation. Transit stops are on gravel shoulders or dirt areas adjacent to the highway. Sidewalk facilities exist along the north side of SH 7 between Cherryvale Road and 63rd Street. Within the study area, there are no other sidewalks, pedestrian facilities, or bike lanes.

Alternatives Evaluated

A wide range of alternatives was developed and evaluated during the EA process. The public and local, state and federal agencies were involved during the alternatives development and evaluation. Alternatives evaluated included a wide range of roadway build options, multimodal enhancements, intersection enhancements, and congestion management options. Alternatives were also evaluated for the Burlington Northern Santa Fe (BNSF) railroad alignment that crosses SH 7, because the Preferred Alternative requires the reconstruction of the BNSF railroad bridge over SH 7.

The reasonable alternatives evaluated in detail are the No-Action Alternative and Alternative 2 – the Preferred Alternative. The No-Action Alternative includes intersection improvements at the 75th Street intersection, including four through lanes of traffic along SH 7 with on-street bike lanes and sidewalks. In addition, the City of Boulder has funding for intersection improvements for transit operations along SH 7 from Cherryvale Road to east of 63rd Street. The US 36 Environmental Impact Statement (EIS) is evaluating highway and Bus Rapid Transit transportation improvements between Denver and Boulder. In addition, the Regional Transportation District (RTD) is evaluating commuter rail along the BNSF railroad corridor as part of a separate NEPA study. This corridor crosses SH 7. To support the commuter rail service, a potential park-n-Ride is being considered in the vicinity of the SH 7 and 63rd Street intersection.

The Preferred Alternative (Alternative 2) provides two through lanes in each direction on the east and west ends of the project. The two through lanes in each direction narrow to one through lane in each direction between Westview Drive and east of the railroad bridge. The proposed improvements feature curb and gutter with storm sewer for the west portion of the project and shoulders and roadside ditches for the east portion of the project.

The Preferred Alternative includes right- and left-turn lanes, improved shoulders, and improved sight distance. It also includes a sidewalk on the south side of SH 7 from 63rd Street to Westview Drive and a multi-use path on the north side for the entire length of the alignments which would replace the existing sidewalk facility between Cherryvale

Road and 63rd Street. Additionally, bicycle facilities are included by the use of the ten-foot shoulder or five-foot on-street bicycle lanes.

The BNSF railroad alternative evaluated in this document has a temporary offset alignment to the east of the existing railroad alignment during the reconstruction of the railroad bridge over SH 7.

Environmental Consequences

- The mobile home park at the southwest corner of SH 7 and 63rd Street has a high proportion of low-income and minority residents. The Preferred Alternative would require the removal of one mobile home and relocate SH 7 55 feet closer to the mobile homes.
- The Preferred Alternative would require the relocation of three business structures and one residence. It would require approximately 6.6 acres of right-of-way from 27 owners within the study area.
- Traffic congestion would improve with the Preferred Alternative and would result in 2030 intersection LOS B for the 63rd Street and BVSD signalized intersections. This compares to LOS D in 2030 for the No-Action Alternative. The Preferred Alternative results in a road segment LOS E (between BVSD and 75th Street) in the 2030 forecast. (Six levels of service are defined from A to F, with LOS A representing the best operating conditions and LOS F the worst. LOS E is generally considered to correspond to maximum capacity.)
- The Preferred Alternative would improve safety by enhancing vertical geometry, improving drainage, improving sight distance, providing clear zones for vehicle recovery, providing required auxiliary lanes, consolidating and controlling access and providing refuge for stalled vehicles.
- The Preferred Alternative would result in two residences experiencing noise levels above the Noise Abatement Criteria (NAC) in 2030.
- The Preferred Alternative would result in a permanent loss of approximately 0.309 acre of non-jurisdictional wetlands and 0.013 acre of jurisdictional wetlands.
- There would be no direct impacts to any federally listed wildlife or plant species.
- The addition of impervious area and a storm sewer system would cause storm flows to reach the outfalls more rapidly and would result in larger quantities of sediment and pollutants to enter the surrounding surface waters.

- Impacts to two historic properties would occur. Twenty feet of the Cottonwood Ditch #2 would be removed and placed in a subsurface siphon pipe. The widening of SH 7 would require the removal of approximately 25 to 35 feet of existing track of the BNSF railroad on the north side of SH 7 that would ultimately be on the newly constructed railroad bridge.
- One of the right-of-way acquisitions is a noted hazardous materials concern.
- At Legion Park, a resource protected by Section 4(f) of the DOT Act, impacts consist of grading the side slope in the area where the road is lowered and removing approximately ten trees. This would require a temporary easement. The Preferred Alternative would consolidate two adjacent park accesses into one access.
- Short- and long-term changes to the existing visual corridor would occur.
- The Preferred Alternative would result in conversion of approximately 5.0 acres of Prime farmland.
- The Preferred Alternative would require the relocation of existing utilities.

Mitigation measures include:

- Following the Municipal Separate Storm Sewer System (MS4) requirements for water quality.
- Purchasing credits at one of the three wetland mitigation banks within the primary service area for wetlands impacted by the Preferred Alternative.
- Following CDOT procedures concerning hazardous waste issues to determine project mitigation requirements.

Section 4(f)

Eight Section 4(f) properties will be impacted by the project: Cottonwood Ditch #2, the BNSF railroad, the Enterprise Ditch, Legion Park, the Butler/Smith Property, the Gas Station and Small House, the Harburg House, Barn and Gazebo and the DeBacker-Tenenbaum House. Cottonwood Ditch #2 and the BNSF railroad will be adversely effected and result in a Section 4(f) use. The impacts to the Enterprise Ditch are considered *de minimis* impacts and do not result in an adverse effect. The impacts to Legion Park, the Butler/Smith Property, the Gas Station and Small House, the Harburg House, Barn and Gazebo and the DeBacker-Tenenbaum House are considered *de minimis* impacts since they are considered temporary in nature.

Public Participation

Prior to this EA, two public open houses were held in July 2001, and February 2002, as part of the SH 7 Cherryvale Road to North 75th Street Improvement Assessment Study. A total of 135 people attended these two meetings. A total of 87 written comments and two e-mails were received.

Two public meetings were held during the course of the development of the EA, on June 17 and November 9, 2004. These meetings were advertised through postcards to adjacent property owners, advertisements in the *Boulder Daily Camera*, and signs placed at the major intersections. There were 71 people in attendance at the June meeting and 82 people in attendance at the November meeting. Meetings were also held with local, state and federal agencies throughout the EA process.

Once this EA has been completed and signed, a 30-day public and agency comment period will begin. During this period a public hearing will be held to explain the proposed action to agencies and the public, and to obtain their input. Any comments received during the comment period will be addressed in the Decision Document.

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Chapter 1.0: Purpose and Need

1.1 Background

State Highway 7 (SH 7), between Cherryvale Road in the City of Boulder through the 75th Street intersection in Boulder County (approximately 2.2 miles), is a principal east-west arterial roadway serving as a commuter and intra-regional facility (see **Figure 1-1** and **Figure 1-2).** This important arterial roadway serves the communities of Lafayette, Louisville, Erie and Boulder as well as other communities to the east. Previous studies have identified congestion, safety and multi-modal deficiencies along this segment of SH 7.

The Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) are considering improvements to this approximate two-mile section of State Highway (SH) 7. To comply with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) is being conducted to evaluate the reasonable alternatives that address the purpose and need for the project and assesses the impacts of implementing the preferred alternative. FHWA is the lead federal agency for the EA and CDOT is the applicant.

1.2 Study Area Description

The SH 7 EA focuses on the transportation needs along the corridor. The study area is predominantly in unincorporated Boulder County with the very west end being within the incorporated boundaries of the City of Boulder. A separate CDOT project addressing capacity and safety improvements at the SH 7 and 75th Street intersection was recently completed in 2006.

The west end of the study area is predominantly characterized by urban residential, commercial and light industrial uses. The middle segment is characterized by open space and undeveloped land. Finally, the east end is characterized by rural residential and commercial uses at the 75th Street intersection. The highway provides direct public access at intersections with Cherryvale Road, 62nd Street, 63rd Street, the Boulder Valley School Access Road, Westview Drive, Valtec Lane and 75th Street. Direct access to abutting land serving residential, commercial, industrial and public use is prevalent in the study area. In addition to SH 7, South Boulder Road, Baseline Road and Valmont Road provide east-west travel options serving the eastern communities of Boulder County and the City of Boulder.

Figure 1-1
Project Location

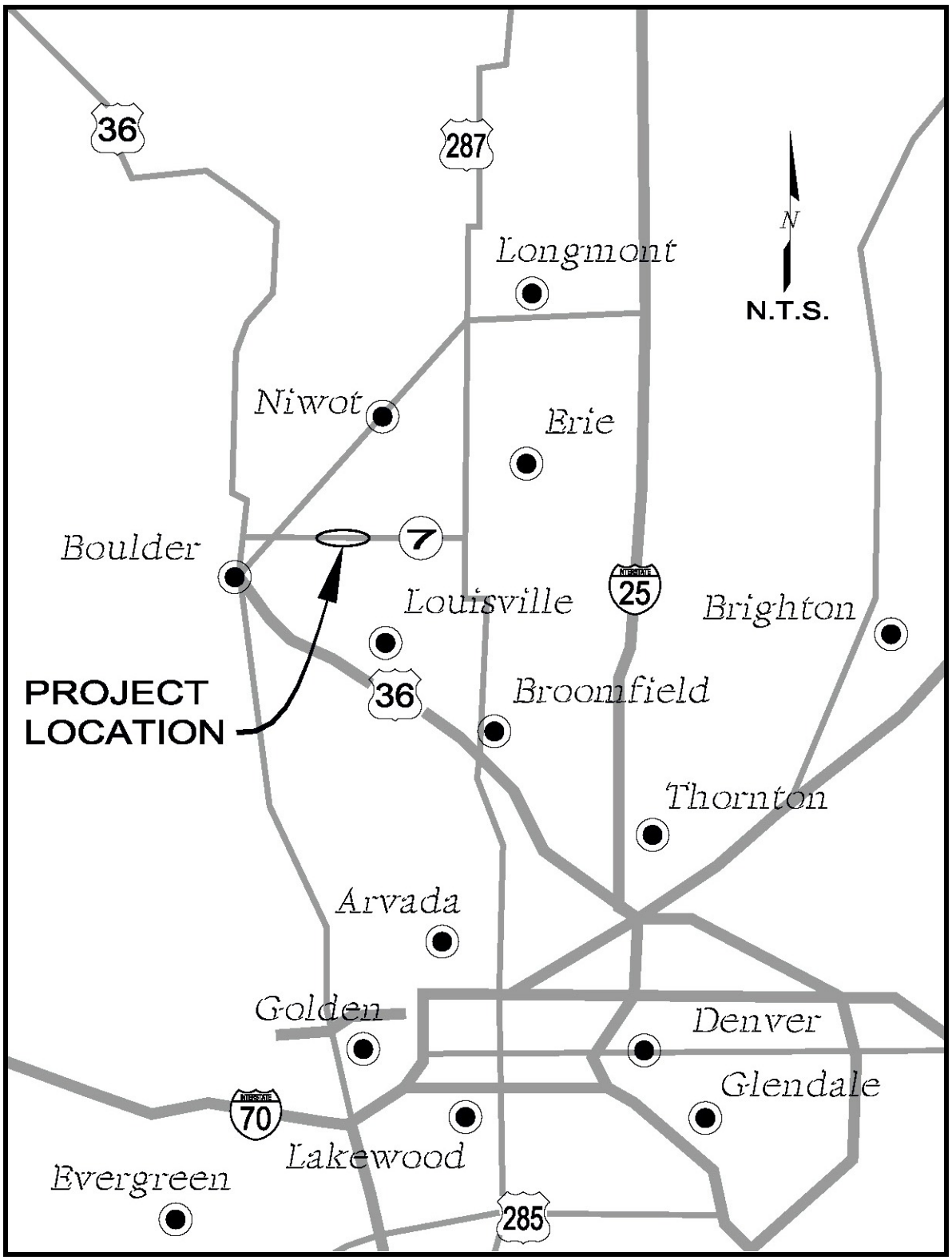
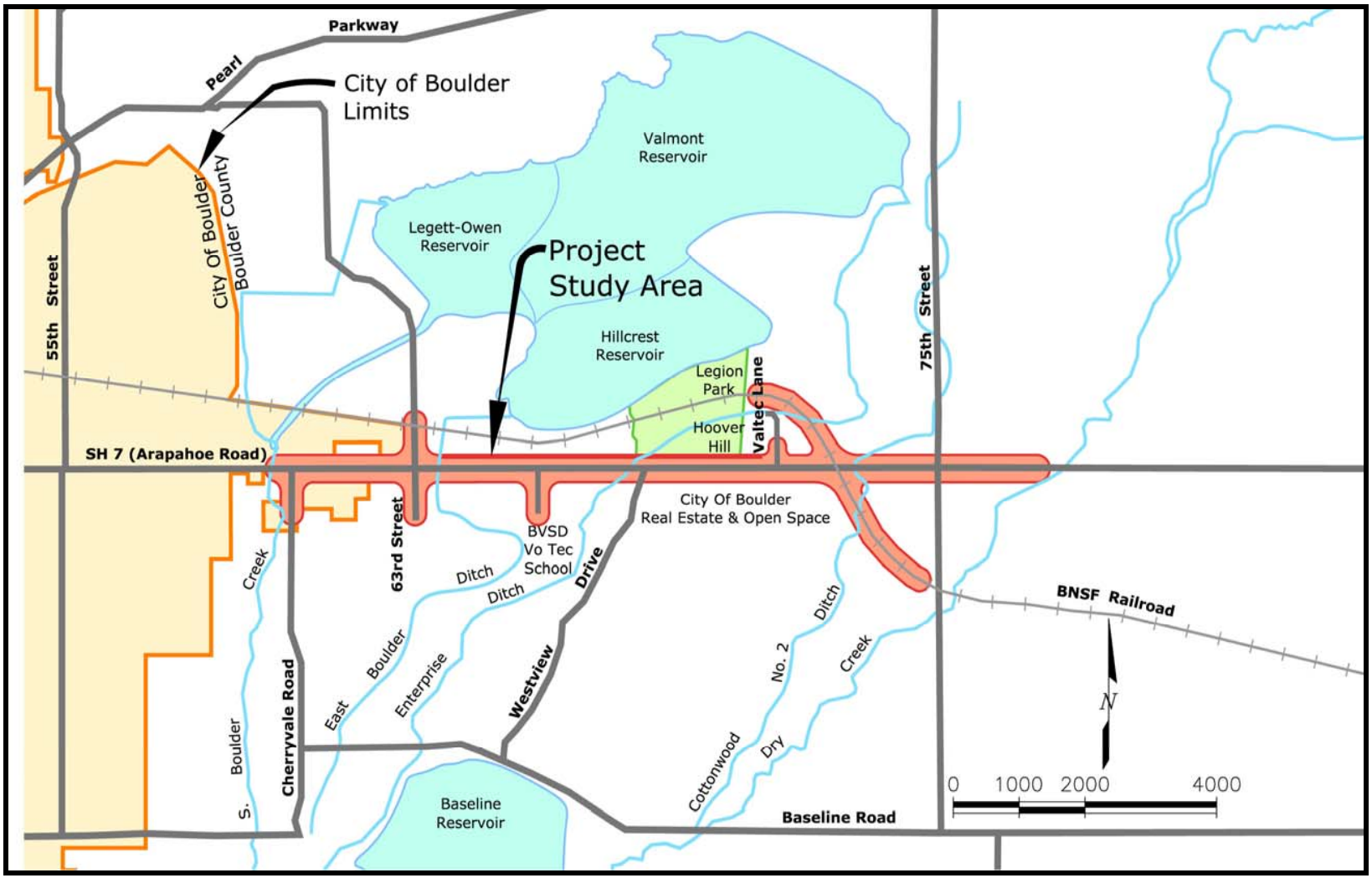


Figure 1-2
Study Area



A Burlington Northern Santa Fe (BNSF) railroad line crosses SH 7 with an overpass in the study area (see **Figure 1-2**). The existing railroad bridge structure only allows for a restricted roadway section, consisting of two travel lanes and minimal (two- to three-foot) shoulders. Modifications to the BNSF alignment are evaluated in this EA because changes to SH 7 precipitate impacts to the railroad crossing. Improvements to the safety and capacity of the BNSF railway are not included in this study.

1.3 Project History and Status

CDOT, Boulder County, the City of Boulder and other local jurisdictions have identified SH 7 as an important commuter and intra-regional arterial roadway. Population and employment growth in the City of Boulder and suburban areas east in Boulder County have brought increases in traffic along the SH 7 study corridor. The following studies and project work identify the need for improvements to the transportation system along the SH 7 study area:

- ***DRCOG 2030 Metro Vision Regional Transportation Plan -*** The DRCOG 2030 Metro Vision Regional Transportation Plan addresses the challenges and guides the development of a multimodal transportation system and is an element of the overall Metro Vision 2030 Plan. The 2030 Metro Vision Regional Transportation Plan reflects a transportation system that closely interacts with the growth, development and environmental elements of the Metro Vision Plan.

  The Regional Transportation Plan includes corridor visions for clearly identified transportation corridors. SH 7, between Cherryvale Road and 75th Street is identified as a Suburban Transition Road in the Regional Transportation Plan.

  The transportation vision for Suburban Transition Roads is to serve as multimodal arterials facilitating longer and medium distance regional trips. Future improvements will primarily increase mobility as well as maintain system quality and improve safety. Most of these roads are serviced by bus transit routes. Access control and property setbacks will be implemented in currently rural areas to protect against expensive right-of-way takings needed for widening in the future.

The goals and objectives for Suburban Transition Roads are:

  - Increase travel reliability and improve mobility for private and commercial vehicles
  - Support urban development within the Denver regions Urban Growth Boundary/Area
  - Serve the proposed Urban Centers in the corridor

- Improve management of the existing facilities and travel demand
- Provide alternative modes of transportation to travelers
- Reduce motor vehicle crash rates
- Eliminate design deficiencies
- Maintain or improve pavement to optimal conditions
- Maintain statewide transportation connections

Improvements to the SH 7 project area should be consistent with this vision statement and these goals and objectives for Suburban Transition Roads.

- The ***RTTF Final Report to the Consortiums of Cities (June 1998) -*** In 1996 the Boulder County Consortium of Cities created a Regional Transportation Task Force (RTTF) and began a study of major regional county transportation corridors. The RTTF studied six transportation corridors, of which SH 7, between Cherryvale Road and US 287 in Lafayette, was one. The RTTF *Final Report to the Consortiums of Cities* indicated that a consensus was reached regarding improvements to the SH 7 corridor, including additional turn lanes at major intersections; shoulder widening to improve safety, capacity and bicycle accommodations; extension of the existing four-lane sections through the 63rd Street intersection; improved bus service, with mini park-n-Rides, bus priority at signalized intersections and improved bus stops.

- ***US 36 MIS (June 2001) -*** The Regional Transportation District (RTD) initiated the US 36 Major Investment Study (MIS) in February 1998 to identify potential solutions to long-term transportation needs in the US 36 study corridor between Denver and Boulder. The Locally Preferred Alternative of the MIS included a new regional rail service utilizing two rail lines along the BNSF railroad alignment, which crosses the SH 7 project.

- ***US 36 Corridor Draft EIS (August 2007) -*** The purpose of the US 36 Corridor DEIS is to identify local and regional transportation improvements in the US 36 corridor between Denver and Boulder.

- ***Northwest Rail EA (Ongoing) –*** This EA includes an evaluation of passenger rail alternatives along the BNSF alignment and commuter rail park-n-Ride stations in the vicinity of the SH 7 project.

- ***SH 7 – Cherryvale Road to North 75th Street Improvement Assessment Study (March 2002) -*** CDOT initiated a study in April 2001 to gather data, evaluate and document needs for transportation improvements and outline improvement recommendations to address the capacity, safety and level of service concerns on

SH 7 between Cherryvale Road and 75th Street in Boulder County. The study assessed existing conditions, evaluated constraints along the corridor, identified needs and obtained public input. The study also identified and screened alternatives and presented recommended improvements for the corridor.

- ***SH 7 and 75th Street Intersection Improvements (2006) -*** Following the recommendations of the SH 7 – Cherryvale Road to North 75th Street Improvement Assessment Study, CDOT undertook the design of improvements to the SH 7 and 75th Street intersection. The design incorporated two travel lanes in each direction along SH 7 through the intersection, along with turn lanes on all four legs, bicycle lanes, transit queue jump lanes, improved drainage and access control, traffic signalization and lighting. These improvements to the SH 7 and 75th Street intersection are considered as completed in the evaluation of the No-Action Alternative for the EA. The intersection improvements were cleared as a Categorical Exclusion under NEPA. Construction was completed in the fall of 2006.

- ***East Arapahoe Transportation Network Plan (Ongoing) –*** The City of Boulder developed a network plan for Arapahoe Road (SH 7) in 2004 that defines transportation improvements for all modes of travel. The plan identifies proposed multi-use paths and sidewalks, on-street bike lanes and transit improvements for SH 7 east of Cherryvale Road.

In addition to the planning that has been completed, CDOT funding is identified for the reconstruction of SH 7 in the 2005-2010 Colorado State Transportation Improvement Program (STIP). The project is also identified in the Denver Regional Council of Government's 2005-2010 Transportation Improvement Program (TIP).

1.4 Overview of Purpose and Need

The primary purpose and need for improvements to SH 7 (Cherryvale Road to 75th Street) are to reduce congestion, enhance safety and improve mobility for multiple modes of transportation, summarized as follows:

- **To Reduce Congestion -** Population and employment growth in the City of Boulder, Boulder County and the surrounding communities has increased traffic along SH 7 to a level that is overloading the existing transportation system. There is currently a two hour peak traffic period during the morning and another two-hour peak traffic period in the evening. In addition, the two-lane roadway segment between 63rd Street and 75th Street currently operates at near capacity conditions, with traffic growth anticipated to continue to grow in the future.

- **To Enhance Roadway Deficiencies and Safety-** The existing roadway does not meet current design standards with regard to roadway grades, stopping sight distance, roadway shoulder widths, roadside clear zone, roadway drainage, warranted auxiliary lanes and access control. On the west end (at Cherryvale Road) and the east end (at 75th Street) of the study limits, SH 7 is a 4-lane facility, requiring traffic to transition through sub-standard lane drops to the existing 2-lane facility within the study limits. These roadway deficiencies result in unsafe roadway and operating conditions.

- **To Improve Mobility for Multiple Modes of Transportation -** The City of Boulder, Boulder County, CDOT and RTD have identified that SH 7 provides improved opportunities for multiple modes of transportation. The "JUMP" bus service currently serves SH 7 commuters utilizing general-purpose traffic lanes, but bus stops in the project area are not served by sidewalks or standard bus stop facilities. Pedestrians along SH 7 use makeshift dirt roadside trails or substandard roadway shoulders due to the lack of sidewalks. Also, the lack of bicycle trails, bicycle lanes, or standard shoulder widths do not provide adequate bicycle facilities consistent with the SH 7 vision identified in the Boulder County Bikeway Plan.

1.5 Traffic Characteristics

Weekday daily traffic volumes on SH 7 range from near 19,300 vehicles per day (vpd) at the east end of the project near 75th Street, to 25,000 vpd at the west end near Cherryvale Road.

The intersection of 75th Street was improved in 2005-2006 to add through and turn lanes in the intersection area. SH 7 narrows back to one lane each direction outside of the intersection area. The 75th Street intersection improvement has allowed AM peak hour traffic to increase about 10% on SH 7 when comparing 2007 counts to 2004 counts. PM peak traffic on SH 7 did not increase between 2004 and 2007, but that may be due to a 2006-2007 construction project further west on SH 7.

The 2007 intersection LOS was calculated at project intersections based on 2007 traffic counts. (Six levels of service are defined from A to F, with LOS A representing the best operating conditions and LOS F the worst. LOS E is generally considered to correspond to maximum capacity (see **Figure 1-3**).

Figure 1-3
Level of Service Definitions

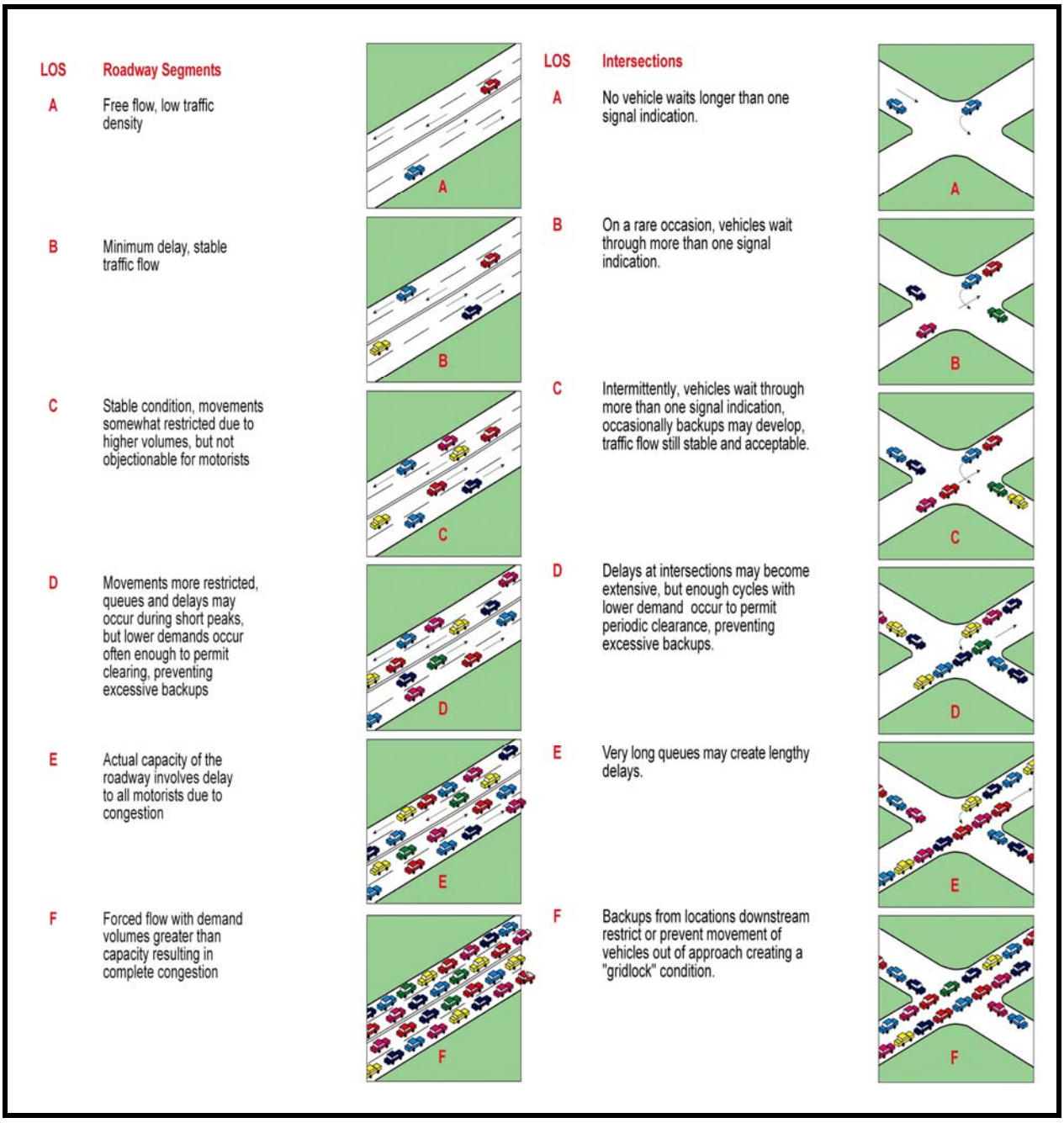


Table 1-1 shows the 2007 LOS at the signalized intersections.

Table 1-1
2007 LOS at the Signalized Intersections

SH 7 Intersection with:	AM Peak	PM Peak
Cherryvale	C	C
63rd Street	C	C
Votec access	B	B

The existing signalized LOS is generally good because the side-street traffic is relatively low, allowing SH 7 through traffic to have between 70 percent and 80 percent of the signal time.

In addition to intersection LOS, an operating LOS for the roadway in between the signals was also calculated. The existing LOS for the AM and PM peak hour for the two-lane corridor segment (from 63rd Street to 75th Street) is classified as LOS E, with travelers experiencing reduced travel speeds and significant friction from turning vehicles at access points and slow accelerating vehicles.

Based on planning conducted by Boulder County, population and employment growth in Boulder County is expected to increase 51 percent and 63 percent, respectively, between 1990 and 2020. Population and employment on the eastern extent of the SH 7 corridor, in the communities of Erie, Lafayette and Louisville, is expected to increase 113 percent and 50 percent, respectively. Many people living in the communities to the east commute along SH 7 to the Boulder area for employment.

Due to the projected increase in population and employment discussed above, traffic volumes are projected to increase on SH 7 in the future. The 2030 daily traffic is forecasted to increase about 20% to about 23,000 vpd.

Table 1-2
Traffic Trends on SH 7 between 63rd and 75th

Year	Daily Traffic
1988	10,600*
1990	13,000*
1995	14,200*
2001	16,000
2004	18,500
2007	19,300

*The counts prior to 2001 are Average Annual Daily Traffic (AADT), while more recent counts are weekday traffic counts

Table 1-2 shows traffic trends on SH 7 between 63rd and 75th Street dating back to 1988.

The No-Action Alternative will result in increasing congestion in the AM peak and PM peak periods in 2030. The 20% traffic growth will use up the remaining available peak hour capacity at the signalized intersections and result in two to three congested hours in each peak period. As traffic volumes increase, the two-lane segment of SH 7 is anticipated to experience increasing congestion and to approach LOS F during the peak hours.

1.6 Roadway Deficiencies and Accident History

The project is located in rolling terrain, with the middle section of the project dominated by a hill that is higher in elevation than the east and west ends of the project limits by approximately 120 feet. Approach grades are 7 percent on the west side of the hill and 6

percent on the east side of the hill. The approach grades can be difficult for drivers to maneuver during inclement weather. The posted speed in the vicinity of the hill is 50 mph, which correlates to a minimum stopping sight distance of 425 feet. The existing crest vertical curve has a stopping sight distance of 250 feet, which corresponds to a 35 mph design speed.

The existing paved roadway section is 28 to 30 feet in width (12-foot lanes with 2 to 3-foot paved shoulders), with additional 2- to 6-foot gravel shoulders. Roadside ditches are steep and are directly adjacent to the shoulder. This roadway section provides little room to pass an incapacitated vehicle or to easily maneuver past a turning vehicle and is leading to rear end accidents. Roadside clear zone is inadequate or nonexistent for vehicle recovery. Due to tight radii at intersections and lack of adequate shoulders many culvert end sections have been crushed due to their close proximity to the travel lanes.

Along segments of the project, there is not enough slope across the lanes to allow for adequate drainage. Also, warranted right- and left-turn lanes are either nonexistent or substandard leading to rear-end type accidents. These include the right-turn lanes for eastbound traffic at the BVSD signal, Westview Drive and 75th Street. Substandard left-turn lanes are present at Cherryvale Road, 63rd Street, the BVSD signalized intersection, and 75th Street.

There is no access control along the project. Numerous accesses are in close proximity to intersections and other accesses, creating conflict areas.

CDOT completed a Safety Assessment Report for SH 7 from Cherryvale Road through the 75th Street intersection in May 2001. Accident data for the Safety Assessment was collected and compiled by CDOT for the period from March 1, 1996 to February 29, 2000. In addition, to supplement the information developed as part of the Safety Assessment report, CDOT collected and compiled accident data for the period from March 1, 2000 to December 31, 2002. This supplemental accident data was obtained to confirm that the conditions identified in the Safety Assessment report were still valid.

The Safety Assessment Report identified that there were 128 accidents along the corridor. Of those, 40 percent of the accidents resulted in injuries to 74 persons. The overall Weighted Hazard Index for the SH 7 project area was 1.76, slightly better than average when compared with other, similar highways statewide. Approximately 50 percent of the accidents occurred in the peak hour periods. Accidents associated with intersections and driveway accesses accounted for 87 percent of the accidents. A concentration of the accidents occurred at the intersection with 75th Street. Following are other observations made as part of the Safety Assessment Report with regard to the accident data:

- Five of the accidents on SH 7 at Cherryvale Road involved eastbound vehicles during wet pavement conditions.
- Ten rear-end accidents (nine were westbound), six involving injuries, occurred at or immediately east of the intersection of SH 7 with Westview Drive.
- Eight accidents, six being rear-ends, occurred at the SH 7 intersection with Valtec Lane.
- Sixteen accidents occurred at the business accesses just west of 75th Street. Six were broadsides, involving vehicles turning left out of the accesses onto SH 7, and two were approach turns, involving vehicles turning into the accesses.
- Thirteen accidents occurred at the 75th Street intersection, with 54 percent being broadsides.

The supplemental accident data supported the findings of the Safety Assessment Report with no noted changes in type or frequency of accidents.

1.7 Alternative Modes of Transportation

The City of Boulder/RTD provides the "JUMP" bus service every 10 minutes to the Boulder Valley School District (BVSD) Vocational and Technical Education Center (VoTec) with a bus that continues to the Lafayette park-n-Ride every 30 minutes. There are bus stops along SH 7 at 63rd Street, the BVSD signal, Valtec Lane and at 75th Street. In addition, there are bus stops within the BVSD Vocational School internal circulation routes. Ridership along the JUMP route is approximately 1,800 passengers per day.

Buses utilize the same lanes as general traffic. Congestion along the corridor creates a reduced level of service for transit operation. Transit stops are on gravel shoulders or dirt areas adjacent to the highway. Bus stop locations do not have bench facilities, shelters, sidewalk facilities, or pedestrian access to adjacent land uses.

Sidewalk facilities exist along the north side of SH 7 between Cherryvale Road and 63rd Street. There are no other sidewalks or pedestrian facilities along SH 7 in the study area. An existing bike lane along SH 7 ends just east of Cherryvale Road. Existing paved shoulders along the study area are generally two to three feet in width with an additional two- to six-foot gravel shoulder. Substandard clear zones characterize the roadway, providing little recovery area for bicyclists.

On the Boulder County Bikeway Plan, SH 7 is designated as a proposed on-road bike facility. The bikeway plan designates that on-road bike facilities shall be accommodated by a minimum four-foot shoulder. SH 7 intersects with 75th Street and 95th Street, which are also designated as major bike routes.

The programmed FasTracks commuter rail corridor, which will parallel and then cross SH 7 along the BNSF railroad right-of-way, is likely to attract patrons to the park-n-Ride in the study area.

Chapter 2.0: Alternatives

2.1 Introduction

The National Environmental Policy Act (NEPA) requires that reasonable alternatives, including a No-Action Alternative, be presented and evaluated in a NEPA document. This chapter describes the process used to identify the alternatives that are fully assessed in this Environmental Assessment (EA). Engineering plan sheets depicting the preliminary Preferred Alternative are included in **Appendix B**.

The EA process began with scoping to identify issues and concerns related to SH 7 and its potential improvement. These issues and concerns were used to:

- Develop the Purpose and Need for the project.
- Identify screening criteria to apply to the alternatives development.
- Develop a range of alternatives to evaluate.
- Identify reasonable alternatives to retain for further study.

2.2 Description of Preliminary Alternatives

Section 2.2.1 contains a list of alternatives from which a preliminary screening was conducted. They are categorized as Roadway Build Alternatives and a Congestion Management Alternative. In addition, three Burlington Northern Santa Fe (BNSF) railroad alignment alternatives were evaluated as part of this study, since the roadway build alternatives require reconstruction of the BNSF bridge overpass.

In addition to the alternatives considered, numerous options that could be included as part of the build alternatives were evaluated. These options included the following: Multimodal Enhancement Options and Intersection Enhancement Options. Also, refinements to the build alternatives were considered and evaluated as modifications to the build options to address impacts to environmental resources.

All alternatives were designed to meet applicable design criteria. The criteria were based upon American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, the Colorado Department of Transportation *Design Guide*, the City of Boulder *Design and Construction Standards* and the Boulder County *Road Standards and Specifications*. Auxiliary lanes will be provided where warranted by CDOT's *State Highway Access Code* (2003) and designed per *A Policy on Geometric Design of Highways and Streets*. The access category is Non-Rural Arterial (NR-B) between Cherryvale Road and 63rd Street, Non-Rural Principal Highway (NR-A) between 63rd Street and Westview Drive, and Rural Highway (R-A) between Westview Drive and 75th Street. The design speed between

Cherryvale Road and Westview Drive is designated as 45 mph and the design speed between Westview Drive and 75th Street is designated as 55 mph.

The No-Action Alternative assumed that no system improvements, other than those identified below, are made within the study area to meet the project goals. Common to all of the alternatives, including the No-Action Alternative, is the reconstruction of the SH 7 and 75th Street intersection by Colorado Department of Transportation (CDOT) as a separate, previously identified and designed improvement. In addition, the No-Action Alternative includes intersection improvements for transit operations funded by the City of Boulder. Finally, the No-Action Alternative includes any improvements that would occur as a result of the ongoing US 36 EIS.

2.2.1 Roadway Build Alternatives

Initially, build alternatives were identified and developed that addressed the western and eastern extents of the study area separately (reflecting the urbanized and rural segments). These preliminary alternatives are shown in Appendix A. The western extents, from Cherryvale Road to Westview Drive, is designated as an urban arterial roadway, has an urban character, and is mostly located in the City of Boulder urbanized area with adjacent land use categorized as urban commercial, industrial and institutional (Boulder Valley School District facilities). The eastern extents, from Westview Drive to 75th Street, is designated as a rural arterial roadway, with undeveloped City of Boulder Open Space, a Boulder County rural park, and undeveloped agricultural land scattered with some concentrated commercial and industrial development. Roadway Build Alternatives were categorized as W-1 to W-5 for the western extents and as E-1 to E-5 for the eastern extents as follows:

Western Extent Alternatives—Cherryvale Road to Westview Drive

- **W-1—No-Action Alternative:** The No-Action Alternative assumes programmed improvements at the intersection of SH 7 and 75th Street, intersection improvements for transit operations from Cherryvale Road to east of 63rd Street and possible commuter rail and park-n-Ride facilities associated with the ongoing US 36 Environmental Impact Statement (EIS).

- **W-2—Two-Lane Urban Section with Enhanced Turn Lanes:** This alternative would include one through lane in each direction with curb and gutter (rather than roadside ditches). Warranted turn lanes for left- and right-turning vehicles were incorporated.

- **W-3—Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd), Transitioning to Two-Lane Section East of VoTec:** The four-lane urban section would include curb and gutter with two lanes in

each direction and warranted auxiliary lanes for left- and right-turning vehicles. This alternative would transition to a two-lane section east of the VoTec signal. This alternative would be consistent with Eastern Extent alternatives that include one lane in each direction (Alternatives E-2 and E-3).

- **W-4—Four-Lane Urban Section:** Throughout the entire western extents of the project, four lanes would be constructed with warranted auxiliary lanes. This alternative would be consistent with Eastern Extent alternatives that include two lanes in each direction (Alternatives E-4 and E-5).

- **W-5—Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd):** This alternative would be similar to Alternative W-4, with the additional inclusion of a continuous auxiliary lane from Cherryvale Road through the 63rd Street intersection in each direction. Although this additional lane would be an auxiliary lane, it would provide a continuous third lane along that portion of the segment. The remainder of the alternative would be the same as Alternative W-4.

Eastern Extent Alternatives—Westview Drive to 75th Street

- **E-1—No-Action:** The No-Action Alternative assumes programmed improvements at the intersection of SH 7 and 75th Street, intersection improvements for transit operations from Cherryvale Road to east of 63rd Street and possible commuter rail and park-n-Ride facilities associated with the ongoing US 36 EIS.

- **E-2—Intersection Safety Improvements at Valtec and Westview Drive:** This alternative would address safety concerns at Valtec and Westview Drive by providing auxiliary lanes for left- and right-turning vehicles.

- **E-3—Two-Lane Rural Section:** This alternative would include a two-lane roadway section (one in each direction) with a continuous center two-way left-turn lane, widened shoulders to accommodate design standards and bicycles, improved vertical geometry to accommodate vertical sight distance and vertical grade deficiencies, clear roadsides to enhance safety and roadside drainage ditches.

- **E-4—Four-Lane Rural Section:** This alternative would be very similar to Alternative E-3, with the exception that two through lanes of travel would be provided in each direction. The designation as a rural section generally implies that shoulders and roadside ditches are utilized as opposed to bike lanes, curb and gutter and a storm sewer system typical of an urban section.

- **E-5—Four-Lane Urban Section with Sidewalks.** Alternative E-5 would provide a four-lane urban type section. In this roadway section, curb and gutter with a subsurface storm sewer system would be provided, along with adjacent sidewalks.

2.2.2 Congestion Management Alternative

In addition to build alternatives, a non-build alternative was considered. The congestion management alternative considered the following strategies:

- Encourage carpools and promote the Denver Regional Council of Governments (DRCOG) vanpool program.
- Increase the frequency of bus service and encourage additional bus ridership.
- Encourage telecommuting and flex hours.

Downtown Boulder is already using many creative ways to bring commuter benefits to the community. The City offers the EcoPass, an unlimited regional transit pass for bus and light rail, free of charge to the employees of all downtown businesses. In addition, the City provides a wide range of commuter benefits including bike parking throughout the downtown area, electric bikes, and a full-service Transportation Resource Center.

2.2.3 BNSF Railroad Alignment Alternatives

A subset of alternatives with regard to the BNSF railroad alignment was also evaluated, since roadway build alternatives would require the reconstruction of the BNSF railroad bridge over SH 7. The following railroad alignment alternatives were considered:

- **R-1 – No-Action**
- **R-2—Reconstruct with Alignment in Existing Location:** This alternative would require the construction of a temporary railroad alignment and bridge over SH 7 to allow the construction of a new bridge along the existing railroad alignment over SH 7.
- **R-3—Realign to the East in Existing Right-of-Way:** This alternative would realign approximately 4,000 feet of the existing railroad approximately 25 feet east of the existing alignment. This alignment shift would remain within the existing railroad right-of-way. The offset alignment would transition back to the existing alignment through the horizontal curves north and south of the offset alignment.

- **R-4—Realign to the West in Existing Right-of-Way:** This alternative would realign approximately 4,000 feet of the existing railroad approximately 25 feet west of the existing alignment. This alignment shift would remain within the existing railroad right-of-way. The offset alignment would transition back to the existing alignment through the horizontal curves north and south of the offset alignment.

2.2.4 Multimodal Enhancement Options

Multimodal build enhancement options were evaluated for inclusion into the build alternatives. These enhancements were identified to address bicycle, pedestrian and transit accessibility issues and were outlined as follows:

- **Continuous On-Street Bicycle Lanes / Shoulders:** Bicycle facilities in the form of bike lanes or shoulders were included in all build alternatives except Alternative E-2, which is an intersection safety improvement only. The City of Boulder, Boulder County and local stakeholders have all expressed the need for bicycle facilities.

- **Sidewalks:** Sidewalks (either attached or detached) were considered as options for all build alternatives. Various locations were evaluated.

- **Multi-Use Trails:** Multi-use trails (typically wider than sidewalks) were considered at various locations to provide multimodal access to adjacent land uses and along the length of the project.

Many of these multimodal options were included in the roadway build alternatives in various forms.

2.2.5 Intersection Enhancement Options

Intersection operations could be enhanced by providing separate lanes for turning or waiting vehicles and by providing buses with the ability to "jump" queued vehicles at signalized intersections. Intersection enhancement options were evaluated for inclusion into build alternatives. They are:

- **Turn Lanes and Deceleration and Acceleration Lanes:** Auxiliary lanes, which include left- and right-turn lanes along with acceleration lanes and decelerations lanes, are an important safety and capacity element of a roadway transportation system. Both local and state criteria dictate where lanes are warranted. Their inclusion allows for safe and efficient vehicle maneuvers at intersections.

- **Transit Queue Jump Lanes:** Transit queue jump lanes use the right-turn acceleration and deceleration lanes as an option for the bus to bypass any queue. This requires modifying the right-turn islands at an intersection to allow a "bus-only" through movement. This option does not require special signal timing.

- **Transit Signal Priority Lanes:** Transit signal priority lanes allow a bus to bypass vehicles queued in the through lanes. This requires special signal phases for buses that could occur every phase or be triggered by the presence of a bus.

2.2.6 Environmental Resource Avoidance Variations

The presence of National Register of Historic Places (NRHP)-eligible resources, low-income and minority populations, and the presence of mature vegetation at the Boulder County Legion Park and the City of Boulder Open Space presented the need to evaluate avoidance or minimally impactful variations of the build alternatives. The following variations were considered and evaluated:

- Roadway alignment shifts were evaluated to minimize impacts to historic resources, including the historic gas station on the northeast corner of 63rd Street, the Harburg property and the Tenenbaum property.

- Roadway alignment shifts were evaluated to minimize impacts to low-income and minority populations in the study area. In particular, the SH 7 alignment and typical section were evaluated at the 63rd Street intersection to assess the avoidance of impacts to the mobile home park on the southwest corner of the 63rd Street intersection.

- Mature vegetation exists at the Boulder County Legion Park and the City of Boulder Open Space near the high point along the project. The construction of build alternatives would require lowering the highpoint along the roadway in this area, resulting in the need to transition back to existing ground level with graded side slopes or with retaining walls. These two options were evaluated for these build alternatives.

2.3 Preliminary Alternatives Evaluation

A two-step process was used to evaluate the alternatives. The Preliminary Alternatives Evaluation assessed the initial alternatives against a wide range of parameters, including transportation, community, environmental and construction issues. Members of the project team developed the evaluation parameters. The parameters were based on input from Boulder County, City of Boulder, Federal Highway Administration (FHWA), resources agencies and the issues as identified from public meetings.
The preliminary alternatives evaluated were broken out into the following categories:

1. No-Action
2. Congestion Management
3. Improvement Alternatives—Cherryvale Road to Westview Drive
4. Improvement Alternatives—Westview Drive to 75th Street

In the preliminary evaluation, a relative scale was used to rate the alternatives. The project team (design and environmental specialists) evaluated the effectiveness of the alternatives against the evaluation criteria. This preliminary screening gained concurrence from the project team and the City of Boulder and Boulder County.

Multimodal enhancements and intersection enhancements were not considered as individual stand-alone build alternatives, since they do not address the full spectrum of the identified Purpose and Need for the project. Based upon public feedback, community planning and compatibility with local design standards, some elements of the typical section were included for all the build alternatives carried forward. These included bicycle lanes, sidewalks and multi-use trails as well as auxiliary lanes and queue jump/bus priority lanes.

2.4 Preliminary Screening Summary

Based on the results of the Preliminary Alternatives Evaluation, the following alternatives did not sufficiently address the Purpose and Need, and were not carried forward for more detailed evaluation. The primary reasons for eliminating each alternative are outlined below:

- **Congestion Management:** Although the strategies listed on page 2-4 will encourage some additional use of the JUMP system, these strategies by themselves do not fulfill the project Purpose and Need, specifically improving safety, upgrading outdated transportation facilities and providing bicycle facilities.

- **Alternative W-2: Two-Lane Urban Section with Enhanced Turn Lanes:** Although this alternative would have improved traffic operations over the No-Action Alternative, it still resulted in a poor traffic operating condition and was not compatible with local planning efforts [the Boulder County Regional Transportation Task Force (RTTF) and the City of Boulder East Arapahoe Transportation Network Plan].

- **Alternatives W-4: Four-Lane Urban Section and W-5: Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd) -** During the Preliminary Alternatives Evaluation, it was decided that the

remaining alternatives should be refined to address public feedback and project constraints. It was determined that continuous acceleration/deceleration lanes in both directions from Cherryvale Road through the 63rd Street intersection should be considered based upon criteria and need. These auxiliary lanes would also serve as transit lanes identified by the City of Boulder as a desirable enhancement. Therefore, Alternatives W-3 and W-4 would be sufficiently similar to be combined into one alternative. Similarly, Alternative W-5 was no longer sufficiently different to warrant its continuance as an independent alternative. Alternative W-5 served as an avoidance alternative for the gas station (NRHP-eligible property) on the northeast quadrant of the 63rd Street intersection. Avoidance alternatives were further defined in the description of the Preferred Alternative.

- **Alternative E-2: Intersection Safety Improvements at Valtec and Westview Drive:** This alternative was developed to address safety concerns identified as part of the *Safety Assessment Report* conducted by CDOT. While the alternative would provide improved safety at the intersecting street locations of Westview Drive and Valtec Lane, it did not sufficiently address the other elements of the Purpose and Need for the project; specifically, improving safety along the other sections of SH 7, upgrading outdated transportation facilities and providing bicycle facilities. The safety improvements specific to Alternative E-2 were incorporated into the Preferred Alternative.

- **Alternative E-4: Four-Lane Rural Section:** For the eastern extent of the project, Alternatives E-3 and E-5 would be advanced for further consideration. Alternative E-5 is a variation of E-4 (E-5 is an urban section and E-4 is a rural section) and is not sufficiently different to carry both E-4 and E-5 forward.

Based upon this preliminary screening, the combined alternatives of Alternative W-3 with Alternative E-3 and Alternative W-3 with Alternative E-5, along with the No-Action Alternative, were further considered and designated as follows:

- **Alternative 1**: No-Action

- **Alternative 2: Combined W-3 and E-3**: Four-Lane Urban Section (curb and gutter) with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd), Transitioning to Two-Lane Rural Section (shoulders) East of VoTec to the 75th Street Intersection.

- **Alternative 3: Combined W-3 and E-5**: Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd), Transitioning to a Four-Lane Rural Section East of Westview Drive to the 75th Street Intersection.

In addition to the described enhancements, both build alternatives incorporate continuous bicycle lanes. Also, a multi-use path is included on the north side of SH 7 between Cherryvale Road and 75th Street, and a sidewalk is included on the south side of SH 7 between Cherryvale Road and Westview Drive. Auxiliary lanes and either transit queue jump lanes or transit signal priority lanes were incorporated.

Since both build alternatives include the requirement to replace the BNSF railroad bridge, an evaluation of railroad alternatives was also conducted as part of the Short-Listed Alternatives Evaluation.

2.5 Railroad Alternatives Evaluation

A BNSF railway line crosses SH 7 between 63rd Street and 75th Street and currently conveys about six trains per day. The existing railroad overpass structure is designated DOT 244809X and is located in the BNSF Front Range Subdivision at BNSF milepost 24.04 in Boulder County, Colorado.

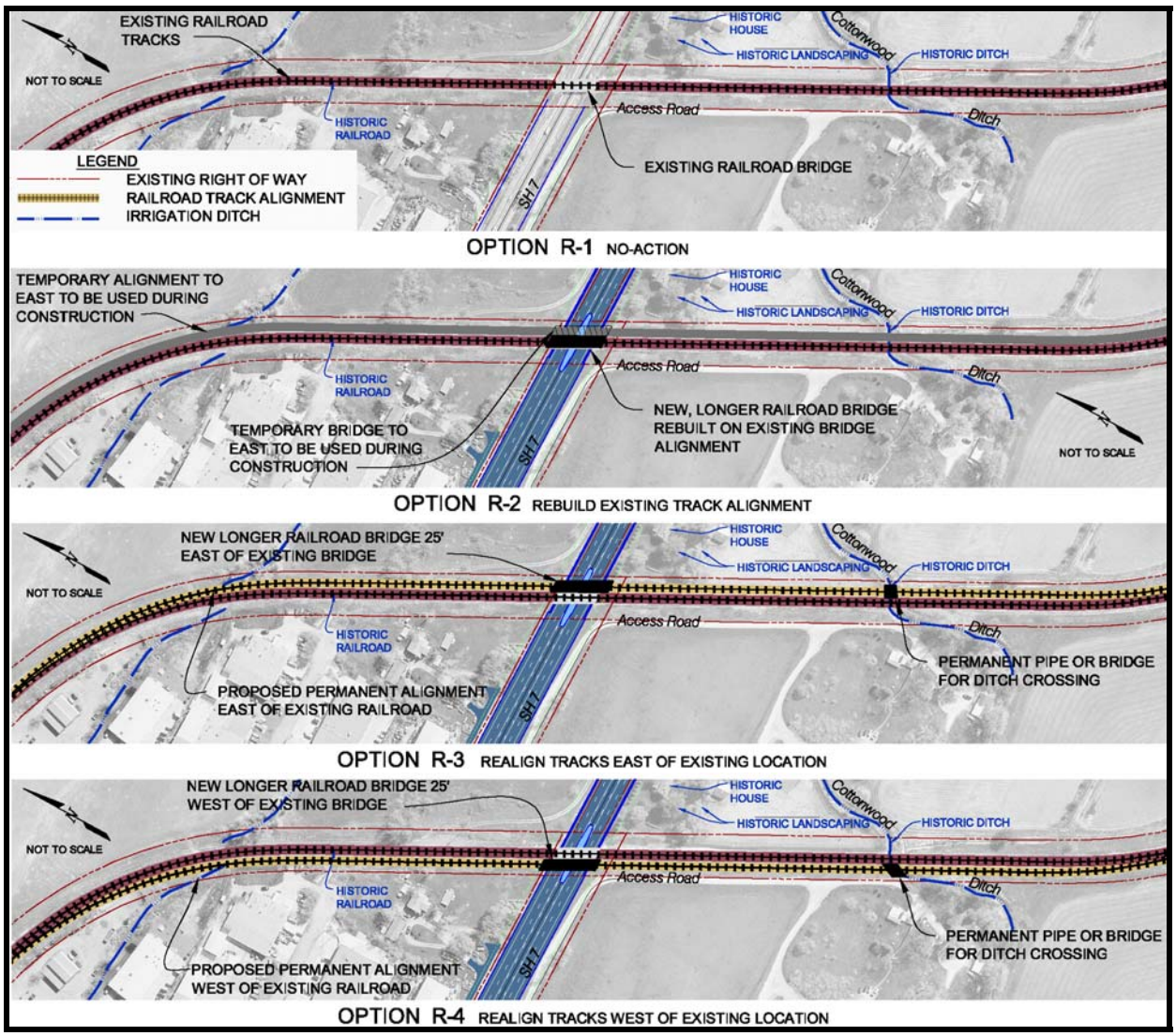
The existing bridge was built in 1931 and consists of three simple spans with a ballast covered concrete deck. The substructure consists of concrete stub abutments and concrete wall piers.

Under Alternative 2 or 3, the 40-foot existing center span and end span configuration would not accommodate the proposed roadway safety and capacity improvements with bikeways and sidewalks. Therefore, railroad alternatives to accommodate the replacement of the existing bridge were developed and evaluated as part of a build alternative. The railroad structure in all the alternatives would accommodate a four-lane principal arterial typical section, regardless of which roadway alternative is built.

2.5.1 Description of Railroad Alternatives

It has been determined that rerouting train traffic during construction to an alternate route is not practical; therefore, either a temporary bridge and temporary alignment or a permanent offset alignment would be required. The existing BNSF right-of-way is 100 feet wide with the existing track centered in the railroad right-of-way. The alternatives evaluated are shown in **Figure 2-1**. Coordination with BNSF has occurred to ensure that the alternatives are acceptable. Coordination has also occurred with Regional Transportation District's (RTD's) US 36 EIS project team, which, at the time this report was written, is analyzing the BNSF rail corridor as a commuter rail corridor. The railroad alternatives considered in this EA do not preclude the build options in the US 36 EIS. The following is a description of railroad alternatives evaluated:

Figure 2-1
Railroad Alternatives



- **Railroad Alternative 1: No-Action**: The No-Action Alternative assumed no improvements are made and the existing bridge would remain in place.

- **Railroad Alternative 2: Rebuild on Existing Alignment:** This alternative would require the construction of a temporary bridge and temporary alignment offset 25 feet to the east of the existing alignment. This temporary alignment would be required so that the new, longer bridge over SH 7 could be constructed in the existing bridge location while train operations continue on the temporary alignment. The temporary offset alignment would be approximately 4,000 feet in total length. The ultimate railroad alignment would follow the existing railroad

alignment. The temporary railroad alignment and temporary bridge would be removed once the new railroad facilities are completed.

For this alternative, a temporary pipe or bridge to carry the temporary railroad alignment over the Cottonwood Ditch # 2 would also be required. This temporary pipe or bridge would be removed following the need for the temporary alignment.

- **Railroad Alternative 3: Realign Tracks East**: This alternative would require the construction of a permanent alignment offset 25 feet to the east of the existing alignment. This permanent alignment would include a longer bridge over SH 7 to accommodate the widening of the highway. The vertical alignment of this alternative would match the existing vertical alignment. SH 7 is on a downgrade to the east; therefore, offsetting the railroad alignment to the east would result in the roadway not requiring further lowering to achieve clearance under the ultimate railroad bridge. The offset alignment would be approximately 4,000 feet in total length. The existing railroad alignment would be used for train traffic while the new alignment and bridge are constructed.

  For this alternative, a permanent pipe or bridge to carry the railroad alignment over the Cottonwood Ditch would be required.

- **Railroad Alternative 4: Realign Tracks West:** This alternative would require the construction of a permanent alignment offset 25 feet to the west of the existing alignment. This permanent alignment would include a longer bridge over SH 7 to accommodate the widening of the highway. The vertical alignment of this alternative would match the existing vertical alignment. SH 7 is on a downgrade to the east; therefore, offsetting the railroad alignment to the west would result in the roadway requiring further lowering to achieve clearance under the ultimate railroad bridge. The offset alignment would be approximately 4,000 feet in total length. The existing railroad alignment would be used for train traffic while the new alignment and bridge are constructed.

  For this alternative, a permanent pipe or bridge to carry railroad alignment over the Cottonwood Ditch would be required, and approximately 100 feet of the Cottonwood Ditch would have to be realigned or placed in a pipe.

2.5.2 Railroad Alternative Evaluation

The Alternatives Evaluation assessed the four railroad alternatives against parameters including community, environmental, and construction issues. The project team developed evaluation parameters. The railroad evaluation matrix is shown in **Table 2-1**.

Both Alternative 3 and 4 result in an offset alignment for the ultimate configuration of the railroad alignment resulting in greater impacts to the Colorado and Southern Railway and to the Cottonwood Ditch, both historic and 4(f) resources, than Alternative 2. In order to minimize impact to these historic and 4(f) resources, Railroad Alternative 2, Rebuild on Existing Alignment, was identified as the preferred railroad alternative.

Table 2-1
Railroad Evaluation Matrix

	Railroad Alternatives			
	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Issues	No Action	Re-build on Existing Alignment	Realign Tracks East	Realign Tracks West
Community Issues				
Right-of-Way Impacts	●	●	◕	◒
Compatible with RTD and US 36 EIS	○	●	●	◒
Environmental Issues				
Wetlands	●	◒	◒	◒
Noise	◒	◒	◒	◒
Historic Resources	●	◕	◒	◔
Section 4(f)	●	◕	◒	◔
Endangered Species	●	◒	◒	◒
Wildlife	●	◒	◒	◒
Construction Issues				
Cost	$0 M ●	$2.8 M ◔	$2.1 M ◒	$2.1 M ◒
Constructability	●	◒	◕	◕
RELATIVE IMPACT SCALE BEST	●	◕	◒	◔	○ WORST

2.6 Short-Listed Alternatives Evaluation

Based on the preliminary screening of alternatives, feedback from the general public and public agencies, and refinement by the project team, the evaluation criteria were further refined for the screening of short-listed alternatives. The short-listed alternatives evaluation matrix is presented in **Table 2-2**.

As a result of the alternative evaluation and refinement process, the No-Action and Alternative 2 were advanced for further analysis in this EA. Additionally, rebuilding the railroad on the existing alignment (Railroad Alternative 2) was analyzed

Table 2-2
Final Evaluation Matrix

Issues	Improvement Alternatives		
	Alt. 1	**Alt. 2**	**Alt. 3**
	No Action	**Four-Lane Urban with Transit Lanes West of 63rd, 4-Lane Urban to Votec, 2-Lane Rural to 75th Improvements**	**Four-Lane Section with Transit Lanes West of 63rd, Urban West of Westview, Rural East of Westview.**
Transportation Issues			
Traffic Operations (AM Peak / PM Peak) 63rd Intersection (Signalized Intersection-LOS) BVSD Intersection (Signalized Intersection-LOS) Road Segment BVSD to 75th (LOS) Travel Time 75th to Cherryvale	 E / D D / D E / E 6 min.	 B / B B / B E / E 5 min.	 B / B B / B C / C 5 min.
Safety	Substandard Shoulders, Sight Distance, Acceleration and Deceleration lanes	Improved Geometry, Sight Distance and Access Management	Improved Geometry, Sight Distance and Access Management
Pedestrian and Bicycle Enhancements	None	Add Sidewalks Add Bike Lanes	Add Sidewalks Add Bike Lanes
Transit Enhancements	No	Yes Improved Stops and Accessibility, Bus Priority Features Incorporated	Yes Improved Stops and Accessibility, Bus Priority Features Incorporated
Community Issues			
Owner / Business Relocations	0 Residential 0 Business	1 Residential Mobile Home 3 Business	1 Residential Mobile Home 3 Business
Right-of-Way Impacts	0 Buildings 0 Parcels	4 Buildings 27 Parcels	4 Buildings 29 Parcels
Impact to Low Income or Minority Populations	None	One mobile home taken, some loss to community property, and change in access to property	One mobile home taken, some loss to community property, and change in access to property
Access from Adjacent Properties	Poor	Good All Warranted Auxiliary Lanes Incorporated	Good All Warranted Auxiliary Lanes Incorporated
Compatible with Local Planning (RTTF and East Arapahoe Transportation Network Plan)	No	Yes	Partial
Compatible with Regional Planning (DRCOG)	No	Yes	Partial
Public Support	Generally Unsupported	Generally Favored Over No Action	Generally Preferred
Environmental Issues			
Wetlands	0 Acres	0.013 Acres Jurisd. 0.309 Acres Non-Jurisd.	0.013 Acres Jurisd. 0.309 Acres Non-Jurisd.
Noise	0 Receptors Impacted	2 Receptors Impacted	2 Receptors Impacted
Air Quality	No Improvement	Some Improvement	Some Improvement
Historic Resources	0 Properties Adversely Impacted	2 Properties Adversely Impacted	2 Properties Adversely Impacted
Section 4 (f)	0 Properties Adversely Impacted	2 Properties Adversely Impacted	2 Properties Adversely Impacted
Endangered Species	None	None	None
Wildlife	None	Minimal	Minimal
Visual Impacts	None None	Potential 20' Walls Over Hill or Slope Impacts w/Removal of Trees 60' Pvmt. Width Over Hill	Potential 23' Walls Over Hill or Slope Impacts w/Removal of Trees 84' Pvmt. Width Over Hill
Implementation Issues			
Cost	$0 M	$22.6 M*	$23.8 M*
Maintenance	Poor	Good	Good
Ease of Construction	No Construction	Constructable	Constructable
Overall Rating		**Preferred**	**Good**

*Preliminary Estimates (For Comparative Purposes)

(Includes Preferred BNSF RR Alternative 2)

in detail as part of the roadway build alternative.

Both short-listed alternatives address the purpose and need and result in similar projected traffic operations. Although Alternative 3 results in slightly better LOS for the road segment over the Hoover Hill (between Westview Drive and the BNSF RR overpass), the travel times for both alternatives are anticipated to be almost identical. Acknowledging that both build alternatives are relatively similar in terms of addressing the purpose and need, Alternative 2 was identified as the Preferred Alternative based upon the following differentiators from Alternative 3:

- Less Right of Way Required
- Less Vegetation Impact in Vicinity of Hoover Hill (Legion Park and Boulder Open Space)
- Less Impervious Surface Area Resulting in Less Water Quality Impact and Reduced Need for Mitigation
- Less Temporary Grading Impact to Legion Park
- Less Visual Impact Due to Narrower Roadway Section Over Hoover Hill
- Less Prime Farmland Impact
- Lower Construction Cost
- Higher Agency Support Due to Consistency with Prior Local Planning

CDOT is committed to coordinating directly with the local public agencies to develop a consensus on the specific phasing of improvements identified in the Preferred Alternative and to develop the anticipated schedule and operational thresholds that will precipitate the completion of the phases of improvements. This approach will leave options open for decision makers to address specific operational issues in a phased manner. Initial phases of construction will be designed to accommodate major investments in bridge and retaining wall structures and ultimate right-of-way needs in consideration toward the full completion of the Preferred Alternative.

2.7 Alternatives Advanced

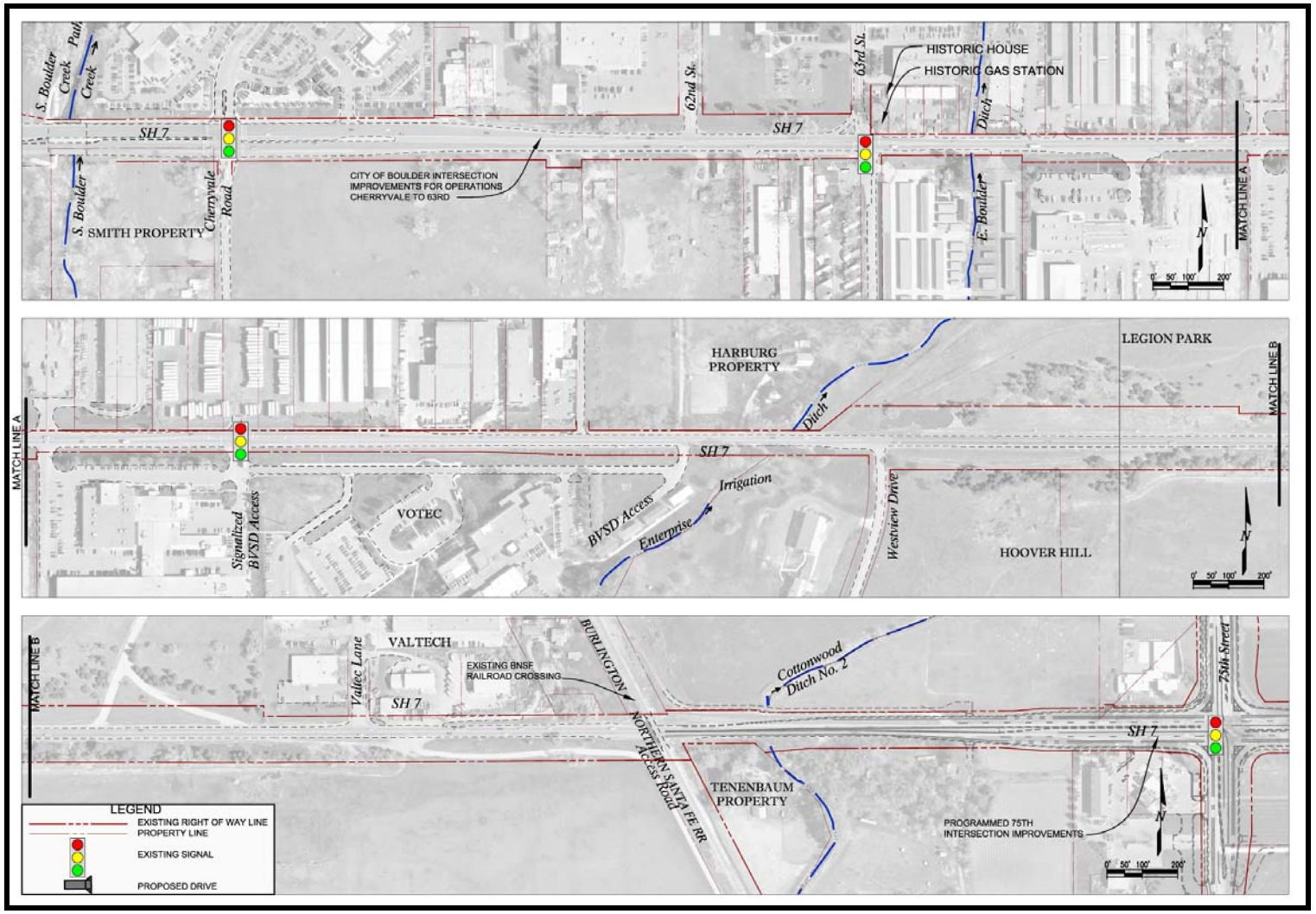
The alternatives described in this section were developed to a conceptual level only. Specific details may change during the final design process. The No-Action Alternative and the Preferred Alternative are described in this section and are fully evaluated in Chapter 3 of this EA.

2.7.1 No-Action Alternative

The No-Action Alternative (shown in **Figure 2-2**) would include no transportation improvements but does account for the recently completed SH 7 and 75th intersection improvements. This intersection project includes four through lanes of traffic along SH 7 with on-street bike lanes and sidewalks. The build alternative would tie to the western extents of the intersection project.

In addition, the City of Boulder has funding for intersection improvements for transit operations along SH 7 from Cherryvale Road to east of 63rd Street. These improvements include queue jump lanes, sidewalks and connections to transit stops.

Figure 2-2
No-Action Alternative – Plan View



The RTD and the U.S. Army Corps of Engineers have initiated a NEPA study along the BNSF corridor. As part of this study, improvements, including commuter rail, are being considered along the existing BNSF railroad corridor that crosses SH 7. In addition to possible commuter rail service, a potential park-n-Ride is being considered in the vicinity of the SH 7 and 63rd Street intersection.

There is no cost beyond routine maintenance associated with the No-Action Alternative.

2.7.2 Preferred Alternative

A preliminary Preferred Alternative has been designated in this document. No decision has been made, however, and no decision will be made until full public and agency review of this document has occurred. A plan view of the Preferred Alternative is shown in **Figure 2-3**.

2.7.2.1 Typical Section

The typical sections for the Preferred Alternative are shown in **Figure 2-4** and **Figure 2-5**. The Preferred Alternative has two through lanes in each direction from Cherryvale Road to the BVSD entrance. At Cherryvale Road, curb and gutter is added to the existing right-turn deceleration lane for eastbound traffic. At 63rd Street, in the westbound direction, there is a continuous right-turn acceleration/deceleration lane that also functions as a bus bypass lane from east of 63rd Street to Cherryvale Road. In the eastbound direction, there is a continuous right-turn acceleration/deceleration lane between the business access west of the BVSD to east of the BVSD signal. From the BVSD signal to Westview Drive there is one through lane westbound and two through lanes eastbound. The second eastbound through lane is dropped as a right-turn lane at Westview Drive. There is a right-turn lane in the westbound direction at Valtec Lane.

The two-lane section (one lane in each direction) continues past the BNSF railroad overpass where the roadway section widens to two lanes in each direction at the 75th Street intersection improvements.

The roadway is an urban section with curb and gutter between Cherryvale Road and Westview Drive. Between Westview Drive and the BNSF railroad overpass, the Preferred Alternative is a rural section with ten-foot shoulders. Between the railroad overpass and 75th Street, SH 7 is an urban section with curb and gutter.

The Preferred Alternative features a raised median with left-turn lanes between Cherryvale Road and 63rd Street. East of 63rd Street to the 75th Street improvements is a continuous sixteen-foot two-way left-turn lane.

Figure 2-3
Preferred Alternative – Plan View

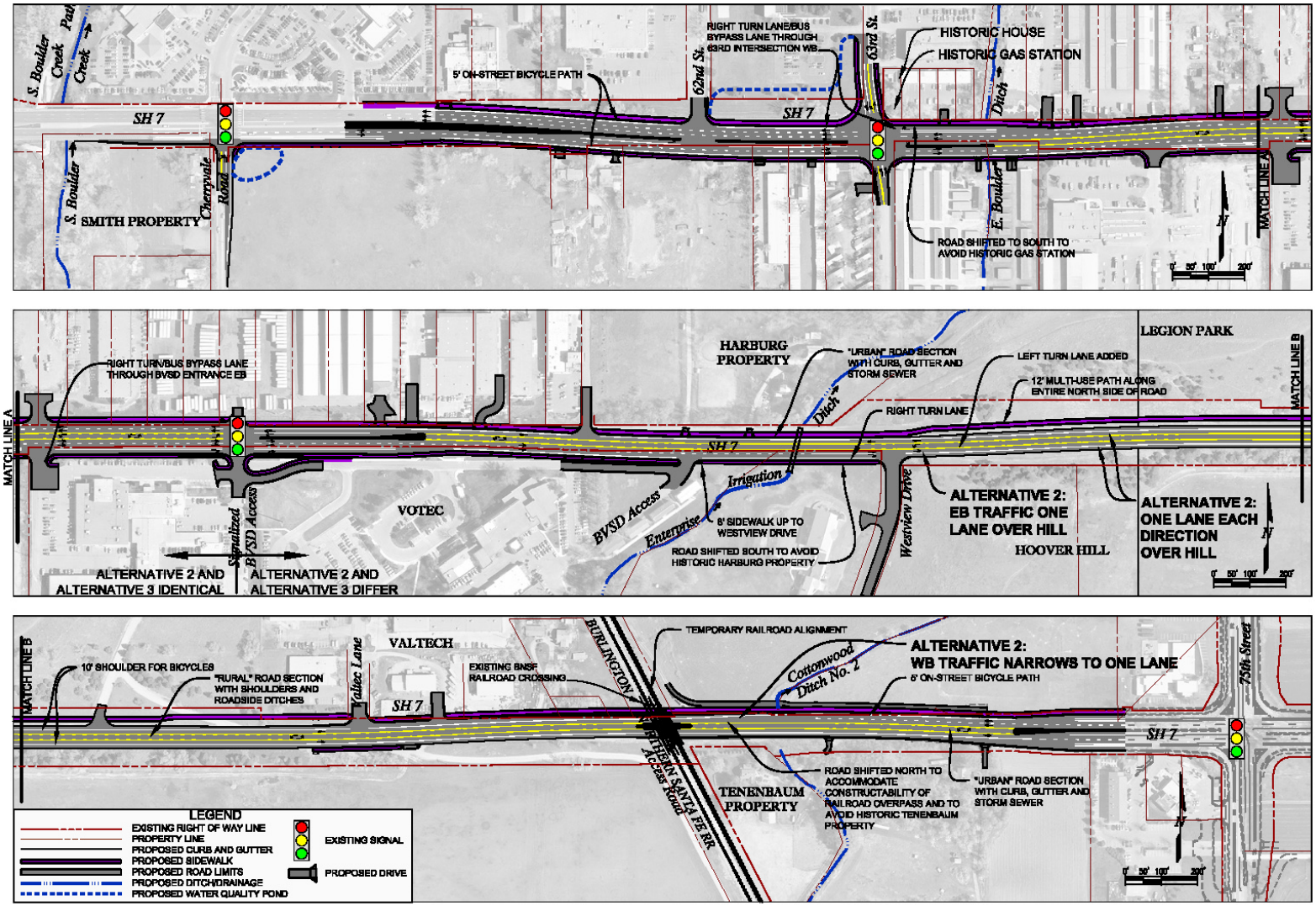


Figure 2-4
Preferred Alternative Typical Sections

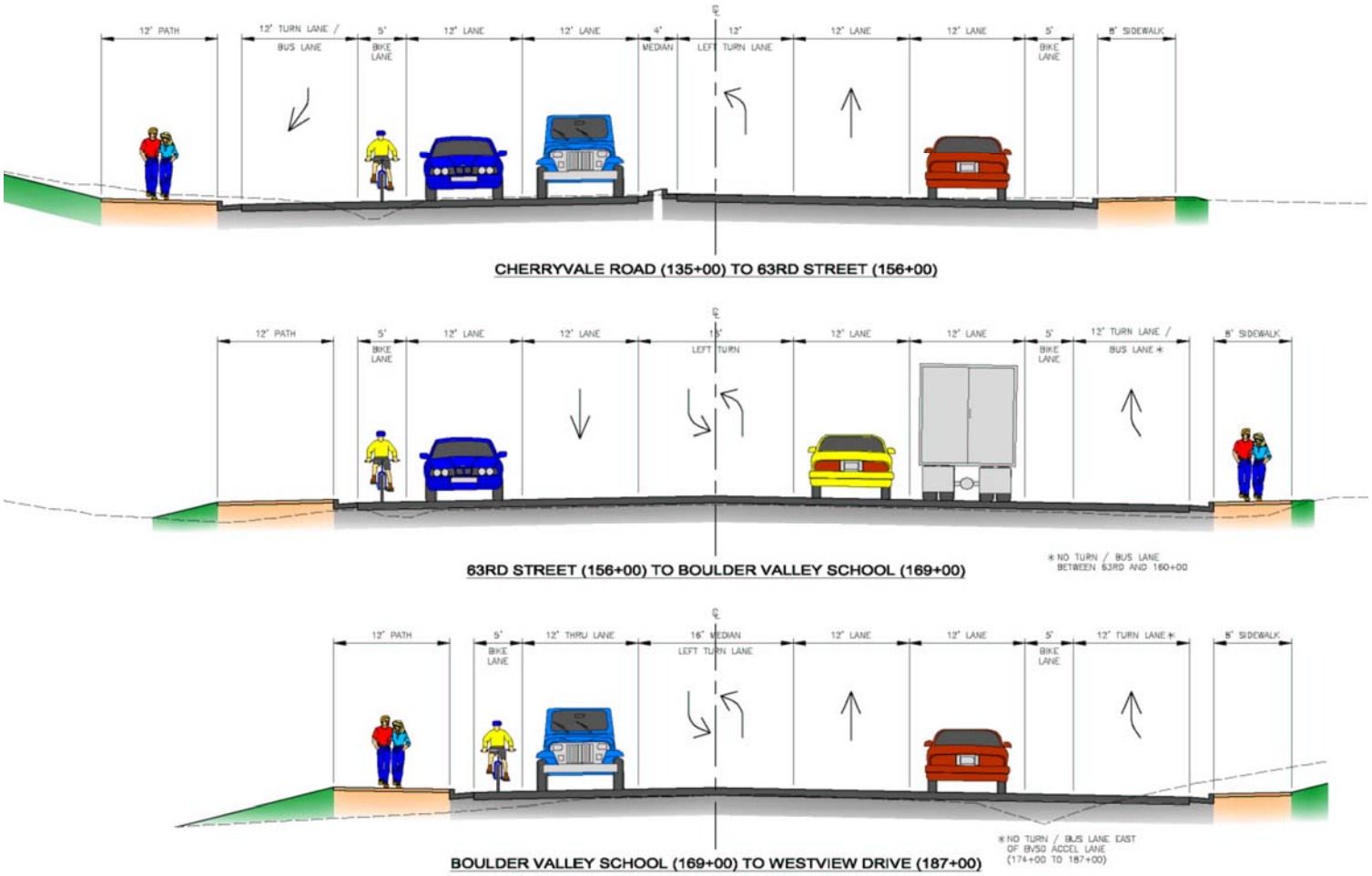
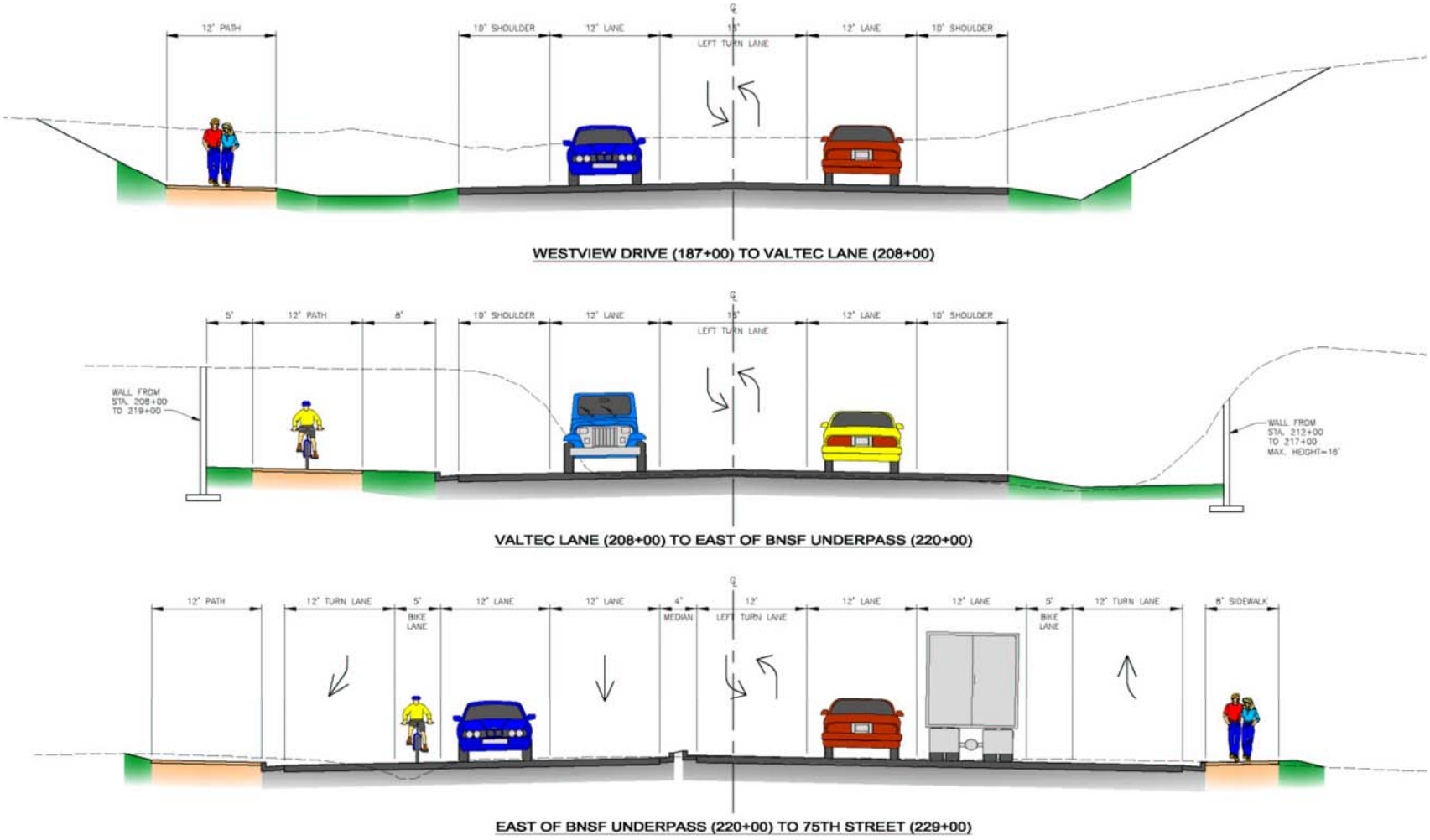


Figure 2-5
Preferred Alternative Typical Sections



2.7.2.2 Pedestrian/Bicycle Facilities

The Preferred Alternative includes bicycle lanes and shoulders along the entire length. The roadway section includes a five-foot bicycle lane in each direction in the urban sections, adjacent to the curb and gutter. Bicycle lanes would extend through intersections as exclusive lanes. In the rural section, the ten-foot shoulder would also function as a bicycle lane. Flattening the side slopes adjacent to the paved roadway and removing obstructions would provide a safer roadside by providing an unobstructed uniform clear zone adjacent to the roadway.

A continuous twelve-foot multi-use path on the north side of SH 7 is intended for both pedestrian and bicycle traffic. An eight-foot sidewalk is incorporated along the south side of SH 7 between Cherryvale Road and Westview Drive. Pedestrian and handicap access to transit facilities would be provided at intersections with 63rd Street, the BVSD access and at Valtec Lane. Handicap ramps would be provided at all intersections. Traffic signals would be enhanced to include pedestrian phases.

2.7.2.3 Alignment

The horizontal alignment is shifted from the existing roadway centerline and section line to avoid the NRHP-eligible properties along the corridor. The proposed roadway centerline is shifted 37 feet south of the existing centerline adjacent to the historic gas station on the northeast corner of the 63rd Street intersection. The alignment is also shifted 29.5 feet south adjacent to the Harburg property. Finally, the roadway centerline is shifted 24.5 feet north adjacent to the Tenenbaum property and Cottonwood Ditch.

The vertical alignment would generally follow the existing alignment. The exception is at the existing hill east of Westview Drive. To achieve a design speed of 55 mph and provide the required minimum stopping sight distance between Westview Drive and 75th Street, the existing hill east of Westview Drive would be lowered approximately 13 feet. The alignment is also slightly lowered below the BNSF railroad bridge to obtain the 16'-6" required clearance.

2.7.2.4 Access Management

All state highways in Colorado are limited access highways. CDOT is authorized to regulate vehicular access to or from any state highway under its jurisdiction from or to property adjoining that highway to protect the public health, safety and welfare; to maintain smooth traffic flow, to maintain highway right-of-way drainage; and to protect the functional level of the highway. Because of the high volume of traffic and in order to maintain the safe operation of traffic at intersections and in the vicinity of intersections, access control has been incorporated into portions of the Preferred Alternative. From Cherryvale Road, through the 63rd Street intersection, auxiliary lane

delineation and required intersection storage lengths create the need to control mid-block access.

In most cases, access locations and configurations are perpetuated along the corridor. In a few locations, for safety reasons, access control is incorporated into the Preferred Alternative. Access control includes restricting left-in and left-out maneuvers through the use of raised medians at the following locations:

- South Side SH 7
  - 6160 (Cherryvale Commons)
  - 6180 (Cherryvale Commons)
  - 6234 (Cherryvale Commons)
  - 6270 (5 String Partnership)
  - 6254 (William Robert Eason)
  - 6338 (Securcare Boulder Group)
- North Side SH 7
  - 6123 (White Wave)
  - 6301 (A. B. Tuorah)
  - 6325-6333 (David Salzman)

In addition, the access just east of Valtec Lane, which currently accesses SH 7 along the entire property frontage, would be consolidated to one access point to improve the safety of the intersection.

Auxiliary lanes, where warranted by the CDOT *State Highway Access Code*, have been incorporated into the design.

2.7.2.5 Railroad

For the Preferred Alternative, reconstruction of the BNSF railroad bridge is required. Railroad Alternative 2, which reconstructs the railroad bridge over SH 7 along the existing railroad alignment, is the preferred alternative. It has been determined that rerouting rail traffic is not practical, so a temporary bridge and offset rail alignment 25 feet east of the current location is required. The existing vertical alignment includes positive grades that are near the maximum allowed for the current track design speed of 30 mph. Therefore, the temporary vertical alignment of the offset alignment would be essentially the same as the existing alignment. The temporary alignment would require a temporary bridge or culvert for the Cottonwood Ditch #2 crossing. It is anticipated that the temporary embankment and track would be contained within the existing 100-foot-wide BNSF right-of-way limits.

The typical section for the new bridge accommodates a single track with walkways and handrails provided on both sides in accordance with BNSF design criteria. It is anticipated that an I-girder bridge with a center pier would be utilized. The bridge would require a total superstructure depth of approximately five feet. The bridge would consist of two 59-foot spans. SH 7 is realigned to the north in this location;

therefore, the center railroad bridge pier can be constructed while still maintaining two lanes of traffic. The vertical alignment for SH 7 is lowered to provide 16'-6" of clearance with the new railroad bridge. Retaining wall abutments are required to minimize impacts to existing residences, businesses, frontage roads, and adjacent City of Boulder Open Space.

2.7.2.6 Cost

Construction costs were identified for the Preferred Alternative based on an initial opinion of probable construction costs, including contingencies, right-of-way (not including structures) design and construction engineering. The total conceptual-level estimated cost for the Preferred Alternative is approximately $23 million.

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Chapter 3.0: Affected Environment and Environmental Consequences

3.1 Introduction

This chapter provides a concise description of the general social, economic and environmental setting for the area that may be affected by the alternatives presented in Chapter 2. It also provides an evaluation of possible impacts that could occur as a result of implementation of the Preferred Alternative or the No-Action Alternative.

3.2 Land Use

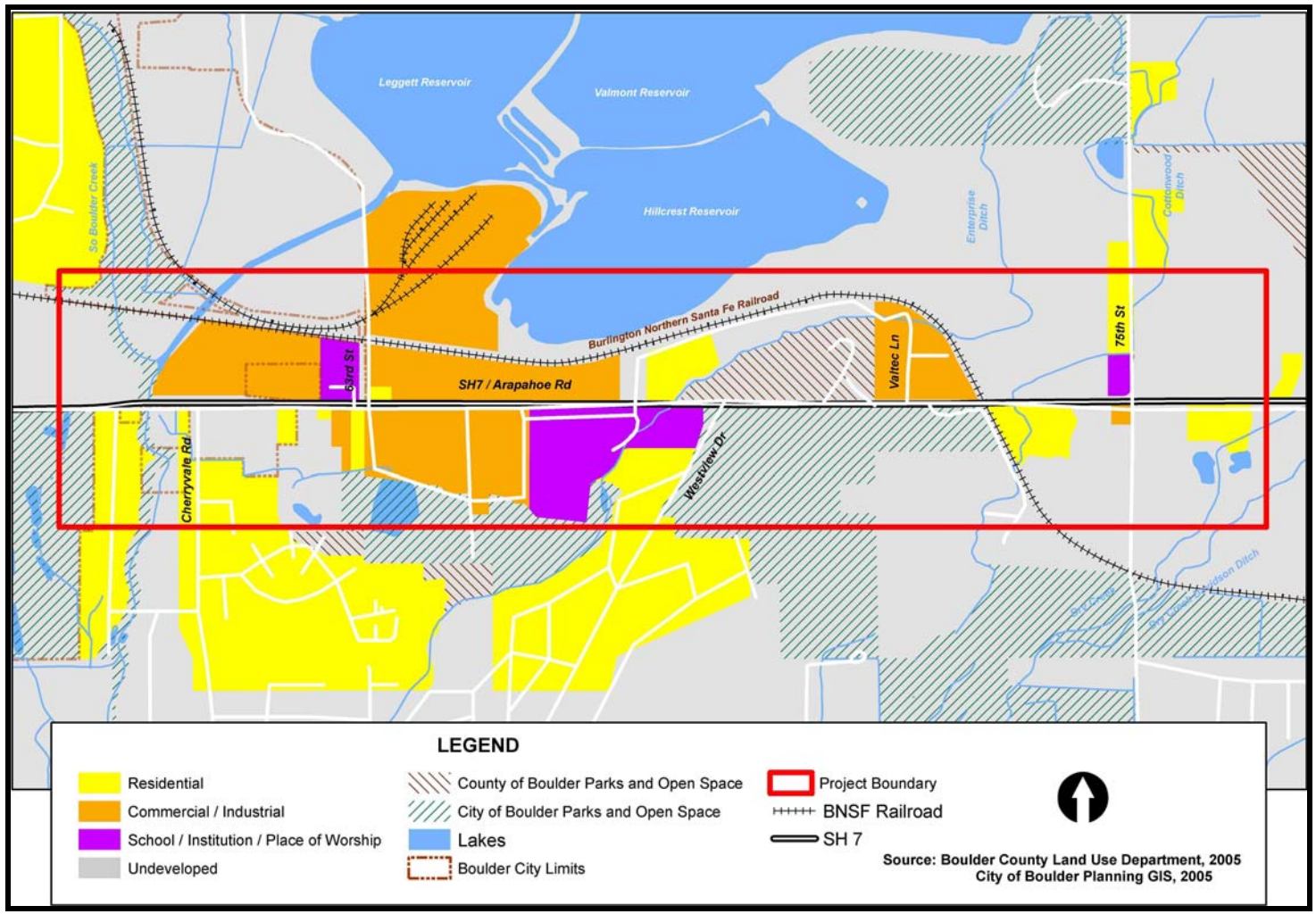
3.2.1 Existing Conditions

The extreme western limit of the project is within the incorporated boundaries of the City of Boulder. The city limit is between Cherryvale Road and 63rd Street. The remainder of the project is located in unincorporated Boulder County, but is within the area covered by the *Boulder Valley Comprehensive Plan* (BVCP) for the City of Boulder and Boulder County. The existing land use for the study area is shown in **Figure 3-1**. Existing land uses were identified through the use of aerial photography, property ownership information, Boulder County Zoning maps and field observation. Following is a description of the uses adjacent to SH 7.

- **Cherryvale Road to 63rd Street:** On the south side of SH 7 there is undeveloped property, several single-family residences, a self-storage facility and a mobile home park. On the north side of SH 7, there is a car dealership, a tofu factory, other commercial businesses and a satellite campus of the Naropa University.

- **63rd to Just East of Westview Drive:** There is commercial development along the north side of SH 7. Businesses include storage facilities, automobile repair shops, a carpet business and parts supply businesses. Along the south side of SH 7, there are storage facilities, a lumber business, Boulder Valley School District (BVSD) offices and bus facility and the Vocational and Technical Education Center (VoTec). There is a church at the southwest corner of the intersection of SH 7 and Westview Drive. On the north side of SH 7, just west of Westview Drive, there is a private residence with equestrian facilities.

Figure 3-1
Existing Land Use



- **Westview Drive to the Burlington Northern Santa Fe (BNSF) Railroad Overpass**: On the south side of SH 7, the land is owned by the agricultural division of the City of Boulder's Open Space Department. It is not currently being farmed and is not open to the public. On the north side of SH 7, the Legion Park is owned and maintained by Boulder County's Open Space Department. This park is open to the public. Just west of Legion Park is the Valtec Industrial Park, which is the location of approximately 12 commercial and industrial businesses.

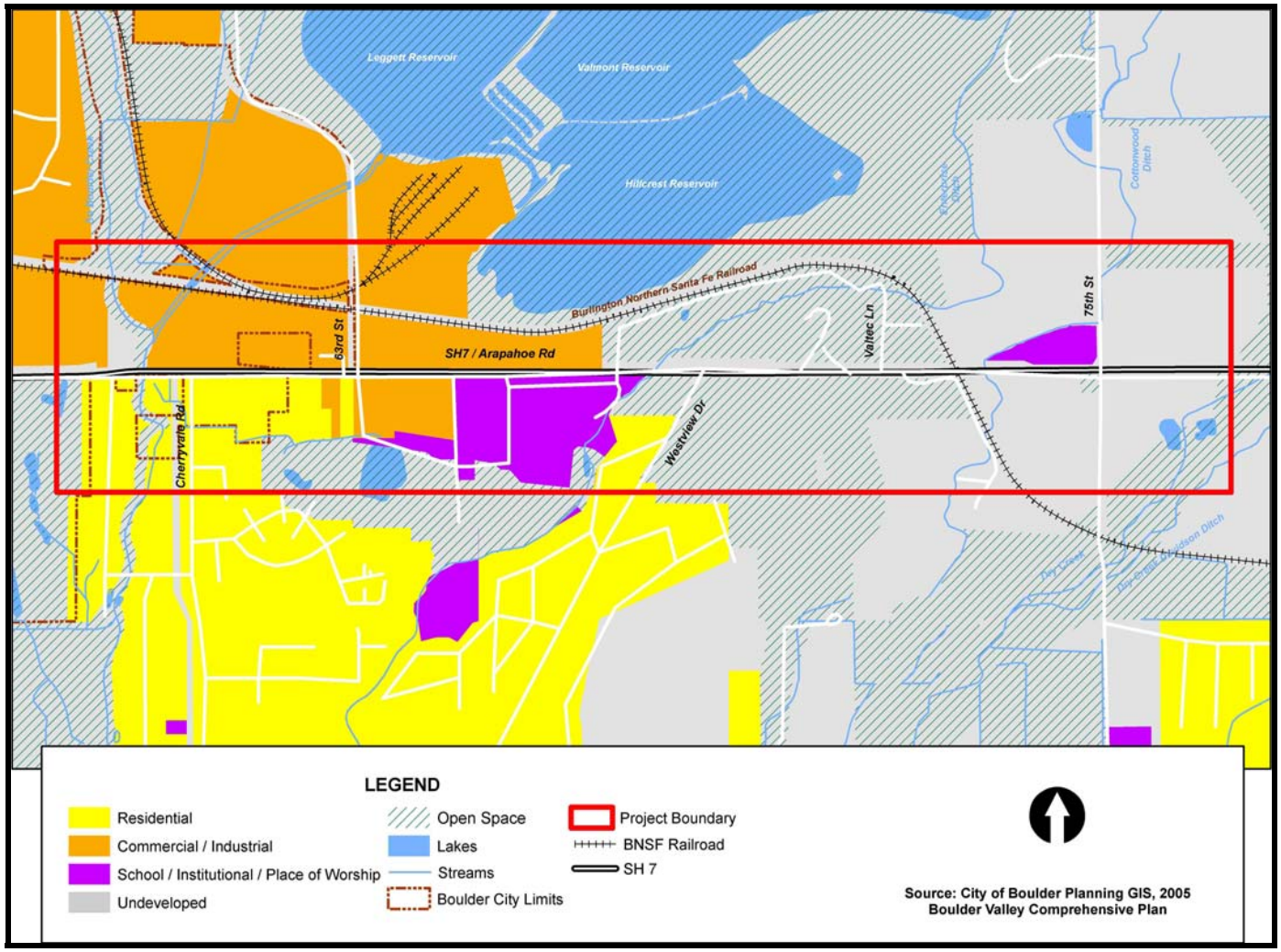
- **BNSF Overpass to the Eastern Extent of the Project**: The south side of SH 7 is zoned rural residential with the exception of the businesses on the southwest corner of the intersection of 75th Street, which are zoned transitional and include a gas station, a restaurant and approximately seven small business to the south of the restaurant. On the north side of SH 7, there is undeveloped land from east of the railroad to the end of the project limits with the exception of a church (State and Locally eligible historic Arapahoe School) and several single-family residences on the west side of 75th Street north of the church.

3.2.2 Future Conditions

The City of Boulder and Boulder County have jointly adopted a land use plan. The BVCP was first adopted in 1978 and was updated in 1982, 1990, 1995 and 2000. This plan guides land use decisions in the study area. The future land uses as outlined in the BVCP are shown in **Figure 3-2**. The following paragraph outlines the changes in land use in the proposed plan as compared with existing conditions.

The southeast quadrant of Cherryvale Road and SH 7 is designated for low-density residential. This primarily undeveloped land is owned by Cherryvale Commons and is currently going through the City of Boulder building approval process. The BVCP designates the current light industrial use surrounding Valtec Lane as open space. Undeveloped land around the reservoir, southwest of the intersection of 63rd Street and SH 7 and southeast of the intersection of 75th Street and SH 7 is designated as future open space land use.

Figure 3-2
Future Land Use



3.2.3 Land Use Impacts

No-Action Alternative
The No-Action Alternative would have no direct impacts on existing land use.

Preferred Alternative
The direct land use impact of the project would be in areas where right-of-way acquisition is required. In these areas, the current land use would be changed to a roadway use.

As discussed in Section 3.5, the total right-of-way acquisition required for the Preferred Alternative is 6.6 acres of right-of-way from 27 owners.

The local agencies of the City of Boulder and Boulder County anticipate improvements as defined by the Preferred Alternative, which is consistent with local planning.

3.2.4 Land Use Mitigation

Mitigation for the change in land use will be through compensation to the landowner during the right-of-way acquisition process. The right-of-way mitigation is discussed in Section 3.5.

3.3 Social Conditions (including Environmental Justice)

Boulder, located at the base foothills of the Rocky Mountains and 35 miles northwest of downtown Denver, maintains a mountain community feel infused with urban culture. Boulder is home to the University of Colorado, and just north of the university is downtown Boulder, an entertainment/shopping district centered around a pedestrian mall. Downtown Boulder is adjacent to five historic neighborhoods and is home to a growing residential population in the downtown district itself. Residential areas spread from downtown to the north, east and south, becoming more rural in character as the distance from the city center increases. Unincorporated Boulder County is generally rural in character with a large amount of land dedicated to open space.

Boulder has been growing steadily but slowly since a growth management ordinance was enacted in 1976. This ordinance regulates the number of residential building permits to no more than two percent annually.

3.3.1 General Population Characteristics

As shown in **Table 3-1** the total population in the study area is approximately 988 persons. The study area is about 1.0 percent of the total population of the City of Boulder and 0.3 percent of the population of Boulder County.

Table 3-1
Population Statistics

Area	1990	2000	Change
Boulder	83,312	94,673	13.6 %
Boulder County	225,339	291,288	29.3 %

Source: 1990 Census, 2000 Census.

3.3.1.1 Race and Ethnicity

The study area is predominately white at almost 91 percent. The largest non-white group is Hispanics at 5.7 percent. Hispanic (or Latino) is a group separate and distinct from race. Persons of Hispanic origin can be of any race. At 2.9 percent, persons listed as "other" make-up the largest racial group, followed by Blacks and Asians at 2.1 percent and 1.9 percent, respectively. See **Table 3-2** for a complete listing.

Table 3-2
Race and Hispanic Origin Statistics

Race/Ethnicity	Study Area*		Boulder		Boulder County	
	Pop.	%	Pop.	%	Pop.	%
White	897	90.8%	83,627	88.3%	257,909	88.5%
Black	21	2.1%	1,154	1.2%	2,559	0.9%
American Indian	4	0.4%	450	0.5%	1,787	0.6%
Asian	19	1.9%	3,806	4.0%	8,915	3.1%
Pacific Islander	0	0.0%	48	0.1%	171	0.1%
Other	29	2.9%	3,318	3.5%t	13,596	4.7%t
Two or More Races	18	1.8%	2,270	2.4%t	6,351	2.2%t
Hispanic	56	5.7%	7,801	8.2%t	30,456	10.5%

Source: 2000 Census.
*Figures for blocks extending beyond study area are not adjusted.

Minority persons are defined by FHWA as a person who is Black, Hispanic, Asian American, or American Indian or Alaska Native. The evaluation of impacts to minority populations is included in Section 3.3.4, Environmental Justice.

3.3.1.2 Persons with Disabilities

On February 24, 2004, President Bush issued Executive Order 13330, which includes persons with disabilities as meeting criteria for being transportation-disadvantaged. The Americans with Disabilities Act (ADA) defines a disability as "a physical or mental impairment that substantially limits one or more of the major life activities of such an individual; a record of such an impairment; or being regarded as having such an impairment." According to the 2000 Census, the City of Boulder has 16,306 disabled persons (17 percent of the population) and Boulder County has 55,338 disabled persons (19 percent of the population).

3.3.1.3 Advanced Age

Persons of advanced age are also included in Executive Order 13330 as persons meeting criteria for being transportation-disadvantaged. The limits of advanced age are not federally defined, so for this study, advanced age will mean persons 60 years of age and older. The senior population grew by 25 percent since 1990 and, according to the Colorado Department of Local Affairs (DOLA), is expected to be 13 percent of the total population in Colorado by 2020.

Though seniors constitute only 10.8 percent of the Boulder County population, they account for 28 percent of all disabilities in Colorado. Generally speaking, an advanced-age person is 3.5 times more likely to have a disability than a person under the age of 60.

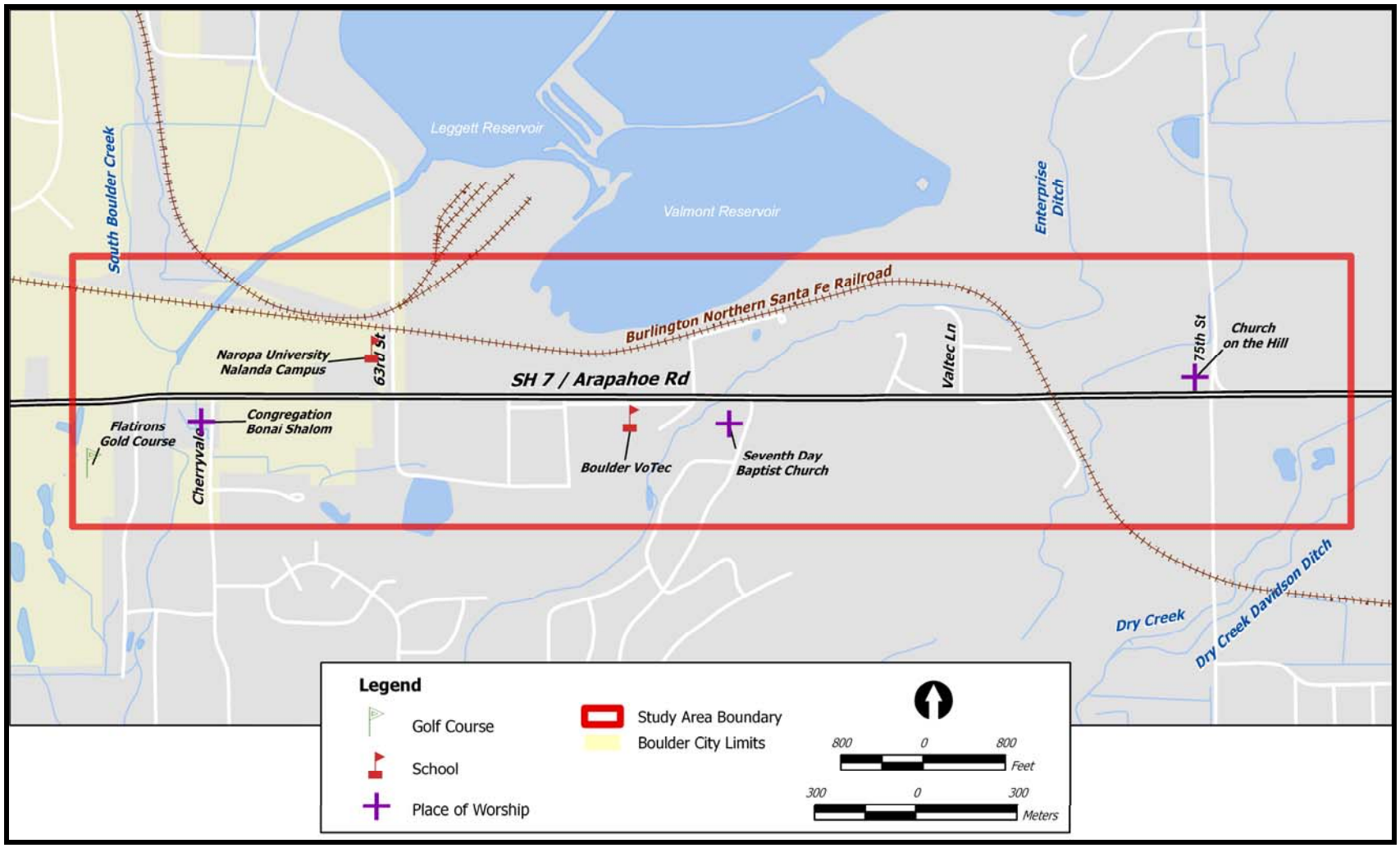
3.3.2 Community Facilities/Resources

The community facilities mentioned in this section are shown by location in **Figure 3-3**.

The study area is served by the Boulder Valley School District (BVSD). There are two schools located within the study area boundary. These include the Boulder Technical Education Center (VoTec) - Arapahoe Campus and the Naropa University–Nalanda Campus. VoTec, which is open to all Boulder Valley School District students, offers state-approved vocational secondary programs for several disciplines. The Naropa University is an accredited university with undergraduate and graduate programs.

There are three worship facilities located within the study area. These include the Seventh Day Baptist Church, located directly in the middle of the study area south of SH 7; Congregation Bonai Shalom, located on the west side of Cherryvale Road near the

Figure 3-3
Community Facilities



western edge of the study area; and City on the Hill Church, located on the northwest corner of SH 7 and 75th Street. Flatirons golf course is located in the southwest corner of the study area. It is a city course open to the public.

3.3.2.1 Public Safety

Police

The western part of the study area lies within Boulder city limits, and is protected by the Boulder Police Department. The Boulder Police Department provides general law enforcement, community services, and crime prevention. The unincorporated areas in the study area fall under the jurisdiction of the Boulder County Sheriff's Office, which meets public safety needs. The Sheriff maintains the County Jail, coordinates search and rescue efforts, handles civil process and evictions, provides animal control services, responds to hazardous materials events, oversees the operation of a cooperative, countywide radio and telecommunications center, and provides public safety services to the nearly 57,000 residents of unincorporated Boulder County.

Fire

The study area west of 63rd Street is served by the Boulder Fire Department, which provides emergency services, non-emergency functions, fire prevention, fire safety education, and wildland fire management. The Emergency Services division provides emergency response to fires, natural and man-made disasters, hazardous releases, rescue situations and medical emergencies within the City of Boulder. The Emergency Services function also includes routine Fire Code inspections, public education efforts, coordination with other public safety agencies and maintenance of apparatus and fire stations. The study area east of 63rd Street is protected by the Cherryvale Fire Department, which offers a complete line of emergency medical services (EMS), fire, and rescue services to areas within its jurisdiction.

3.3.3 Housing

According to 2000 Census data, there are 394 housing units in the study area (see **Table 3-3**); 1.8 percent of the units are vacant. The vacancy rate includes 43 percent that are for sale, 14 percent that are for rent, and 14 percent that are for migrant workers. According to the Boulder County Assessor, the average price of a home in Boulder in 2003 was $375,000, and $286,900 in Boulder County.

Table 3-3
Housing Statistics

Area	Households		Housing Units			
	Total	Average Persons	Total	Owner Occupied	Renter Occupied	Vacant
Study Area	387	2.55	394	269	118	7
Boulder	39,596	2.2	40,726	19,605	19,991	1,130
Boulder County	114,680	2.47	119,900	74,237	40,443	5,220

Source: 2000 Census.

3.3.4 Environmental Justice

On February 11, 1994, Federal Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* was issued to reinforce Title VI of the Civil Rights Act of 1964. The Civil Rights Act states that "No person in the United States shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Executive Order 12898 states "Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

Subsequent Orders at the state and federal level, including US Department of Transportation (DOT) Order 5610.2 issued in February 1997, have reinforced the legislation outlined in Executive Order 12898. The order requires federal agencies to use the NEPA planning process to satisfy Environmental Justice (EJ) requirements by taking the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. As an entity utilizing federal funds for the development of the SH 7 EA, the Colorado Department of Transportation (CDOT) is responsible for successfully integrating environmental justice into its program and planning activities.

In order to determine any issues or concerns, minority and/or low-income populations within 0.25 mile from either side of SH 7 are included in this analysis. This analysis has been carried out in accordance with the CDOT Title VI and Environmental Justice Guidelines for NEPA Projects (October 2005).

3.3.4.1 Minority Populations

As defined in FHWA Order 6640.23 Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, December 2, 1998 minority means a person who is Black, Hispanic, Asian American, or American Indian or Alaskan Native. As stated in CDOT's Environmental Justice Guidelines, US Census data are the best primary source of data for defining minority populations.

The racial classifications used by the US Census Bureau include White, Black, American Indian and Alaska Native, Asian, Native Hawaiian or other Pacific Islander, some other race, and two or more races. The US Census Bureau separates Hispanic from race, and addresses this category under ethnicity. Ethnicity is tied to character, background or affiliation. The US Census Bureau separates race from the Hispanic category since people who identify their origin as Spanish, Hispanic, or Latino may be of any race. To identify minority populations, then, the total population of the census block is subtracted from the total White, non-Hispanic population of the census block.

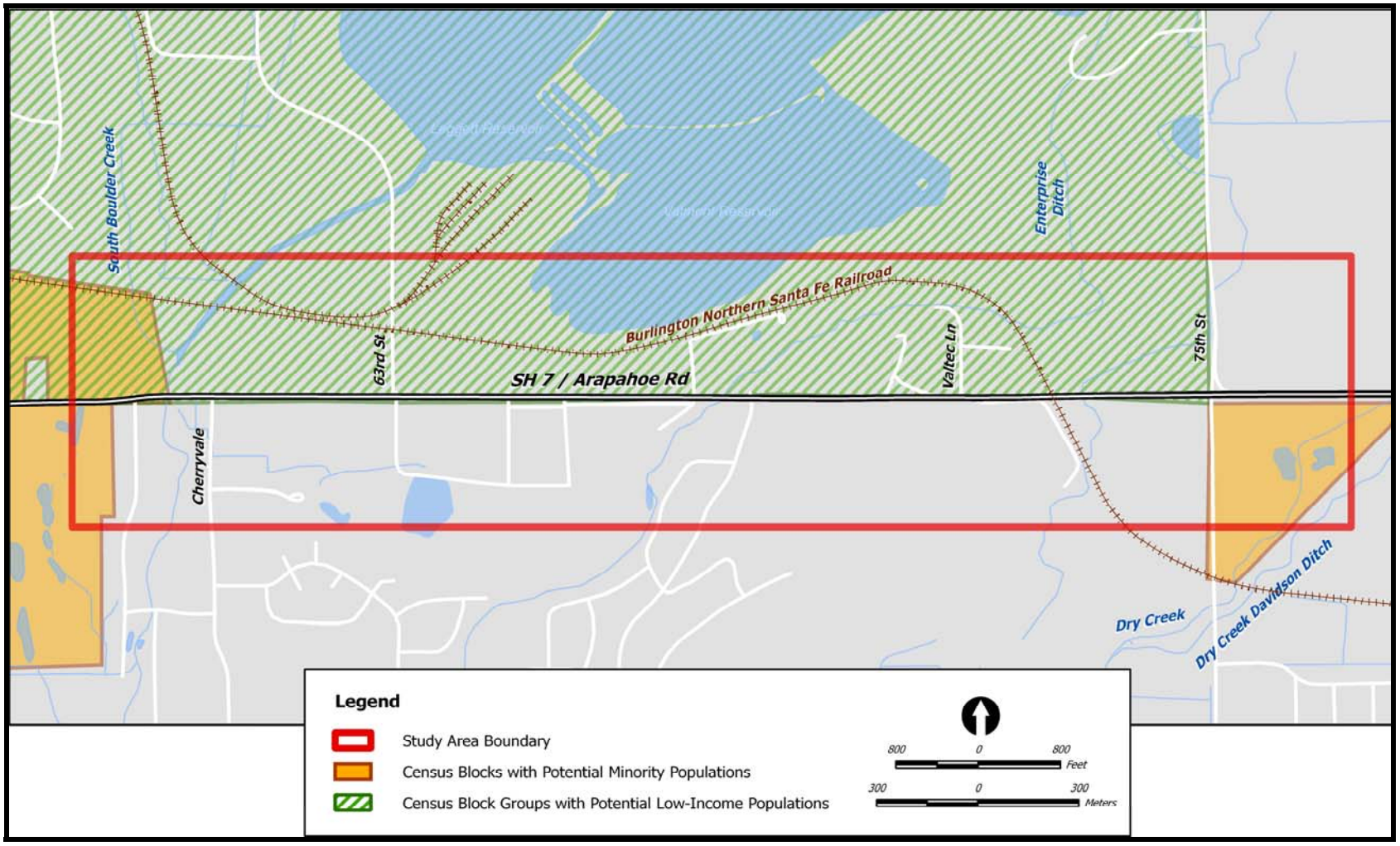
According to the 2000 Census, 16.4 percent of Boulder County residents categorize themselves as minorities. Census Blocks with a higher percentage of minority populations than the rest of Boulder County will be evaluated for disproportionately high and adverse impacts.

Portions of three Census Blocks that contain minority populations above 16.4 percent occur in the study area. The Census Block located at the southeast corner of the study area contains 5 minorities out of a total population of 14 persons. This block is made up of four households total, one of which contains 4 minorities. The Census Block located at the northwest corner of the study area, contains 3 minorities out of a total population of 5 persons. This Census Block has two households, one of which contains 3 minorities out of a total population of 5. The Census Block located at the southwest corner of the study area is 20 percent minority. All of the households within this Census Block fall outside of the study area boundary. See **Figure 3-4**.

3.3.4.2 Low-Income Populations

US Census data collected from the 2000 Census for income is only released at the Census Block Group level for confidentiality reasons, which are larger areas than Census Blocks. To identify concentrations of low-income populations the following data sources were used: 2000 census data, county data, and income thresholds established for the year by the US Department of Housing and Urban Development (HUD) prepared for the distribution and allocations of Community Development Block Grant (CDBG) funds. Both HUD and the state of Colorado establish low-income definitions based upon household income as a percentage of median household income. Low-income households are defined using different criteria depending on the program to

Figure 3-4
Census Blocks and Block Groups with Potential Minority and Low-Income Populations



which it applies. For this study, low-income is defined as 30 percent of the Median Family Income (MFI).

The MFI for the Boulder-Longmont Primary Metropolitan Statistical Area (PMSA) is $81,600 (HUD, 2006). The PMSA is the area specifically selected by HUD for which data was gathered. The average household size in Boulder County is 2.47 persons. The income limits for 30 percent of the MFI is $22,122. Since Census income statistics are divided into increments of $5,000, the income threshold of $25,000 is used. Any households in the study area with household incomes below $25,000 will be evaluated for disproportionately high and adverse impacts.

In Boulder County, 20 percent of households fall below the $25,000 threshold. Of the five Census Block Groups in the study area, only one contains a higher percentage of low-income households than the County. The portion of this Block Group that is in the study area is located north of SH 7 between 75th Street and the western project terminus. Twenty-six percent of the households in this Block Group fall below the $25,000 threshold. It is important to note that this Block Group extends well outside of the study area (approximately 1.5 miles to the north). Because the study area in this location is predominantly commercial/industrial with little residential, it is reasonable to assume that the majority of these households are located outside of the study area. In the remaining Block Groups in the study area less than 12 percent of households fall below the $25,000 threshold.

3.3.4.3 Additional Data Collection Efforts

Census data alone is too broad to accurately represent the social and economic make-up of the households within the study area. For this reason, the following additional efforts were made to identify low-income and minority populations in the study area:

- Boulder County Social Services, Boulder County Planners, and the Colorado Demography Department were contacted, but were not able to provide data identifying low-income populations within the study area.
- City of Boulder Housing and Human Services and City of Boulder Planning Department were contacted to identify low-income population in the study area, but they were unable to provide data more specific than existing 2000 Census data.
- Field research was conducted on August 25, 2004. The former manager of the Columbine Mobile Home Park, located at the southwest corner of SH 7 and 63rd Street was interviewed. According to the information provided by the property manager, the majority of homes in the Columbine Mobile Home Park are low-income. Approximately 7 out of 26 units are occupied by minorities.

Section 8 Housing Facilities and Other Low-Income Populations

Locations of known government-subsidized housing within the study area (also known as Section 8 Housing under the Tenant Based Assistance: Housing Choice Voucher Program) were not found.

Specialized Outreach

In an effort to gather more information about the potential impacts of the project alternatives on low-income and minority populations, all potentially affected business owners were contacted to ask about their ownership, employees, customers, and clients. Sixty-three percent responded to the survey. Business owners and managers were assured that the results of individual surveys would be kept confidential and all statistics used in the EA would be generalized for each alternative. Only one of the businesses surveyed is minority owned. This business has two employees, one of which is a minority. Eight other businesses in the study area reported having a combined total of 25 minority employees. This number is an approximation because in some cases survey respondents estimated the number of minority employees.

All mobile home units at the Columbine Mobile Home Park were provided with hand-delivered announcements of each public meeting held for the project.

3.3.5 Social and Environmental Justice Impacts

3.3.5.1 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 the city and county. Access to and from driveways along SH 7 would continue to be hampered by congestion; this congestion would also hamper the provision of emergency services.

Preferred Alternative

The Preferred Alternative would reduce congestion and improve road conditions along SH 7, thereby improving accessibility to businesses and neighborhoods in the study area. Safety conditions would also be improved with this alternative, which also would improve access to local businesses and neighborhoods. Access changes and some out-of-direction travel may occur as a result of construction.

The Preferred Alternative would require the relocation of three business structures and one residence.

Pedestrian and bicycle safety and access would be improved with the addition of the bicycle lanes and sidewalks, along the roadway.

This alternative would temporarily reduce or degrade access to businesses and neighborhoods during construction, which could possibly impact businesses in the study area.

Because there are very few residential land uses in the study area, adverse impacts on persons of advanced age or with disabilities are not anticipated. In addition, this alternative would address roadway safety concerns and include the addition of multi-use pathways, benefiting persons living in or traveling through the study area.

3.3.5.2 Environmental Justice Impacts

As defined in FHWA Order 6640.23, a disproportionately high and adverse effect on minority and low-income populations means an adverse effect that: (1) is predominantly borne by a minority population and/or a low-income population; or (2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non minority population and/or non low-income population.

Potential impacts associated with the alternatives are assessed in terms of their relationship to property acquisitions or relocations; changes in access to employment areas; and changes in low-income and minority communities based upon changes in the physical environment, such as increases in noise levels, air pollution levels, and the presence or introduction of hazardous materials. These impacts can result from the acquisition of properties needed to construct improvements, the displacement of low-income and minority households based upon property acquisitions, or a change in low-income and minority neighborhoods based upon the placement of facilities or improvements.

No-Action Alternative

The No-Action Alternative would result in continued and increased congestion along SH 7, and the attendant traffic safety and access concerns for residents and businesses in the study area. There would be no displacement of minority or low-income residents, businesses, or employees.

Preferred Alternative

Minority populations are limited to three Census Blocks on the outer edges of the study area. These blocks extend well outside of the study area. The small number of households within these blocks (some possibly occurring in the portion of the Census Block that is outside of the study area) does not indicate a concentrated minority population.

Impacts experienced by minority persons would be the same as those experienced by the non-minority population and would include temporary construction related impacts such as access changes, dust, noise, and construction related traffic and delays as well as longer term impacts including increased traffic, noise, and added pavement to the viewshed. Roadway improvements would also address traffic safety and access concerns, provide pedestrian and bicycle facilities, and increase mobility in the study area. These impacts would benefit minorities in the study area. In addition, several Census Blocks within the study area adjacent to the proposed improvements contain much larger non-minority populations that would bear these impacts. Therefore, impacts to minority populations are not considered to be disproportionately high and adverse.

The Preferred Alternative would relieve congestion along SH 7, thereby improving accessibility to community resources, businesses, and residences for residents, employees, and customers in the study area.

The Preferred Alternative would require the relocation of three business structures. One of these businesses is minority owned and has two full-time employees, one of which is a minority. Relocation impacts will be borne by all three businesses and associated employees and therefore, does not constitute a disproportionately high and adverse impact to minority owned businesses or minority employees. This alternative would require driveway reconstruction for twenty properties, as well as impacts to access for eight properties.

One of the structures that would be removed is a mobile home at the Columbine Mobile Home Park. Due to the sensitivity of the data and to protect confidentially, it is unknown whether this specific structure contains minority or low-income residents. Conversations with the property manager indicated that the majority of the residents of the mobile home park are low-income. Therefore, it is reasonable to assume that the residents of the impacted property are low-income. Additional impacts anticipated at the mobile home park include some right-of-way acquisition and access modifications. This would move SH 7 55 feet closer to the first mobile home in the park. This would result in increased noise and visual impacts at this mobile home park (more information is included in Section 3.7). This would not be considered a disproportionately high and adverse impact because other noise impacts of greater magnitude occur to the general population areas along SH 7.

3.3.6 Social Mitigation Measures

Good communication with emergency service providers, the community, and residents with regard to road delays, access, and special construction activities is recommended

during the construction phase. This may be accomplished by radio and public announcements, newspaper notices, on-site signage, and the use of the City's Web site.

3.3.7 Environmental Justice Mitigation Measures

Every effort was made to avoid or minimize potential impacts to low-income and/or minority populations in the study area. This included eliminating the auxiliary/queue jump lane in order to narrow the width of the roadway in front of the mobile home park. Because of these efforts, no disproportionate impacts to low-income or minority populations are anticipated, and therefore, no mitigation measures are required.

All property acquisition will follow the procedures outlined in the CDOT *Right of Way Manual*. CDOT follows the Federal Uniform Relocation and Real Property Acquisition Act of 1970 (Public Law 91-646), as amended in 1987 (Public Law 100-17), 1991 (Public Law 102-240) and 1997 (Public Law 105-117). The purpose of the act is "To provide for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by Federal and federally assisted programs and to establish uniform and equitable land acquisition policies for Federal and federally assisted programs."

3.4 Economic Conditions

3.4.1 Existing Conditions

The study area, along with the rest of Colorado, experienced significant population growth and an economic boom in the late 1990s. In the early part of the 2000s, however, Colorado's economy weakened and economic growth has flattened. Growth is expected to continue in the future, but at a more moderate and steady pace than what was seen in the 1990s.

Employment

Boulder began as a supply base for miners looking for gold and silver in the mountains. Three decades after Boulder was incorporated in 1871, its economy faltered and the city turned to tourism. Tourism continued to be a dominating force for the economy until World War II. Beginning in the 1950s, technical and high tech industries located in Boulder, making it one of the largest high tech employment centers in the state.

The North American Industry Classification System (NAICS) was developed by the United States, Canada, and Mexico to provide comparability in statistics about business activity across North America. The NAICS is designed to organize industries into meaningful sectors for consistency, adaptability, and comparability. See **Table 3-4** for the main NAICS industries in the City of Boulder and Boulder County by the number of paid employees.

Table 3-4
Top NAICS Industries by Paid Employees

Area	Manufacturing	Retail Trade	Professional, Scientific, Technical Services	Administrative & Support & Waste Management & Remediation	Health Care & Social Assistance	Accommodation & Food Service
Boulder	9,940	9,587	See note	4,293	2,990	8,098
Boulder County	26,225	17,269	16,458	9,865	11,661	13,844

Source: 1997 Economic Census.
Note: ranging from 5,000 – 9,999 paid employees.

Unemployment rates have increased since 2000. Boulder County unemployment rates remained at or below Colorado's rates but grew by over 51 percent from 2001 to 2002. The change in the unemployment rate for Colorado for that same period was approximately 54 percent. Colorado and Boulder County saw only slight unemployment rates changes in 2003 (5.1 percent and 1.7 percent respectively), and both saw a decline in unemployment in 2004. In the 5 years prior to 2000, unemployment rates fluctuated between 4.1 percent and 2.6 percent for Boulder County and 4.2 percent and 2.9 percent for Colorado. See **Table 3-5** for unemployment rates from 2000 to 2003.

Table 3-5
Unemployment Rates

	2000		2001		2002		2003		2004	
Area	Rate	Change*	Rate	Change	Rate	Change	Rate	Change	Rate	Change
Colorado	2.6	3.6 %	3.9	50 %	5.9	51.3 %	6.2	5.1 %	5.5	-11.3 %
Boulder County	2.4	8.3 %	3.8	58.3 %	5.9	55.3 %	6.0	1.7 %	4.9	-18.3 %

Source: Colorado Department of Labor and Employment.
*Change = percent change from previous year.

Over 28,000 jobs were lost from 2001 to 2002 alone, mostly in the Information, Manufacturing, and Professional and Technical Services industries. The largest change in employment was in the Management of Companies and Enterprises at -55.3 percent, followed by Information, Manufacturing, Retail Trade, and Professional and Technical Services (-28.6 percent, -22.1 percent, -21.7 percent, and -21.7 percent, respectively). Only two industry categories gained employment: Health Care and Social Assistance at 1.6 percent, and Non-Classifiable Government at 0.3 percent. In 2003, employment was down by almost 6,000 jobs compared to 2002, but these numbers increased in 2004 to almost 153,500 by the third quarter.

Retail Sales and Tax

As shown in **Table 3-6**, the City of Boulder's 2004 sales tax rate is 3.41 percent, and Boulder County's is 0.65 percent. The Colorado state sales and use tax rate is 2.9 percent. Purchases within Boulder County are also subject to a Regional Transportation District (RTD) tax of 1.0 percent, plus a 0.1 percent cultural district tax and a 0.1 percent stadium tax.

Table 3-6
Sales Tax Rates

Type of Tax	City (percent)	State (percent)	County (percent)	RTD (percent)	Other* (percent)	Total (percent)
Sales	3.41	2.90	0.65	1.0	0.2	8.16

Source: Colorado Department of Revenue.
* Comprised of 0.10 percent Scientific and Cultural Facilities District and 0.10 percent Football Stadium District.

Boulder saw a decrease in retail sales in 2001 and 2002 at 9.6 percent and 7.7 percent, respectively, from the prior year. Retail sales in Boulder County decreased by 14.5 percent from 2001 to 2002. Though sales increased in Boulder County in both 2003 and 2004, sales in Boulder increased only in 2003 and decreased in 2004 by 3.3 percent. See **Table 3-7** for actual figures.

Table 3-7
Retail Sales in Dollars ($)

Area	2000	2001	2002	2003	2004
Boulder	3,392,755,582	3,360,208,677	3,101,078,133	3,119,118,849	3,016,300,349
Boulder County	7,033,522,392	7,146,997,346	6,110,463,577	6,386,679,551	6,550,736,737

Source: Colorado Department of Revenue.

Economic Areas

The study area is characterized by a number of different economic areas. On the eastern end of the study area, there is a skateboard park and youth church north of SH 7 at 75th Street. Across from the church to the south is a Conoco station, a restaurant, and a small business center. There are several self-storage facilities along the corridor, as well as trailer storage across from the Boulder Valley Public Schools Education Center. On the west end of the corridor there are car dealerships and other car care businesses. There is a large grouping of businesses at Valtec Lane, most of which are north of SH 7 and at 63rd Street.

3.4.2 Economic Impacts

No-Action Alternative

The No-Action Alternative would not change population growth trends or development patterns within the study area. Direct impacts would be caused by the increased demand for commercial facilities, services, and construction in response to the projected population growth. The location of these development areas would generally follow development and land use plans identified by the county and city.

Under the No-Action Alternative, the level of service LOS during AM and PM peak periods would approach LOS F by 2030. As traffic volumes grow, it would become increasingly difficult for commuter, truck, transit, and delivery traffic to traverse SH 7 during peak periods. With the anticipated growth in Boulder, Lafayette, Louisville, and Erie and no improvement to intersections and the roadway from Cherryvale Road to 75th Street, this could become a more critical issue.

Preferred Alternative

Selection of a build alternative could temporarily boost the economy of the study area during the construction period by providing employment of construction workers and revenue generated by the purchase of construction material from local sources. Additional employment could provide a temporary economic boost to the region, through increased wages and retail sales to firms in the project vicinity, partially offsetting any lost revenue from temporary increase in congestion and access restrictions during construction.

With the Preferred Alternative there would likely be no direct permanent impacts to economic conditions in the study area.

Short-term temporary impacts would occur during construction. Access to businesses located near construction sites may be impaired which could cause consumers to go elsewhere. This could be offset by sales to construction workers in the area.

Due to improved access and mobility, this alternative could be expected to enhance the economic condition of the majority of the study area and would be consistent with economic growth areas identified in the comprehensive plans. Ease of access into and out of the businesses would be improved.

3.4.3 Economic Mitigation Measures

Good communication with the community, business owners, and residents with regard to road delays, access, and special construction activities is recommended during the construction phase. This may be accomplished by radio and public announcements,

newspaper notices, on-site signage, and through the CDOT's Web site. Mitigation for relocation impacts is addressed in Section 3.5, Right-of-Way.

3.5 Right-of-Way

3.5.1 Existing Conditions

There are 63 ownerships within the study area. The existing right-of-way width varies throughout the project. The existing right-of-way between Cherryvale Road and 63rd Street is generally 120 feet to 128 feet. Between 63rd Street and Westview Drive, the right-of-way is 60 feet to 70 feet in width with a segment at the BMC Lumber business being 80 feet in width. From Westview Drive to Valtec, adjacent to City of Boulder and Boulder County Open Space, the right-of-way varies from 160 feet to 180 feet in width. West of Legion Park to the BNSF railroad overpass, the right-of-way is 130 feet in width. From the railroad overpass to the eastern extent of the project, the right-of-way is generally 60 feet in width. Existing right-of-way and ownerships are shown on the Preferred Alternative plans in Appendix B.

3.5.2 Right-of-Way Impacts

A preliminary assessment of right-of-way requirements, permanent easement requirements, and building acquisitions for the Preferred Alternative was completed. **Table 3-8** summarizes this information for each property along the project. For specific impacts to low income and minority communities, see Section 3.3.5.

No-Action Alternative
The No-Action Alternative would require no additional right-of-way.

Preferred Alternative
The Preferred Alternative would require the removal of four structures. **Figure 3-5** depicts the location of these structures. Two structure removals are located near 63rd Street on the south side of SH 7 where the roadway improvements would be shifted south. The improvements are 55 feet south of the existing pavement. The first is the mobile home on the southwest corner of 63rd Street and SH 7. The proposed sidewalk is within four feet of the house. The second is a house that has been converted to an office for the storage facility business on the southeast corner of 63rd Street and SH 7. The proposed improvements would fall within the footprint of the building.

Figure 3-5
Locations of Structures to be Removed

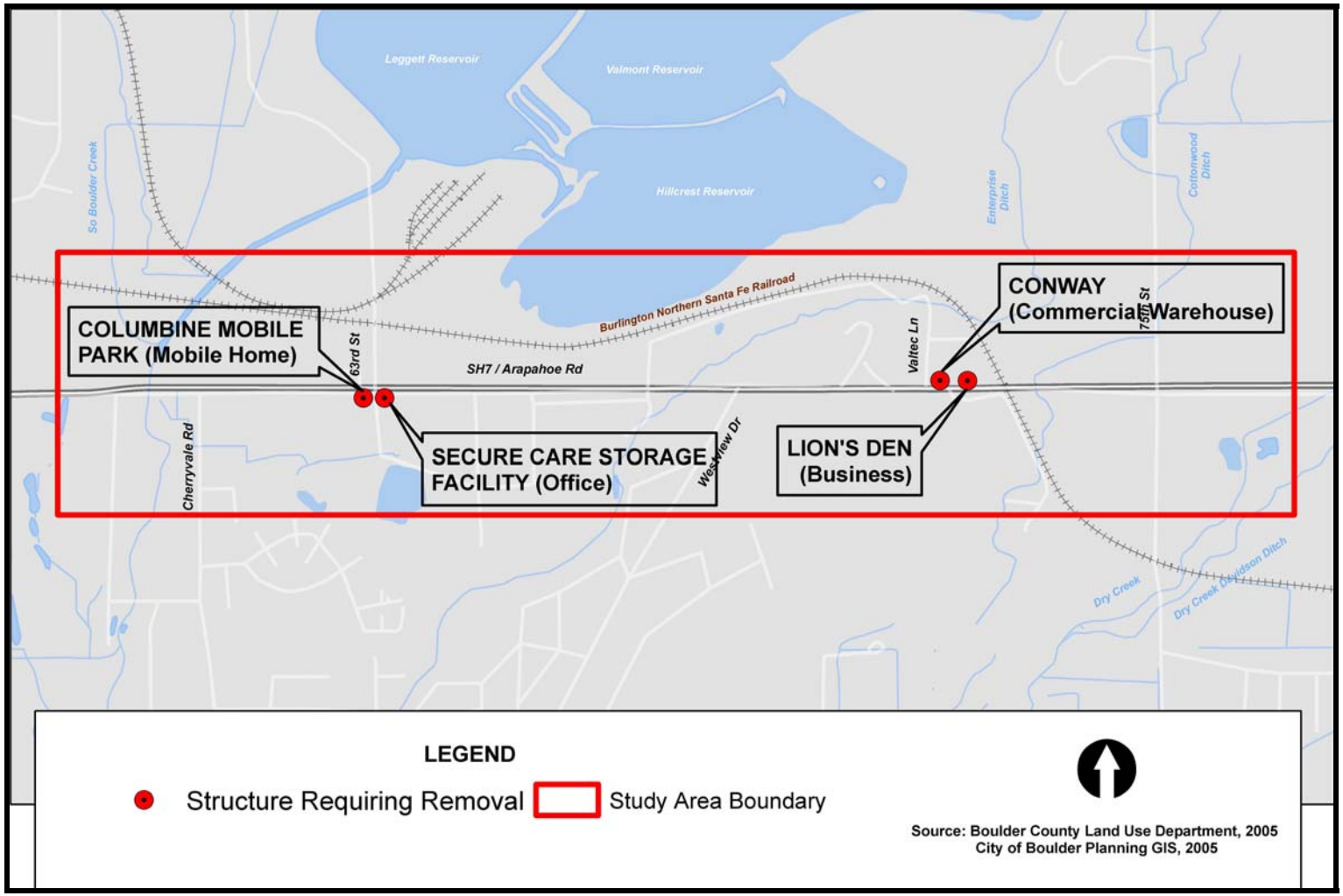


Table 3-8
Right-of-Way Summary

Property Address	Area of Acquisition for Preferred Alternative		Land Use	Building Acquisition for Preferred Alternative
	Right-of-Way (sf)	Perm. Esmt. (sf)		
6025 Arapahoe Road	3,800		Commercial	None
6287 Arapahoe Road	22,400		Commercial	None
6307 Arapahoe Road	250		Commercial	None
6325-6333 Arapahoe Road	0	300	Commercial	None
6367 Arapahoe Road	0	1,500	Commercial	None
6389 Arapahoe Road	1,200	3,700	Commercial	None
6389 Arapahoe Road	1,200	1,200	Commercial	None
?? Arapahoe Road	2,500	1,500	Residential	None
6437-6439 Arapahoe Road	7,000	4,200	Residential	None
6519 Arapahoe Road	5,500	3,300	Commercial	None
6551 Arapahoe Road	10,000	3,900	Commercial	None
6585 Arapahoe Road	3,200	4,500	Commercial	None
6655 Arapahoe Road	2,100	3,900	Commercial	None
6661 Arapahoe Road	1,050	2,000	Commercial	None
6681 Arapahoe Road	0	3,000	Commercial	None
6687 Arapahoe Road	0	5,000	Commercial	None
6775 Arapahoe Road	0	0	Residential and Equestrian Facilities	None
Arapahoe Road	0	0	Public Park	None
7123 Arapahoe Road	3,600	5,300	Commercial	None
7183 Arapahoe Road	3,900	1,200	Commercial	One Commercial Structure
7185 Arapahoe Road	9,100	0	Commercial	None

continued

Table 3-8 (continued)
Right-of-Way Summary

Property Address	Area of Acquisition for Preferred Alternative		Land Use	Building Acquisition for Preferred Alternative
	Right-of-Way (sf)	Perm. Esmt. (sf)		
7195 Arapahoe Road	2,600	0	Commercial	None
7209 Arapahoe Road	7,950	0	Commercial	One Commercial Structure
Arapahoe Road	9,400	0	Vacant	None
7483 Arapahoe Road	15,100	0	Church	None
1599 Cherryvale Road	0	0	Farm Land and Residence	None
5980 Arapahoe Road	17,100	0	Vacant	None
6160 Arapahoe Road	0	0	Residential	None
6180 Arapahoe Road	2,600	0	Residential	None
6234 Arapahoe Road	14,800	0	Vacant	None
6270 Arapahoe Road	4,700	0	Commercial	None
6280 Arapahoe Road	4,600	0	Commercial	None
6292 Arapahoe Road	6,800	0	Residential Mobile Homes	One Residential Structure
6338 Arapahoe Road	23,900	0	Commercial	One Commercial Structure
6400 Arapahoe Road	20,400	0	Commercial	None
6500 Arapahoe Road	73,300	13,000	School	None
6710 Arapahoe Road	12,400	0	Church	None
Arapahoe Road	0	0	Open Space	None
6908 Arapahoe Road	0	0	Open Space	None

continued

Table 3-8 (continued)
Right-of-Way Summary

Property Address	Area of Acquisition for Preferred Alternative		Land Use	Building Acquisition for Preferred Alternative
	Right-of-Way (sf)	Perm. Esmt. (sf)		
7280 Arapahoe Road	0	0	Residential	None
7394 Arapahoe Road	0	0	Farm Land and Residence	None

The second two structures requiring removal are on the north side of SH 7 near Valtec Lane just west of the Burlington Northern Santa Fe Railroad (BNSF) overpass where the proposed improvements would be in the transition of the north shift of the roadway alignment. The first is a commercial warehouse. The second structure is a house that has been converted into a business.

According to the Boulder County Assessor, the average price of a home in Boulder in 2003 was $375,000 and $286,900 for Boulder County. According to Census 2000 data, Boulder County had 119,900 housing units shown, of which 5,220 were identified as vacant. The City of Boulder had 40,726 housing units shown, of which 1,130 were identified as vacant. Within the study area, there were 394 housing units shown, of which 7 were vacant.

While the total number of commercial and retail properties in the Boulder area is not readily available, numerous realtors have listings of commercial and retail buildings and vacant property for sale or lease. Prices are highly variable depending on location and amenities.

Replacement housing for displaced residents and commercial space for displaced businesses is at a premium in the Boulder area. Some displaced businesses and residents may be able to relocate within the study area, depending on the availability of space or land at the time, price, and location and amenity needs.

The Preferred Alternative would require a total of approximately 6.6 acres of right-of-way from 27 owners along the project and approximately 0.9 acre of permanent slope easement.

3.5.3 Right-of-Way Acquisition Process, Compensation, and Relocation Benefits

All property acquisition will follow the procedures outlined in the CDOT *Right of Way Manual*. CDOT follows the Federal Uniform Relocation and Real Property Acquisition

Act of 1970 (Public Law 91-646), as amended in 1987 (Public Law 100-17), 1991 (Public Law 102-240) and 1997 (Public Law 105-117). The purpose of the act is "To provide for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by Federal and federally assisted programs and to establish uniform and equitable land acquisition policies for Federal and federally assisted programs."

For permanent right-of-way acquisitions, under CDOT right-of-way policy, owners will be compensated in a fair and equitable manner. Depending on the estimated value of the property, monetary compensation is determined through independent and impartial appraisals by qualified professionals (over $5,000) or by value finding (under $5,000). For permanent slope easements acquisitions, similarly to right-of-way acquisitions, owners will be compensated in a fair and equitable manner through the use of appraisals (over $5,000) or by value finding (under $5,000). For permanent slope easements, owners are compensated for the property but retain limited usage in ways that do not cause negative impacts to the roadway.

For properties requiring relocation, the relocation benefits provided to those displaced are determined by eligibility guidelines based on federal regulations. For eligible businesses, this includes reimbursement of actual reasonable and necessary moving and related expenses and certain re-establishment costs, or a fixed payment in lieu of all other possible relocation benefits. For eligible residences, this includes reimbursement of moving and related expenses, a replacement housing benefit for owners, or a rental supplement for renters. The rental supplement payment may also be used towards the down payment for the purchase of a replacement dwelling to encourage renters to become property owners. The replacement housing benefit and rental supplement benefit have certain monetary limitations; however, these limitations can be exceeded in certain circumstances.

3.6 Existing and Forecasted Transportation Conditions

3.6.1 Roadway Existing Conditions

West of Westview Drive, SH 7 is classified as a Federal-Aid Urban Principal Arterial. East of Westview Drive, SH 7 is classified as a Federal-Aid Rural Minor Arterial. SH 7 is a two-lane rural facility with the exception of the western limit of the project in the City of Boulder, which is a four-lane urban divided arterial.

The project is located in rolling terrain, with the middle section of the project dominated by a hill that is higher in elevation than the east and west ends of the project limits by approximately 120 feet. Approach grades are 7 percent on the west side of the hill and 6 percent on the east side of the hill. The approach grades can be difficult for drivers to maneuver during inclement weather. The posted speed in the vicinity of the hill is 50

mph, which correlates to a minimum stopping sight distance of 425 feet. The existing crest vertical curve has a stopping sight distance of 250 feet, which corresponds to a 35 mph design speed.

The west end of the project (Cherryvale Road to approximately 500 feet east of Westview) is posted at 45 mph. The eastern remainder of the corridor is posted at 50 mph with the exception of the direct vicinity of the 75th Street intersection, which is posted at 45 mph.

The existing paved roadway section is 28 to 30 feet in width with additional 2- to 6-foot gravel shoulders. The roadway was originally paved with a width of 16 feet of concrete pavement. Widening and overlays have been done with asphalt. Roadside ditches are steep sided and are directly adjacent to the shoulder. The existing roadway section provides little room to pass an incapacitated vehicle and does not provide warranted auxiliary lanes. Roadside clear zone is inadequate or nonexistent for vehicle recovery. In many cases culvert end sections have been crushed due to their close proximity to the travel lanes.

Along segments of the project, there is not enough slope across the lanes to allow for adequate drainage. Also, warranted right- and left-turn lanes are either nonexistent or substandard, including the right-turn lanes for eastbound traffic at the BVSD signal, and Westview Drive. Substandard left-turn lanes are present at Cherryvale Road, 63rd Street and at the BVSD signalized intersection.

3.6.2 Transit Facilities Existing Conditions

The Go Boulder/RTD provides the "JUMP" bus service every 10 minutes to the BVSD VoTec school and a bus that continues to the Lafayette park-n-Ride every 30 minutes. There are bus stops along SH 7 at 63rd Street, the BVSD signal, Valtec Lane and at 75th Street. In addition, there are bus stops within the BVSD VoTec internal circulation routes. Ridership along the JUMP route is approximately 1,800 passengers per day. Bus stops do not have bench facilities, shelters, sidewalk facilities or pedestrian access to adjacent land uses.

3.6.3 Existing and Forecasted Traffic Operations and Impacts

3.6.3.1 Existing Traffic Data

Traffic data for this project was initially collected in May 2001. Additional traffic data was collected in the July 2004, and more data in the corridor was collected in January 2007. **Table 3-9** shows traffic trends on SH 7 between 63rd and 75th Street dating back to 1988.

Table 3-9
Traffic Trends on SH 7 Between 63rd And 75th Street Dating Back To 1988

Year	Daily Traffic
1988	10,600*
1990	13,000*
1995	14,200*
2001	16,000
2004	18,500
2007	19,300

*The counts prior to 2001 are Average Annual Daily Traffic (AADT), while more recent counts are weekday traffic counts.

Hourly traffic counts were also done in the three years of 2001, 2004, and 2007 and provide information on trends in peak hour traffic (see **Figure 3-6**). The graphs show the effect of the improvement at 75th Street, which allows more westbound traffic in the AM peak hours. The counts also show a continuing increase in PM peak traffic, and a continuing trend of traffic growth throughout the day in both directions.

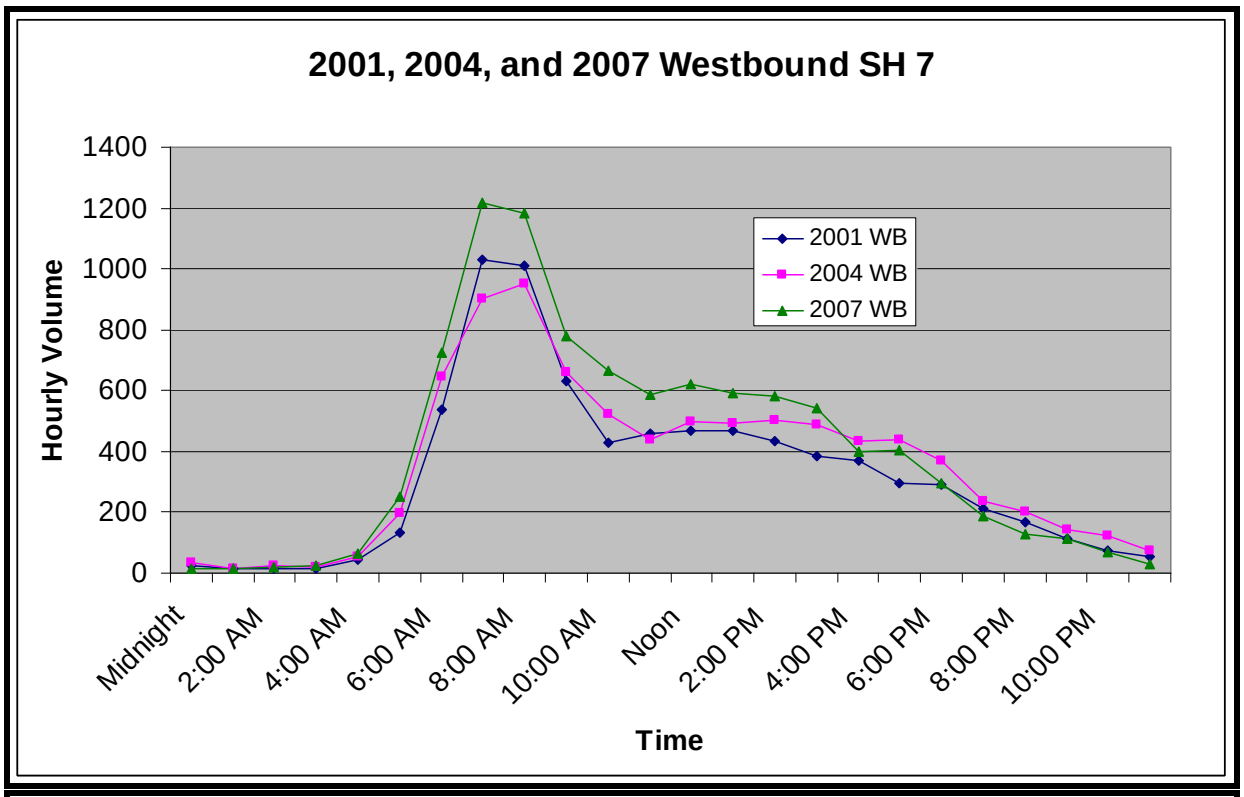
The LOS of the existing condition is similar to the No-Action LOS described in the next section.

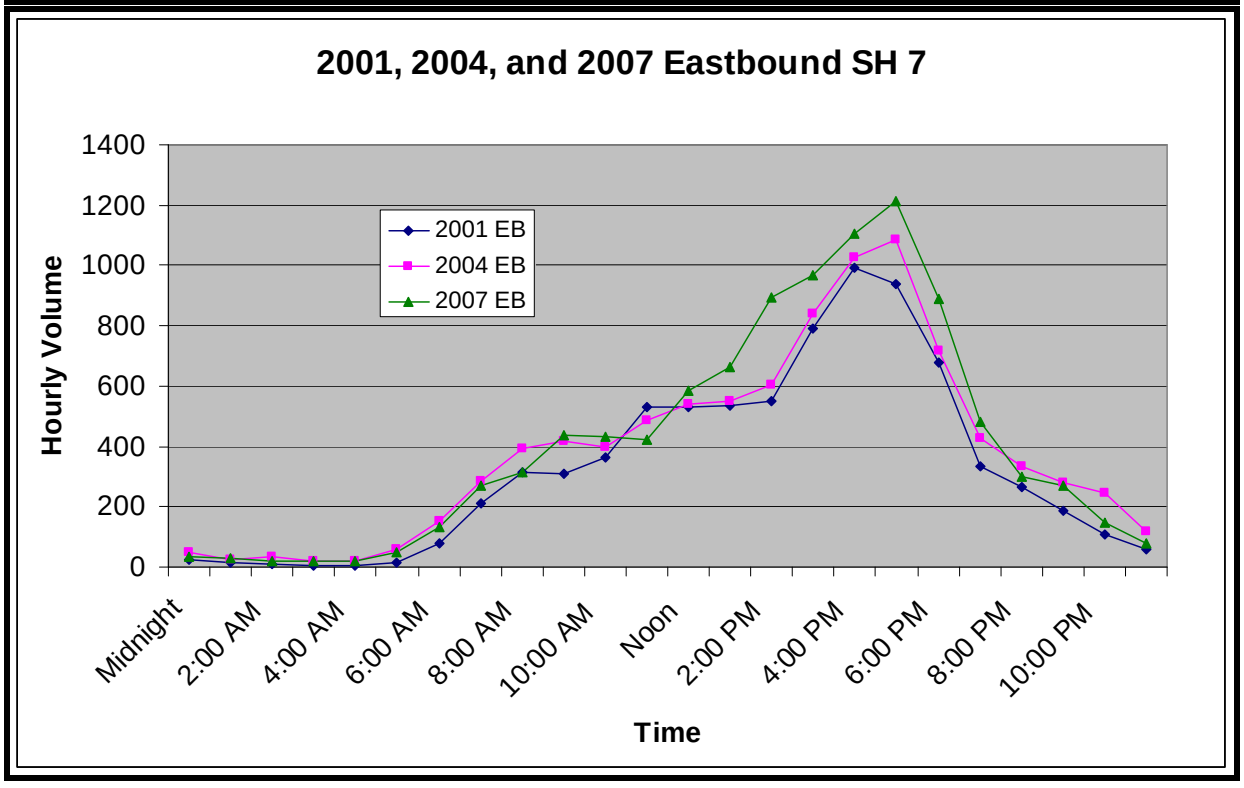
3.6.3.2 Future Traffic Data

Traffic forecasting for 2030 was done using the Denver Regional Council of Governments (DRCOG) regional transportation plan (RTP) sketch plan model. The RTP model has the Cherryvale to 75th section of SH 7 at two-lanes. The model appears to be recognizing this capacity constraint, thus the ability for the traffic model to assign more traffic to this segment is limited. Below are comparisons of forecasts from different points in time looking forward to different horizon years:

- 2020 forecasting from the *Consortium of Cities Transportation Study* done in the mid-late 1990s showed this section of SH 7 with 21,000 vpd.
- 2020 forecasting using the DRCOG RTP sketch model from the late 1990s had a forecast of 21,500 vpd on the same section of SH 7.
- 2025 forecasting using the DRCOG RTP sketch model during the improvement assessment study of SH 7 had a forecast of 23,000 vpd on this section of SH 7.
- 2030 forecasting done in 2005 using the DRCOG RTP sketch model for this section of SH 7 forecasted 22,000 vpd.

Figure 3-6
2001, 2004, and 2007 Hourly Volume Comparison





- The most recent 2030 forecasting from DRCOG includes the regional trip adjustment for FasTracks projects, 2 lanes on SH 7, and a forecast of 23,100 vpd on SH 7 west of 75th.

All of the different forecasting periods from the DRCOG model show that the model is basically filling up the available two-lane capacity of SH 7. The conclusion is that if SH 7 is two lanes, those two lanes will fill to capacity at some time, regardless of the horizon year that is evaluated. SH 7 is already near capacity in the peak hours and peak direction, so much of the traffic growth in the future will have to occur outside the peak hours and/or in the off-peak traffic direction.

The above model forecasts are appropriate to use for a No-Action forecast for SH 7 as well as the Preferred Alternative, since a substantial segment of SH 7 will still be two through lanes. Since the model forecasts SH 7 at capacity in 2030, and the LOS of the two-lane section is nearing capacity with LOS E operations in 2004 and 2007, an alternative model run with four lanes on SH 7 from Cherryvale to 75th Street was done. The results of that model run show about 27,300 vpd on SH 7 west of 75th Street, an increase of 20% over the two-lane model run. Other notable results from the four-lane model run:

- The traffic forecasts on Baseline Road and Cherryvale drop by 28%-35% with four lanes on SH 7. The model recognizes Baseline/Cherryvale as an alternative route to a two-lane SH 7 at capacity. This is notable because Cherryvale is residential and has traffic calming features, and there is an elementary school and residential driveways along Baseline Road.

- The traffic forecasts on Valmont drop by about 7% with four lanes on SH 7.

- The 27,300 vpd forecast for a four-lane SH 7 is well below the capacity of a four-lane section; it appears that the two-lane section of SH 7 east of 75th Street (toward 95th Street) is constraining the ability of the four-lane section to approach its capacity.

The DRCOG forecasts were used in conjunction with the updated 2007 traffic counts to develop 2030 forecasts for analysis. The forecasts for both the No-Action and the Preferred Alternative were augmented with the trips generated by the proposed park-n-Ride for the commuter rail station, which is planned to be on the north side of SH 7 at the BVSD/Votec signal. The DRCOG regional model is not detailed enough to specifically forecast trips from this park-n-Ride, so these trips were estimated using ITE trip rates for an 800 parking space facility.

The added turning volumes at the park-n-Ride will add the most conflicting traffic at an intersection in the corridor. Park-n-Ride traffic was determined from trip calculations for an 800 space park-n-Ride and 75% of the patrons to/from the west. The turning traffic to/from the park-n-Ride has the following characteristics:

- AM peak traffic into the park-n-Ride may occur mostly between 6:30 a.m. and 7:30 a.m., assuming a 45 minute to one hour train ride to Denver, assuming most rail users are going toward Denver. The peak of the AM traffic toward Boulder is currently 7:30 a.m. to 8:30 a.m., but that period will likely expand in the future to slightly overlap the peak inflow at the park-n-Ride. There will still be a conflict of inbound park-n-Ride traffic versus heavy westbound SH 7 through traffic.

- PM peak traffic patterns from the park-n-Ride and SH 7 will not conflict substantially with each other. Heavy right turns out of the park-n-Ride do not conflict with the heavy eastbound through traffic.

3.6.3.3 Future Traffic Operations

The traffic operations were evaluated for the key signalized intersections in the study area, and for the key roadway segment being evaluated for widening to four lanes. The LOS analysis was done using the Highway Capacity Manual (HCM) methodology for signalized intersections and for roadway segments. The results are shown in **Table 3-10.**

Table 3-10
Traffic Alternatives, Level of Service

	Level of Service (LOS) AM Peak / PM Peak			
	Cherryvale Intersection	63rd Intersection	Votec \ RTD Intersection	Road Segment (BVSD to 75th)
Existing	C/C	C/C	B/B	E/E
2030:				
No-Action	C/D	E/D	D/D	E/E
Preferred Alternative	C/D	B/B	B/B	E/E

The HCM methodology for analysis of two-lane highways is based on highways that are more rural in character than this portion of SH 7. The methodology considers the capacity effects of improved shoulders but does not consider the effect of left-turn lanes at intersections. The LOS E for the two-lane alternatives is a reflection of the single-lane

of peak traffic being at capacity. Although the two-lane LOS is E, the difference in travel times between the two-lane and four-lane alternative is minimal.

Safety and accidents should be considered when comparing the No-Action to the Preferred Alternative. While it is difficult to predict accident rates for roadways due to the complexity and abundance of variables on different roadways, the majority of research conducted on the relationship of congestion and accident rates has determined that a U-shaped pattern will result when graphing number of accidents (vertically) versus traffic volume (horizontally).

At low traffic congestion levels, single-vehicle accident rates are high, and gradually decrease as congestion rises. This could be attributed to drivers taking more risks with fewer vehicles on the road, and could also include time-of-day factors.

Multiple-vehicle accidents most closely follow the U-shaped pattern. Accident rates are at the lowest levels when traffic levels are near LOS C, and the accident rates increase along with worsening congestion levels.

3.6.4 Safety Existing Conditions

CDOT completed a Safety Assessment Report for SH 7 from Cherryvale Road through the 75th Street intersection in May 2001. Accident data for the safety assessment was collected and compiled by CDOT for the period from March 1, 1996, to February 29, 2000. In addition, to supplement the information developed as part of the Safety Assessment report, CDOT collected and compiled accident data for the period from March 1, 2000, to December 31, 2002. This supplemental accident data was obtained to confirm that the conditions identified in the Safety Assessment report were still valid.

The Safety Assessment Report identified that there were 128 accidents along the corridor. Of those, 40 percent of the accidents resulted in injuries to 74 persons. The overall Weighted Hazard Index for the studied section of SH 7 was 1.76, slightly better than average when compared with other, similar highways statewide. Approximately 50 percent of the accidents occurred in the peak hour periods. Accidents associated with intersections and driveway accesses accounted for 87 percent of the accidents. A concentration of the accidents occurred at the intersection with 75th Street. Following are other observations made as part of the Safety Assessment Report with regard to the accident data:

- Five of the accidents on SH 7 at Cherryvale Road involved eastbound vehicles during wet pavement conditions.

- Ten rear-end accidents (nine were westbound), six involving injuries, occurred at or immediately east of the intersection of SH 7 at Westview Drive.
- Eight accidents, six being rear-end, occurred at the SH 7 intersection with Valtec Lane.
- Sixteen accidents occurred at the business accesses just west of 75th Street. Six broadsides involved vehicles turning left out of the accesses onto SH 7 and two approach turns involved vehicles turning into the accesses.
- Thirteen accidents occurred at the 75th Street intersection, with 54 percent being broadsides.

The supplemental accident data supported the findings of the Safety Assessment Report with no noted changes in type or frequency of accidents.

At Cherryvale Road the most frequent occurring accident types are approach turn and broadside. Based upon operational characteristics, consideration should be given to providing protected/permitted phasing for westbound left turns. A high proportion of the accidents at the intersection, particularly those involving eastbound vehicles, occurred during wet pavement conditions. In addition, CDOT Maintenance confirmed that there is a drainage problem at the intersection that causes ponding water.

Rear-end accidents were the only type of accident to occur at Westview Drive with 90 percent of them being westbound. Stopping sight distance of 250 feet (35 mph design speed) at the crest of the hill and the 7 percent westbound downgrade could be contributing to the rear-end collisions.

At and near the Valtec Lane intersection with SH 7, the most common accident types were rear end and approach turn.

3.6.5 Transit Facilities Impacts

No-Action Alternative
With the No-Action Alternative, the existing conditions described above would continue (no bike lanes, sidewalks, and improved bus stops).

Preferred Alternative
The Preferred Alternative would improve transit for the corridor. This alternative would include pad and bench facilities along with sidewalk facilities for bus users. In the case of the intersection at 63rd Street, westbound deceleration and acceleration lanes are warranted and can be used as queue jump lanes for buses.

3.6.6 Safety Impacts

No-Action Alternative
With the No-Action Alternative safety would not be improved.

Preferred Alternative
The Preferred Alternative would improve the deficient roadway condition and thus improve safety by enhancing vertical geometry, improving drainage, improving sight distance, providing clear roadsides, providing required auxiliary lanes, consolidating and controlling access and providing refuge for stalled vehicles.

Incorporation of accident counter measures into the final design and designing a roadway consistent with CDOT and American Association of State Highway and Transportation Officials (AASHTO) design standards would help to reduce accidents and thus provide a benefit to the users of the facility.

3.6.7 Transportation Mitigation

Because there are no adverse impacts, mitigation is not necessary.

3.7 Noise

3.7.1 Existing Conditions

FHWA and CDOT have established criteria by which to determine noise impacts from traffic sources on certain land uses. These are shown in **Table 3-11**.

Table 3-11
CDOT Noise Abatement Criteria (NAC)

Activity Category	CDOT Leq (h) (hourly)	Description of Activity Category
A	56 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	--	Undeveloped lands.

The above criteria are typically applied to outdoor areas of use, which for residences is usually described as a first-floor outdoor patio/deck area. For example, for a residential area, a noise impact would occur if the project results in a noise level of 66 dB(A) or greater. If a project would result in noise levels that reach or exceed these thresholds, noise mitigation would need to be considered as a part of the project. In addition, a noise impact is considered to be substantial if the project would result in a noise increase of 10 dB(A) or greater over existing noise levels.

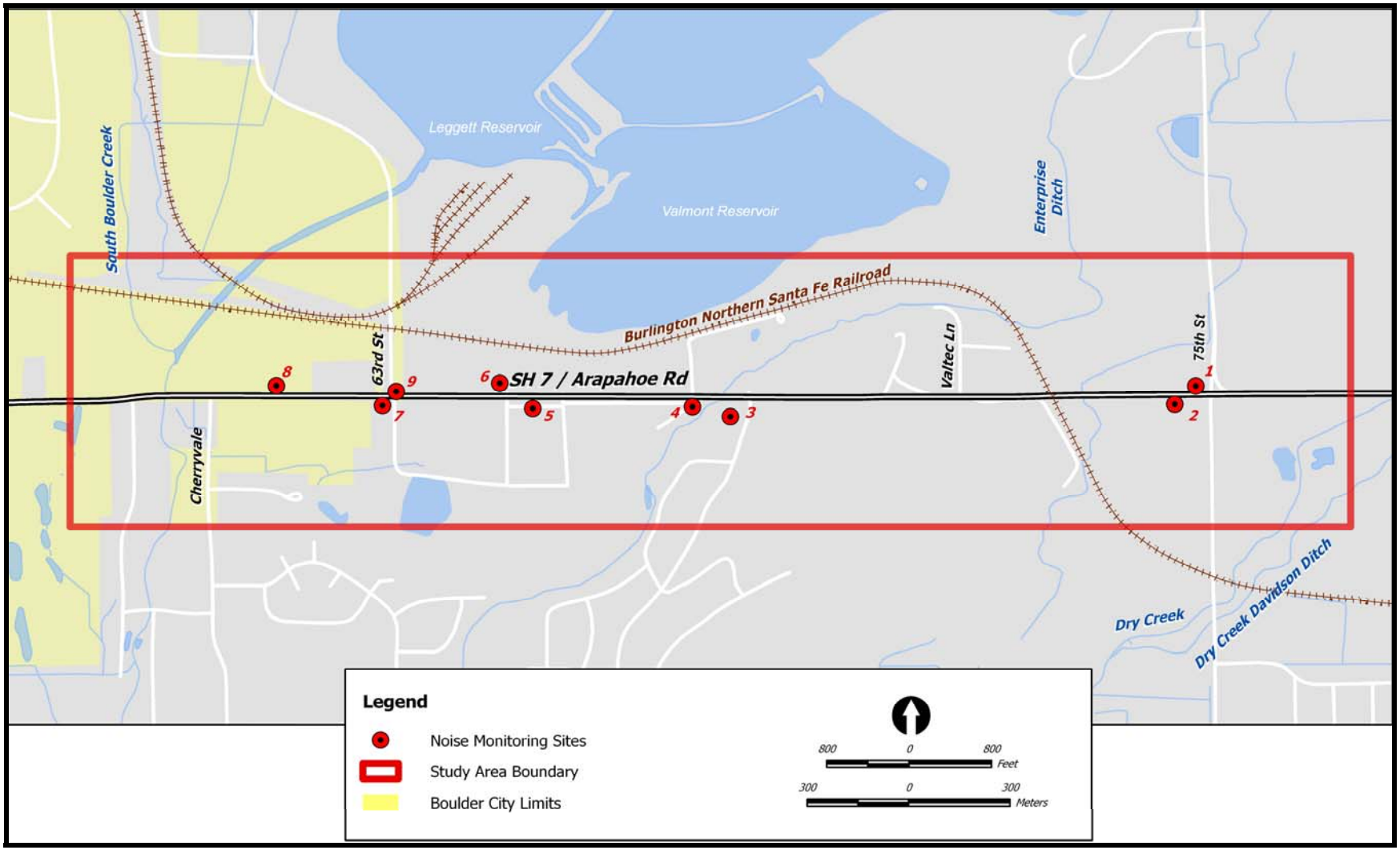
Noise measurements were taken at nine different sites to determine the existing noise conditions (see **Figure 3-7**). Land uses within the study area are primarily residential and commercial, with some light industrial, open space and agricultural uses. "Noise-sensitive" land uses, including a mobile home park, a church, a school and numerous single-family residential units, are present along the project.

The on-site measurements ranged from 60.6 to 69.9 dB(A). All on-site noise measurements were taken during the PM (4:00 p.m. to 6:00 p.m.) peak periods. Field measurements at the monitoring locations were generally taken at the closest point of the structure or closest outdoor use area to the roadway. **Table 3-12** summarizes the results of the on-site measurements. The existing noise levels do not reach or exceed the NAC, as defined in **Table 3-11**, at any of the monitoring locations.

Table 3-12
Existing Noise Levels

Site	Category	Location	Monitored Noise (dB(A))	Modeled Noise (dB(A))
1	B	Church at northwest corner of SH 7/75th Street	65.3	63.8
2	C	Restaurant at southwest corner of SH 7/75th Street	63.5	62.8
3	B	Church at southwest corner of SH 7/Westview Drive	60.9	59.5
4	B	Trailers at BVSD site	62.8	60.2
5	B	Tech school at 6500 Arapahoe Road (SH 7)	61.8	60.4
6	B	Abandoned residence at 6437-6439 Arapahoe Road (SH 7)	61.1	62.2
7	B	Trailer park southwest of SH 7/63rd Street	60.6	64.9
8	C	Commercial site at 6123 Arapahoe Road (SH 7)	67.5	65.6
9	C	Historic structure at northeast corner of SH 7/63rd Street	69.9	70.7

Figure 3-7
Noise Monitoring Sites



In order to accurately model future noise conditions, the STAMINA noise model must be validated to emulate the existing field conditions. The model run for existing conditions resulted in noise levels that were within 3 dB(A) as required by CDOT guidelines, except at one location. At location 7, the field measurements were approximately four decibels lower than the noise level predicted by the model. Although the model tended to over-predict noise levels at this location, overall the noise model was found to perform acceptably for this project.

Noise levels were modeled at 39 locations along SH 7 to represent the receptors along the study area (see **Figure 3-9**). These locations are listed in **Table 3-13**.

Figure 3-8
Noise Modeling Sites

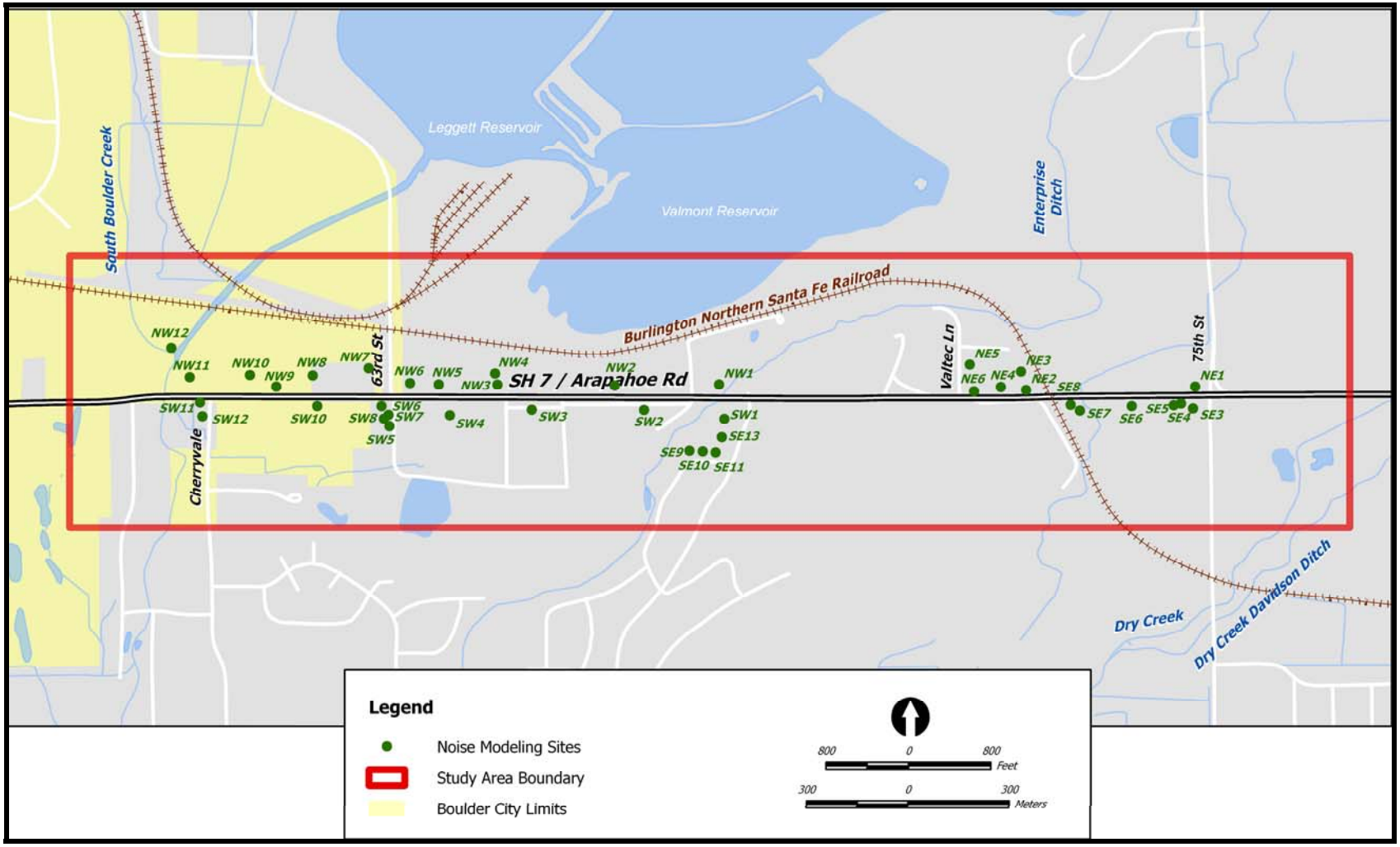


Table 3-13
Noise Model Results (Peak Hour 2004 and 2030)

Site ID	Activity Category (# Of Receptors)	AM 2004 Modeled Noise Level (dB(A))	PM 2004 Modeled Noise Level (dB(A))	AM 2030 No-Action and Preferred Alternatives Modeled Noise Level (dB(A))	PM 2030 No-Action and Preferred Alternatives Modeled Noise Level (dB(A))	Impact
NE1	B(1)	62.3	61.5	62.6	63.2	No
NE2	C(1)	71.8	71.0	Acquired	Acquired	No
NE3	B(1)	58.9	59.0	60.5	60.4	No
NE4	C(1)	66.9	66.5	68.0	68.4	No
NE5	C(1)	56.6	56.8	58.2	58.0	No
NE6	C(1)	70.7	69.9	Acquired	Acquired	No
SE3	C(1)	56.8	58.4	59.5	57.8	No
SE4	C(1)	59.2	61.4	62.6	60.3	No
SE5	B(2)	58.0	60.2	61.4	59.1	No
SE6	B(1)	60.3	60.6	62.0	61.7	No
SE7	B(1)	59.8	60.5	61.9	61.2	No
SE8	B(1)	62.4	63.3	64.7	63.8	No
SE9	B(1)	52.6	53.3	54.2	54.1	No
SE10	B(1)	52.5	53.2	54.2	54.0	No
SE11	B(1)	52.4	53.1	54.1	53.8	No
SE13	B(1)	54.6	55.3	56.3	56.1	No
NW1	B(1)	62.7	63.0	63.8	64.1	No
NW2	C(1)	64.2	64.5	65.3	65.6	No
NW3	B(1)	63.5	64.0	65.4	65.3	No
NW4	B(1)	58.7	59.3	60.8	60.5	No
NW5	C(1)	61.8	62.3	63.8	63.6	No
NW6	C(2)	61.3	61.8	63.1	63.0	No
NW7	C(1)	57.7	58.3	59.4	59.0	No
NW8	C(1)	54.8	55.6	56.6	56.1	No
NW9	C(1)	67.8	67.6	68.6	68.9	No
NW10	C(1)	61.1	61.4	62.4	62.3	No
NW11	C(1)	53.5	54.1	55.2	54.7	No
NW12	C(1)	67.6	67.6	68.7	69.0	No
SW1	B(1)	58.7	59.6	60.5	60.2	No
SW2	B(1)	61.7	62.7	63.6	63.3	No
SW3	C(1)	61.6	62.7	64.1	63.6	No
SW4	C(1)	60.5	61.5	62.9	62.4	No
SW5	B(2)	62.2	63.2	64.4	63.6	No
SW6	B(2)	58.3	59.2	60.4	59.8	No
SW7	B(1)	68.1	69.7	Acquired	Acquired	No
SW8	B(2)	60.7	61.7	62.8	62.1	No
SW10	B(2)	65.9	**67.4**	**68.4**	**67.2**	**Yes**
SW11	B(1)	57.9	58.8	59.8	59.1	No
SW12	B(1)	55.4	56.4	57.5	56.6	No

3.7.2 Noise Impact Assessment

No-Action Alternative
There would be no noise impacts with the No-Action Alternative.

Preferred Alternative
According to the model, the Preferred Alternative would cause four of the modeled locations to have noise levels above the NAC in 2030. These four receptors approach or exceed the NAC with predicted future noise levels increasing between 3 and 5 dB(A). One of the sites, Receptor SW10 representing two residences, would experience noise levels above the impact NAC for Category B if the Preferred Alternative was constructed. Mitigation should be considered for this location. Receptors NE2, NE6 and SW7 would be acquired and removed, and therefore no mitigation needs to be considered for these locations.

All remaining receivers falling below the NAC have modeled noise levels ranging from 53.8 to 67.2 dB(A) for Category B receivers and from 56.0 to 71.3 dB(A) for Category C receivers. Of these receivers, the greatest projected increase over existing noise levels is 3.4 dB(A).

3.7.3 Mitigation Analysis

Once a noise impact is determined to result from the proposed improvements, a reasonableness and feasibility analysis must be conducted to determine if mitigation is warranted at these locations. Mitigation should consider all possible noise abatement measures for reasonableness and feasibility. These include providing 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 CDOT guidelines, the "feasibility and reasonableness" of mitigation needs to be considered for all locations that are projected to experience noise impacts. The feasibility analysis of mitigation considers such factors as the effectiveness of a barrier to achieve a 5-dB(A) reduction in predicted future noise levels, construction, engineering, maintenance or other design issues. Mitigation measures are considered feasible if they can achieve a noise reduction of 5 dB(A) for at least one receiver. They should not create any safety or unacceptable 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 7 as a major highway and the commercial and light industrial uses along the highway. 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 models were run to test the reasonableness and feasibility of noise walls. Note that a unit noise wall cost of $30.00 per square foot was used in all of the calculations, according to current CDOT guidelines. Noise abatement structures were analyzed for one impacted area according to CDOT guidelines.

Mitigation Barrier

Mitigation Barrier at SW10

A noise barrier was analyzed for Site SW10, which consists of two residences located at 6160 and 6180 Arapahoe Road. Noise mitigation at this site is not recommended because the resultant cost-benefit was unreasonable according to CDOT and FHWA guidelines. The feasible and reasonable analyses are detailed in Appendix B of the SH 7 *Noise Analysis Technical Memorandum*, which is located in **Appendix E** of this document.

An effective noise reduction of 5.7 decibels could be achieved at this location by constructing a continuous six-foot noise wall that is 310 feet long. The noise wall would require relocation of the two residential driveway accesses. Any gaps in the wall would decrease the effectiveness of the noise abatement, making the wall infeasible. The wall is shown **Figure 3-9**, illustrating the gaps created by intervening driveway access points. Construction of a continuous wall should not create safety hazards for vehicles or pedestrians along SH 7. The cost of a continuous wall of these dimensions would be approximately $55,800. Using the CDOT criterion for cost benefit in determining the reasonableness of noise abatement discussed in the paragraphs above, the cost benefit of this noise wall would be approximately $4,895 per receiver per decibel noise reduction. CDOT considers any amount over $4,000 not reasonable. Noise mitigation at this location is not recommended because, although relocating the two accesses would make this wall feasible, the extraordinary cost/benefit ratio would make the wall unreasonable.

Figure 3-9
Analyzed Noise Barrier Location SW10

3.8 Air Quality

3.8.1 Existing Conditions

Air quality issues in the SH 7 study area include visibility and gaseous pollutant levels related to motor vehicle emissions and street sanding sources.

The transportation and circulation system evaluated for air quality impacts consists of major intersections of 63rd Street, the Boulder Valley School District signalized access, and 75th Street with SH 7. Data pertinent to traffic volumes and LOS in this section are drawn from traffic data presented in Section 3.6.3 *Existing and Forecasted Traffic Operations and Impacts*. LOS values for the various intersections of interest are listed in **Table 3-14**. Project level air quality analyses are typically completed for signalized intersections demonstrating deficient levels of service, LOS D or worse.

Table 3-14
Project Intersection Level of Service

Intersection	Existing	No-Action	Preferred Alternative
75th Street & SH 7	F/F	D/D*	C/C
Boulder Valley School District Rd & SH 7	B/B	D/D	B/B
63rd Street & SH 7	C/C	E/D	B/B

*This includes constructed improvements.

3.8.1.1 National Ambient Air Quality Standards

The US Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for each of the six criteria pollutants to protect the public from the health hazards associated with air pollution. These six criteria pollutants are carbon monoxide (CO), ozone (O_3), nitrogen oxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The State of Colorado has adopted the NAAQS for these criteria pollutants as shown in **Table 3-15**.

The Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) monitors concentrations of these pollutants. Geographic areas that violate a particular NAAQS pollutant standard are considered "non-attainment" areas for that pollutant. Violations are determined by a prescribed number of exceedances of the particular standard.

Table 3-15
National Ambient Air Quality Standards for Criteria Pollutants

Pollutant/Averaging Time	Primary Standard	Secondary Standard
Particulate Matter less than 10 microns (PM_{10})		
Annual	50 ug/m^3	50 ug/m^3
24-hour	150 ug/m^3	150 ug/m^3
Particulate Matter less than 2.5 microns ($PM_{2.5}$)		
Annual*	15 ug/m^3	15 ug/m^3
24-hour*	65 ug/m^3	65 ug/m^3
Sulfur Dioxide (SO_2)		
Annual	80 ug/m^3 (0.03ppm)	--
24-hour	365 ug/m^3 (0.14ppm)	--
3-hour	--	1300 ug/m^3 (0.5ppm)
Nitrogen Dioxide (NO_2)		
Annual	100 ug/m^3 (0.053ppm)	100 ug/m^3 (0.053ppm)
Ozone (O_3)		
1-hour	235 ug/m^3 (0.12ppm)	235 ug/m^3 (0.12ppm)
8-hour	157 ug/m^3 (0.08ppm)	157 ug/m^3 (0.08ppm)
Carbon Monoxide (CO)		
8-hour	10,000 ug/m^3 (9 ppm)	--
1-hour	40,000 ug/m^3 (35 ppm)	--
Lead (Pb)		
Calendar Quarter	1.5 ug/m^3	--

*The ozone 8-hour standard and the PM2.5 standards are included for information only. These standards are currently not in use.
ug/m3 = micrograms per cubic meter.
ppm = parts per million.

The APCD also monitors for pollutants that do not have a national standard established. These "non-criteria" pollutants include nitric oxide, total suspended particulate, cadmium, arsenic, sulfates, and visibility.

The APCD completed installation of $PM_{2.5}$ monitors in 2000 and has been acquiring data in the Denver metropolitan area, including Boulder County, without an exceedance of NAAQS since that time.

Greenhouse gases (water vapor, carbon dioxide, methane, and nitrous oxide) and emissions are discussed in the 1998 CDPHE report, *Climate Change & Colorado – A Technical Assessment* and the November 2000 supplement. The APCD has developed several CO_2 reduction strategies and will be considering regional programs to reduce stationary, area and mobile CO_2 sources.

3.8.1.2 Climate & Meteorology

The study area is situated within the Colorado Front Range at an average elevation of 5250 feet above sea level at SH 7 and 75th Street. The climate is moderate with average temperatures ranging from 36°F in January to 75°F in July, with low relative humidity. The average annual precipitation is 15 to 20 inches with annual snowfall averaging 79 inches since 1961. The predominant winds are from the southeast. Wind speeds can be highly variable. Gusty system front-generated winds over 50 mph are not uncommon.

3.8.1.3 Air Pollution Sources

The SH 7 study area contains neither industrialized areas nor power generating plants. Emission sources for this study area are generated from re-entrained dust and motor vehicle emissions.

3.8.1.4 Air Quality Monitoring

There are six monitoring stations near the study area. The monitoring station types are highlighted in **Table 3-16**. There are no monitors within the actual study area.

Table 3-16
Air Quality Monitoring Stations near Study Area

Monitoring Station	Monitored Critical Pollutants			
	CO	O_3	PM_{10}	$PM_{2.5}$
2150 28th Street, Boulder	X			
1405 ½ South Foothills, Boulder		X		
2102 Athens Street, Boulder				X
2440 Pearl Street, Boulder			X	X
3rd Avenue, Longmont			X	X
440 Main Street, Longmont	X			

Class I and II Visibility Areas

There are no Class I or Class II visibility areas in the study area.

State Implementation Plans and Air Quality Conformity

Section 176(c) of the Clean Air Act and related requirements mandate that federally related transportation plans, programs and projects must demonstrate and assure air quality conformity for non-compliance or redesignated attainment areas (i.e., maintenance plan). Boulder County was historically classified as a moderate non-attainment area for PM_{10} but was redesignated by the EPA for PM_{10} attainment in August 2002. The EPA redesignated Boulder County as in attainment for CO in January 2002 for ozone in September 2001. The area is currently under approved maintenance implementation plans for all three pollutants. There are no non-attainment areas within

the study area, and no violations of the NAAQS in the study area have been reported since 1991.

The federal Clean Air Act requires states to submit plans, known as State Implementation Plans (SIPs) to demonstrate how the state will meet the NAAQS for which they are designated non-attainment. As a part of the SIP development process, an emissions budget is established for non-attainment and attainment/maintenance areas to maintain the NAAQS. Because Boulder County is classified as an attainment/maintenance area for PM_{10}, ozone and CO, projected emissions of these pollutants resulting from transportation improvement plans (TIP) and regional transportation plans (RTPs) must not exceed the emissions budgets set forth in the SIP.

Multiple violations of the 8-hour ozone standard from 2002 through 2003 led the Regional Air Quality Council and the State of Colorado to pursue a deferral of the effective date of non-attainment of the 8-hour ozone standard and related requirements through an Early Action Compact (EAC) with EPA. The EAC covers the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson, as well as portions of Larimer and Weld counties. The EAC established a plan to expedite a return to ozone compliance and must implement milestones to achieve this goal before December 31, 2007, to avoid a non-attainment declaration by EPA. Ozone is formed as a by-product of combining the precursor pollutants of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) with sunlight. Dispersion and point source air quality modeling are establishing emission levels for base 2002 and target 2007 years, incorporating mobile source and non-road, industrial, and agricultural source ozone precursor emissions of NO_x and VOCs. As part of EAC milestones, precursor pollutant reduction and educational outreach programs were developed and implemented by the Regional Air Quality Council to achieve EAC area ozone compliance. EPA originally deferred designating the northern Front Range area as an 8-hour ozone non-attainment area as long as an enforceable plan was developed to demonstrate compliance with the ozone standard by the end of 2007. The non-attainment designation decision for the Front Range currently has been moved forward to July 1, 2007, rather than April 15, 2008, as is the case for the 13 other EAC areas in the nation.

In addition, the Colorado Air Quality Control Commission sets the requirements for air quality analysis for regional and "hot-spot" air quality on a project level. This includes the requirements for modeling and screening analysis of the selected project. These requirements have been incorporated in the air quality analysis for the study area.

The Colorado Air Quality Control Commission on April 19, 2001, adopted the current PM_{10} Re-designation Request and Maintenance Plan for the Denver metropolitan area.

Re-entrained dust from road sanding is a prime contributor to PM_{10}. CDOT reduces street sanding emissions through the use of alternative de-icing compounds such as magnesium chloride, lower temperature "M-Caliber 1000 and 2000", and "Ice-slicer" and rapid sand clean up. Transportation control measures (TCM) have been proposed in the SIP to induce reduction of PM_{10} emissions from mobile sources.

3.8.2 Air Quality Impact Assessment

The study area is located in Boulder County, which is included in the Denver metropolitan attainment/maintenance area for carbon monoxide (CO), ozone, and particulate matter (PM_{10}). Therefore, the conformity provisions of the federal Clean Air Act apply. The impacts of motor vehicle emissions in the study area on concentrations of CO, ozone and PM_{10} were analyzed for the Preferred Alternative. Pollutant concentrations, rather than total emissions, are a better indicator of project-level air quality impacts because they can be compared to the federal standards that were established to protect public health.

Carbon Monoxide

Carbon monoxide concentrations in the study area were calculated for future (2025) traffic conditions representing approximations of the Preferred Alternative. CO concentrations were modeled using the 2025 peak hour traffic volumes included in **Table 3-17** and motor vehicle emission rates. Traffic volumes consistent with the most recent RTP, *MetroVision 2030 Plan*, are slightly lower than the estimates used in the 2025 modeling (see **Table 3-17**). Because emission rates have been consistently decreasing from 2025 to 2030 plans, the original CO modeling for this intersection represents the most conservative calculation of CO concentrations likely at any location along the corridor. The numbers shown are "worst-case" CO concentrations for receptors located near the edge of the highway shoulder within 10 to 12 feet from the travel lane. CO concentrations at buildings and sensitive resources near the highway would be lower because most of the buildings are at least 40 feet from the highway and vehicle-related emissions would experience some dispersion by wind and turbulence. Thus, future violations of the CO standard are not likely to occur.

Table 3-17
Carbon Monoxide Concentrations

Alternative	2025 Traffic Volume (vpd)	2030 Traffic Volume (vpd)	NAAQS 8-hour CO	Maximum 8-hour CO concentration
Preferred Alternative	24,800	23,700	9 ppm	5.5 ppm

PM_{10}

Motor vehicle-related PM_{10} emissions are the primary source of PM_{10} in the study area. About 80 percent to 90 percent of vehicle related PM_{10} is due to re-entrained dust

associated with winter sanding operations. The remainder is due to exhaust, and brake and tire wear. Maximum PM_{10}concentrations are based upon comparison with regional PM_{10} modeling. The sixth highest PM_{10} average daily concentration over a 5-year period is typically used for comparison. The nearest point of comparison from the 2030 Denver regional attainment/maintenance PM_{10} model with a similar or higher VMT is at I-25 near SH 7. This regional grid receptor (#155) for 2030 PM_{10} concentrations provides a value of 89 ug/m^3. The federal 24-hour PM_{10} standard is 150 ug/m^3. This suggests that PM_{10}concentrations within the study area would remain below the federal standard.

Ozone

Ozone is not directly emitted by motor vehicles; it is an indirect by-product of motor vehicle emissions. Ozone is created by the reaction of nitrogen oxides (NOX) and volatile organic compounds (VOCs), primarily on hot summer days. Since ozone formation depends on the dispersion and reaction of the NOX and VOCs and occurs over several hours, ozone is predominantly a regional pollutant and cannot be quantified at the project level. It takes a 3-year average of the fourth-highest measured ozone level over 0.080 ppm (mathematically over 0.085 ppm) to create a violation similar to those that occurred in the 2003 season. The ozone situation in the summer of 2007 has led to a violation of the 8-hour ozone standard. EPA and APCD are currently evaluating how and when the non-attainment plan will be implemented.

3.8.3 Mobile Source Air Toxics

In addition to the NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. See document No. EPA420-R-00-023 (December 2000).

In the 2001 rulemaking, EPA identified six priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1, 3 butadiene (66 FR 17230). EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS

database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Under the proposed revised Carcinogen Risk Assessment Guidelines (US EPA, 1996), **benzene** is characterized as a known human carcinogen.
- Under the Draft Revised Guidelines for Carcinogen Risk Assessment (US EPA, 1999), the potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- Under EPA's 1999 Guidelines for Carcinogen Risk Assessment (US EPA, 1999), **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Using US EPA's revised draft 1999 Guidelines for Carcinogen Risk Assessment (US EPA, 1999), **diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

As noted, EPA is the lead federal government agency responsible for the establishment of national air quality standards, national guidance and guidelines for the uniform and scientifically reliable study of air pollutants. To date, neither National Ambient Air Quality Standards for MSATs nor national project level guidelines or guidance to study MSATs under various climatic and geographic situations have been developed. Such limitations make the study of MSAT concentrations, exposures, and health impacts difficult and uncertain. Thus, accurate and reliable estimates of actual human health or environmental impacts from transportation projects and mobile source air toxics are not scientifically possible at this time.

EPA has also not established toxicity factors for diesel particulate matter, although one study asserts that this pollutant accounts for a large portion of MSAT health risk in certain situations, using a toxicity factor that is unique to California.

On February 3, 2006, the FHWA released its interim guidance on when and how to analyze MSATs in the NEPA process for highways. The following discussion and discussion in the air quality technical report (Appendix F) are in accordance with the interim guidance.

3.8.3.1 Project Level MSAT Discussion

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For the Preferred Alternative in the EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Preferred Alternative is slightly higher than that for the No-Action Alternative because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor; along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the alternatives are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT

growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the Preferred Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under the build alternatives than the No-Action Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded SH 7 roadway sections that would be built between Cherryvale Road and 75th Street under the Preferred Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Action Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Action Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

3.8.4 Mitigation

Motor vehicle emissions in the study area would not result in any exceedance of the NAAQS; therefore, no direct project air quality mitigation is necessary. During construction, dust emissions should be minimized by including techniques to control fugitive dust.

3.8.5 Coordination

All proposed improvements will be included in the DRCOG 2030 or 2035 fiscally-constrained, conforming RTP prior to FHWA adoption of the final Decision Document. This project has been coordinated with CDOT and the APCD of the CDPHE. APCD concurrence was received January 19, 2006.

3.9 Wetlands

This section describes existing wetland resources in the study area, which were delineated in Summer 2001 and reviewed in Spring 2005. Wetlands are transition zones between aquatic and upland habitats. Wetlands were delineated following Executive Order 11990 and the guidelines and criteria of the US Army Corps of Engineers (USACE) *1987 Wetlands Delineation Manual* (Environmental Laboratory 1987) based on

characteristics of vegetation, soils, and hydrology. 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 prepared for this EA (**Appendix D**).

3.9.1 Existing Conditions

As shown in **Figure 3-10**, there are seven wetland sites within the study area totaling approximately 0.66 acre. As determined by the USACE, three clusters of jurisdictional wetlands are present within the study area (correspondence from the USACE in **Appendix G**). **Table 3-18** lists the wetlands and their size and type. Emergent wetlands are typically cattail, bulrush, grass sedge and/or rush. Scrub shrub wetlands are low-growing woody plants, typically willow.

Table 3-18
Study Area Wetlands

Site ID	Acres within Study Area	USACE Jurisdictional?	Wetland Type*	Comments
1	<0.01	Yes	Emergent	Adjacent to East Boulder Ditch
2 a, b, c, d, e	0.29	No	Emergent with Scrub Shrub	Roadside ditches
3	0.08	No	Emergent	Detention basin
4 a, b	0.03	Yes	Emergent with Scrub Shrub	Adjacent to Enterprise Ditch
5 a, b, c, d, e	0.14	No	Emergent with Scrub Shrub	Adjacent to BNSF railroad embankment
6 a, b, c, d	0.08	Yes-a, b, d; No-c	Emergent with Scrub Shrub	Adjacent to Cottonwood Ditch
7 a, b, c	0.03	No	Emergent	Roadside ditches
Total	0.66	*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		

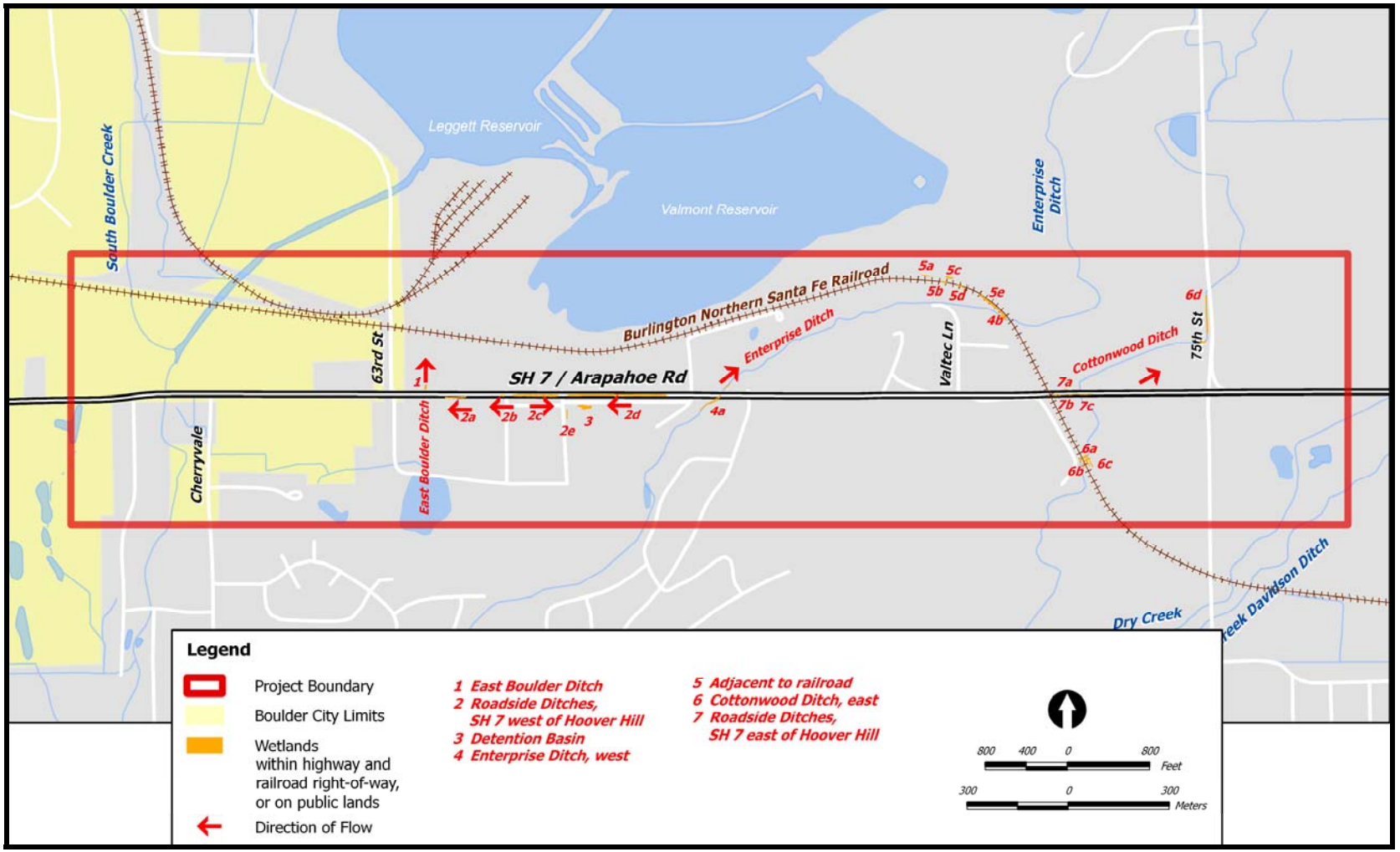
Wetlands within the study area are generally small and scattered. Nearly all wetlands are associated with irrigation or roadside ditches. The major wetland type within the study area is palustrine emergent with some areas of scrub-shrub wetland. Wetland vegetation includes cattail, sedges, spikerush, 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.

3.9.2 Practicable Alternatives

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 ditches to maintain wetland bands. Mitigation measures to offset unavoidable impacts to wetlands are discussed in Section 3.9.4.

Figure 3-10
Wetlands



3.9.3 Wetland Impacts

Table 3-19 presents wetland impacts for the Preferred Alternative.

Table 3-19
Wetland Jurisdictional Determination, Areas, and Permanent Impacts

Wetland	USACE Jurisdiction	Preferred Alternative Permanent Impacts (acres)
1	Yes	0.002
2a	No	0.035
2b	No	0.006
2c	No	0.110
2d	No	0.135
2e	No	0.001
3	No	0
4a	Yes	0.011
4b	Yes	0
5a	No	0
5b	No	0
5c	No	0
5d	No	0
5e	No	0
6a	Yes	0
6b	Yes	0
6c	No	0
6d	Yes	0
7a	No	0.001
7b	No	0.003
7c	No	0.018
Total		0.322 acre

No-Action Alternative
No wetlands would be impacted by the No-Action Alternative.

Preferred Alternative
Wetland impacts are based on 2001 wetland delineations and Spring 2005 field review. Based on these boundaries and preliminary design plans, the Preferred Alternative would permanently impact approximately 0.309 acre of non-jurisdictional wetlands and 0.013 acre of jurisdictional wetlands (see **Table 3-19**).

Best management practices (BMPs) will be implemented to prevent temporary and indirect impacts that could also result from construction and operation activities, including 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 3.9.4.

3.9.4 Wetland Impact Minimization and Mitigation Measures

The Preferred Alternative 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 because of 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 3:1 or steeper, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times.
- 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 additional 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 and will be seeded in phases throughout construction. 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/sediment 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.

3.9.5 Wetland Creation/Restoration

Wetlands, as well as their associated functions permanently impacted by the Preferred Alternative will be mitigated at a 1:1 ratio by purchase of credits at one of the three wetland mitigation banks within the primary service area. Wetland impacts will be reduced as much as possible during final design. 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.

Wetland areas temporarily impacted by construction activities will be restored as soon as possible following completion of the activity.

3.10 Vegetation

3.10.1 Vegetation Existing Conditions

A mix of vegetation communities are present in the study area. Landscaped areas of trees, lawn and flowerbeds are adjacent to residences and businesses. Mature trees are

common in and adjacent to the highway right-of-way for both SH 7 and 75th Street. Typical tree species are plains cottonwood (*Populus deltoides* subsp. *monilifera)*, crack willow (*Salix fragilis*), box-elder (*Negundo aceroides*), ponderosa pine (*Pinus ponderosa*), pinon pine (*Pinus edulis*), Chinese elm (*Ulmus pumila*), Russian-olive (*Elaeagnus angustifolia*), locust (*Robinea* spp.), Douglas fir (*Pseudotsuga menziesii*), spruce (*Picea engelmannii*), and juniper (*Juniperus* spp.). Chokecherry (*Padus virginiana*) and wild plum (*Prunus americana*) are present adjacent to flowing ditches and other more mesic sites. Common highway right-of-way grasses include smooth brome (*Bromopsis inermis*), cheatgrass (*Bromus tectorum*), quackgrass (*Elytrigia repens*), and bluegrass (*Poa* spp.). Many weedy species are present and are discussed in Section 3.10.1.1.

The Hoover Hill middle portion of the study area in the vicinity of Legion Park from approximately the SH 7 crossing of Enterprise Ditch on the west to the BNSF railroad crossing on the east (except for the commercial area in the vicinity of Valtec Lane) contains mostly plantings that are native to Colorado, and understory species unusually well developed for the urbanized Front Range area. Dominant woody species are native ponderosa pine, pinon pine, juniper, skunk brush (*Rhus aromatica* subsp. *trilobata*), wild rose (*Rosa woodsii*), mountain mahogany *(Cercocarpus montanus)* and introduced Chinese elm and Russian olive. Understory species include western wheatgrass (*Pascopyron smithii*), yucca (*Yucca glauca*), prickly-pear cactus (*Opuntia macrorhiza*), snakeweed (*Gutierrezia sarothrae*), sand lily (*Leucocrinum montanum*), and yellow violet (*Viola nuttallii*). Invasive weed cover in this area is low.

3.10.1.1 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 means an alien plant or parts of an alien plan that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board and 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.

Boulder County lists 13 weed species. These plants may not be sold in Boulder County, and if present on private property must be controlled.

Study area weeds were noted in early May 2005. Much of the herbaceous vegetation cover in the study area is by non-native species although not all these species are currently listed as weeds. 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 Boulder County Noxious Weed List, CDOT's Top 25 List, State Medium Priority List (List B), and State Low Priority List (List C) were observed in the study area during the surveys. These weed species are listed in **Table 3-20**. A map of high and medium priority weed species locations, details on weed species, and a commitment to prevent further establishment of noxious weeds during and following project construction will be presented in the Integrated Weed Management Plan, to be completed prior to construction.

Other undesirable plants not currently listed by the State of Colorado or by CDOT but which noted as having large infestations in the study area include kochia (*Bassia sieversiana*), yellow alyssum (*Allysum alyssoides*), flixweed (*Descuriana sophia*), blue mustard (*Chorispora tenella*), and Japanese knotweed (*Reynoutria japonica*).

Table 3-20
Boulder County, CDOT, and State of Colorado Listed Weed Species Observed in the SH 7 Study Area

Common Name	Species	Boulder Co. Weed List*	CDOT Weed List**	State Noxious Weed List***
Canada thistle	*Cirsium arvense*	X	X	B
Chicory	*Cichorium intybus*			C
Common mullein	*Verbascum thapsus*			C
Downy brome	*Bromus tectorum*			C
Field bindweed	*Convolvulus arvensis*		X	C
Hoary cress	*Cardaria draba*			B
Musk thistle	*Carduus nutans*	X	X	B
Perennial sowthistle	*Sonchus arvensis*			C
Poison hemlock	*Conium maculatum*			C
Quackgrass	*Elytrigia repens*			B
Redstem filaree	*Erodium cicutarium*			B
Russian-olive	*Elaeagnus angustifolia*		X	B
Scotch thistle	*Onopordum* spp.	X	X	B

*Boulder County Web site: http://www.co.boulder.co.us/openspace/resources/weeds/weeds_noxious.htm.
**CDOT Noxious Weed Management Plan top 25 weed species to be mapped.
***Colorado Department of Agriculture Plant Industry Noxious Weeds Web site, 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.

3.10.2 Vegetation Impacts

No-Action Alternative
No impacts to vegetation would occur under the No-Action Alternative.

Preferred Alternative
Direct impacts to vegetation would occur from clearing, excavation and grading for the proposed improvements. It is anticipated that numerous mature trees including cottonwood, box elder, Ponderosa pine, piñon pine, Chinese elm, and Russian-olive would be removed prior to construction. There are no conservation sites or sensitive plant communities within the study area. The Preferred Alternative would impact approximately 4.3 acres of well-developed vegetation in the Hoover Hill/Legion Park area. In this area, the Preferred Alternative would require the removal of approximately 100 trees on the south side of SH 7 (adjacent to and within City of Boulder Open Space) and 10 trees on the north side of SH 7 (in Legion Park). During final design, efforts will be made to minimize impacts to existing vegetation.

3.10.2.2 Noxious Weed Impacts

No-Action Alternative

No soil disturbing activities would occur that would initiate new noxious weed infestation. Existing patches of noxious weeds would continue to exist within the highway right-of-way and would not be disturbed or made to spread. CDOT-integrated weed management would continue to be implemented along the exiting highway right-of-way.

Preferred Alternative

Soil disturbance associated with construction of the Preferred Alternative is anticipated to provide further conditions for invasion of noxious weeds. Construction would disturb areas already inhabited by weeds as well as areas that currently have very minor weed cover, such as the grass and woodland community in and adjacent to Legion Park, and result in the potential for accelerated weed infestation of a park site. Temporary work areas would also be susceptible to weed invasion.

3.10.3 Vegetation and Noxious Weed 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 will not be determined until final design, mitigation measures are anticipated to include:

- Minimize the amount of disturbance of grading to 10 feet beyond the toe of slope. Project will follow CDOT standard specifications for amount of time that disturbed areas are allowed to be non-vegetated.
- Avoid existing trees, shrubs and vegetation, to the maximum extent possible, especially wetlands and riparian plant communities. Coordinate with CDOT landscape architect prior to construction to determine which vegetation will be protected during construction.
- Salvage weed free topsoil for use in seeding.
- 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.
- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction.

- Develop acceptable revegetation plan with the CDOT Landscape Architect, City of Boulder, and Boulder County.

- A Senate Bill 40 (SB 40) Certification will be required by the Colorado Division of Wildlife for stream crossings or adjacent streambanks to avoid adverse effects to waterways and adjacent riparian vegetation. In these areas, trees and shrubs must be replaced at a 1:1 basis (trees) and square foot basis (shrubs).

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

- 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 of Boulder or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds.

- Weed management measures will include removal of heavily infested topsoil, herbicide treatment of lightly infested topsoil, limiting disturbance areas, phased seeding with native species throughout the project, monitoring during and after construction, other herbicide 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.

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.

3.11 Wildlife and Aquatic Resources

3.11.1 Wildlife Existing Conditions

Topographical maps of the study area and a data review of information pertaining to endangered, threatened, sensitive and rare wildlife and vegetative species from Colorado Division of Wildlife (CDOW), the Colorado National Heritage Program (CNHP), and US Fish and Wildlife Service (USFWS) was completed in preparation for the field survey.

Potential wildlife of the study area includes mammals (deer, raccoon, opossum, squirrels, skunk, cottontail rabbit, prairie dog), reptiles (turtles and snakes), and birds (hawk, eagle, songbirds, heron, geese, duck, and burrowing owl). State threatened, endangered, and sensitive species potentially occurring within the project, as documented by the CNHP, can be found in **Table 3-21**. Based on mapping provided by CNHP, there are two areas south of the project location that are listed as having "very high" and "high biodiversity significance".

One raptor nest has been observed within the study area. The nest is located in an isolated cottonwood tree along an irrigation ditch that crosses 75th Street about 0.25 mile north of SH 7. Active Osprey nests have been identified by NDIS mapping in an area South of Hillcrest Lake.

There are two black-tailed prairie dog colonies located near the project area. One is located on the north side of Legion Park, and the other is located south of Legion Park, south of SH 7 in some open space. Neither colony is likely to be affected by work along SH 7. Burrowing owl surveys conducted at these colonies did not find any owls. Additional burrowing owl surveys will be conducted prior to construction.

Table 3-21
State Threatened, Endangered, and Sensitive Species

Name	Listing	Occurrence Within Study Area
Ferruginous Hawk (*Buteo regalis*)	State Species of Special Concern	Not likely to occur
Northern redbelly dace (*Phoxinus eos*)	State Endangered	Not likely to occur
Townsend's big-eared bat (*Plecotus townsendii pallescens*)	State Species of Special Concern	Not likely to occur
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	State Threatened	Not likely to occur
Burrowing owl (*Athene cunicularia*)	State Threatened	Not likely to occur
Black-tailed prairie dog (*Cynomys ludovicianus*)	State Species of Special Concern	Potentially occurring

3.11.1.1 Migratory Bird Treaty Act

As stated in the Migratory Bird Treaty Act of 1918 (MBTA), and amended 1989, the take (possess, hunt, pursue, wound, shoot, kill, capture, trap, collect or attempt to do so) of a migratory bird is prohibited. Bird species not protected by the MBTA include English sparrow, European Starling, feral pigeon (also known as rock dove), and resident game birds (please see note in Section 3.11.4). The MBTA also states that it is illegal to collect, possess, and by any means transfer possession of any migratory bird nest; however, it does not contain any prohibition that applies to the destruction of a bird nest alone (without birds or eggs), provided that no possession occurs during the destruction. Statutes other than the MBTA legally protect some unoccupied nests, including nests of threatened and endangered migratory bird species, bald, and golden eagles, within certain parameters.

The principal concern for road construction projects is impacting occupied nests during the course of clearing activities. While the MBTA permits the clearing of nests that are unoccupied, with no birds or eggs, because there is no incidental take provision in the MBTA, no permit may be granted for the taking of an occupied nest unless it can be demonstrated that failure to take the occupied nest results in an immediate threat to human health and safety. Though costly, delaying the clearing of right-of-way does not typically result in an immediate threat to human health and safety.

3.11.2 Aquatic Resources Existing Conditions

The study area is located between Valmont Reservoir and Baseline Reservoir, and crosses over the East Boulder, the Enterprise and the Cottonwood irrigation ditches.

The irrigation ditches have flowing water intermittently throughout the year, and do not provide viable fish habitat. Based on CNHP inventories, the northern redbelly dace and the hornyhead chub potentially exist in the reservoirs around the study area.

3.11.3 Wildlife and Aquatic Resources Impacts

No-Action Alternative
The No-Action Alternative would result in no impacts.

Preferred Alternative
The Preferred Alternative consists of widening the current road and would generally follow the existing roadway alignment. The southern border of Legion Park and vegetated area across from Legion Park on the south side of existing SH 7 would have temporary impacts from clearing and grading for the new roadway. Removal of vegetation in these areas could impact migratory bird nesting areas and reduce habitat for mammal species. No impacts are anticipated to the black-tailed prairie dog colonies, or to burrowing owls.

3.11.4 Wildlife and Aquatic Resources Mitigation

- Disturbance to native plant communities will be minimized.
- Tree removal will be minimized.
- 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 practical a wildlife biologist will inspect the area prior to spraying to ensure crucial habitat is not impacted.
- Temporary erosion control blankets will have flexible natural fibers.
- Follow requirements of the Colorado Department of Transportation, outlined in the note below:

Note: The Migratory Bird Treaty Act (MBTA) protects all migratory birds, nests and eggs except English sparrow, European starling, and rock dove and resident game birds. For projects that could potentially result in the killing, taking, harassing, or harming of these birds, the following conditions must be adhered to:

Tree Trimming/Removal
Tree trimming and/or removal activities shall be completed before birds begin to nest or after the young have fledged. In Colorado most nesting and rearing activities occur between April 1st and August 31st. However, since some birds nest as early as February a nesting bird survey must be conducted by a biologist before any tree trimming or removal activities begin.

Bridge/Box Culvert Work
Bridge or box culvert work that may disturb nesting birds must be completed before birds begin to nest or after the young have fledged. No bridge or box culvert work may take place between April 1st and August 31st. If work activities are planned between these dates, nests must be removed (before nesting begins) and appropriate measures taken to assure no new nests are constructed. Failure to remove and keep nests from becoming established could postpone construction of the project.

Clearing/Grubbing Activities
Clearing and grubbing of vegetation that may disturb ground nesting birds must be completed before birds begin to nest or after the young have fledged. If work activities are planned between April 1st and August 31st, vegetation must be removed and/or trimmed to a height of six (6) inches or less prior to April 1st. Once vegetation has been removed and/or trimmed, appropriate measures (i.e. repeated mowing/trimming) must be implemented to ensure vegetation does not grow more than six (6) inches. Failure to maintain vegetation height of six (6) inches or less could provide habitat suitable for nesting birds that could postpone construction of the project.

Birds of Prey
For birds or prey that could potentially nest near the project site, please refer to the Colorado Divisions of Wildlife's "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" guidelines, available at Colorado Division of Wildlife district offices.

- Work activities, including the movement and placement of vehicles, shall not disturb black-tailed prairie dog colonies. If any sites are encountered, CDOT Region 4 Environmental Unit shall be notified so that all applicable clearances and permits may be obtained, including following CDOT prairie dog policy.
- Although no Burrowing owls were observed in or near the study area, they are a state threatened species and are protected under MBTA. No human encroachment or disturbance within 75 yards of a nest site shall occur from April 1 to July 31. If project activities are scheduled to take place between March 1 and October 31, a burrowing owl survey must be completed before construction activities begin. If owls are identified on or adjacent to the project, CDOT Region 4 Environmental Unit shall be notified immediately.

3.12 Threatened, Endangered or Sensitive Species

3.12.1 Threatened and Endangered Wildlife

Federally threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.). Significant adverse effects to a federally listed species or its habitat would require consultation with the USFWS under Section 7 of the ESA.

Section 7 of the ESA of 1973, as amended, requires federal agencies to ensure that actions which they authorize, fund, or carry out are not likely to jeopardize the continued existence of proposed, threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

Populations of the following federally listed threatened or endangered species potentially occur in Boulder County:

- Bald Eagle (*Haliaeetus leucocephalus*): The bald eagle was listed as endangered in 1967, in 1995 it was reclassified as threatened, and in 1999 it was proposed for removal from the U.S. Fish and Wildlife Service list of threatened and endangered species. High mortality from shooting, loss of habitat, and use of the organochlorine pesticide DDT all contributed to the population decrease. Bald Eagle habitat typically is comprised of mature trees, areas of quiet isolation, and clean waterways. The bald eagles in Colorado are often found near reservoirs or water systems with abundant fish. Although outside of the study area, Valmont Reservoir is located near the northwestern project boundary and may provide possible habitat for the Bald Eagle.

- Preble's Meadow Jumping Mouse (*Zapu hudsonius preblei)*: In May 1998 the Preble's meadow jumping mouse (PMJM) was listed as threatened in its entire range under the ESA. Currently, PMJM is being proposed for removal from the ESA because of recent research indicating that PMJM should not be classified as a separate subspecies of meadow jumping mouse. Typically, along Colorado's Front Range, PMJM inhabits relatively undisturbed riparian areas below 7,600 feet in elevation that includes dense herbaceous vegetation including grasses, thick shrubs providing cover, and forbs. No PMJM habitat will be impacted by this project.

3.12.2 Threatened and Endangered Plants

- Colorado Butterfly Plant (*Gaura neomexicana* spp. *coloradensis*): The Colorado Butterfly Plant (CBP) was listed as a threatened species under the ESA in October 2000, and is found within a small area in southeastern Wyoming, western Nebraska, and north-central Colorado. Colonies normally occur on sub-irrigated, alluvial soils often found in low depressions or along bends in wide, active, meandering stream channels just above the actual channel. No Colorado Butterfly Plant habitat will be impacted by this project.

- Ute Ladies'-Tresses Orchid (*Spiranthes diluvialis*): The Ute Ladies'-Tresses Orchid (ULTO) was listed as a threatened species under the ESA in January 1992. Typical soils inhabited by the orchid are silty loam alluvial soils associated with wetlands or floodplains of perennial streams in intermontane valleys. There were no open, wet riparian areas, or alluvial meadows located with the study area, therefore the proposed project would not have a negative affect on this species.

3.12.3 Threatened and Endangered Species Impacts

No-Action Alternative
No impacts to federally listed threatened or endangered species would occur under the No-Action Alternative.

Preferred Alternative
No direct impacts to any federally listed threatened or endangered species would be expected from the Preferred Alternative. Potential habitat for Bald Eagle could exist around the perimeter of Valmont Reservoir. Any nesting eagles near the reservoir could occasionally occur in the study area and could be slightly affected by either of the two build alternatives because of noise and disturbance during construction. Since the build alternatives would be widening an existing roadway, any resident eagles are most likely adapted to vehicular presence in the area and would not be negatively affected in the long term.

3.12.4 Threatened and Endangered Species Mitigation

Mitigation is not necessary since there will be no impacts.

3.13 Water Resources and Water Quality

Water resources are integral to vegetation, wildlife, economic development, agriculture and recreational uses. The degradation of the quality of the water in the environment has a far-reaching impact on the ecological matrix. Water resources evaluated in the EA include streams, irrigation ditches, groundwater, and floodplains.

The study area is located within the St. Vrain watershed of the South Platte River Basin. The South Platte River Basin drains 19,000 square miles in Colorado, Wyoming and Nebraska. Flow in the basin is primarily snowmelt. The region's climate is semi-arid with an average annual precipitation of 18 inches. Typical rainfall in the region is high intensity and short duration.

3.13.1 Surface and Groundwater Resources

3.13.1.1 Creeks and Surface Drainage

Stormwater runoff from the study area outflows to two creeks: South Boulder Creek and Dry Creek No. 3. South Boulder Creek crosses SH 7 500 feet west of Cherryvale Road. South Boulder Creek is a perennial stream. Dry Creek No. 3 crosses SH 7 1,000 feet east of 75th Street and is also a perennial stream. South Boulder Creek begins above Eldorado Springs, west of Rollinsville. Dry Creek No. 3 flow begins at Baseline Reservoir. Both creeks outfall to Boulder Creek with an ultimate confluence with the St.

Vrain Creek east of Longmont. Water flow in the creeks tends to be at a minimum in the winter and a maximum in early summer. Both creeks have been modified by municipal, industrial, and agricultural uses.

There are three major drainage basins located along the SH 7 project limits. One basin drains on the north side of SH 7 from a ridge-line (high point) located approximately 500 feet east of Westview Drive to the 75th Street intersection. Another basin drains from the same high point, but on the south side of SH 7 to the 75th Street intersection. Both of these basins are tributary to Dry Creek No. 3. The third major basin includes the south side of SH 7 and is located from the high point east of Westview Drive to the Cherryvale Road intersection. This basin is ultimately tributary to South Boulder Creek, located just west of the Cherryvale Road intersection. On the north side of SH 7 from the high point to Westview Drive, the land drains away from the roadway.

3.13.1.2 Irrigation Ditches

There are three irrigation ditch crossings located within the study area. These ditches serve agricultural uses.

- Cottonwood Ditch No. 2 crosses SH 7 east of the existing railroad bridge in a siphon pipe. The ditch also crosses the BNSF railroad south of SH 7. The primary ditch flow is from April to September.
- Enterprise Ditch crosses SH 7 just west of Westview Drive. The ditch also crosses the BNSF railroad alignment north of SH 7 in a siphon pipe.
- East Boulder Ditch crosses SH 7 east of 63rd Street. The base flow in East Boulder Ditch is approximately 30 cubic feet per second (cfs), but currently a large portion of the storm water from SH 7 enters East Boulder Ditch.

3.13.2 Groundwater

The Colorado Division of Water Resources maintains a database of Colorado wells, applications, and permits. According to the database, water levels and well depths in the study area range between 12 and 460 feet. The study area falls within the "complex" region of the mapped aquifer.

There is evidence of possible high groundwater in the vicinity of the railroad overpass. The water would be captured and directed to the storm sewer system that is being constructed as part of the 75th Street intersection improvements.

3.13.3 Water Quality

The Clean Water Act (CWA) was established in 1972 to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." It controls most surface water quality requirements in the United States.

Section 303 (d) requires that states submit to the EPA waters within the state where applicable water quality standards have not yet been attained. These streams are considered impaired. South Boulder Creek and Dry Creek No. 3 are not listed on Colorado's 303(d) list. However, Boulder Creek, which both creeks outfall to is listed for e. coli impairment upstream of the South Boulder Creek outfall. Boulder Creek also has e. coli impairment downstream of the South Boulder Creek entrance between Coal Creek and Saint Vrain Creek. Both segments are considered a high priority to improve water quality in relation to other impaired streams in the area.

The CDPHE Water Quality Control Division (WQCD) establishes standards for selected stream segments in Colorado.

South Boulder Creek is classified as:

- Aquatic Life Warm 1
- Recreation 1a
- Water Supply
- Agriculture

Dry Creek No. 3 is classified as:

- Aquatic Life Warm 2
- Recreation 1a
- Water Supply
- Agriculture

These classifications require a minimum dissolved oxygen level of 5.0 mg/l, a pH of 6.5 to 9.0, a fecal coli bacteria less than 200 counts per 100 ml, and an escherichia coli less than 126 counts per 100 ml.

Under Section 402 of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) permit for point discharge and stormwater is required if a proposed project impacts more than a specific size of land. Under the NPDES and Colorado regulations, a Colorado Pollution Discharge System (CPDS) permit is required if one or more acres of land disturbance is anticipated on a construction project, or if the project is part of a larger plan. Since the Preferred Alternative disturbs more than one acre, a CPDS permit is required for stormwater discharge associated with construction activities.

3.13.4 Water Resource Impacts

No-Action
The No-Action Alternative would result in no new direct impacts to water resources.

Preferred Alternative
The Preferred Alternative would add curb and gutter with a storm sewer system between Cherryvale Road and Westview Drive and between the BNSF railroad crossing and 75th Street. The addition of impervious area and a storm sewer system would cause the storm flows to reach the outfalls more rapidly and with more concentrated flows. Increased impervious area would result in larger quantities of sediment and pollutants to enter in the surrounding surface waters. From the crest of the hill to the west, stormwater would be captured in a storm sewer system that would outfall into South Boulder Creek. From the crest of the hill to the east, stormwater would flow in roadside ditches to the BNSF railroad crossing. It would then be captured in a storm sewer system being constructed as part of the SH 7 and 75th Street intersection improvements (a No-Action programmed improvement) and outfalls into Dry Creek No. 3.

Temporary impacts to water resources during construction are also expected. The primary pollutant carried from a construction site is sediment or total suspended solids (TSS). Erosion is prevalent when the surface vegetation is disturbed as is required for roadway widening side slope construction.

The Preferred Alternative would result in an increased impervious surface area from an existing 11 acres with the No-Action Alternative to approximately 20 acres.

3.13.5 Water Resource Mitigation

For the high groundwater in the proximity of the railroad overpass, the design will accommodate this groundwater and direct it to the storm drainage system.

This project commits to following CDOT's Erosion Control and Stormwater Quality Guide, sections 107.25 & 208 of the specifications for the Standard Specifications for Road and Bridge Construction and the Stormwater Management Plan. CDOT follows The Municipal Separate Storm Sewer System (MS4) requirements for water quality. These requirements will be followed on this project by the process outlined in Appendix I of the CDOT Drainage Design Manual.

A Stormwater Management Plan (SWMP) will be completed during final design. It will address specific methods of reducing pollutants in stormwater runoff during construction. Stormwater BMPs for a site during construction would consist of five major elements:

- Implementation of BMPs for erosion control. These include, but are not limited to, phased seeding with mulch and tackifier, the use of erosion control blankets, the use of embankment protectors, the use of berm diversions or check dams, and outlet protection for storm sewer pipes.

- Implementation of BMPs for sediment control. These include, but are not limited to, erosion bales or logs, silt fence, storm drain inlet and outlet protection, sediment traps, concrete washout and saw water containment basins, and stabilized construction entrances.

- Implementation of BMPs for materials handling and spill prevention. These include, but are not limited to, stockpile management, material management, material use, and spill prevention and control.

- Implementation of BMPs for waste management. These include, but are not limited to, concrete, hazardous, and contaminated waste management to ensure that solid or liquid wastes are not carried off the site by stormwater.

- Implementation of BMPs for pollution prevention. These include treatment during dewatering and paving operations. It also includes the use of street sweeping and temporary waterway crossings.

Permanent BMPs will be designed to protect stormwater quality and reduce pollutant discharges after construction is complete. The permanent BMPs are developed with the intention of mitigating the potential impacts typical of a roadway corridor. These can include petroleum or other vehicle fluids, hazardous spills, sand or other snow melting chemicals, and litter. General BMPs for this project will include the vegetation of all disturbed areas with erosion control blankets on slopes 3:1 or steeper. In addition to maintaining BMPs installed on the project, maintenance activities after construction will include consistent roadway sweeping and removal of sediment from storm inlets and basins.

The EA evaluated a wide range of Best Management Practices (BMPs) for the use on SH7. The following outlines the process for choosing the appropriate BMPs that should be incorporated for the project. During final design, a determination will be made of exact methods and locations of stormwater management during construction and will be outlined in the SWMP.

Sensitive Waters Evaluation

SH 7 improvements will fall under a "Tier 1" Best Management Practice (BMP) Management Level. Tier 1 of CDOT's BMP Management Levels is the most restrictive and requires maximum design criteria. In order to meet CDOT MS4 permit requirements, the SH 7 project needs to provide 100 percent water quality capture

volume (WQCV) for a BMP or remove 80 percent of the average annual TSS. The WQCV, as defined by CDOT, includes the first 0.5-inch of runoff from all impervious surfaces.

Physical Design Constraints

The physical design constraints for the project area include the following:

- Topography-Steep slopes occur in the central portion of the project eliminating the feasibility of some BMPs
- 4(f)-4(f) properties adjacent to the roadway eliminate possible locations for BMPs
- ROW- Development adjacent to the roadway on both the east and west end of the project constrain the possible locations for BMPs

Adjacent Land Owner Concerns

Coordination with the water quality requirements for Boulder County and the City of Boulder has occurred. By meeting CDOT MS4 requirements, the project will also comply with water quality requirements for both municipalities. Coordination will continue with these local agencies during final design to ensure compliance with local requirements.

Maintenance Considerations

CDOT Region 4 has committed to maintaining the permanent BMPs installed on the project. Close coordination will occur with maintenance personnel during the final design stages.

The EA evaluated the feasibility of all acceptable BMPs including those listed in **Table 3-22** (western portion of the project tributary to South Boulder Creek) and **Table 3-23** (eastern portion of the project tributary to Dry Creek No. 3).

Table 3-22
Permanent BMP's Applicability for West of Project Highpoint

BMP	Applicable to this reach of Project?	Comments
Infiltration Trench	No	Right-of-way constraints due to commercial properties
Infiltration Basin	No	Right-of-way constraints due to commercial properties
Bioretention	Yes	
Extended Detention Basin/Detention Pond	Yes	
Wetlands	Yes	
Underground Filters	Yes	Would require multiple structures due to size of basin
Surface Sand Filters	Yes	

continued

Table 3-22 (cont'd.)
Permanent BMPs Applicability for West of Project Highpoint

BMP	Applicable to this reach of Project?	Comments
Organic Medial Filters	No	Right-of-way constraints due to commercial properties
Vegetated Swales	No	Right-of-way constraints due to commercial properties
Vegetated Filter Strips	No	Right-of-way constraints due to commercial properties
Oil-Grit Separators	Yes	Would require multiple structures due to size of basin
Catch Basin Inserts	Yes	Would require multiple inserts due to number of inlets
Manufactured Systems	Yes	Would require multiple structures due to size of basin
Porous Pavement	No	Not appropriate for large traffic volumes

Table 3-23
Permanent BMP's Applicability for East of Project Highpoint

BMP	Applicable to this reach of Project?	Comments
Infiltration Trench	No	Topographic constraints (large grade changes)
Infiltration Basin	No	Topographic constraints (large grade changes)
Bioretention	No	Topographic constraints (large grade changes)
Extended Detention Basin/Detention Pond	No	Topographic constraints (large grade changes)
Wetlands	No	Topographic constraints (large grade changes)
Underground Filters	No	Topographic constraints (large grade changes)
Surface Sand Filters	No	Topographic constraints (large grade changes)
Organic Medial Filters	No	Topographic constraints (large grade changes)
Vegetated Swales	Yes	
Vegetated Filter Strips	No	Swale adjacent to roadway, no room for veg. strip
Oil-Grit Separators	Yes	
Catch Basin Inserts	Yes	
Manufactured Systems	No	Topographic constraints (large grade changes)
Porous Pavement	No	Not appropriate for large traffic volumes

Based upon the above outlined evaluation, the following are site-specific BMPs proved a well-reasoned approach to water quality. During final design, contingent upon right-of-way being available, the following site-specific BMPs will be refined and incorporate into the project.

- **East of the Project Highpoint**: Roadway runoff to the east of the highpoint on the project will be collected in roadside ditches before the outfall to Dry Creek No. 3. The length of ditches will allow pollutants to settle out or become trapped in the vegetation of the ditch before entering the storm sewer system that begins near the BNSF railroad bridge. Channel stabilization in this area will be required

and will include small check dams and erosion control blankets or mats. Manufactured Systems will also be considered to capture additional sediment and pollutant. Since vegetated swales alone do not provide CDOT MS4 requirements.

- **West of the Project Highpoint**: To the west of the highpoint on the project, roadway storm drainage outfalls to South Boulder Creek. Riprap stabilization will be required at the storm sewer outfall at South Boulder Creek. Roadway drainage will collect in roadside ditches in the rural section without curb and gutter east of Westview Drive. West of Westview Drive, roadway runoff will collect in the curb and gutter and enter the proposed storm sewer system. The best option for the basin's tributary to South Boulder Creek (west side of hill) would be to construct water quality ponds. As a part of this EA, feasible locations for the water quality ponds were evaluated. It was determined that two smaller water quality ponds would meet capture volume requirements. These ponds are shown in **Figure 3-11**. One pond with a volume of 1.8 acre-feet could be located on the northwest corner of 63rd Street and SH 7 in front of Naropa University. This pond would utilize existing right-of-way and also require the purchase of right-of-way from Naropa University. The second pond with a volume of 0.4 acre-feet could be located on Cherryvale Commons LTD property on the southeast corner of Cherryvale and SH 7. This pond would also require the purchase of private right-of-way. The areas for both ponds are currently undeveloped.

The discussions above of temporary and permanent BMPs are conceptual. During final design, a determination will be made of exact methods and locations of stormwater management during construction and will be outlined in the SWMP. For permanent BMPs during final design other locations for water quality ponds may be evaluated based on changes in land use and any additional constraints before final design stages. If it is determined that a water quality pond is not feasible, other BMPs will be evaluated.

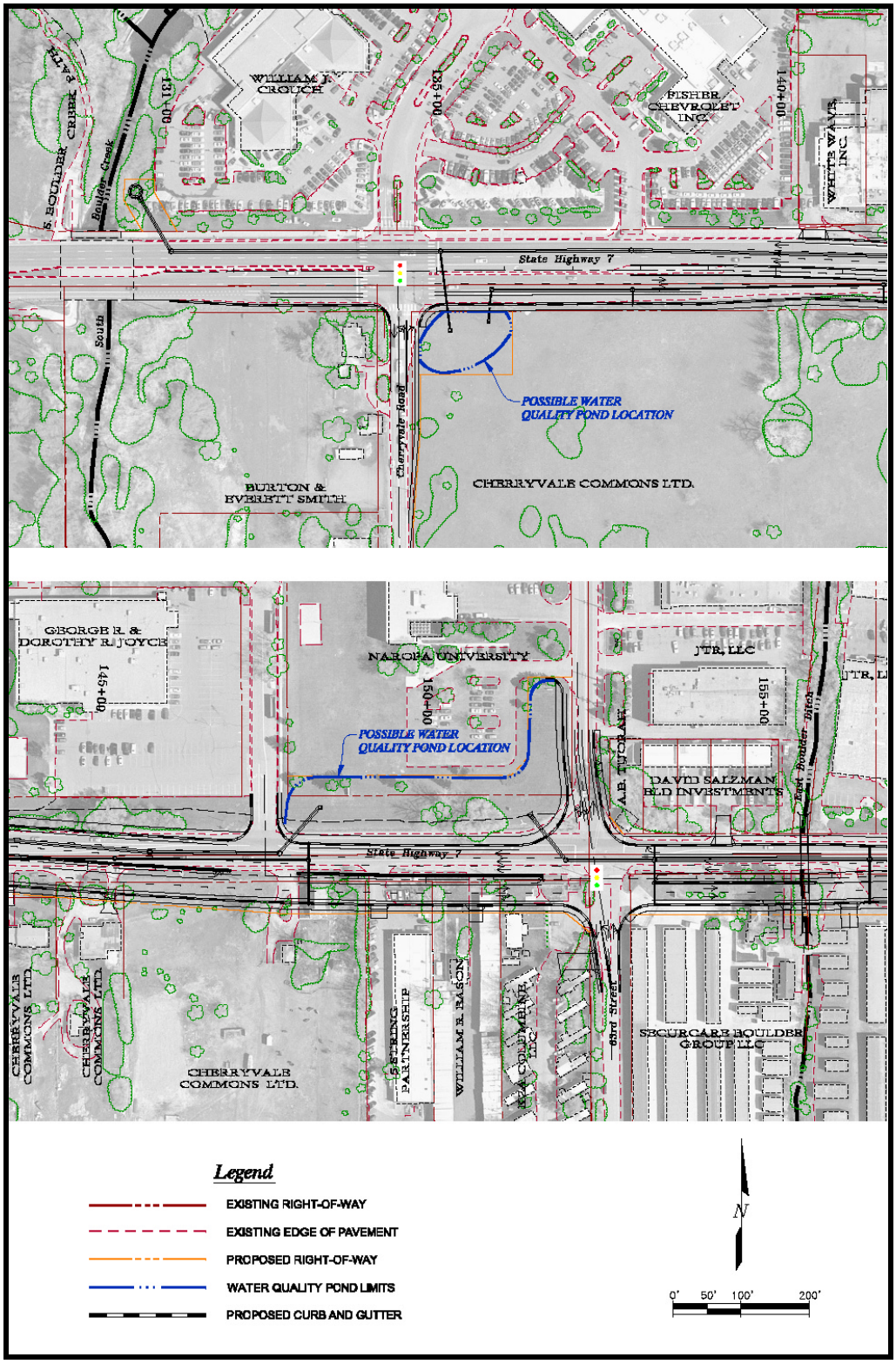
Through the implementation of the temporary and permanent BMPs discussed above, impacts to water resources caused by the Preferred Alternative should be minimal.

3.14 Wild and Scenic Rivers

3.14.1 Existing Conditions

There are currently no rivers near the study area designated or being studied for inclusion in the Wild and Scenic Rivers System.

Figure 3-11
Possible Water Quality Pond Locations



3.15 Floodplains

3.15.1 Existing Conditions

There are two major channels located within the study area that have floodplain delineations on Federal Emergency Management (FEMA) Flood Insurance Rate Maps (FIRM) for Boulder County, Colorado and Incorporated Areas. South Boulder Creek is located just west of Cherryvale Road and is mapped in Panel 415 of 595 on map No. 08013CO415F, Effective Date June 2, 1995. Floodplain changes were completed as part of an 11/01/95 Letter of Map Revision issued by FEMA. Dry Creek No. 3 is located approximately 1,000 feet east of 75th Street and is mapped in map No. 08013CO420F in Panel 420 of 595 on map No. 08013CO420F, Effective Date June 2, 1995.

3.15.2 Floodplains Impacts

No-Action
The No-Action Alternative would have no direct or indirect impact to floodplains.

Preferred Alternative
The storm sewer outfall pipe into South Boulder Creek falls within the floodplain. The proposed 54-inch concrete pipe would outfall to a tail-water basin. There would be no additional fill required for the improvements; therefore, the floodplain would not be adversely impacted. All remaining improvements are outside the mapped floodplains.

3.15.3 Floodplains Mitigation

Since the improvements within the floodplain would not cause a rise in the floodplain, no mitigation measures are required for floodplains. A floodplain development permit from Boulder County would be required since work is taking place in the floodplain. This permit would be obtained during the final design of the project.

3.16 Geology

3.16.1 Existing Conditions

Based on document review and field reconnaissance, the site is underlain by Cretaceous and Tertiary sedimentary bedrock units. Thinner units (less than 25 feet thick) of Quaternary stream and windblown deposits also are exposed at the surface in the study area. Each geologic unit is briefly described as follows:

- The west extent of the study area (Cherryvale Road to just west of 63rd Street) is underlain by Broadway Alluvium, a humic clayey silt and sand with sections of cobbly pebble gravel.

- Between 63rd Street and the crest of the hill (to approximately 500 feet west of the Legion Park entrance), SH 7 is underlain by Pierre Shale, which can be up to 8,000 feet thick and consists of an olive-gray shale and interbedded brown fine-grained sandstone layers. Pierre Shale can have low permeability and locally high swelling potential.

- In the vicinity of the Legion Park entrance, Foxhills Sandstone, a fine- to medium-grained crossbedded sandstone, underlies the highway.

- In the vicinity of the Valtec Lane, Eolian Sand and Silt, a wind-deposited medium sand and silt is prevalent. This deposit may contain some loose, unconsolidated zones that are prone to settlement and hydrocompaction when water saturates the deposit.

- From just west of the BNSF railroad overpass to approximately 800 feet west of 75th Street, alluvial deposits (Slocum Alluvium and Colluvium) consisting of course gravels that are deeply altered by weathering are present.

- The east extent of the study area (800 feet west of 75th Street to the eastern extent of the study area) is underlain by the Louviers Alluvium, a pebbly to bouldery alluvium.

According to the Global Seismic Hazard Map, the study area falls in the low hazard zone with 0.2 m/s^2 peak ground acceleration during the next 50 years with 10 percent probability. However, a potentially active fault has been mapped approximately one mile north of SH 7. The Class B Valmont Fault runs east-west near the Valmont Reservoir and is exposed in a road cut on North 75th Street.

3.16.2 Geology Impacts

No-Action
There would be no geology impacts associated with the No-Action Alternative.

Preferred Alternative
No signs of major slope instability were observed. Natural hillsides in the area appear to have a stable geologic history. Construction activity in the vicinity of the Pierre Shale (between 63rd Street and the crest of the hill) may require slope stabilization when large cuts are made. These Pierre Shales can also exhibit expansion potential when exposed to moisture.

3.16.3 Geology Mitigation

The final design stages of the project will include a detailed geotechnical and pavement design to provide structural integrity of the roadway for the geological conditions. Bridge foundations, retaining walls and culvert structures will be designed based on specific geologic conditions. Deep foundations will be considered based upon the presence of potentially swelling or collapsible soils. Some locations east of Legion Park where sandstone and alluvial sands are present may allow structures founded on spread footings.

The improvements will be designed to meet the seismic requirements for the area. Therefore, seismic events typical of the region will not affect the project.

3.17 Historic Preservation

Section 106 of the National Historic Preservation Act, as amended, and implementing regulations found at 36 CFR Part 800, require that federal agencies take into consideration any effect a proposed action may have on historic properties. This is generally accomplished through the Section 106 compliance process, which consists of the following steps:

- Identify consulting parties.
- Identify and evaluate historic properties located within the Area of Potential Effect established for an undertaking.
- Assess adverse effects to properties listed on, or eligible for listing on, the National Register of Historic Places (NRHP).
- Consult with the State Historic Preservation Officer (SHPO) and, as appropriate, the Advisory Council on Historic Preservation (ACHP) and other interested parties to resolve adverse effects.

There are four main criteria used to determine if a property is eligible for inclusion on the NRHP. A property is considered eligible if it meets one or more of those criteria, which are listed below:

- **Criterion A:** Associated with events that have made a significant contribution to the broad pattern of our history.
- **Criterion B:** Associated with the lives of persons significant in our past.
- **Criterion C:** Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or that possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.

- **Criterion D:** Has yielded, or may be likely to yield, information important in history or pre-history.

3.17.1 Native American Consultation

Section 106 of the National Historic Preservation Act (as amended) and the Advisory Council on Historic Preservation regulations [36 CFR 800.2(c)(2)(ii)] mandate that federal agencies coordinate with interested Native American tribes in the planning process for federal undertakings. Consultation with a Native American tribe recognizes the government-to-government relationship between the United States government and sovereign tribal groups. Federal agencies must be sensitive to the fact that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries. Consulting tribes are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. If it is found that the project will impact cultural resources that are eligible for inclusion on the National Register of Historic Places and are of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. By describing the proposed undertaking and the nature of any known cultural sites, and consulting with the interested Native American community, CDOT and FHWA strive to effectively protect areas important to Native American people.

In August 2004, FHWA contacted 15 federally recognized tribes with an established interest in Boulder County, Colorado, and invited them to participate as consulting parties:

- Ute Mountain Ute Tribe (Colorado)
- Southern Ute Indian Tribe (Colorado)
- Ute Tribe of the Uintah and Ouray Agency ("Northern" Ute) (Utah)
- White Mesa Ute Tribe (Utah)
- Cheyenne River Sioux Tribe (South Dakota)
- Crow Creek Sioux Tribe (South Dakota)
- Oglala Sioux Tribe (South Dakota)
- Rosebud Sioux Tribe (South Dakota)
- Standing Rock Sioux Tribe (North Dakota)
- Cheyenne and Arapaho Tribes of Oklahoma (two tribes administered by a unified tribal government)
- Pawnee Nation of Oklahoma
- Comanche Nation of Oklahoma
- Kiowa Tribe of Oklahoma
- Northern Arapaho Tribe (Wyoming)

- Northern Cheyenne Tribe (Montana)

The Southern Ute Indian Tribe responded to the invitation, expressing the desire to be a consulting party for the project (**Appendix G**). None of the remaining tribes conveyed an interest in the undertaking to either FHWA or CDOT. The Southern Ute Tribe requested notification in the event Native American artifacts and/or human remains are exposed during construction, but did not otherwise raise specific issues of concern in the context of known places of religious or cultural significance.

The Southern Ute Indian Tribe has continued to receive information about the project as it became available, and every opportunity was taken to involve them in the NEPA planning and project development process. In so doing, FHWA and CDOT fulfilled their legal obligations for tribal consultation under federal law.

3.17.2 Archaeological Properties

A search of the study area and project files housed at the Office of Archaeology and Historic Preservation (OAHP), Denver, and at the CDOT Archaeological Unit revealed that portions of the study area were previously surveyed, but no archaeological resources had been documented within or near the Area of Potential Effect (APE). The APE included the SH 7 right-of-way corridor between the project termini, in addition to a narrow segment of adjacent property to the north and south. Segments of 63rd and 75th Streets, as well as a long segment of the rail corridor, were also included in the APE. A pedestrian survey of the APE by a CDOT archaeologist resulted in the documentation of three historic archaeological resources, none of which were determined eligible for listing on NRHP. Correspondence with the SHPO regarding these determinations is located in Appendix G.

3.17.3 Historic Properties

Historic Resources were evaluated for the defined APE. Activities undertaken to identify historic resources in the APE included a file search at the Colorado Office of Archaeology and Historic Preservation, a review of the NRHP and State Register of Historic Places (SRHP) listings, a review of the information on historic properties from Boulder County staff, and a review of previous historical resource assessments in the general area. In addition, a field assessment was conducted to assess potential historic properties in the study area.

There are seven properties in the area of potential effects that are identified as eligible for or listed on NRHP. **Table 3-24** and accompanying details describe the eligible properties.

Section 106 consultation on eligibility and effect of the historic resources took place in March 2002, March 2005, and August 2005. Copies of those letters are located in **Appendix G**.

Table 3-24
Historic Properties in the SH 7 Area of Potential Effects

Historic Properties	Site #	SHPO Determination of Eligibility for NRHP
Butler/Smith Property	5BL8917	Eligible
Gas Station and Small House	5BL9021	Eligible
The Harburg House, Barn and Gazebo	5BL9024	Eligible
DeBacker-Tenenbaum House	5BL9029	Eligible
Colorado and Southern Railroad- Burlington Northern Railroad	5BL400.5	Railroad segment eligible; bridge not eligible and non-contributing
Cottonwood Ditch #2	5BL4488.2 and 5BL4488.3	Eligible
Enterprise Ditch	5BL4164.2 and 5BL4164.4	Entire ditch eligible; segments in study area have low degree of integrity

Source: Colorado Historical Society, State Historic Preservation Office, 2002.

3.17.3.1 Description of Historic Properties

Butler/Smith Property

Site #5BL8917 is the only property in the study area with a 19th Century house and barn. It is an excellent example of a 1880s farmhouse with clapboard siding and a Victorian front porch. This house meets Criterion C for a type, period, and method of construction. This is the earliest surviving house in this area of SH 7.

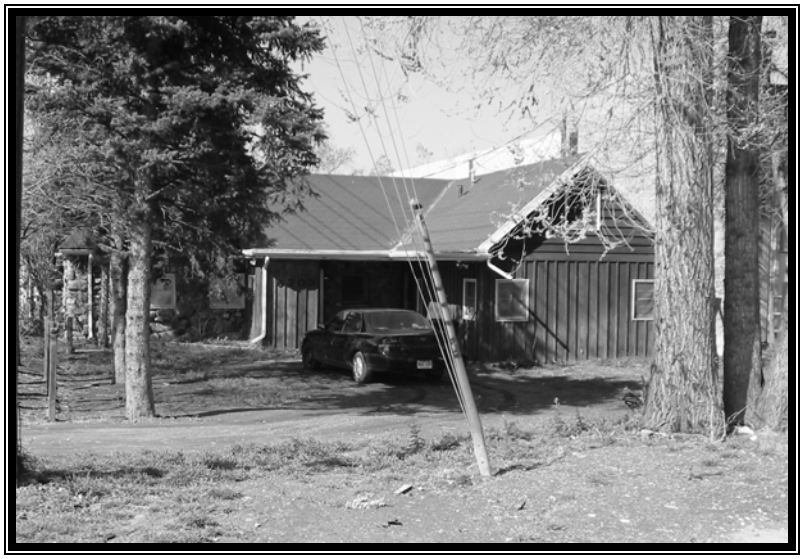
Butler/Smith House (barn)
1599 Cherryvale Road

Butler/Smith House (rear)
1599 Cherryvale Road

Gas Station and Small House

Site #5BL9021 meets Criterion C for its characteristics as a 1920s Craftsman style gas station in rural Boulder County. The combination of cinder block sheathed in wood siding is somewhat rare, as are early gas stations of any style.

Gas Station
6301-6303 Arapahoe Road

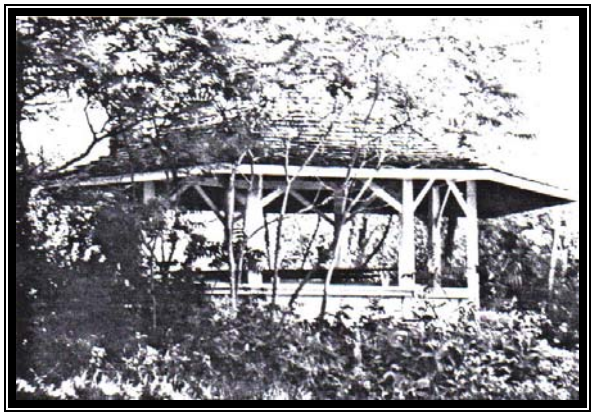


House (south side)
6301-6303 Arapahoe Road

The Harburg House, Barn and Gazebo

Site #5BL9024 is a complex of buildings that meets Criterion C for architectural significance relating to a 1930s rural complex in the Boulder Valley. The house and gazebo are excellent examples of Craftsman style. The property also meets Criterion A as one of the important farms and for its association with the history of the area and its agricultural development from the 1880s.

The Harburg House
6775 Arapahoe Road



Harburg Gazebo
6775 Arapahoe Road

Harburg Barn
6775 Arapahoe Road

DeBacker-Tenenbaum House

Site #5BL9029 contains the distinctive characteristics of a type, period, and method of construction seen in the original house and older out buildings and meets Criterion C. The house, built in 1913 by a member of the DeBacker family, is notable for the fine decorative brickwork and wood shingle siding. In addition, the landscaping consists of the original 1913 plantings on the property that have grown into outstanding specimens not commonly seen. This building complex is one of the few intact farm properties in the survey area that retains its rural setting and represents the former rural agricultural nature of the area. According to the site form, the original landscaping is part of what makes the property significant.

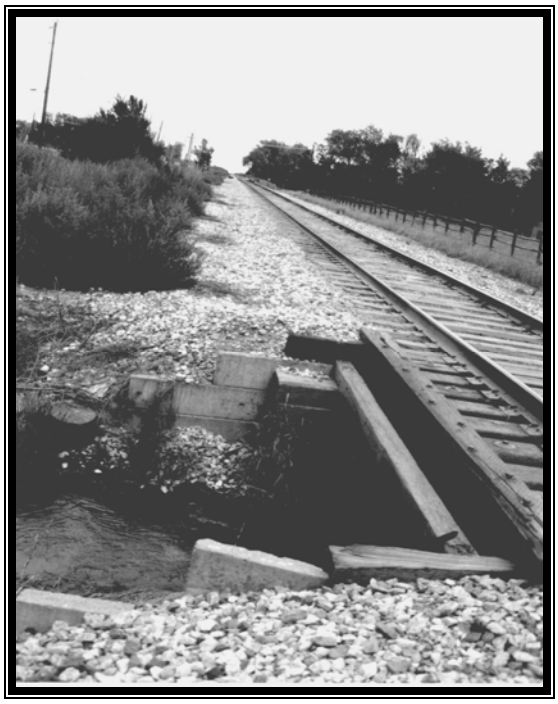
DeBacker-Tenenbaum House
(yard and house looking east)
7280 Arapahoe Road

Barn looking east

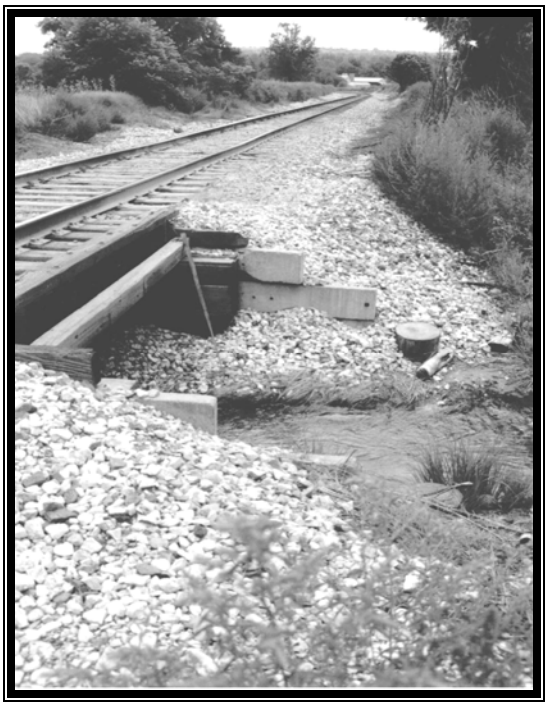
Colorado and Southern Railroad-Burlington Northern Railroad

Site #5BL400.5 played a significant role in the development of Boulder County and meets Criterion A. This railroad line served to transport freight in the 19th century and both freight and passengers in the early part of the 20th century. The segment in the current area of potential effects meets Criterion C because it retains integrity of setting, design, location, feeling and association. The bridge over SH 7 (1931) was determined not eligible during the most recent CDOT bridge survey because its technology is not significant—steel stringer bridges are the most common bridge type in Colorado.

View to North



View to South



Colorado & Southern-Burlington Northern Railroad crossing over Cottonwood Ditch southwest of DeBacker-Tenenbaum property

Cottonwood Ditch #2

Site #5BL4488 meets Criterion A for its importance in the agricultural history of the development in this area of Boulder County. This ditch was begun in 1863 Segments 5BL4488.2 and 5Bl4488.3 still retains integrity of design, setting, feeling and association. The ditch still flows past farms in a rural setting that has not been redeveloped. It may also be eligible for local landmark designation.

Cottonwood Ditch #2
north side of Arapahoe Road

Cottonwood Ditch #2
south side of Arapahoe Road

Enterprise Ditch

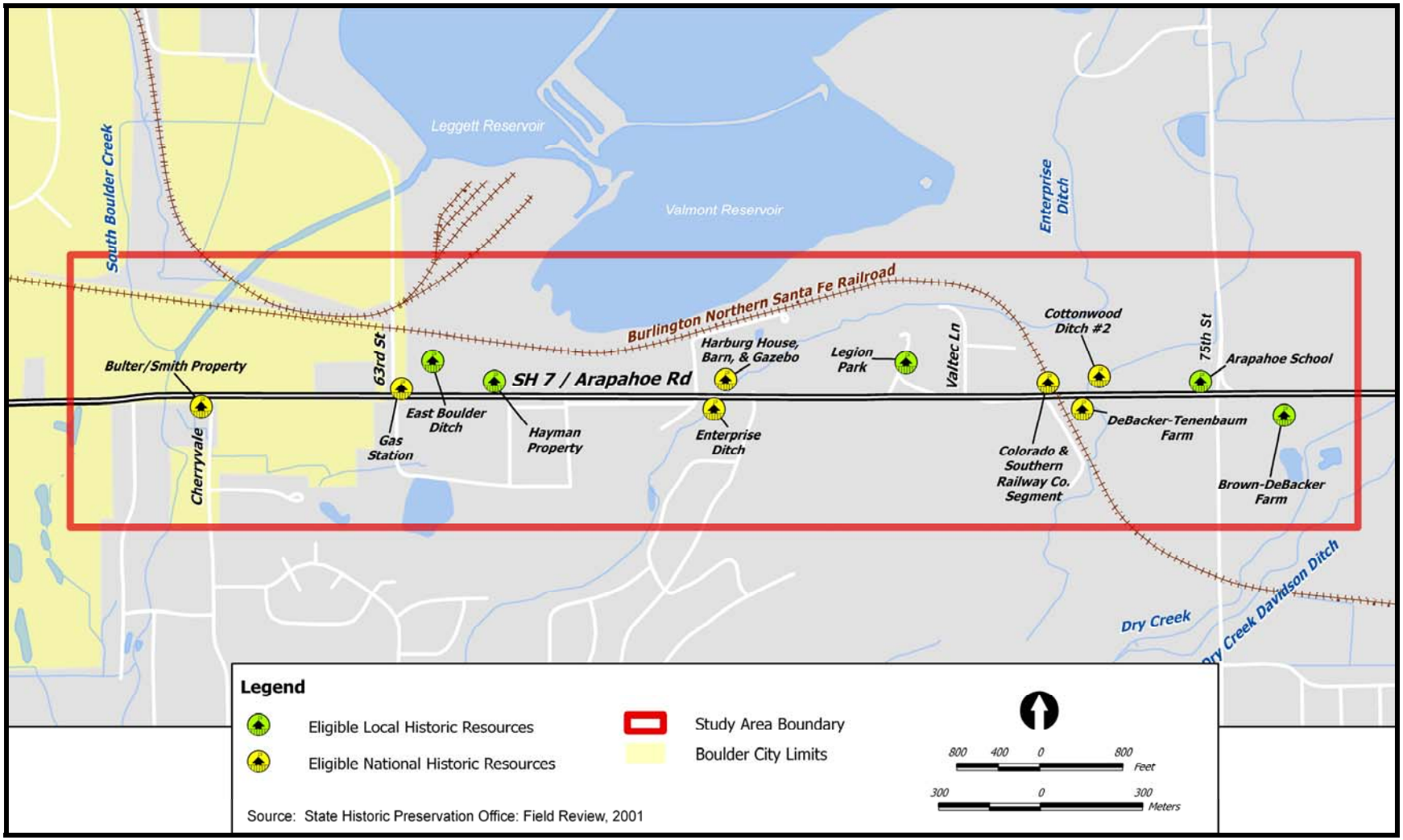
Site 5BL4164 is eligible under National Register Criterion A. The ditch is very important in the agricultural development of Boulder County, but segments of it have lost historical integrity due to recent residential and commercial development. There are two segments of the ditch that are located in the project area. Segment 5BL4164.2 is located at SH 7 just west of Westview Drive. Segment 5BL4164.4 is a 1000-foot segment that extends north of SH 7 and crosses under the railroad in a siphon.

Enterprise Ditch

Enterprise Ditch

These findings described above were submitted to the SHPO; concurrence was provided in correspondence dated March 29, 2005 and August 15, 2005. See **Figure 3-12** for the location of all historic properties.

Figure 3-12
Historic Resources



In addition to the seven NRHP qualifying parcels, there are five properties determined eligible for the State Register or local designation. These parcels do not qualify as historic resources under NEPA guidance and therefore will not be analyzed for impacts. However, a brief description of the state or locally registered properties is provided below:

- **Arapahoe Elementary School (5BL409):** State and locally eligible property. School building does not meet the NRHP criteria because of additions, but appears to meet criterion for listing in State Register and/or as a Local Landmark for its association with rural Boulder County architecture and history. The addition on the north rear is sensitively done and is attached to the west side by a glassed walkway. The front and east sides of the original building are still visible.

- **Brown-DeBacker Farm (5BL5712):** Locally eligible for historical value. The Brown-DeBacker Farm is important in the history of agriculture in Boulder County, but has lost integrity through alterations. It is also important for its association with the DeBacker family.

- **East Boulder Ditch (5BL4163.2):** Locally eligible for historical value. This ditch may qualify as a county landmark for its importance in agricultural history. However, the ditch has lost integrity of original agricultural setting, feeling, and association. Recent residential and commercial development has impacted the agricultural "feel" of the ditch.

- **Hayman Bungalow (5BL9022):** Locally eligible for it unique method of construction. However, the house was demolished in August 2004.

- **Goodview Hill- Veteran's Memorial (5BL516) in Legion Park:** State and locally eligible for historical value. This site is important to the history of Boulder County and is associated with the pioneer settlement in the county. The site also has good examples of C.C.C. rock wall construction.

3.17.4 Paleontological Resources

On September 29, 2004, a paleontological field survey was conducted by a CDOT paleontologist along SH 7 between Cherryvale Road and North 75th Street. The APE for paleontological resources extends from MP 54.6 to MP 57.0, with a 1,312-foot buffer to the north and south of the right-of-way.

Within the study area, bedrock and surficial deposits outcrops are largely covered by artificial fill, roads, buildings, and vegetation. These outcrops are primarily exposed at the surface on Hoover Hill, especially in Goodview/Legion Park. The exposures and

many anthills associated with them were examined for fossils. Information about fossil localities and paleontological resources from the geologic units cropping out within and near the study area was gathered from existing publications and fossil locality databases at the University of Colorado and the Denver Museum of Nature and Science.

No fossils were found in bedrock or surficial deposits exposures or associated anthills within the study area. No fossil localities from within the study area are recorded in either the University of Colorado Museum or Denver Museum of Nature and Science databases. The Upper Pierre Shale transition member is known to contain *Baculites clinolobatus* in its lower part and rare *Sphenodiscus* (*Coahuilites*) spp. in the upper shale in other areas. The Fox Hills Sandstone can contain rare marine mollusk shells, and the trace fossil *Ophiomorpha*. The Louviers Alluvium, the Broadway Alluvium, and unnamed colluvium (slopewash) and eolian (windblown) deposits all can contain vertebrate fossils in the region, but none are known from within the study area.

3.17.5 Historical Preservation Impacts

3.17.5.1 Archaeological Properties Impacts

There are no NRHP eligible archaeological properties that would be impacted by the build alternatives.

3.17.5.2 Historic Properties Impacts

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

Preferred Alternative
Roadway improvements have been planned in order to avoid permanent adverse impacts to the NRHP eligible sites with the exception of the Cottonwood Ditch and a segment of the BNSF railroad. **Table 3-25** describes different impacts to each site.

3.17.5.3 Paleontological Resources Impacts

No fossils are known to occur in the SH 7 study area, though fossils are known from the same geologic units elsewhere in the Denver-Boulder region. As a result, no impacts can be predicted.

Table 3-25
Summary of Effects to National Register Eligible Properties

Site No.	Name and Address	Impacts
5BL8917	Butler-Smith Property (1880) 1599 Cherryvale Road	SH 7 would be widened in front of the Butler-Smith House and additional vegetation would be removed in the right-of-way between the road and the house. All improvements would stay within existing roadway right-of-way. There would be no direct impact to the house or the barn and no impact to the qualities that made this property significant. Very small temporary easement for construction of curb return may be required. As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.
5BL9021	Gas Station (1920) and House 6307 (6301) Arapahoe Road	When SH 7 is reconstructed, the corner of this property, which is currently paved and used as roadway, would continue to be used as a roadway. In consultation with SHPO, it was determined that the corner of the property does not contribute to the significance of the property. All other improvements to SH 7 would occur to the south. Curb cut from 63rd would be installed on existing roadway right-of-way. Temporary easement for construction would be required to construct private access on private property. Tree removal may be required for access construction. As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.
5BL9024	Harburg House w/Barn & Gazebo (1930) 6775 Arapahoe Road	When SH 7 is widened some of the vegetation in the CDOT right-of-way would be removed, but would have no impact on the setting or direct impact on the Harburg property. Constructing two private driveways to match proposed improvements would require a temporary easement for the Preferred Alternative and may require some limited vegetation removal. Public road on the west side of the Harburg property would require reconstruction and may require a temporary easement. If headwall and wingwalls of Enterprise Ditch outlet are replaced in current location, this construction may be on Harburg property. As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.
5BL9029	DeBacker-Tenenbaum House (1913) 7280 Arapahoe Road	When SH 7 is widened a retaining wall may be constructed along a portion of the roadway right-of-way, north of the DeBacker-Tenebaum property, but would not have a direct impact to the landscaped setting or the buildings. The BNSF railroad would be temporarily realigned to be east of the existing location, but there would be no direct impact to the landscaped setting or the buildings. There will be temporary fill slope impacts within this historic property. The ultimate railroad alignment would follow its existing alignment. A temporary easement may be required to build the temporary fill slope for the temporary railroad alignment. As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.

Table 3-25 (cont'd.)
Summary of Effects to National Register Eligible Properties

Site No.	Name and Address	Impacts
5BL4488.2	Cottonwood Ditch #2 (1863) North side Arapahoe to North 75th	The Cottonwood Ditch #2 currently crosses SH 7 just east of the Colorado Southern (BNSF) railroad bridge in an inverted siphon pipe. This existing structure would be replaced with a new inverted siphon. In order to accommodate the improvements, the inlet end of the siphon pipe (south end) would be located at the existing inlet end and the north end of the siphon pipe would be located approximately 20 feet north of the existing outlet end of the siphon pipe. This 20-foot portion (north end) of the existing open ditch would be removed and be in the pipe. Regrading of ditch at outlet end (north end) would be required when siphon is replaced. This has been determined as an adverse effect by CDOT and FHWA and confirmed by SHPO.
5BL4488.3	Cottonwood Ditch #2 (1863) South side Arapahoe around 7280 Arapahoe	This segment crosses under the railroad south and west of the DeBacker-Tenenbaum property. In order to construct a new BNSF railroad bridge over SH 7, a temporary railroad alignment would be required 25 feet to the east of the current alignment. The temporary BNSF alignment would require a temporary bridge to be constructed over the Cottonwood Ditch. The temporary bridge would be removed when the temporary alignment is removed. The ultimate railroad alignment would be along its current alignment and would not result in a direct impact to the Cottonwood Ditch since it would be restored to its original function and appearance. This has been determined as no adverse effect by CDOT and FHWA and confirmed by SHPO.
5BL400.5	Colorado and Southern Railway Company Segment. (1870s) N and S of Arapahoe Road	The widening of SH 7 would require the removal of approximately 25 to 35 feet of existing track on the north side of the highway. This portion of the track alignment would ultimately be on the future bridge structure over SH 7. The Preferred Alternative involves the construction of a temporary railroad alignment offset 25 feet to the east of the existing alignment and the construction of a temporary bridge along this alignment over SH 7. This temporary alignment is required so that the new, longer bridge over SH 7 can be constructed while train operations can continue on the temporary alignment. The ultimate railroad alignment would follow the existing alignment. To construct the temporary alignment, approximately 500 feet of the existing railroad track would be temporarily impacted along the southern curve and approximately 600 feet of existing track would be temporarily impacted along the northern curve. A temporary bridge would be required to carry the temporary railroad alignment over the Cottonwood Ditch. This temporary bridge would be removed following the need for the temporary alignment.

Table 3-25 (cont'd.)
Summary of Effects to National Register Eligible Properties

Site No.	Name and Address	Impacts
		This has been determined as an adverse effect by CDOT and FHWA and confirmed by SHPO. (The existing railroad bridge over SH 7 is officially not eligible.)
5BL4164.2	Enterprise Ditch Segment – North and South of Arapahoe Road	For the Preferred Alternative, a 120-foot concrete box culvert would replace the southern 60 feet of the existing box culvert. Additionally, 250 feet of the existing ditch on the south side of SH 7 would be realigned and reconstructed as an open ditch. This has been determined as no adverse effect by CDOT and FHWA and confirmed by SHPO.
5BL4164.4	Enterprise Ditch Segment – North of SH 7 Crossing Under the BNSF Railroad	For the Preferred Alternative, a temporary railroad alignment would require approximately 100 feet of the ditch to be placed into a pipe. Once the temporary alignment is removed, the ditch would be restored to its original function and appearance. This has been determined as no adverse effect by CDOT and FHWA and confirmed by SHPO.

3.17.6 Historic Preservation Mitigation Measures

Agreement among the SHPO, ACHP, FHWA, and the Certified Local Government, represented by the Boulder Landmarks Preservation Board, has been reached through the Section 106 process of the National Historic Preservation Act on measures to minimize harm. Those measures are incorporated into the alternatives designs. A Memorandum of Agreement has been prepared and was signed by FHWA on December 4, 2006.

No mitigation for paleontological resources has been recommended for the alternatives. However, if these resources are uncovered during construction, the CDOT Paleontologist will be notified immediately.

3.17.7 Summary of Coordination

Coordination with appropriate agencies and other parties has occurred relative to archaeological resources and Native American interests. Coordination with the SHPO relative to historic properties has been extensive, including several meetings with the SHPO's representative individually and several meetings where the SHPO attended along with other agencies. These meetings have included:

- April 9, 2004, scoping meeting with SHPO
- May 11, 2004, field meeting with SHPO
- October 26, 2004, pre-CLG meeting
- November 4, 2004, CLG meeting

The letter of eligibility and effects was sent to the SHPO on August 4, 2005. Concurrence was received on August 15, 2005.

3.18 Hazardous Waste

This section provides information about hazardous waste sites identified within the SH 7 study area. The term hazardous waste as used in this EA is inclusive of all waste materials that require specific handling, worker health and safety, and disposal because of the product's contaminated waste nature. Hazardous waste encompasses materials regulated as solid waste, toxic substances, hazardous materials, hazardous waste, radioactive materials, petroleum fuels, and others as defined and regulated by various state and federal laws.

Hazardous waste can be generated in a number of ways and is considered any waste product that is flammable, corrosive, reactive or toxic. These wastes are found in various forms and can originate from a variety of industrial, mining, and municipal land uses. Hazardous wastes can be toxic to plants and animals.

3.18.1 Methodology

In accordance with the American Society for Testing and Materials (ASTM) procedures and CDOT requirements, a Phase 1 Environmental Site Assessment was conducted for SH 7 between Cherryvale Road and 75th Street. The Phase 1 covers the properties adjacent to the SH 7 right-of-way and approximately 0.5-mile north and south of the highway. The Phase 1 included searching environmental databases, reviewing records at public agencies, examining historical aerial photographs and conducting a site reconnaissance. Carter & Burgess conducted initial on-site inspection on June 11, 2001, and sites identified by records review were checked.

The Phase 1 identified three sites within the study area with recommendations for soil and groundwater sampling. One of these sites is a leaking underground storage tank (LUST) located at 75th Street and SH 7. This site was addressed under the separate project that is taking place at this location. The other two sites are listed below:

- **Transmission Technology Services, 6270 Arapahoe Road:** This property is an active auto repair shop located on the south side of SH 7. A search of the US EPA database revealed no documentation of environmental issues. A limited

subsurface site investigation of the property was conducted on July 8, 2003, to detect any potential contamination of the soil or groundwater. The soil constituents were detected at low levels, while no groundwater was encountered during the investigation.

- **Historic Gas Station & House, 6301-6303 Arapahoe Road:** Three underground storage tanks (USTs) were identified at the historic gas station located on the north side of SH 7. Carter & Burgess conducted initial soil and groundwater investigation in January 2002 and found soil samples heavily impacted by petroleum constituents. A follow-up investigation by EnviroClean Rocky Mountain (ERM) in 2003 found no impact by petroleum constituents. ERM noted that a steel line in the area of the Carter & Burgess soil boring might have had a line leak that impacted the findings in 2002. ERM recommended that the USTs be closed before further development of the site occurs. Should petroleum-impacted groundwater or soil be encountered during construction, special management would be required.

3.18.2 Hazardous Waste Impacts

No-Action Alternative

No impacts to or from any identified hazardous waste sites are anticipated as a result of the No-Action Alternative since there would be no property acquisitions or excavations.

Preferred Alternative

- **Transmission Technology Services, 6270 Arapahoe Road:** The Preferred Alternative would shift the roadway closer to this property. Should right-of-way acquisition become necessary, mitigation requirements would be obtained from the appropriate regulatory agency.

- **Historic Gas Station and House, 6301-6303 Arapahoe Road:** The Preferred Alternative would have no impact in this area since no right-of-way would be obtained, and testing has been completed.

3.18.3 Hazardous Waste Mitigation

During construction, CDOT utilizes its Environmental Health and Safety Management Specification (250 Specification) on projects to address issues related to the transportation, handling, monitoring, and disposal of any hazardous or solid waste materials encountered during construction, including contaminated soils, lead-based paint, and other toxic substances. If deemed necessary, a materials management plan would be prepared regarding the removal and disposal of contaminated soils. A Health and Safety Plan would also be developed to protect workers during construction.

During final design when right-of-way and access requirements are further developed, CDOT will obtain the status of any suspect sites in the study area and will take the necessary precautions during future construction activities.

When contaminated properties are encountered, either during or prior to construction, CDOT coordinates with the affected property owners through the right-of-way process, as well as with the appropriate state, local and federal authorities. Prior to a construction project, CDOT ascertains the status of adjacent properties and updates all available information at that time. Construction contractors are required to comply with Section 250, Environmental Health and Safety Management (CDOT Standard Specifications), when applicable, during construction.

Specific mitigation is unknown at this time, but will be incorporated into final design plans when more detailed design information becomes available. At the Historic Gas Station, further testing of soils and groundwater on site and off site may be necessary. At the time of final design, the necessary right-of-way acquisition and relocation processes would be initiated in accordance with the CDOT right-of-way manual, FHWA, and other federal guidance procedures involving acquisition and relocation. CDOT procedures concerning hazardous waste issues would also be followed to determine necessary project mitigation requirements.

3.19 Parks and Recreation

3.19.1 Open Space/Recreation Existing Conditions

Parks and recreational resources, which include parks, open space areas, and trails, are a primary attraction for both Boulder residents and regional users. Common recreational activities include hiking, biking, wildlife viewing, and picnicking. Amenities at the recreational parcels include parking, trailhead information, picnic areas, and trail networks. The following properties qualify as recreational/open space parcels:

Legion Park is owned and operated by the Boulder County Open Space department. Located on the north side of SH 7 between Valtec Lane and Westview Drive, Legion Park is open to the public and used for recreational purposes. On-site facilities include a multi-use trail, parking areas, and benches for scenic viewing. Currently Boulder County has no future plans for improvements to the park.

Sombrero Marsh Open Space is located south of the Boulder Valley Schools Technical Education Center along the southern boundary of the study area. Sombrero Marsh is open to the public and owned and operated by both the City of Boulder and Boulder County. Seasonal trails allow for hiking and wildlife viewing. The primary goals of the

open space are to: restore and sustain the ecological health of the Sombrero Marsh, and use the educationally rich outdoor setting for teaching children and adults about wetland ecology, environmental restoration, and land stewardship. (*Site Management Plan for Sombrero Marsh*. City of Boulder Open Space and Mountain Parks Department, December 5, 2001 pp. 3).

City of Boulder Open Space parcel is located alongside SH 7 between Westview Drive and the BNSF railroad tracks. The property is managed by the City as an agricultural preservation area and there is no public access or active recreation on this site.

South Boulder Creek Path is located at the western end of the study area along South Boulder Creek. The path crosses under SH 7 just west of Cherryvale Road and continues westward on the south side of the roadway. The path is used by the public and is maintained by the City of Boulder.

See **Figure 3-13** for parks, open space and recreational sites.

3.19.2 Open Space/Recreation Impacts

No-Action Alternative

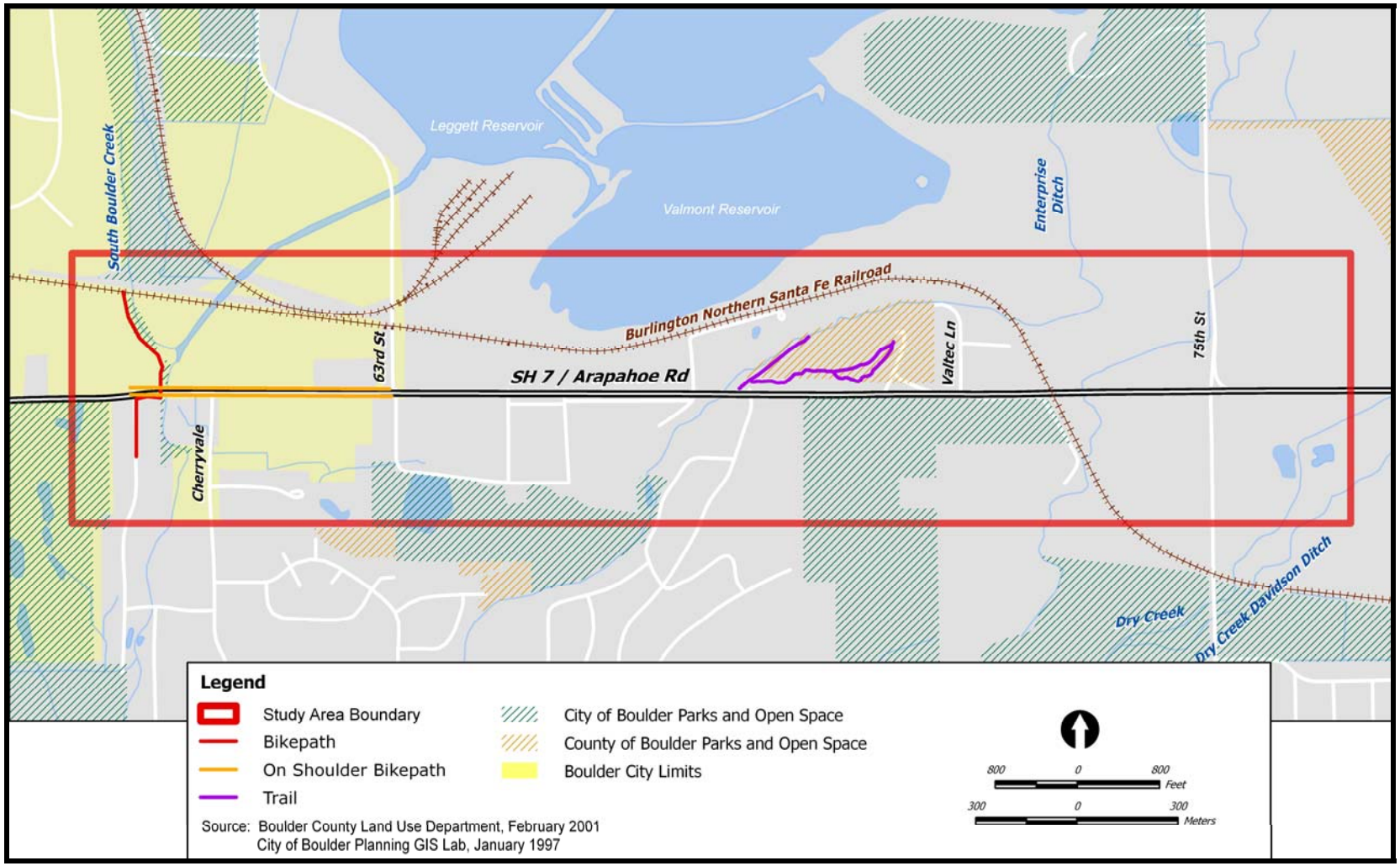
The No-Action Alternative would have an indirect impact on all parks and recreational facilities within the study area. As traffic increases over time, congestion would result in diminished accessibility to the parks and recreational facilities along SH 7. There would be no direct impacts to parks and recreational facilities under the No-Action Alternative.

Preferred Alternative

The Preferred Alternative would have beneficial indirect impacts on all parks and recreational facilities within the study area by alleviating congestion along SH 7, thereby improving accessibility. There would be short-term increases in emissions from vehicles due to construction and both long-term and short-term increases in noise that may impact users' experience. Direct impacts to each individual property are described below.

Bicycle improvements included for this alternative include a five-foot on-street bike lane in each direction on the west segment of the alignment and 10-foot shoulders serving as bike lanes along the eastern segment. In addition, a 12-foot multi-use path is included on the north side of SH 7 for the entire length of the corridor. On the south side of SH 7, an 8-foot sidewalk would be constructed between Cherryvale Road and Westview Drive.

Figure 3-13
Park and Recreation Facilities



There is currently one access drive to the Legion Park that splits into a "Y" that has two access points onto SH 7. Direct impacts at Legion Park would consist of cut slopes that would require a temporary construction easement in an area of the park that has no public use, and the closure of the eastern leg of the "Y" access point. The western leg of the access point would be improved to accommodate all the traffic going in and out of the park. The proposed limits of the cut slope would require the removal of some vegetation. The eastern leg of the access point would be removed.

There would be no direct impacts to the Sombrero Marsh Open Space under the Preferred Alternative. There would be improvements made to the SH 7 and 63rd Street intersection that would allow the public to more easily access the open space area.

There would be no direct impacts to the South Boulder Creek Path with this alternative. SH 7 improvements would begin to the east of where the path crosses the roadway.

There would be some intrusion on Legion Park and on the City of Boulder Open Space parcel across the road from Legion Park. Approximately 0.5 acre of temporary easement would be needed to accommodate the grading for the road lowering and widening at Legion Park. Also, there would be a substantial amount of vegetation located along SH 7 that would need to be removed from the Legion Park property. For the City of Boulder Open Space, approximately 2.4 acres of temporary easement for grading would be required.

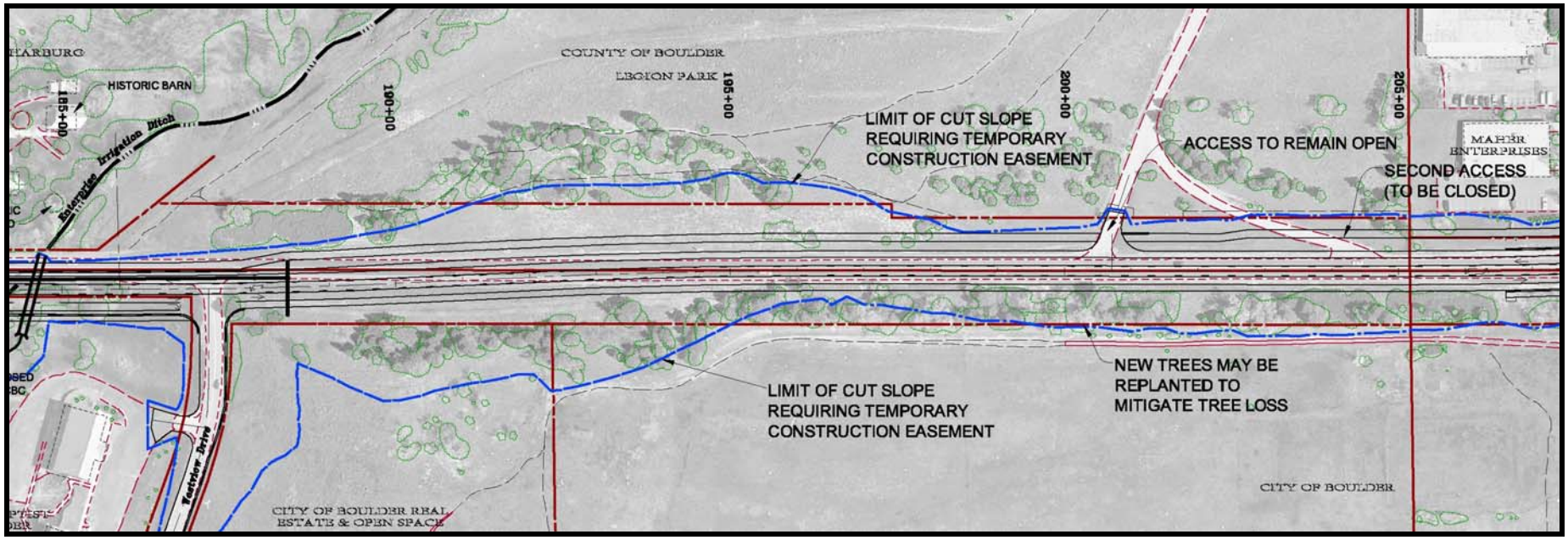
See **Figure 3-14** for the proposed impacts to Legion Park.

3.19.3 Open Space/Recreation Mitigation

The land where the eastern leg of the access into Legion Park is removed will be revegetated with native plant seed mixtures. No other mitigation measures are necessary for any of the parks or recreation facilities. The following BMPs will mitigate the build alternative's impacts:

- Minimize the amount of disturbance of grading to 10 feet beyond the toe of slope. Project will follow CDOT standard specifications for amount of time that disturbed areas are allowed to be non-vegetated.
- Develop and implement a noxious weed management plan. This will be completed during final design.
- Salvage weed free topsoil for use in seeding.
- Implement temporary and permanent erosion control measures to limit erosion and soil loss.
- Reseed all disturbed locations except rock cuts with native plant seed mixtures

Figure 3-14
Impact to Legion Park



- Develop acceptable revegetation plan with the CDOT Landscape Architect, City of Boulder, and Boulder County. Removed trees and shrubs in the Boulder Creek riparian zone will be replaced on a 1:1 basis as required by SB 40.

3.20 Visual Quality

3.20.1 Visual Quality Existing Conditions

The SH 7 study area is located on the east side of the City of Boulder and includes approximately two miles of SH 7 between 75th Street and Cherryvale Road. The study area is generally characterized by level grades with one steep slope that reaches its maximum height just east of Westview Drive. The area contains a variety of land uses that include residential subdivisions, irrigated farmland, commercial and industrial development, business parks, public open space, and educational facilities.

Landscape Character

Landscape character can be broken down into landscape units containing similar landscape elements that are different from other distinct areas. The physical elements of a landscape form the visual patterns that strongly influence our response to the landscape. These physical elements include landform and vegetation, water and wildlife features and other manmade modifications, such as residential and commercial development. Foreground landscape units are those immediately visible from the highway and define the local character of the area. The foreground is defined as the area within 0.0 to 0.5 mile. The middleground is defined as 0.5 to 4 miles. The background views are 4.0 miles or greater.

Looking west from SH 7, just west of 75th Street. The BNSF bridge dominates the middleground view. Notice the Rocky Mountains in the distant background.

The existing landscape character within the study area is varied, consisting of agricultural land, rural undeveloped land, and residential, commercial, and industrial development. The Rocky Mountains, Front Range, and Flatirons are the most significant features of the study area and are visible from many viewpoints in the area. The BNSF railroad crosses the study area on a bridge west of 75th Street.

A detailed description of the study area from east to west is provided below. Photos of the study area were taken in March 2005. Photo simulations are shown in the public meeting graphics in Appendix H.

Looking northwest from SH 7. As the grade becomes steeper, foreground elements dominate the landscape; the middleground and background views become obstructed.

East of 75th Street to the Highest Point of the Study Area

In this portion of the study area, the foreground element is pavement, with agricultural, commercial, and rural residential land adjacent to the roadways. Commercial land uses in this area are clustered around the SH 7 and 75th Street intersection. The middleground views are primarily of agricultural and rural residential lands. The BNSF bridge dominates the middle ground view to the west. As the roadway grade becomes steeper, coniferous trees become visible in the foreground and the hillside begins to obstruct the middleground. The background views to the west, northwest, and southwest are of the Rocky Mountains. Background views to the north, south, and east consist primarily of agricultural land. To the south and east, long stretches of roadway surrounded by trees are also present in the background view.

Looking east from SH 7. Commercial development and the BNSF bridge dominate the middleground view; background views consist of trees and rural land uses.

Looking west from the BNSF and SH 7 crossing. Agricultural and rural residential land uses dominate the middleground views.

The Highest Point of the Study Area to Cherryvale Road

This portion of the study area is characterized by numerous variations in the visual landscape. From the top of the grade looking west, the viewshed widens considerably, enhancing scenic quality. Descending from this point, the middleground views include Hillcrest Lake, Valmont/Leggett-Owen Reservoirs, industrial development, and the Seventh Day Baptist Church. Background views of the Rocky Mountains, Front Range, and Flatirons continue to dominate the landscape. The foreground element is pavement, with agricultural land and coniferous trees adjacent to the roadway. Traveling west toward Cherryvale Road, industrial and commercial land uses begin to dominate the foreground until the roadway widens from two lanes to four lanes. In this area, the middleground views to the north and south are somewhat obstructed by commercial developments. To the east, the middleground view is dominated by the increasing roadway grade. The background views to the west, northwest, and southwest are of the Rocky Mountains, Front Range and Flatirons. Background views to the north and south consist of agricultural lands. Background views to the east are somewhat obstructed by the elevated grade.

Looking west from the highest point of the study area. The viewshed widens considerably, enhancing scenic quality.

Looking southwest from SH 7, descending from the highest point of the study area, view of the Seventh Day Baptist Church. The Flatirons dominate the background view at this location.

Looking west from SH 7. Power lines and commercial establishments dominate the landscape in the foreground.

Looking east from SH 7. The middleground view is dominated by the increasing grade. Background views are obstructed.

3.20.2 Visual Quality Impacts

No-Action Alternative

The No-Action Alternative would result in no visual alterations or impacts on the visual setting of the SH 7 roadway corridor.

Preferred Alternative

Between Cherryvale Road and the Boulder Valley School District, added pavement and a raised median would alter foreground and middleground views. Because this portion of the study area is currently a four-lane urban section, these changes would be consistent with existing land uses and visual character.

To accommodate roadway design speeds, the existing hill near Legion Park would have to be lowered approximately 13 feet, which may widen the viewshed and improve background views. At the top of Hoover Hill, 10 trees would be removed on the north side of the road and 100 trees on the south side of the road, exaggerating the presence of the roadway. Retaining walls up to 21 feet high (adjacent to the BNSF crossing) would alter foreground and middleground views where erected in the vicinity of the railroad overpass.

Pedestrian and bicycle improvements include the addition of bicycle lanes and pedestrian pathways. These improvements would increase the amount of pavement in the viewshed, most notably near Legion Park.

This alternative would not impact background views of the Rocky Mountains, Front Range, and Flatirons where currently visible throughout the study area.

Overall, impacts to the visual quality of the study area would be most prominent east of the Boulder Valley School District (approximately 0.25 mile east of 63rd Street), where the existing roadway consists of two-lanes and the landscape begins to become more rural in character. In this area, a third two way left turn lane and twelve-foot detached concrete path would be added to the viewshed as travelers approach Legion Park.

3.20.3 Visual Mitigation Measures

Visual mitigation measures could include:

- Choose wall colors and textures that will fit into the landscape visually and aesthetically by complimenting the surrounding area to reduce visual impact to the community.
- Revegetation of disturbed areas in a manner that is consistent with adjacent landscape features. Use native and indigenous species for revegetation.
- Where feasible, slope modifications will be completed in a manner that maintains or accentuates foreground views. Techniques could include creating pockets for native vegetation, undulating finished grades, and application of erosion control measures.

3.21 Farmland

US Congressional Public Law 95-87 (Federal Register January 31, 1978: Part 657) requires the US Department of Agriculture, Natural Resources Conservation Service (NRCS) to identify and locate soils that are considered prime and unique farmland. These farmlands are protected in accordance with the Farmland Protection Act of 1981. Prime farmlands are considered to be of national importance and have been defined as land with the best characteristics for producing feed, forage, fiber, and oilseed crops, and are available for these uses. Unique farmland is land other than Prime farmland that is used for the production of specific high-value crops. In addition, the Important Farmland Program has encouraged the NRCS or other appropriate local or state agencies to identify soils that can be considered farmland of statewide or local importance.

3.21.1 Existing Conditions

A letter was sent to the Natural Resources Conservation Service (NRCS) on September 5, 2001, requesting information on soils that can be classified as prime or unique farmlands. A response was received on September 21, 2001. Approximately 70 percent of the study area contains soils that are considered Prime farmland, as defined by the

NRCS. However, only about 10 percent of these soils are actually being used for farming activities. There are no soils considered to be of statewide or local importance within the study area. A copy of the letter from the NRCS is located in Appendix G.

3.21.2 Farmland Impacts

Direct farmland impacts would result from removal of cultivated lands by placement of impervious (paved) surface, cut and fill slopes and/or acquisition of right-of-way.

No-Action Alternative
There would be no impacts to Prime farmland with the No-Action Alternative.

Preferred Alternative
The Preferred Alternative would result in conversion of approximately 5.0 acres of Prime farmland from several parcels. This is based on additional right-of-way that would be required. A Farmland Conversion Impact Rating form (AD-1006) was completed in accordance with the Farmland Protection Policy Act (FPPA – 7 USC 4201, et seq.). This rating form indicated that 6.06 acres would be impacted. Since that time, the design has been refined to impact less farmland. There will be no impacts to the ability to irrigate the remaining farmland, nor to the access to and from fields.

3.21.3 Farmland Mitigation

The total points on the Farmland Conversion Rating form (AD-1006) for impacts are less than 260. Therefore, under the provisions of 7 CFR 658.4 (c), no mitigation is required by the NRCS. Any crops that are damaged during construction will be compensated by CDOT.

3.22 Energy/Utilities

3.22.1 Utilities Existing Conditions

The Utility Notification Center of Colorado (UNCC) was contacted to identify private utility companies with facilities in the study area. Each of the utility owners was contacted for available mapping information related to the location of their facility. ICG Communications has an exclusive easement in the BNSF railroad right-of-way. The irrigation ditches also have exclusive prescriptive right-of-way. No other utility owner was aware of exclusive easements within the study area. Numerous utilities exist within the study area and those affected by the proposed improvements are listed below:

- Xcel Energy Natural Gas and Electric
- City of Boulder (water and sewer)

- Comcast (formerly AT&T Cable)
- QWEST
- MCI
- ICG Communications
- East Boulder Ditch
- Enterprise Ditch
- Cottonwood Ditch

Approximate existing utility locations were obtained from key maps from each utility company. Locations are shown in the conceptual design plans of the Preferred Alternative in **Appendix B**. The following sections provide general information about the utilities identified in the study area by utility type.

Electric Lines
Xcel Energy provides electric power to residential and commercial customers in the study area. Electrical lines are primarily overhead with the exception of recently installed underground lines between the east property line of the BVSD and Valtec Lane. The underground line was installed outside the south edge of the existing pavement.

Gas
Xcel Energy also provides natural gas to residential and commercial customers in the study area. A 2- to 3-inch gas line runs the length of the corridor. A 12-inch high-pressure gas line crosses SH 7 west of the BVSD west entrance.

Water and Sanitation
The City of Boulder owns and operates water and sewer facilities for the western portion of the project. Water lines run from Cherryvale Road to the BVSD east entrance. The water line is 12 inches in diameter west of the BVSD west entrance and 8 inches in diameter to the east. The water main is in the existing pavement of SH 7. An 8-inch sewer main runs from the BVSD west entrance to the west, south of the existing pavement.

Cable TV
Comcast has an underground cable TV line on the south side of SH 7 within the roadway right-of-way adjacent to the BVSD property. From the underground line to the west, the cable lines are overhead on shared poles with Xcel.

Telephone/Fiber Optic

Buried and overhead fiber optic and telephone cables are located throughout the study area. Qwest Communications, MCI, and ICG Communications own these lines. All MCI lines are in leased Qwest conduit. On the west end of the study area, Qwest/MCI have underground telephone lines and overhead fiber optic lines on the south side of SH 7 up to the BVSD west entrance. An underground telephone line continues east from the BVSD property to 75th Street on the south side of SH 7. Between 63rd Street and the east entrance to the BVSD property, overhead telephone lines also exist on the north side of SH 7. An underground telephone line serves the commercial properties along Valtec Lane on the north side of SH 7.

ICG Communications has an underground fiber optic line that runs within the BNSF right-of-way. To cross SH 7, the line traverses approximately 760 feet along the north side of SH 7 in CDOT right-of-way, crosses SH 7, and then continues back along the south side of SH 7. ICG does not know the depth of the line.

Irrigation Ditches

There are three irrigation crossings located within the study area. **Table 3-26** summarizes the irrigation ditches within the study area. Communication with all of these irrigation ditch companies has been established.

Cottonwood Ditch # 2 is eligible as a historic resource. See Section 3.17.3. The ditch crosses SH 7 east of the existing railroad bridge. The existing structure below SH 7 is a siphon. The ditch also crosses the BNSF railroad south of SH 7. The railroad traverses the ditch on a timber bridge. The primary ditch flow is from April to September.

Enterprise Ditch is also eligible as a historic resource. The ditch crosses SH 7 just west of Westview Drive. The existing structure under SH 7 is a 10-foot by 5-foot box. The ditch crosses the BNSF railroad alignment north of SH 7 in a siphon.

East Boulder Ditch is not eligible as a historic resource. The ditch crosses SH 7 east of 63rd Street. The existing structure is a box culvert, with approximate dimensions of 10 feet by 5 feet.

Table 3-26
Irrigation Ditch Summary

Irrigation Ditch	Ditch Contact	Existing Structure	Required Replacement Structure	Other Comments and Requirements
Cottonwood Ditch #2	Bob Pherson President (303) 494-7036	Siphon, dimensions unknown	Same as existing	This ditch is eligible as a historic resource. Primary ditch flow April to Sept. Upstream end of siphon damaged, improvements needed.
Enterprise Ditch	Nancy Love, Love and Associates (Ditch Engineer) (303) 673-9795	10-foot by 3-foot box	Same as existing	This ditch is eligible as a historic resource. Require guardrails and handrails. Require trash rack on upstream side. Require regular cleaning of trash rack and new structure. Design review fee required by engineer.
East Boulder Ditch	Randy Rhodes, President (720) 497-2123	10-foot by 3-foot box (approximate)	Same as existing	Ditch eligible as a historic resource; segment in study area non-contributing Base flow approx. 30 cfs, but also take storm water upstream. Operates April through October.

There is also irrigation water from Cottonwood Ditch #2 that is routed to the DeBacker property. A turnout for this Cottonwood lateral is located on the Tenenbaum property. The irrigation water is routed to the east by open ditch and pipe from the turnout to the DeBacker property. The Cottonwood lateral outfalls in the southwest corner of the DeBacker property on the southeast corner of the SH 7 and 75th Street intersection.

Personal Water Supply Wells
The Colorado Division of Water Resources was contacted for existing personal water well system information within the study area. The resulting information included an extensive list of well locations. However, not all information pertaining to the well locations was listed. Only the quarter corner of the section was listed in most instances. Based upon the permit information gathered, there are numerous wells that are located adjacent to the project. Some of the information indicated that more than one well permit has been issued for several of the adjacent properties.

Personal Septic Disposal Systems
The Boulder County Health Department was contacted for Personal Septic Disposal System records. Numerous systems exist on both the north and south sides of the proposed alignments.

3.22.2 Utilities Impacts

No-Action Alternative
There would be no impacts to utilities with the No-Action Alternative.

Preferred Alternative
The Preferred Alternative would impact several existing utilities. The lowering of the roadway profile east of Westview Drive and subsequent cut slopes from the widening would require the utility lines to also be lowered. This lowering would affect the 2-inch Xcel gas line and the underground telephone and electrical lines. Overhead and underground electric lines exist along the roadway alignment would be impacted. The power poles in conflict with the roadway work would require relocation to accommodate excavation and embankment activities. Fiber optic lines run between manholes in the existing roadway pavement. It is anticipated that the proposed roadway vertical profile and widening would create earthwork cut/fill activities. The fiber optic lines may be in conflict and the manholes would require reset work. The ICG fiber optic near the BNSF railroad may be impacted, depending on the depth of the existing line. Roadway widening activities may also impact existing underground Comcast cable television coaxial cable. Initial utility locating efforts show that more investigation would be required.

In addition to the utilities mentioned above, underground sanitary sewer lines, water lines and fire hydrants are present. These features would be reset or adjusted in order to maintain service and match the proposed roadway section.

Several drainage structures also exist adjacent to the existing roadway. The structures are part of a network of drainage ditches in the area. Widening activities for the two build alternatives would impact the drainage ditches and structures.

The Cottonwood Ditch No. 2 siphon under SH 7 would require replacement. The temporary offset railroad alignment east of the existing alignment would require a temporary bridge crossing over the Cottonwood Ditch.

The box culvert for the Enterprise Ditch crossing below SH 7 would be replaced in kind to accommodate the wider roadway improvements. The Enterprise Ditch siphon under the railroad would likely not require replacement.

The East Boulder Ditch box culvert would be replaced in kind to accommodate the larger roadway footprint and the south shift of the improvements.

All wells within the proposed right-of-way and construction easements would be located in the first stages of final design.

Personal Septic Disposal Systems may be impacted by the build alternatives. It is anticipated that the footprint for the roadway widening may necessitate relocation of these systems.

3.22.3 Utilities Mitigation

All utility locations will be identified and field verified prior to construction. Exposed utilities will be protected during construction activities. If utility service must be interrupted, temporary service will be provided as needed and maintained during the disruption. It is expected that some of the utilities will be in conflict with the proposed improvements and require reset and/or relocation work to a new permanent location. Impacted utility owners will be contacted during the early stages of the design process to closely coordinate this work and design.

An effort will be made to minimize impacting the existing ditches and drainage structures through efficient design and coordination with the owners.

The exact location of personal wells and septic systems adjacent to the proposed action will be determined during the design process and noted on the plans, if applicable. Protection and/or relocation of the wells and septic systems might be needed and will be mitigated during the right-of-way acquisition process. Coordination with the affected residents, CDOT, Boulder County, and the City of Boulder will be necessary to minimize conflicts. Adequate public notice will be given for proposed work activities. Coordination with impacted residents will be maintained throughout the construction process.

If it is determined that the improvements will impact the existing system, the owner will be notified in advance of roadway work for coordination efforts to protect or relocate the system. Design modifications, such as retaining wall installations instead of embankment or excavation roadway slopes, may be preferred.

3.23 General Construction Impacts and Mitigation

3.23.1 General Construction

Major construction issues include the lowering of the existing hill east of Westview Drive by 13 feet requiring the construction of large cut slopes. Additionally, the existing BNSF crossing would require the construction of a temporary offset railroad track and bridge east of the existing alignment and the construction of the replacement bridge in the current bridge location. The proposed centerline shift in the Preferred Alternative is designed to avoid impacts to historic properties and provide opportunities to construct future traffic lanes outside the existing roadway. The following summarizes the

possible construction phases (actual phasing would be determined during construction):

- Construct track and temporary railroad bridge to the east of the existing BNSF alignment. Construct detour pavement to the south of existing SH 7. In the area of the historic gas station at 63rd Street and the historic house near Westview Drive, the proposed roadway alignment is shifted south. This would allow for proposed eastbound lanes to be constructed while existing traffic remains on SH 7.

- Shift existing traffic south and construct proposed westbound lanes and railroad east onto temporary alignment. Lower hill for westbound lanes and construct cut slopes on north side of SH 7 at Legion Park. Excavate and construct north portion (including center pier) of proposed BNSF bridge.

- Shift existing traffic north and construct remainder of eastbound lanes. Construct south portion of railroad bridge. Shift traffic into final configuration and railroad back to existing alignment.

3.23.2 General Construction Impacts

No-Action Alternative

There would be no impacts with the No-Action Alternative.

Preferred Alternative

The Preferred Alternative would have temporary impacts during the construction period. The construction period for this alternative would likely be two years. Detailed construction phasing will be addressed during final design. It is anticipated that one lane of traffic in each direction in addition to a center left-turn lane at intersections would be maintained at all times and that most construction would take place during normal work hours. The contractor would be required to maintain access to all residences and businesses along the corridor.

Construction of this alternative would have potential temporary impacts to the following resources:

- Air Quality
- Noise
- Water Quality
- Visual
- Section 4(f)

3.23.2.2 Air Quality

Construction activities could have a temporary impact on air quality. These include fugitive dust during earthmoving operations and stockpiling. PM_{10} (particles less than 10 microns in diameter) dust particles are of particular pollution concern because the particles can travel further and are more likely to be inhaled by humans.

Emissions from construction equipment can also contribute to air pollution. Gasoline and diesel engines emit exhaust, including particulate matter, carbon monoxide, sulfur dioxides, nitrogen oxides and other pollutants. Increased emissions would also result if congestion occurs as a result of construction closures or delays.

3.23.2.3 Noise

Temporary noise impacts to receptors along the construction corridor are expected. The increased noise during construction would be primarily due to construction equipment including earth moving, hauling, pile driving and paving equipment.

3.23.2.4 Water Quality

Construction activities can affect water quality through erosion and sedimentation. Erosion is usually greater during construction due to the exposed soil during grading and dirt moving operations. This sediment can reach waterways and impact water quality if not properly managed. Another concern during construction is water contamination from spilled fuels or other hazardous materials.

3.23.2.5 Visual

During the construction period, visual impacts would occur through the use of traffic control devices, dirt and construction material stockpiles, and equipment storage areas.

3.23.2.6 Section 4(f)

Impacts to 4(f) properties would include the construction of cut slopes north of SH 7 at Legion Park in an area of the park where there is no public use. Because of the lowering of the hill east of Westview Drive, grading of side slopes would be required for the Preferred Alternative. Removal of approximately 10 trees on park property would be required. During the construction of the cut slopes and during seeding operations, construction equipment would require access to Legion Park property. A temporary easement would be required during construction.

3.23.2.7 Sustainability

Both the Preferred and No-Action 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 entirely be avoided. It is recognized that these impacts should be minimized to the extent practicable.

3.23.3 Mitigation of Construction Impacts

3.23.3.1 Air Quality

To mitigate impacts to air quality during construction, water as a dust palliative will be used. Stockpile areas can be stabilized through covering or the application of water. Haul trucks should be covered during transport. Finally, to reduce emissions, the contractor can be encouraged to retrofit equipment to reduce pollution, to use clean burning fuels and to properly maintain construction equipment.

3.23.3.2 Noise

To limit noise impacts to residents, it is recommended that the construction activities be limited to daytime work hours. Also, the contractor shall be encouraged to phase as much of the noise inducing activities together to help limit the duration of higher noise levels. Finally, the contractor shall be required to use mufflers or noise blankets on equipment and quiet generators.

3.23.3.3 Water Quality

Impacts to stormwater quality can be mitigated during construction. This project commits to following CDOT's Erosion Control and Stormwater Quality Guide and sections 107.25 and 208 of the Standard Specifications for Road and Bridge Construction. An erosion control plan will be developed during final design and followed during construction. Inspections of erosion control and water quality devices should occur during construction. The following are stormwater quality methods to be implemented during construction:

- Implementation of BMPs for erosion control. These include but are not limited to seeding, the use of erosion control blankets, the use of embankment protectors, and outlet protection for storm sewer pipes.
- Implementation of BMPs for sediment control. These include but are not limited to erosion bales, silt fence, storm drain inlet protection, sediment traps, and stabilized construction entrances.

- Implementation of BMPs for materials handling and spill prevention. These include but are not limited to stockpile management, material management, material use, and spill prevention and control.

- Implementation of BMPs for waste management. These include but are not limited to concrete, hazardous, and contaminated waste management.

- Implementation of BMPs for pollution prevention. These include treatment during dewatering and paving operations. It also includes the use of street sweeping and temporary waterway crossings.

3.23.3.4 Visual

Visual impacts will be minimized during construction by limiting stockpiles and equipment storage to designated areas. Any traffic control devices can be removed promptly after use.

3.23.3.5 Section 4(f)

Mitigation for temporary impacts to the Legion Park 4(f) property will include seeding with a native seed mix approved by Boulder County.

3.23.3.6 Sustainability

Sustainable practices incorporated into the project planning, construction, and maintenance can minimize resource impacts. As part of its environmental ethic and policy, CDOT encourages its staff, consultants, and contractors to identify and utilize 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, minimally processed and packaged items, and preference for locally-available resources. CDOT encourages the identification and incorporation of proven alternative materials that are as long or longer-lasting, and which require the same or less amount of maintenance, as long as such materials do not impact CDOT's ability to meet its primary obligations for providing a safe and efficient transportation system.

3.24 Cumulative Impacts

3.24.1 Methodology

This section addresses the cumulative impacts associated with the Preferred Alternative. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7).

To identify cumulative impacts, a baseline is established which includes development from a specified period of time for past actions, added to present and reasonably foreseeable actions. This baseline establishes the impacts, which have or would occur without the proposed action.

The environmental resources identified for analysis within the cumulative impacts discussion are based on those which are impacted by the Preferred Alternative and which are also of concern for cumulative effects based on scoping comments, other comments, or environmental analysis. Not all resources impacted by the proposed action are evaluated for cumulative effects.

For this EA, the resources that have been identified for cumulative effects analysis are land use changes, wildlife, wetlands, and water quality. The cumulative analysis addresses the "incremental impacts" of the proposed action related to these resources. To determine the impacts to these resources on a cumulative basis, the impacts of the proposed action are added to the baseline and analyzed as the incremental impacts of the proposed action.

Geographic Area

The cumulative study area was chosen to represent an analysis of the likely land use effects of widening SH 7. In this section, the cumulative study area is referred to as the study area. The boundary for land use changes, wildlife, and wetlands is (approximately) an 8,600-acre area bounded by Foothills Parkway to the west, 95th Street to the east, Baseline Road to the south and Valmont Road to the north. The study area for water quality is the 1,160-square-kilometer Boulder Creek watershed. The cumulative study area for land use changes, wildlife, and wetlands is shown in **Figure 3-15**.

Time Period

The timeframe used for this analysis is (approximately) 40 years in the past based on the earliest available aerial photography (which is 1963). The future timeframe is to the year 2030 based on the project time horizon.

Resource Data

Data was collected for the resources of concern from readily available data sources for the cumulative impacts study area. Data on past and existing conditions were derived from aerial photography, Boulder County, the City of Boulder, the Colorado Division of Wildlife—Natural Diversity Information Source (DOW-NDIS) and the US Geological Survey (USGS). A list of reasonably foreseeable land use and transportation projects was compiled by Boulder County and the City of Boulder.

Figure 3-15
Cumulative Impacts Study Area

3.24.2 Past Actions and Conditions

3.24.2.1 Land Use

In 1963, much of the land within the study area was used for agricultural, open space, and low-density residential purposes. In 1967, Boulder voters approved a 4/10 of a cent sales tax specifically to buy, manage and maintain open space. This was the first time citizens in any United States city had voted to tax themselves specifically for open space. Because of this aggressive approach toward open space preservation, a significant amount of land in the study area has been protected from development. This is especially true for the eastern portion of the study area, which contains the largest areas of open space and agricultural land.

In 1963, low-density residential developments existed north of Baseline Road/East of 75th Street, north of Baseline Road/West of 55th Street, and north of Baseline Reservoir. In the eastern portion of the study area, most residences were on large lots attached to farms along SH 7, 95th Street, and Valmont Road. Valmont and Leggett-Owen Reservoirs, Hillcrest Lake and numerous smaller lakes and creeks dominated the landscape in much of the study area. A few industrial facilities were located in the vicinity of these reservoirs. Aerial photography shows the Flatirons golf course in its early stages of development.

Over the past 40 years, the most significant changes in land use have been the intensification of residential and commercial/industrial development. Residential land uses have intensified south of SH 7 and west of Baseline Reservoir. In the east, residential development has occurred along the Dry Creek riparian corridor and north and south of Baseline Road to the eastern edge of the study area.

Commercial/industrial land uses have intensified north of SH 7 from Leggett-Owen Reservoir to the western boundary of the study area and along the north and south sides of SH 7 near Hillcrest Lake. From 1963 to 2003, land used for residential and commercial/industrial purposes increased by approximately 1,865 acres. This represents an increase of 987 acres of residential land and 878 acres of commercial/industrial land.

3.24.2.2 Wildlife

Black-Tailed Prairie Dogs

Prior to European settlement, the majority of the study area contained habitat suitable for the black-tailed prairie dog except for wetlands and riparian zones. Over time, the conversion of short grass prairie to agriculture, flood irrigation, and agricultural practices throughout Boulder County have altered or destroyed much of the suitable

habitat for prairie dogs. The spread of sylvatic plague through the central Great Plains has compounded the impact of habitat reduction.

More recently, the loss of prairie dog habitat has been attributed to urban development. During the past 40 years, urban development has removed, altered, and fragmented prairie dog habitat within the study area.

Raptors

The presence of prairie dog towns, agricultural fields, pastureland, wetlands and fallow cropland within the study area most likely provided suitable habitat for raptor foraging, nesting, and prey species. Raptors that may have nested in the area include bald eagle, red-tailed hawk, Swainson's hawk, northern harrier, American kestrel, great horned owl, long-eared owl, short-eared owl, burrowing owl, and ferruginous hawk.

The number of raptors may have declined with the loss of habitat to development. Over the past few decades, however, several wetlands have been constructed within the study area. These sites may have provided additional habitat for raptors and their prey.

Additional Wildlife

Based on existing wildlife patterns in the area, wildlife which may have occurred within the study area and surrounding lands include geese, pheasant, great blue heron, pelican, white tailed deer, mule deer, mountain lion, the Preble's meadow jumping mouse, red-headed woodpecker, bobolink and johnny darter. Over time the CNHP has listed several of these species as species of concern.

3.24.2.3 Wetlands

Many natural wetlands once existed along Boulder Creek where today, agricultural and urban developments have clustered. Pre-settlement wetlands were probably found along streams and rivers and in landscape depressions. Abandoned or seldom used channels usually supported wetlands as well. Most of these backwater areas, particularly along Boulder Creek, have been filled and the wetlands lost. Sombrero Marsh, located approximately 0.5 mi. east of South Boulder Creek, is the only naturally occurring perennial open water body still present in the study area today.

Over the years several reservoirs and numerous ditches have been constructed within the study area. Leakage from these reservoirs and ditches have created large and biologically diverse wetlands in areas that were previously dry.

Alteration of riparian systems began with the settlement of the Boulder Valley. Riparian systems within the study area were most likely concentrated along Dry Creek, Bear Creek, Boulder Creek, Valmont Reservoir, Leggett-Owen Reservoir and Hillcrest Lake.

3.24.2.4 Water Quality

The study area for water quality is the 1,160 km^2 Boulder Creek Watershed. Major water features within the study area include Boulder Creek, South Boulder Creek, Bear Creek, Dry Creek, Valmont Reservoir, Leggett-Owen Reservoir, Baseline Reservoir and Hillcrest Lake.

Boulder Creek originates as headwater streams at the Continental Divide and flows through historical mining districts and mountain communities to the mouth of Boulder Canyon. Upon exiting Boulder Canyon, Boulder Creek flows through Boulder and eastward through the plains to the confluence with St. Vrain Creek, 46 miles downstream from the headwaters.

Historically, water quality has been impacted by mining activities, agricultural operations, and development. Between 1963 and 2003 approximately 1,865 acres of new development occurred within the study area. This development has converted natural landscapes in the area to impervious surfaces. Water now runs off of these impervious surfaces, carrying pollutants directly into rivers and lakes, instead of filtering through the soil into underground aquifers.

3.24.3 Existing Actions and Conditions

3.24.3.1 Land Use

Boulder geographic information system (GIS) data shows that more than 80 percent of the land within the cumulative study area is classified as open space, agriculture and low-density residential. Agricultural uses dominate in the area east of 75th Street. Boulder County has identified much of this land as being farmland of national and/or statewide importance. The NRCS has classified 24.5 acres just north and south of SH 7 as Prime farmland if Irrigated.

Industrial uses constitute approximately 12 percent of the land within the cumulative study area. Industrial uses are concentrated from SH 7 to the northern border of the study area and west of Valmont Reservoir to the eastern border of the study area. Other land uses within the study area include medium to high density residential (mostly south and west of 55th Street), commercial (west of 55th Street along SH 7), and public (mostly west of 75th Street).

Valmont, Leggett-Owen and Baseline Reservoirs, Hillcrest Lake and numerous smaller lakes and creeks continue to be dominating features in the study area although there is now a much stronger presence of residential and industrial development.

3.24.3.2 Wildlife

Black-Tailed Prairie Dogs

Data from the NDIS shows numerous black-tailed prairie dog towns scattered throughout the study area.

A colony of several acres is located along both sides of the Colorado Southern Railroad just north of Legion Park. The town appears to be very active and well populated. A second colony is located south of Legion Park in pastureland south of SH 7. One of the largest colonies in the study area (approximately 97 acres) is adjacent to Valmont Reservoir. Several additional colonies can be found in close proximity to Valmont Reservoir and Hillcrest Lake.

Raptors

Segments of the study area provide foraging and potential nesting habitat for numerous raptor species. Black-tailed prairie dog towns within the study area provide foraging areas for raptors. Agricultural fields, pastureland, wetlands and fallow cropland in the area also provide habitat for rabbits, mice and other prey species. Numerous large trees typically associated with waterways or homesteads are scattered throughout the area and provide nesting substrate for raptors. Raptors likely to nest in this portion of Boulder County today include Bald Eagle, Red-tailed Hawk, Swainson's Hawk, Northern Harrier, American Kestrel, Great Horned Owl, Long-eared Owl, Short-eared Owl, Burrowing Owl, and Ferruginous Hawk.

One raptor nest has been observed within the study area. The nest is located in an isolated cottonwood tree along an irrigation ditch that crosses 75th Street about 0.25 mile north of SH 7. Active Osprey nests have been identified by NDIS mapping in an area South of Hillcrest Lake.

No known active bald eagle nests currently exist in Boulder County. The closest active bald eagle nest is located near Standley Lake south of the study area.

Additional Wildlife

Wildlife identified by NDIS mapping with some part of their range occurring in the study area include geese, pheasant, great blue heron, pelican, white tailed deer, mule deer, and mountain lion. The Preble's Meadow jumping mouse may occupy approximately 373 acres of land between SH 7 and Baseline Road west of 75th Street.

The Boulder County Comprehensive Plan (BCCP) has identified the area north and south of Baseline Road along South Boulder Creek as critical wildlife habitat for the following CNHP species of concern: Red-headed woodpecker, Bobolink, and Johnny Darter.

3.24.3.3 Wetlands

Approximately 113 acres of wetlands are present within the study area based on field surveys conducted in the study area in June 2001, as well as wetlands identified through Boulder County GIS and the Boulder Valley Comprehensive Plan for the larger cumulative study area. This does not include riparian habitat as delineated by NDIS. According to current Boulder County GIS data, much of the wetlands occur along Dry Creek throughout the study area. There are also three man-made wetlands (irrigation ponds) along the eastern side of 95th Avenue. There are two separate subsurface wetland treatment systems created for wastewater treatment at the Valmont Power Plant. These wetlands also have some wildlife and aesthetic value because of the varied plant communities in the wetland cells and because they are located adjacent to the reservoirs.

Sombrero Marsh consists of over 20 acres of naturally functioning wetland that contains wetland soils, hydrology and vegetation, which combine to create important habitat for many birds, mammals, amphibians, and invertebrates. The site management plan for the marsh identifies the publicly owned portion (east of 63rd Street) as an Environmental Preservation and Marsh Restoration Area.

Riparian areas, as mapped by the CDOW, are inclusive of jurisdictional wetland areas. To identify wetland areas, the CDOW's *Riparian Mapping Project* delineates wetland associated vegetation. Within the study area wetland associated vegetation is located along numerous creeks, ditches and canals including Dry Creek, Dry Creek No. 3 and New Dry Creek Ditch, McGinn Ditch, South Boulder Canyon Ditch, Enterprise Ditch, East Boulder Ditch, Wellman Canal Ditch, Davidson Ditch, Leyner-Cottonwood Ditch, Marshallville Ditch, Boulder Creek, South Boulder Creek and Bear Creek.

3.24.3.4 Water Quality

In 2000, the USGS collaborated with the City of Boulder and the University of Colorado to produce a report entitled *Comprehensive Water Quality of the Boulder Creek Watershed, Colorado During High-Flow and Low-Flow Conditions*. The findings of this report are summarized below.

Water quality of Boulder Creek is affected by discharge variations from snowmelt, agricultural diversions, wastewater treatment plant effluent, point and non-point sources, and in-stream processes. Seasonal variations in flow affect water quality by diluting pollutants during high-flow conditions (from April to July) and slowing dispersion during low-flow conditions (from October to March). Low-flow conditions, as well as diversions, result in higher concentrations of pollutants because there is less water to support dilution.

Bedrock geology is an important control of water chemistry in the watershed. As bedrock is weathered, a greater amount of mineral dissolution occurs. Although Boulder Creek passes through historical metal mining districts, historical hardrock mining has not had a major effect on existing stream chemistry.

Treated effluent from the 75th Street Wastewater Treatment Plant, which meets Colorado state water quality standards, dominates the chemistry of lower Boulder Creek, in part because upstream flow is diverted for municipal and agricultural uses and cannot provide in stream dilution.

Concentrations of dissolved ions, calcium, chloride, magnesium, silica, sodium, bicarbonate and sulfate have been found to increase slightly between the mouth of Boulder Canyon and upstream of 75th Street.

Several pesticides have been detected during both high and low flow periods in Boulder Creek, most likely originating from urban and agricultural land uses. The USGS estimates that 7,890 kilograms of pesticides are applied annually to agricultural land in Boulder County. The most frequently detected pesticide is diazinon. The pesticide found at the highest concentration is dichlobenil.

3.24.4 Planned Development and Transportation Actions

Other than the roadway improvements that are identified in this EA, no major transportation projects are planned by either the City of Boulder or Boulder County along SH 7. The only County property along SH 7 that could potentially be developed is currently zoned commercial. In the future, any County property zoned agricultural will remain agricultural or will become open space. No projects for Legion Park are planned at this time.

A significant portion of Sombrero Marsh is still in private ownership on the northwest corner of the Marsh (which extends all the way to the corner of Cherryvale Road and SH 7). According to the *Site Management Plan for Sombrero Marsh* prepared in 2001 by the City of Boulder Open Space and Mountain Parks Department, there is a high likelihood that the property adjacent to the marsh will be developed in the future. The City of Boulder has considered opportunities for working with the landowner to preserve this non-public land through landscaping (buffering from potential development) and limiting access.

The Northwest Rail EA process will be initiated in 2007. This is likely to identify commuter rail as the preferred technology for the 28-mile corridor between Denver Union Station and Boulder.

Table 3-27 lists the land use, transportation and infrastructure projects that are "reasonable foreseeable" within the cumulative study area.

Table 3-27
Reasonably Foreseeable Future Development and Transportation Projects

Project Location	Jurisdiction	Description	Status
5550 Arapahoe Road	City of Boulder	Annexation of a small used car dealership	Review
5675 Arapahoe Road	City of Boulder	Office and multi-family residential	No Recent Progress
5729 Arapahoe Road	City of Boulder	Annexation of a small industrial site	Review
5980 Arapahoe Road	City of Boulder	Boulder Jewish Community Center	Planning Stages
5995 Arapahoe Road	City of Boulder	Office Development	No Recent Progress
6032 Butte Mill Road	City of Boulder	Annexation of Industrial Lot	Review
5880 Butte Mill Road	City of Boulder	Annexation and potential development of small service industrial	Review
1121 75th Street	City of Boulder	Subdivision of a 9.5-acre parcel into a 3.4-acre and 6.1-acre parcel to allow for the preservation of a historic farmstead and to create open space.	Application Approved
Valmont Road, 57th Street to 61st Street	Boulder County	Widen to four lanes, traffic signals, reconfigure the intersection with Butte Mill Road and replace the Valmont Road bridge over South Boulder Creek.	Construction 2004-2005
Valmont Road, 57th Street to 95th Street	Boulder County	Major overlay/surface reconstruction, improve curve alignments at two locations and add paved shoulders.	Construction 2007-2008
North 95th Street	Boulder County	Intersection improvements from Longmont to Lafayette, including the Valmont Road/Isabelle Road Intersection.	Construction 2006-2008
95th Street Corridor from Longmont to Broomfield	Boulder County	New Transit Service - includes transit stops and queue jumps at undetermined intersections along the route.	Construction 2005-2006
US 36	CDOT/RTD	Transportation and Bus Rapid Transit alternatives being considered for the US 36 corridor.	Draft EIS being prepared
FasTracks	RTD	Commuter rail added along the BNSF railroad line. A station is included at East Boulder Station (63rd Street and SH 7).	NEPA will begin in 2007.

Source: City of Boulder and Boulder County, 2004.

3.24.5 Impacts

3.24.5.1 Land Use

Land uses within the cumulative study area have remained fairly consistent in recent years. A large percentage (80 percent) of the cumulative study area is classified as open space, agriculture and low-density residential. Much of the open space and agricultural

lands within the cumulative study area are owned by the City of Boulder and Boulder County and are protected from future development. As such, reasonably foreseeable development actions are limited and would have negligible impacts to land uses within the cumulative study area.

The proposed commuter rail station at 63rd and Arapahoe would require the acquisition of approximately 12 acres of existing industrial and storage uses and convert those uses to a park-n-Ride. This change in use may affect the trail along the site. There may also be some conversion of use to higher density in the surrounding area. All of this will result in impacts to traffic, air quality, noise and other resources.

Because much of the land within the cumulative study area is protected from future development, it is unlikely that substantial development or changes in existing development patterns would occur as a result of the construction of the Preferred Alternative.

3.24.5.2 Wildlife

Habitat for black-tailed prairie dogs, raptors and other wildlife has been negatively impacted by agricultural and land development activities in the area. It is, therefore, reasonable to assume that there have been significant reductions in the extent of these species within the study area. Today, the cumulative study area is for the most part, developed or preserved. Open space and agricultural lands that are owned by the City of Boulder and Boulder County will generally remain used for recreational and agricultural purposes. Future development and transportation projects planned for the area are few and would not result in a significant loss of habitat for wildlife within the cumulative study area; however, the proposed commuter rail station at 63rd and Arapahoe would create minor disturbances to wildlife habitat.

Construction of the Preferred Alternative would impact 5.8 acres of vegetation in the Hoover Hill/Legion Park area and would require the removal of approximately 110 trees along the corridor. Even though this would be in an area that is immediately adjacent to the existing roadway, vegetation removal would contribute to the cumulative loss of habitat in the area. These impacts would not result in effects that would exceed the ability of wildlife to sustain itself or remain productive. Under the Preferred Alternative there would be no impact to black-tailed prairie dogs or burrowing owls.

3.24.5.3 Wetlands

Development adjacent to Sombrero Marsh could potentially degrade the quality of this only naturally occurring perennial open water body still present in the study area today. The remainder of Sombrero Marsh is under the management of the City of

Boulder Open Space and Mountain Parks Department. Reasonably foreseeable development actions are limited and would have negligible impacts to the remaining wetlands and riparian corridors within the cumulative study area.

There are wetlands and other Waters of the U.S. along the BNSF alignment north of Arapahoe Road in this study area. The proposed commuter rail project and park-n-Ride would directly impact approximately 0.5 acre of wetlands and 0.2 acre of impact to Boulder Creek. Other indirect impacts would occur to these resources, including sedimentation, erosion, noxious weed invasion, and loss of vegetation due to shadowing of bridges.

Construction of the Preferred Alternative would impact several riparian corridors crossing SH 7 and would impact 0.322 acre of wetlands. Under the Preferred Alternative there would be no impact to any portion of Sombrero Marsh.

3.24.5.4 Water Quality

Similar to many Front Range areas, the Boulder Creek Watershed area has experienced significant population growth over the years. Changes in land use, increased growth, and the conversion of agricultural lands to developed lands have collectively impacted water resources over time. Development throughout the cumulative study area will increase the impervious surface area, change runoff characteristics, and potentially degrade water quality. If the population of Boulder County were to increase as projected by the US Census (by approximately 71,000 persons or 25 percent), there would be an increased demand for water supplies and water treatment. Water depletion and treatment capacity may become a concern for the city.

The new park-n-Ride at 63rd and Arapahoe will result in increased impervious surface (approximately 12 acres) which will increase contaminated stormwater runoff into surface waters. The treatment of this runoff will be done in compliance with Boulder County water quality standards.

The length of roadway along SH 7 that is proposed for improvement under the Preferred Alternative consists of approximately two miles. The cumulative impacts study area for water quality consists of the 1,160-km^2 Boulder Creek Watershed. Because the proposed action is so small in scope, the cumulative impact of the project to this resource is negligible. In addition, because the proposed action would occur in the lower basin of the Boulder Creek Watershed, impacts to Boulder Creek headwater streams would be avoided.

3.24.6 Mitigation

The following measures could reduce the proposed action's portion of the cumulative impacts to the resources of concern:

- Prior to construction, an NPDES Permit would be obtained from the CDPHE, in accordance with Section 402 of the Clean Water Act. Under the NPDES permit stipulations, BMPs would be detailed in the project plans for implementation in the field.

- Use of Stormwater BMPs during construction. These are detailed in Section 3.13.5, Water Resources Mitigation, and would comply with local ordnances.

- All CDOT revegetation BMPs and guidelines will be followed to ensure adequate revegetation of the study area. These are detailed in Section 3.10.3, Vegetation and Noxious Weed Mitigation.

- Adherence to the conditions outlined by CDOT ensure compliance with the Migratory bird Treaty Act. These provisions are detailed in Section 3.11.4, Wildlife and Aquatic Resources Mitigation.

- Implementation of BMPs from the *Erosion Control and Storm Water Quality Guide*, CDOT, 2002 will reduce the potential for impacts to wetlands and riparian areas. These are detailed in Section 3.9.4, Wetland Impact Minimization and Mitigation Measures.

3.25 Permits Required

The following permits and coordination activities may be required to support the construction of the proposed action:

- **National Pollutant Discharge Elimination System (NPDES**). An NPDES Permit will be obtained prior to construction by CDOT from the CDPHE, in accordance with Section 402 of the Clean Water Act. This stormwater discharge permit is required to ensure the quality of stormwater runoff.

  An NPDES stormwater permit (CWA, Section 402) is required for all CDOT construction projects that impact one acre of land or more, or are part of a larger plan. Therefore, all proposed future projects along the SH 7 study area will be issued permits through CDPHE prior to the onset of highway construction activities. Under the NPDES permit stipulations, CDOT will prepare a site-specific SWMP that outlines in detail the specific BMPs in the project plans for implementation in the field. Included in the SWMP are such aspects as BMP locations, turbidity and monitoring requirements, seed mix, concrete washout

containment provisions, and other relevant information that is provided to the CDOT contractor(s).

This project is located within the Phase I and Phase II areas under CDOT's Municipal Separate Storm Sewer System (MS4) permit, which is a subset of the NPDES regulations. Thus, requirements for capturing 100 percent WQCV (water quality control volume, or the first 0.5 inch of precipitation in a storm) or 80 percent TSS (total suspended solids) apply. In order to meet water quality standards, and to reduce impacts from sediments, permanent BMPs will be implemented, as noted in Section 3.13, Water Resources and Water Quality.

- **Section 404 Permit.** A Section 404 Permit, issued by the USACE is required whenever construction projects or maintenance activities requiring filling occur below the ordinary high-water line in any body of water considered a water of the United States (navigable waters of the United States and adjacent wetlands; all tributaries to navigable waters and adjacent wetlands; interstate waters and their tributaries and adjacent wetlands).

- **Section 402 Permit.** A Section 402 Permit, issued by CDPHE, is required for dewatering of construction areas, if necessary. The following activities would require the acquisition of a 402 Permit:

  - Construction dewatering operations associated with activities such as utility excavation, bridge pier installation, foundation or trench digging, or other subsurface activities.
  - If discharge is expected to occur from a point source discharge from mechanical wastewater treatment plants, vehicle washing, or industrial discharges.

- **Section 401 Water Quality Certification.** A Section 401 Water Quality Certification is required in conjunction with an Individual 404 Permit (dredge and fill permit) for any transportation construction project or maintenance activity where work occurs below ordinary high-water line or adjacent to wetlands. As part of the 401 Certification, CDOT notifies downstream water users when impacts to nearby receiving waters may occur during construction, e.g., when blasting occurs near receiving streams. As part of construction, CDOT (or its contractors) will monitor turbidity in any of the affected streams. The 401 Certification must be obtained from the Water Quality Control Division of the CDPHE. If a 404 Nationwide or General permit has not been issued, a 401 Certification is not required.

- **Senate Bill 40 Certification.** A SB 40 Certification will be required by the Colorado Division of Wildlife for stream crossings or adjacent streambanks to

avoid adverse effects to waterways and adjacent riparian vegetation. In these areas, trees and shrubs must be replaced at a 1:1 basis (trees) and square foot basis (shrubs).

- **Fugitive Dust Permit.** A Fugitive Dust Permit will be required if more than 25 acres of land will be impacted and/or project construction will last longer than six months.
- **State Access Permit.** A State Access Permit is required for all requests for new or modified access to SH 7. Any existing accesses adversely affected by the proposed action will be notified of the proposed changes.
- **Construction Access Permits.** Construction Access Permits will be required for temporary access needs outside the construction project limits.
- **Floodplain Permits.** A Floodplain Development Permit from Boulder County may be required. This will be obtained during final design.
- **Other Local Permits.** Additional permits, such as building, utility or survey permits may be required to support project construction requirements.

3.26 Summary of Mitigation

A summary of mitigation measures and commitments for the Preferred Alternative is provided in **Table 3-28** on the following pages.

Table 3-28
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Land Use	Mitigation for the change in land use will be through compensation to the landowner during the right-of-way acquisition process. The right-of-way mitigation is discussed in Section 3.5.	
Social Conditions(including Environmental Justice)	Social: Good communication with emergency service providers, the community, and residents with regard to road delays, access, and special construction activities is recommended during the construction phase. This may be accomplished by radio and public announcements, newspaper notices, on-site signage, and the use of the City's Web site. Environmental Justice: Every effort was made to avoid or minimize potential impacts to low-income and/or minority populations in the study area. This included eliminating the auxiliary/queue jump lane in order to narrow the width of the roadway in front of the mobile home park. Because of these efforts, no disproportionate impacts to low-income or minority populations are anticipated, and therefore, no mitigation measures are required. All property acquisition will follow the procedures outlined in the CDOT Right of Way Manual. CDOT follows the Federal Uniform Relocation and Real Property Acquisition Act of 1970 (Public Law 91-646), as amended in 1987 (Public Law 100-17), 1991 (Public Law 102-240) and 1997 (Public Law 105-117). The purpose of the act is "To provide for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by Federal and federally assisted programs and to establish uniform and equitable land acquisition policies for Federal and federally assisted programs."	
Economic Conditions	Good communication with the community, business owners, and residents with regard to road delays, access, and special construction activities is recommended during the construction phase. This may be accomplished by radio and public announcements, newspaper notices, on-site signage, and through the CDOT's Web site. Mitigation for relocation impacts is addressed in Section 3.5, Right-of-Way.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Right-of-Way	All property acquisition will follow the procedures outlined in the CDOT Right of Way Manual. CDOT follows the Federal Uniform Relocation and Real Property Acquisition Act of 1970 (Public Law 91-646), as amended in 1987 (Public Law 100-17), 1991 (Public Law 102-240) and 1997 (Public Law 105-117). The purpose of the act is "To provide for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by Federal and federally assisted programs and to establish uniform and equitable land acquisition policies for Federal and federally assisted programs." For permanent right-of-way acquisitions, under CDOT right-of-way policy, owners will be compensated in a fair and equitable manner. Depending on the estimated value of the property, monetary compensation is determined through independent and impartial appraisals by qualified professionals (over $5,000) or by value finding (under $5,000). For permanent slope easements acquisitions, similarly to right-of-way acquisitions, owners will be compensated in a fair and equitable manner through the use of appraisals (over $5,000) or by value finding (under $5,000). For permanent slope easements, owners are compensated for the property but retain limited usage in ways that do not cause negative impacts to the roadway. For properties requiring relocation, the relocation benefits provided to those displaced are determined by eligibility guidelines based on federal regulations. For eligible businesses, this includes reimbursement of actual reasonable and necessary moving and related expenses and certain re-establishment costs, or a fixed payment in lieu of all other possible relocation benefits. For eligible residences, this includes reimbursement of moving and related expenses, a replacement housing benefit for owners, or a rental supplement for renters. The rental supplement payment may also be used towards the down payment for the purchase of a replacement dwelling to encourage renters to become property owners. The replacement housing benefit and rental supplement benefit have certain monetary limitations; however, these limitations can be exceeded in certain circumstances.	
Transportation	Because there are no adverse impacts, mitigation is not necessary.	
Noise	Once a noise impact is determined to result from the proposed improvements, a reasonableness and feasibility analysis must be conducted to determine if mitigation is warranted at these locations. Mitigation should consider all possible noise abatement measures for reasonableness and feasibility. These include providing 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.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Noise (continued)	According to CDOT guidelines, the "feasibility and reasonableness" of mitigation needs to be considered for all locations that are projected to experience noise impacts. The feasibility analysis of mitigation considers such factors as the effectiveness of a barrier to achieve a 5-dB(A) reduction in predicted future noise levels, construction, engineering, maintenance or other design issues. Mitigation measures are considered feasible if they can achieve a noise reduction of 5 dB(A) for at least one receiver. They should not create any safety or unacceptable 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 7 as a major highway and the commercial and light industrial uses along the highway. 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 models were run to test the reasonableness and feasibility of noise walls. Note that a unit noise wall cost of $30.00 per square foot was used in all of the calculations, according to current CDOT guidelines. Noise abatement structures were analyzed for three impacted areas according to CDOT guidelines. Mitigation Barrier	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Noise (continued)	Mitigation Barrier at SW10 A noise barrier was analyzed for Site SW10, which consists of two residences located at 6160 and 6180 Arapahoe Road. Noise mitigation at this site is not recommended because the resultant cost-benefit was unreasonable according to CDOT and FHWA guidelines. The feasible and reasonable analyses are detailed in Appendix B of the SH 7 *Noise Analysis Technical Memorandum,* which is located in Appendix E of this document.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Noise (continued)	An effective noise reduction of 5.7 decibels could be achieved at this location by constructing a continuous six-foot noise wall that is 310 feet long. The noise wall would require relocation of the two residential driveway accesses. Any gaps in the wall would decrease the effectiveness of the noise abatement, making the wall infeasible. The wall is shown in Figure 3-11, illustrating the gaps created by intervening driveway access points. Construction of a continuous wall should not create safety hazards for vehicles or pedestrians along SH 7. The cost of a continuous wall of these dimensions would be approximately $55,800. Using the CDOT criterion for cost benefit in determining the reasonableness of noise abatement discussed in the paragraphs above, the cost benefit of this noise wall would be approximately $4,895 per receiver per decibel noise reduction. CDOT considers any amount over $4,000 not reasonable. Noise mitigation at this location is not recommended because, although relocating the two accesses would make this wall feasible, the extraordinary cost/benefit ratio would make the wall unreasonable.	
Air Quality	Motor vehicle emissions in the study area would not result in any exceedance of the NAAQS; therefore, no direct project air quality mitigation is necessary. During construction, dust emissions should be minimized by including techniques to control fugitive dust.	
Wetlands	The Preferred Alternative 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 because of 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 3:1 or steeper, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes should be roughened at all times. • Temporary erosion control blankets will have flexible natural fibers.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Wetlands (continued)	• 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 additional 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 and will be seeded in phases throughout construction. 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/sediment 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	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Wetlands (cont'd.)	Wetlands, as well as their associated functions permanently impacted by the Preferred Alternative will be mitigated at a 1:1 ratio by purchase of credits at one of the three wetland mitigation banks within the primary service area. Wetland impacts will be reduced as much as possible during final design. 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. Wetland areas temporarily impacted by construction activities will be restored as soon as possible following completion of the activity.	
Vegetation and Noxious Weeds	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 will not be determined until final design, mitigation measures are anticipated to include: • Minimize the amount of disturbance of grading to 10 feet beyond the toe of slope. Project will follow CDOT standard specifications for amount of time that disturbed areas are allowed to be non-vegetated. • Avoid existing trees, shrubs and vegetation, to the maximum extent possible, especially wetlands and riparian plant communities. Coordinate with CDOT landscape architect prior to construction to determine which vegetation will be protected during construction. • Salvage weed free topsoil for use in seeding. • 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. • All disturbed areas will be revegetated with native grass and forb species. Seed, mulch and mulch tackifier will be applied in phases throughout construction. • Develop acceptable revegetation plan with the CDOT Landscape Architect, City of Boulder, and Boulder County. • A Senate Bill 40 (SB 40) Certification will be required by the Colorado Division of Wildlife for stream crossings or adjacent streambanks to avoid adverse effects to waterways and adjacent riparian vegetation. In these areas, trees and shrubs must be replaced at a 1:1 basis (trees) and square foot basis (shrubs).	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Vegetation and Noxious Weeds (continued)	Since soil disturbance with accompanying invasion by noxious weed species can be associated with highway construction, an Integrated Weed Management Plan will be incorporated into the project design and implemented during construction. Specific BMPs will be required during construction to reduce the potential for introduction and spread of noxious weed species, such as: • 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 of Boulder or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds. • Weed management measures will include removal of heavily infested topsoil, herbicide treatment of lightly infested topsoil, limiting disturbance areas, phased seeding with native species throughout the project, monitoring during and after construction, other herbicide 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. 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 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Wildlife and Aquatic Resources	• Disturbance to native plant communities will be minimized. • Tree removal will be minimized. • 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 practical a wildlife biologist will inspect the area prior to spraying to ensure crucial habitat is not impacted. • Temporary erosion control blankets will have flexible natural fibers. • Follow requirements of the Colorado Department of Transportation, outlined in the note below: Note: The Migratory Bird Treaty Act (MBTA) protects all migratory birds, nests and eggs except English sparrow, European starling, and rock dove and resident game birds. For projects that could potentially result in the killing, taking, harassing, or harming of these birds, the following conditions must be adhered to: Tree Trimming/Removal Tree trimming and/or removal activities shall be completed before birds begin to nest or after the young have fledged. In Colorado most nesting and rearing activities occur between April 1st and August 31st. However, since some birds nest as early as February a nesting bird survey must be conducted by a biologist before any tree trimming or removal activities begin. Bridge/Box Culvert Work Bridge or box culvert work that may disturb nesting birds must be completed before birds begin to nest or after the young have fledged. No bridge or box culvert work may take place between April 1st and August 31st. If work activities are planned between these dates, nests must be removed (before nesting begins) and appropriate measures taken to assure no new nests are constructed. Failure to remove and keep nests from becoming established could postpone construction of the project.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Wildlife and Aquatic Resources (continued)	Clearing/Grubbing Activities Clearing and grubbing of vegetation that may disturb ground nesting birds must be completed before birds begin to nest or after the young have fledged. If work activities are planned between April 1st and August 31st, vegetation must be removed and/or trimmed to a height of six (6) inches or less prior to April 1st. Once vegetation has been removed and/or trimmed, appropriate measures (i.e. repeated mowing/trimming) must be implemented to ensure vegetation does not grow more than six (6) inches. Failure to maintain vegetation height of six (6) inches or less could provide habitat suitable for nesting birds that could postpone construction of the project. Birds of Prey For birds or prey that could potentially nest near the project site, please refer to the Colorado Divisions of Wildlife's "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" guidelines, available at Colorado Division of Wildlife district offices. • Work activities, including the movement and placement of vehicles, shall not disturb black-tailed prairie dog colonies. If any sites are encountered, CDOT Region 4 Environmental Unit shall be notified so that all applicable clearances and permits may be obtained, including following CDOT prairie dog policy. • Although no Burrowing owls were observed in or near the study area, they are a state threatened species and are protected under MBTA. No human encroachment or disturbance within 75 yards of a nest site shall occur from April 1 to July 31. If project activities are scheduled to take place between March 1 and October 31, a burrowing owl survey must be completed before construction activities begin. If owls are identified on or adjacent to the project, CDOT Region 4 Environmental Unit shall be notified immediately.	
Threatened, Endangered or Sensitive Species	Mitigation is not necessary since there will be no impacts.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Water Resources and Water Quality	For the high groundwater in the proximity of the railroad overpass, the design will accommodate this groundwater and direct it to the storm drainage system. This project commits to following CDOT's Erosion Control and Stormwater Quality Guide, sections 107.25 & 208 of the specifications for the Standard Specifications for Road and Bridge Construction and the Stormwater Management Plan. CDOT follows The Municipal Separate Storm Sewer System (MS4) requirements for water quality. These requirements will be followed on this project by the process outlined in Appendix I of the CDOT Drainage Design Manual. A Stormwater Management Plan (SWMP) will be completed during final design. It will address specific methods of reducing pollutants in stormwater runoff during construction. Stormwater BMPs for a site during construction would consist of five major elements: • Implementation of BMPs for erosion control. These include, but are not limited to, phased seeding with mulch and tackifier, the use of erosion control blankets, the use of embankment protectors, the use of berm diversions or check dams, and outlet protection for storm sewer pipes. • Implementation of BMPs for sediment control. These include, but are not limited to, erosion bales or logs, silt fence, storm drain inlet and outlet protection, sediment traps, concrete washout and saw water containment basins, and stabilized construction entrances. • Implementation of BMPs for materials handling and spill prevention. These include, but are not limited to, stockpile management, material management, material use, and spill prevention and control. • Implementation of BMPs for waste management. These include, but are not limited to, concrete, hazardous, and contaminated waste management to ensure that solid or liquid wastes are not carried off the site by stormwater. • Implementation of BMPs for pollution prevention. These include treatment during dewatering and paving operations. It also includes the use of street sweeping and temporary waterway crossings.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Water Resources and Water Quality (continued)	Permanent BMPs will be designed to protect stormwater quality and reduce pollutant discharges after construction is complete. The permanent BMPs are developed with the intention of mitigating the potential impacts typical of a roadway corridor. These can include petroleum or other vehicle fluids, hazardous spills, sand or other snow melting chemicals, and litter. General BMPs for this project will include the vegetation of all disturbed areas with erosion control blankets on slopes 3:1 or steeper. In addition to maintaining BMPs installed on the project, maintenance activities after construction will include consistent roadway sweeping and removal of sediment from storm inlets and basins. The EA evaluated a wide range of Best Management Practices (BMPs) for the use on SH7. The following outlines the process for choosing the appropriate BMPs that should be incorporated for the project. During final design, a determination will be made of exact methods and locations of stormwater management during construction and will be outlined in the SWMP.	
Wild and Scenic Rivers	No mitigation is necessary.	
Floodplains	Since the improvements within the floodplain would not cause a rise in the floodplain, no mitigation measures are required for floodplains. A floodplain development permit from Boulder County would be required since work is taking place in the floodplain. This permit would be obtained during the final design of the project.	
Geology	The final design stages of the project will include a detailed geotechnical and pavement design to provide structural integrity of the roadway for the geological conditions. Bridge foundations, retaining walls and culvert structures will be designed based on specific geologic conditions. Deep foundations will be considered based upon the presence of potentially swelling or collapsible soils. Some locations east of Legion Park where sandstone and alluvial sands are present may allow structures founded on spread footings. The improvements will be designed to meet the seismic requirements for the area. Therefore, seismic events typical of the region will not affect the project.	
Historic Preservation	Agreement among the SHPO, ACHP, FHWA, and the Certified Local Government, represented by the Boulder Landmarks Preservation Board, has been reached through the Section 106 process of the National Historic Preservation Act on measures to minimize harm. Those measures are incorporated into the alternatives designs. A Memorandum of Agreement has been prepared and will be signed prior to the Final Decision Document. No mitigation for paleontological resources has been recommended for the alternatives. However, if these resources are uncovered during construction, the CDOT Paleontologist will be notified immediately.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Hazardous Waste	During construction, CDOT utilizes its Environmental Health and Safety Management Specification (250 Specification) on projects to address issues related to the transportation, handling, monitoring, and disposal of any hazardous or solid waste materials encountered during construction, including contaminated soils, lead-based paint, and other toxic substances. If deemed necessary, a materials management plan would be prepared regarding the removal and disposal of contaminated soils. A Health and Safety Plan would also be developed to protect workers during construction. During final design when right-of-way and access requirements are further developed, CDOT will obtain the status of any suspect sites in the study area and will take the necessary precautions during future construction activities. When contaminated properties are encountered, either during or prior to construction, CDOT coordinates with the affected property owners through the right-of-way process, as well as with the appropriate state, local and federal authorities. Prior to a construction project, CDOT ascertains the status of adjacent properties and updates all available information at that time. Construction contractors are required to comply with Section 250, Environmental Health and Safety Management (CDOT Standard Specifications), when applicable, during construction. Specific mitigation is unknown at this time, but will be incorporated into final design plans when more detailed design information becomes available. At the Historic Gas Station, further testing of soils and groundwater on site and off site may be necessary. At the time of final design, the necessary right-of-way acquisition and relocation processes would be initiated in accordance with the CDOT right-of-way manual, FHWA, and other federal guidance procedures involving acquisition and relocation. CDOT procedures concerning hazardous waste issues would also be followed to determine necessary project mitigation requirements.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Open Space/Recreation	The land where the eastern leg of the access into Legion Park is removed will be revegetated with native plant seed mixtures. No other mitigation measures are necessary for any of the parks or recreation facilities. The following BMPs will mitigate the build alternatives impacts: • Minimize the amount of disturbance of grading to 10 feet beyond the toe of slope. Project will follow CDOT standard specifications for amount of time that disturbed areas are allowed to be non-vegetated. • Develop and implement a noxious weed management plan. This will be completed during final design. • Salvage weed free topsoil for use in seeding. • Implement temporary and permanent erosion control measures to limit erosion and soil loss. • Reseed all disturbed locations except rock cuts with native plant seed mixtures. • Develop acceptable revegetation plan with the CDOT Landscape Architect, City of Boulder, and Boulder County. Removed trees and shrubs in the Boulder Creek riparian zone will be replaced on a 1:1 basis as required by SB 40.	
Visual Quality	Visual mitigation measures could include: • Choose wall colors and textures that will fit into the landscape visually and aesthetically by complimenting the surrounding area to reduce visual impact to the community. • Revegetation of disturbed areas in a manner that is consistent with adjacent landscape features. Use native and indigenous species for revegetation. • Where feasible, slope modifications will be completed in a manner that maintains or accentuates foreground views. Techniques could include creating pockets for native vegetation, undulating finished grades, and application of erosion control measures.	
Farmland	The total points on the Farmland Conversion Rating form (AD-1006) for impacts are less than 260. Therefore, under the provisions of 7 CFR 658.4(c), no mitigation is required by the NRCS. Any crops that are damaged during construction will be compensated by CDOT.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Energy/Utilities	All utility locations will be identified and field verified prior to construction. Exposed utilities will be protected during construction activities. If utility service must be interrupted, temporary service will be provided as needed and maintained during the disruption. It is expected that some of the utilities will be in conflict with the proposed improvements and require reset and/or relocation work to a new permanent location. Impacted utility owners will be contacted during the early stages of the design process to closely coordinate this work and design. An effort will be made to minimize impacting the existing ditches and drainage structures through efficient design and coordination with the owners. The exact location of personal wells and septic systems adjacent to the proposed action will be determined during the design process and noted on the plans, if applicable. Protection and/or relocation of the wells and septic systems might be needed and will be mitigated during the right-of-way acquisition process. Coordination with the affected residents, CDOT, Boulder County, and the City of Boulder will be necessary to minimize conflicts. Adequate public notice will be given for proposed work activities. Coordination with impacted residents will be maintained throughout the construction process. If it is determined that the improvements will impact the existing system, the owner will be notified in advance of roadway work for coordination efforts to protect or relocate the system. Design modifications, such as retaining wall installations instead of embankment or excavation roadway slopes, may be preferred.	
Construction	Air Quality To mitigate impacts to air quality during construction, water as a dust palliative will be used. Stockpile areas can be stabilized through covering or the application of water. Haul trucks should be covered during transport. Finally, to reduce emissions, the contractor can be encouraged to retrofit equipment to reduce pollution, to use clean burning fuels and to properly maintain construction equipment. Noise To limit noise impacts to residents, it is recommended that the construction activities be limited to daytime work hours. Also, the contractor shall be encouraged to phase as much of the noise inducing activities together to help limit the duration of higher noise levels. Finally, the contractor shall be required to use mufflers or noise blankets on equipment and quiet generators.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Construction (continued)	Water Quality Impacts to stormwater quality can be mitigated during construction. This project commits to following CDOT's Erosion Control and Stormwater Quality Guide and sections 107.25 and 208 of the Standard Specifications for Road and Bridge Construction. An erosion control plan will be developed during final design and followed during construction. Inspections of erosion control and water quality devices should occur during construction. The following are stormwater quality methods to be implemented during construction: • Implementation of BMPs for erosion control. These include but are not limited to seeding, the use of erosion control blankets, the use of embankment protectors, and outlet protection for storm sewer pipes. • Implementation of BMPs for sediment control. These include but are not limited to erosion bales, silt fence, storm drain inlet protection, sediment traps, and stabilized construction entrances. • Implementation of BMPs for materials handling and spill prevention. These include but are not limited to stockpile management, material management, material use, and spill prevention and control. • Implementation of BMPs for waste management. These include but are not limited to concrete, hazardous, and contaminated waste management. • Implementation of BMPs for pollution prevention. These include treatment during dewatering and paving operations. It also includes the use of street sweeping and temporary waterway crossings. Visual Visual impacts will be minimized during construction by limiting stockpiles and equipment storage to designated areas. Any traffic control devices can be removed promptly after use. Section 4(f) Mitigation for temporary impacts to the Legion Park 4(f) property will include seeding with a native seed mix approved by Boulder County.	

continued

Table 3-28 (cont'd.)
Summary of Mitigation and Commitments for the Preferred Alternative

Category	Mitigation Measures and Commitments	Date Completed
Construction (continued)	Sustainability Sustainable practices incorporated into the project planning, construction, and maintenance can minimize resource impacts. As part of its environmental ethic and policy, CDOT encourages its staff, consultants, and contractors to identify and utilize 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, minimally processed and packaged items, and preference for locally-available resources. CDOT encourages the identification and incorporation of proven alternative materials that are as long or longer-lasting, and which require the same or less amount of maintenance, as long as such materials do not impact CDOT's ability to meet its primary obligations for providing a safe and efficient transportation system.	
Cumulative	The following measures could reduce the proposed action's portion of the cumulative impacts to the resources of concern: • Prior to construction, an NPDES Permit would be obtained from the CDPHE, in accordance with Section 402 of the Clean Water Act. Under the NPDES permit stipulations, BMPs would be detailed in the project plans for implementation in the field. • Use of Stormwater BMPs during construction. These are detailed in Section 3.13.5, Water Resources Mitigation, and would comply with local ordnances. • All CDOT revegetation BMPs and guidelines will be followed to ensure adequate revegetation of the study area. These are detailed in Section 3.10.3, Vegetation and Noxious Weed Mitigation. • Adherence to the conditions outlined by CDOT ensure compliance with the Migratory bird Treaty Act. These provisions are detailed in Section 3.11.4, Wildlife and Aquatic Resources Mitigation. • Implementation of BMPs from the *Erosion Control and Storm Water Quality Guide*, CDOT, 2002 will reduce the potential for impacts to wetlands and riparian areas. These are detailed in Section 3.9.4, Wetland Impact Minimization and Mitigation Measures.	

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Chapter 4.0: Section 4(f) Evaluation

4.1 Section 4(f) – Department of Transportation Act of 1966

Section 4(f) of the United States Department of Transportation Act of 1966, as amended, and codified in 49 USC § 303, declares that "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." Congress amended Section 4(f) in 2005 when it enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (Public Law 109-59, enacted August 10, 2005) (SAFETEA-LU). Section 6009 of SAFETEA-LU added a new subsection to Section 4(f), which authorizes the FHWA to approve a project that results in a *de minimis* impact to a Section 4(f) resource without the evaluation of avoidance typically required in a Section 4(f) Evaluation. FHWA regulations on Section 4(f) were revised to re-codify and include the *de minimis* regulation. Section 4(f) was put in its own section, 23 Code of Federal Regulations (CFR) §774. It became effective on April 11, 2008.

FHWA Regulations
Section 4(f) specifies that:

"The Administration may not approve the use, as defined in §774.17, of Section 4(f) property unless a determination is made under paragraph (a) or (b) of this section.

(a) The Administration determines that:

(1) There is no feasible and prudent avoidance alternative, as defined in §774.17, to the use of land from the property; and

(2) The action includes all possible planning, as defined in §774.17, to minimize harm to the property resulting from such use; or

(b) The Administration determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a *de minimis* impact, as defined in §774.17[1], on the property." [23 CFR §774.3 (a) and (b)]

[1]*De minimis impact.* (1) For historic sites, *de minimis* impact means that the Administration has determined, in accordance with 36 CFR part 800 that no historic property is affected by the project or that the project will have "no adverse effect" on the historic property in question.(2) For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f).

Section 4(f) further requires consultation with the Department of Interior and, as appropriate, the involved offices of the United States Department of Agriculture and the United States Department of Housing and Urban Development, and relevant state and local officials, in developing transportation projects and programs that use lands protected by Section 4(f).

The proposed action, as described in Chapter 2, Alternatives Considered, is a transportation project that may receive federal funding and/or discretionary approvals through United States Department of Transportation; therefore, documentation of compliance with Section 4(f) is required.

This Section 4(f) evaluation has been prepared in accordance with the joint FHWA/FTA regulations for Section 4(f) compliance codified at 23 CFR §774 and SAFETEA-LU (Public Law 109-59, enacted August 10, 2005). Additional guidance has been obtained from the FHWA Technical Advisory T 6640.8A (1987) and the revised FHWA Section 4(f) Policy Paper (2005).

This Section 4(f) evaluation summarizes and incorporates the results of this consultation process. The FHWA Division Administrator for Colorado is responsible for determining that this project meets the criteria and procedures set forth in the federal regulations. Application of 4(f) requires a determination of whether there are feasible and prudent alternatives that avoid the use of the 4(f) resource. Supporting information must demonstrate that there are unique problems or unusual factors involved in the use of alternatives that avoid these properties or that the cost, social, economic, and environmental impacts, or community disruption resulting from such alternatives reach extraordinary magnitudes.

The FHWA may not approve the use of land from a Section 4(f) resource unless there are no feasible and prudent alternatives and that the proposed action includes all possible planning to minimize harm. If no alternatives exist that avoid Section 4(f) use, then a least harm analysis must be performed to determine which alternative does the least overall harm to the Section 4(f) properties. In performing this analysis, the net harm (after mitigation) to the properties is the governing factor. The following sections describe and analyze the impacts to the 4(f) properties located within the study area of this project.

4.2 Description of Section 4(f) Properties

4.2.1 Section 4(f) Properties: Parks and Recreational Resources

Table 4-1 lists the properties and the resources that qualify for protection under Section 4(f), and which are potentially used by the project. Section 3.19 in Chapter 3.0 of this document gives a full description of park and recreational resources.

Table 4-1
Section 4(f) Resources: Parks and Recreational Resources

Section 4(f) Resource	Property Jurisdiction	Type of 4(f) Resource	Description of Resource
Legion Park	Boulder County	Park	Parking, benches, Legion Trail

Legion Park is owned and operated by the Boulder County Open Space department. Located on the north side of SH 7 between Valtec Lane and Westview Drive, Legion Park is open to the public and used for recreational purposes. On-site facilities include a multi-use trail, parking areas, and benches for scenic viewing. Currently, Boulder County has no future plans for improvements to the park.

Under Section 4(f) definition, a park or recreational property qualifies when:

- The parcel is publicly owned and operated.
- The parcel has public access.
- The parcel is presumed to be, or is determined by public officials with jurisdiction to be, for significant park, recreation, or wildlife refuge purposes.

With these determinants, Legion Park would qualify as a Section 4(f) resource.

4.2.2 Section 4(f) Properties: Historic Sites

Table 4-2 lists the historical and archaeological resources located within the area of potential effect (APE) that were determined to be listed on or eligible for the National Register of Historic Places (NRHP) and were determined to have a use under Section 4(f). Section 3.17 in Chapter 3.0 of this document gives a full description of historic sites in the APE.

Table 4-2
Section 4(f) Resources: Historic Properties

Historic Properties	Site #	SHPO Determination of Eligibility for NRHP
Colorado and Southern Railroad- Burlington Northern Railroad	5BL400.5	Railroad segment eligible; Bridge not eligible and non-contributing
Cottonwood Ditch #2 Segment	5BL4488.2	Eligible Segment
Cottonwood Ditch #2 Segment	5BL4488.3	Eligible Segment
Enterprise Ditch Segment	5BL4164.2	Eligible Segment
Enterprise Ditch Segment	5BL4164.4	Eligible Segment
Butler/Smith Property	5BL8917	Eligible
Gas Station and Small House	5BL9021	Eligible
The Harburg House, Barn and Gazebo	5BL9024	Eligible
DeBacker-Tenenbaum House	5BL9029	Eligible

Source: Colorado Historical Society, State Historic Preservation Office, 2002 and 2005.

The following is a description of the historic properties located in the SH 7 study area for which there will be a Section 4(f) use:

Colorado and Southern Railroad - Burlington Northern Railroad

The Colorado and Southern Railroad-Burlington Northern (BNSF) Railroad (Site #5BL400.5) is eligible under NRHP Criterion A for its association with the history of rail transportation in Boulder County. This railroad line served to transport freight in the 19th century and both freight and passengers in the early part of the 20th century. The entire Colorado and Southern Railroad-Burlington Northern Railroad is considered eligible and this segment of the railroad was found to retain sufficient integrity to support the overall significance of the railroad. The SHPO concurred with this finding in correspondence dated March 29, 2005, which is located in Appendix G.

Cottonwood Ditch #2

The Cottonwood Ditch #2 (#5BL4488) is eligible under NRHP Criterion A as one of the oldest intact ditches in this area, for its importance in the agricultural history in Boulder County. This ditch, begun in 1863, still retains integrity of design, setting, feeling and association. It still flows past farms in a rural setting that has not been redeveloped. The entire ditch is considered NRHP- eligible. Segments 5BL4488.2 and 5BL4488.3 were found to retain sufficient integrity to support the significance of the entire resource. The SHPO concurred with this determination in correspondence dated March 2002, and March 29, 2005, which is located in Appendix G.

Enterprise Ditch

The Enterprise Ditch (#5BL4164) is eligible under National Register Criterion A. The ditch is very important in the agricultural development of Boulder County, but segments of it have lost historical integrity due to recent residential and commercial

development. There are two segments of the ditch that are located in the project area. Segment 5BL4164.2 is located at SH 7 just west of Westview Drive. Segment 5BL4164.4 is a 1000-foot segment that extends north of SH 7 and crosses under the railroad in a siphon.

The initial determination for Enterprise Ditch was that it was not eligible to the NRHP and would therefore result in *no historic properties affected*; however, SHPO reversed its decision in a letter dated August 15, 2005 which stated that the property is NRHP-eligible. There was a recommended finding of *no adverse effect* for the entire ditch. Correspondence can be found in Appendix G.

Butler/Smith Property

Site #5BL8917 is the only property in the study area with a 19th Century house and barn. It is an excellent example of a 1880s farmhouse with clapboard siding and a Victorian front porch. This house meets Criterion C for a type, period, and method of construction. This is the earliest surviving house in this area of SH 7. The SHPO concurred with this finding in correspondence dated March 29, 2005 and August 15, 2005, which is located in Appendix G.

Gas Station and Small House

Site #5BL9021 meets Criterion C for its characteristics as a 1920s Craftsman style gas station in rural Boulder County. The combination of cinder block sheathed in wood siding is somewhat rare, as are early gas stations of any style. The SHPO concurred with this finding in correspondence dated March 29, 2005 and August 15, 2005, which is located in Appendix G.

The Harburg House, Barn and Gazebo

Site #5BL9024 is a complex of buildings that meets Criterion C for architectural significance relating to a 1930s rural complex in the Boulder Valley. The house and gazebo are excellent examples of Craftsman style. The property also meets Criterion A as one of the important farms and for its association with the history of the area and its agricultural development from the 1880s. The SHPO concurred with this finding in correspondence dated March 29, 2005 and August 15, 2005, which is located in Appendix G.

DeBacker-Tenenbaum House

Site #5BL9029 contains the distinctive characteristics of a type, period, and method of construction seen in the original house and older out buildings and meets Criterion C. The house, built in 1913 by a member of the DeBacker family, is notable for the fine decorative brickwork and wood shingle siding. In addition, the landscaping consists of the original 1913 plantings on the property that have grown into outstanding specimens not commonly seen. This building complex is one of the few intact farm properties in the survey area that retains its rural setting and represents the former rural agricultural

nature of the area. According to the site form, the original landscaping is part of what makes the property significant. The SHPO concurred with this finding in correspondence dated March 29, 2005 and August 15, 2005, which is located in Appendix G.

4.3 Impacts to Section 4(f) Properties

There are three types of impacts to a designated 4(f) property that require an evaluation and determination as set forth in the statute:

- A direct impact to a Section 4(f) property when land is permanently incorporated into a transportation facility;
- A direct impact to a Section 4(f) property when there is a temporary occupancy of land that is adverse; or,
- Any action by the project, while not amounting to a direct use, which would "substantially impair" the current use of the property by such intrusions as noise, air or visual impacts, as well as impairment of property access. This could constitute a "constructive use" of the 4(f) property as defined by 23 CFR 774.17.

No-Action Alternative

Under the No-Action Alternative, there would be no change to the current existing conditions due to this project, and therefore, there would be no direct or indirect impacts to either historic or recreation resources. See Chapter 2 for a complete description of the No-Action Alternative.

Preferred Alternative

Below is an explanation of impacts from the Preferred Alternative to eight Section 4(f) resources; one park and seven historic properties:

- **Legion Park:** Legion Park is owned and operated by the Boulder County Open Space department. Located on the north side of SH 7 between Valtec Lane and Westview Drive, Legion Park is open to the public and used for recreational purposes. On-site facilities include a multi-use trail, parking areas, and benches for scenic viewing. Currently, Boulder County has no future plans for improvements to the park. The area of impact to the park is located on a slope directly adjacent to SH 7 where there is only landscaped vegetation, an access drive, and no recreational facilities.

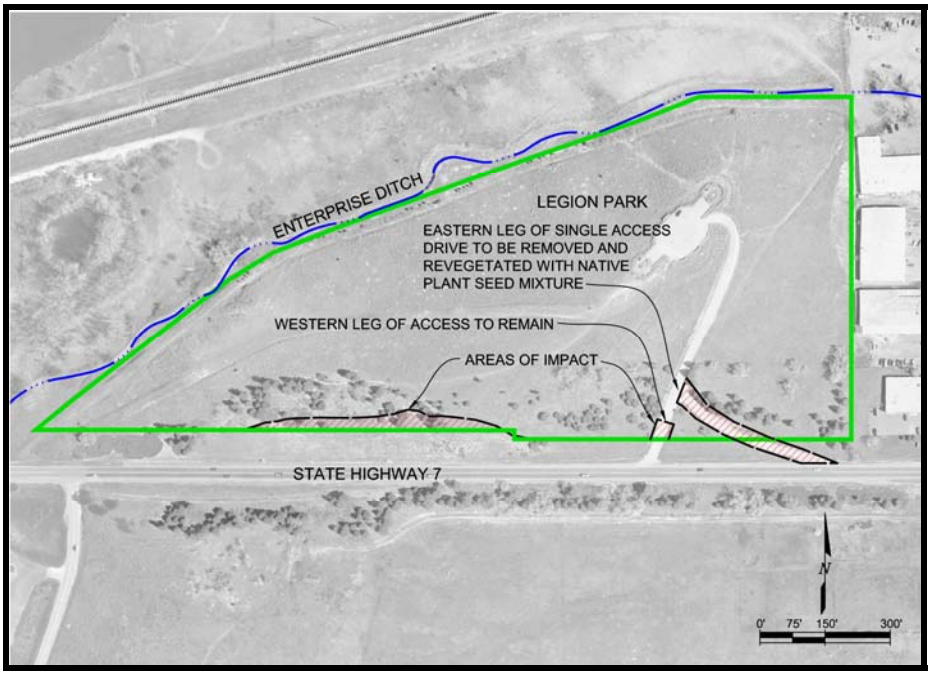
  For the Preferred Alternative, the roadway will be lowered adjacent to Legion Park in order to meet minimum sight distance requirements for the design speed. This lowering will require a cut slope inside the park in order to match back to

existing grades. These cut slopes will generally match the steepness of the existing slopes. Some vegetation in Legion Park will require removal due to the construction of cut slopes, including grasses, shrubs and small trees. This vegetation will be replaced in kind by CDOT.

There is currently a single access drive to Legion Park that is served by two access points on SH 7. For safety and access control reasons, the eastern leg of the single access drive into the park will be closed. This eastern leg will be removed and the land will be revegetated with a native plant seen mixture. The western leg of the single access drive will remain open. A temporary construction easement will be required to construct side slopes for roadway improvements and to reconstruct the western leg of the single access drive to accommodate the project. No trails within the park and no landform or usable portion of the park will be permanently affected. See **Figure 4-1** for the location of impacts.

These impacts to Legion Park have been determined by FHWA and CDOT, and concurred by Boulder County (letter dated May 17, 2005 in appendix G), to have *no adverse effect* to the park. The impacts to the park would result in a *de minimis* use. Correspondence on FHWA's *de minimis* finding is dated November 28, 2007 and located in Appendix G.

Figure 4-1
Legion Park Impact



- **Colorado and Southern Railroad – Burlington Northern Railroad (5BL400.5):** The Preferred Alternative involves the construction of a temporary railroad alignment offset 25 feet to the east of the existing alignment and the construction of a temporary bridge along this alignment over SH 7. This temporary alignment is required so that the new, longer bridge over SH 7 can be constructed while train operations can continue on the temporary alignment. The ultimate railroad alignment would follow the existing alignment.

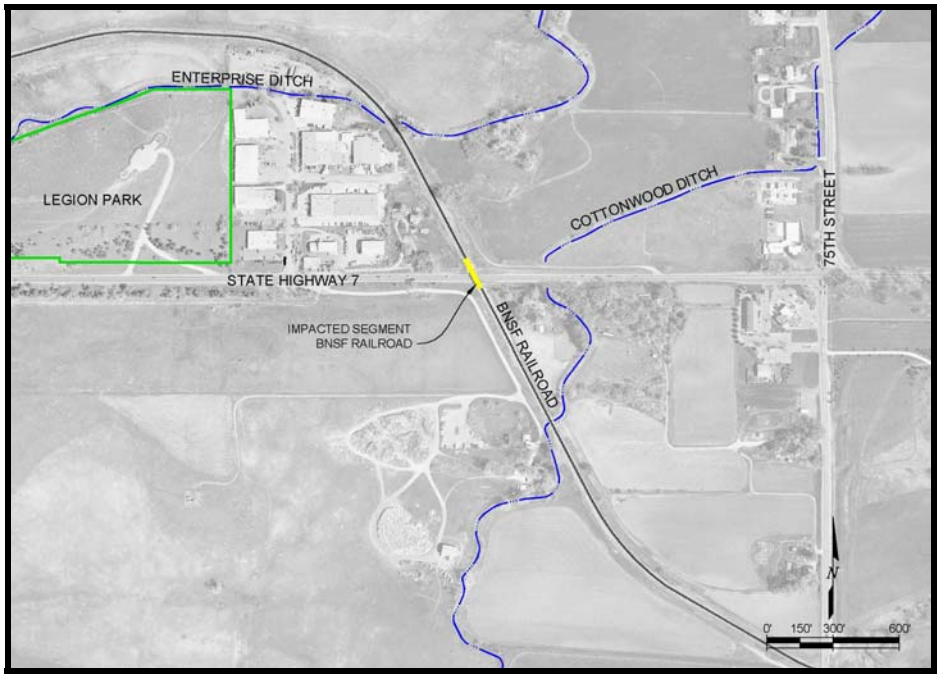
  To construct the temporary alignment, approximately 500 feet of the existing railroad track would be temporarily impacted along the southern curve and approximately 600 feet of existing track would be temporarily impacted along the northern curve.

  The widening of SH 7 would require the removal of approximately 25 to 35 feet of existing track on the north side of the highway. This portion of the track alignment would ultimately be on the future bridge structure over SH 7.

  A temporary bridge would be required to carry the temporary railroad alignment over the Cottonwood Ditch. This temporary bridge would be removed following the need for the temporary alignment. The existing railroad bridge over SH 7 is officially *not eligible*, as documented in the *Colorado Bridge Survey for Colorado Department of Transportation*, conducted in 2000 by Clayton Fraser.

  FHWA and CDOT have determined that the permanent impact to 25 to 35 feet of the railroad segment would result in an *adverse effect* to the historic Colorado and Southern Railroad-Burlington Northern Railroad segment because that portion of the railroad bed and track would be removed and will ultimately be on the new railroad bridge. See **Figure 4-2**.

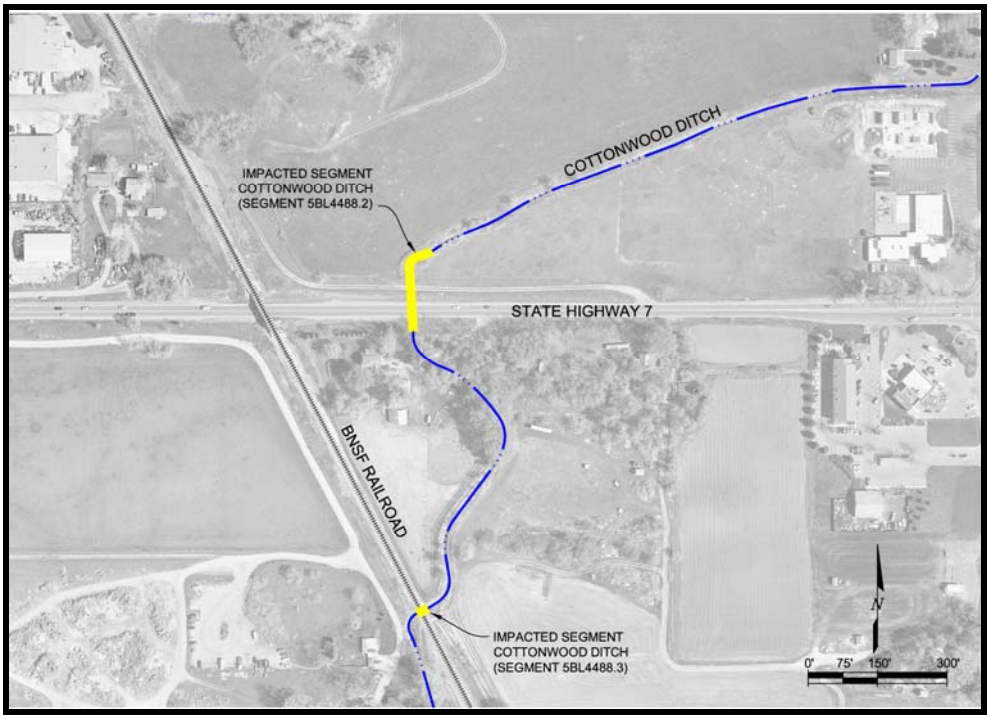
Figure 4-2
Colorado and Southern Railroad - Burlington Northern Railroad Impact



- **Cottonwood Ditch #2 (5BL4488):** For segment 5BL4488.2, located at SH 7 just east of the BNSF railroad, the siphon and pipe under the road and the concrete headwalls at the openings into the siphon would need to be reconstructed. On the north side of SH 7, it is anticipated that an approximate 20-foot segment of the ditch would have to be placed in a pipe. This would constitute an *adverse effect* to this segment of the property under Section 106 and would be a Section 4(f) use of the property.

  The second segment of the ditch (5BL4488.3) in the APE crosses under the railroad south and west of the DeBacker-Tenenbaum property. In order to construct a new BNSF railroad bridge over SH 7, a temporary railroad alignment would be required 25 feet to the east of the current alignment. The temporary BNSF alignment would require a temporary bridge to be constructed over the Cottonwood Ditch. The temporary bridge would be removed when the temporary alignment is removed. The ultimate railroad alignment would be along its current alignment and would not result in a direct impact to this segment of the Cottonwood Ditch since it would be restored to its original function and appearance. This has been determined as *no adverse effect* by CDOT and FHWA and concurred by SHPO. This letter dated March 24, 2006 can be found in Appendix G. **Figure 4-3** shows the impacted segments of Cottonwood Ditch.

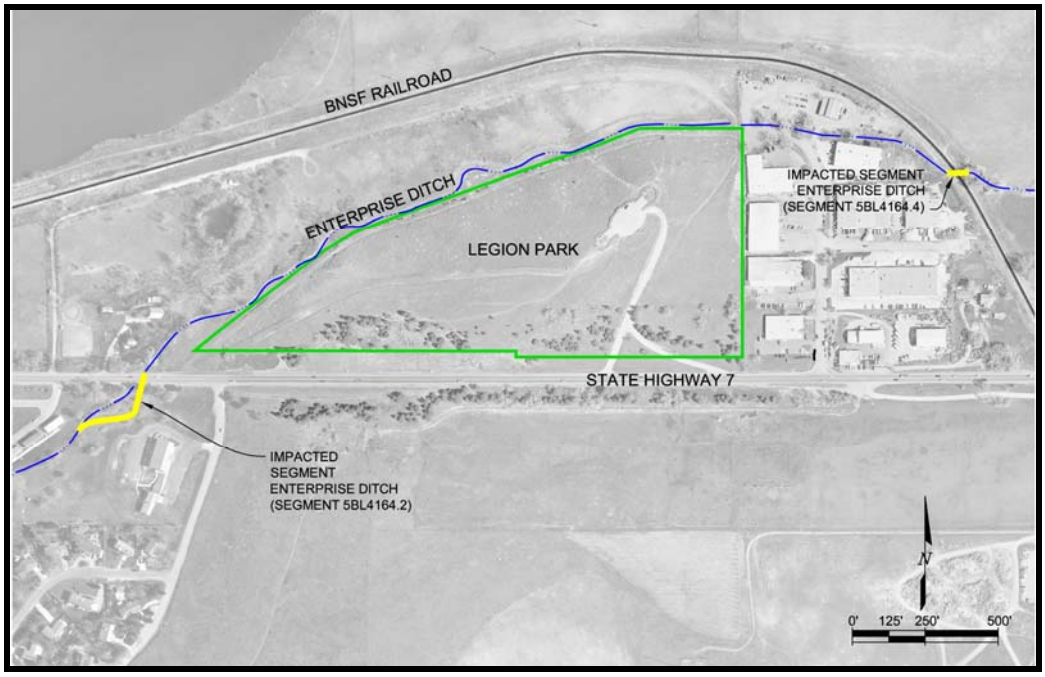
Figure 4-3
Cottonwood Ditch Impact



- **Enterprise Ditch (5BL4164):** For segment 5BL4164.2 of the ditch located just west of Westview Drive, the Preferred Alternative would require a 120-foot concrete box culvert to replace the southern 60 feet of the existing box culvert. Additionally, 250 feet of the existing ditch on the south side of SH 7 would be realigned and reconstructed as an open ditch. This has been determined as *no adverse effect* by CDOT and FHWA and concurred by SHPO. This is documented in a letter dated August 15, 2005 and is located in Appendix G.

  For the Preferred Alternative, the segment of the ditch that extends north of SH 7 and crosses under the BNSF railroad in a siphon (5BL4164.4) would require a temporary railroad alignment that would necessitate placement of approximately 100 feet of the ditch into a pipe. Once the temporary alignment is removed, the ditch would be restored to its original function and appearance. This has been determined as *no adverse effect* by CDOT and FHWA and concurred by SHPO. This is documented in a letter dated June 24, 2006 and is in Appendix G. See **Figure 4-4**.

Figure 4-4
Enterprise Ditch Impact



- **Butler/Smith Property (5BL8917):** SH 7 would be widened in front of the Butler-Smith House and additional vegetation would be removed in the right-of-way between the road and the house. All improvements would stay within existing roadway right-of-way. There would be no direct impact to the house or the barn and no impact to the qualities that made this property significant. Very small temporary easement for construction of curb return may be required.

  As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.

- **Gas Station and Small House (5BL9021):** When SH 7 is reconstructed, the corner of this property, which is currently paved and used as roadway, would continue to be used as a roadway. In consultation with SHPO, it was determined that the corner of the property does not contribute to the significance of the property. All other improvements to SH 7 would occur to the south. Curb cut from 63rd would be installed on existing roadway right-of-way. Temporary easement for construction would be required to construct private access on private property. Tree removal may be required for construction access.

As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.

- **The Harburg House, Barn and Gazebo (5BL9024):** When SH 7 is widened some of the vegetation in the CDOT right-of-way would be removed, but would have no impact on the setting or direct impact on the Harburg property. Constructing two private driveways to match proposed improvements would require a temporary easement for the Preferred Alternative and may require some limited vegetation removal. Public road on the west side of the Harburg property would require reconstruction and may require a temporary easement. If headwall and wingwalls of Enterprise Ditch outlet are replaced in current location, this construction may be on Harburg property.

  As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.

- **DeBacker-Tenenbaum House (5BL9029):** When SH 7 is widened, a retaining wall may be constructed along a portion of the roadway right-of-way, north of the DeBacker-Tenebaum property, but would not have a direct impact to the landscaped setting or the buildings. The BNSF railroad would be temporarily realigned to be east of the existing location, but there would be no direct impact to the landscaped setting or the buildings. There will be temporary fill slope impacts to some of the landscaping along the western boundary of this historic property. With the exception of a single juniper bush, the vegetation impacted by the toe of the slope is not part of the original plantings that contribute to the property's significance. CDOT will build a two-foot to four-foot tall retaining wall to minimize impacts inside the historic property boundary. Crews will remove the retaining wall after construction is completed. The ultimate railroad alignment would follow its existing alignment. A temporary easement may be required to build the temporary fill slope for the temporary railroad alignment. There will be no direct impacts to the property or the elements that make the property eligible for NRHP listing.

  As determined by CDOT and FHWA, the improvements to SH 7 would have no affect to the historic structures on this property. The temporary easement for construction would constitute no adverse effect to the property as a whole as concurred by SHPO.

Table 4-3 summarizes the effects to the historic properties as determined by FHWA and CDOT, and concurred by SHPO.

Table 4-3
Historic Properties' Effect Determinations

Historic Properties	Site #	Determination of Effect
Colorado and Southern Railroad- BNSF Railroad	5BL400.5	Adverse Effect
Cottonwood Ditch #2 Segment	5BL4488.2	Adverse Effect
Cottonwood Ditch #2 Segment	5BL4488.3	No Adverse Effect
Enterprise Ditch Segment	5BL4164.2	No Adverse Effect
Enterprise Ditch Segment	5BL4164.4	No Adverse Effect
Butler/Smith Property	5BL8917	No Adverse Effect
Gas Station and Small House	5BL9021	No Adverse Effect
The Harburg House, Barn and Gazebo	5BL9024	No Adverse Effect
DeBacker-Tenenbaum House	5BL9029	No Adverse Effect

Source: Colorado Historical Society, State Historic Preservation Office, 2002 and 2005.

4.4 Finding of *De Minimis*

Under SAFETEA-LU (the most recent Transportation Act), Congress simplified parts of Section 4(f) by creating a *De Minimis* Finding. If impacts to a resource are minor or temporary, and there is no adverse effect to that resource, it can be cleared as *de minimis* and no avoidance alternative is necessary. Below is more detail about the legislation.

The SAFETEA-LU was enacted August 10, 2005. Section 6009(a) (1) of SAFETEA-LU added a new subsection to Section 4(f) which authorizes the FHWA to approve a project that uses Section 4(f) property, without preparation of an Avoidance Analysis, if it makes a finding that such uses would have *de minimis* impacts upon the Section 4(f) resource.

4.4.1 Parks, Recreation Areas, and Wildlife or Waterfowl Refuges

With regard to Section 4(f) resources that are parks, recreation areas, and wildlife or waterfowl refuges, Section 6009 of SAFETEA-LU adds the following language to Section 4(f):

> (b) *De Minimis* Impacts. --
> (1) REQUIREMENTS.--
>
> ******
>
> (B) REQUIREMENTS FOR PARKS, RECREATION AREAS, AND WILDLIFE OR WATERFOWL REFUGES.--The requirements of subsection

> (a)(1) shall be considered to be satisfied with respect to an area described in paragraph (3) if the Secretary determines, in accordance with this subsection, that a transportation program or project will have a *de minimis* impact on the area. The requirements of subsection (a)(2) with respect to an area described in paragraph (3) shall not include an alternatives analysis.
>
> (C) CRITERIA.--In making any determination under this subsection, the Secretary shall consider to be part of a transportation program or project any avoidance, minimization, mitigation, or enhancement measures that are required to be implemented as a condition of approval of the transportation program or project.
>
> (3) PARKS, RECREATION AREAS, AND WILDLIFE OR WATERFOWL REFUGES. --With respect to parks, recreation areas, or wildlife or waterfowl refuges, the secretary may make a finding of *de minimis* impact only if—
>
> (A) the Secretary has determined, after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
>
> (B) the finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.

In order to clarify the language in SAFETEA-LU, the FHWA has stated that the following procedures must be met in order for the impacts to parks, recreational resources, and wildlife refuges to be considered *de minimis*:

1. The transportation use of the Section 4(f) resource, together with any impact avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f);
2. The official(s) with jurisdiction over the property are informed of FHWA's intent to make the *de minimis* impact finding based on their written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f); and
3. The public has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resource.

FHWA has determined that the impacts to Legion Park, with the mitigation measures proposed, constitutes a *de minimis* impact to this property and does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f). In a letter dated May 17, 2005, the Boulder County Resource Planning Manager (the official with jurisdiction) agreed that the proposed road improvements to SH 7 will not have an adverse impact on the use of Legion Park. See Appendix G for a copy of this letter. Furthermore, at a public meeting held on November 9, 2004, the

public was afforded an opportunity to review and comment on the effects of the project to Legion Park. See Appendix H for comments received from this public meeting about Legion Park.

The following measures to avoid, minimize, mitigate, and enhance include the following best management practices (BMPs):

- The land where the eastern leg of the access into Legion Park is removed will be revegetated with native plant seed mixtures.
- The amount of disturbance of grading will be minimized to 10 feet beyond the toe of slope. Project will follow CDOT standard specifications for amount of time that disturbed areas are allowed to be non-vegetated.
- A noxious weed management plan will be developed and implemented. This will be completed during final design.
- Weed free topsoil will be salvaged for use in seeding.
- Temporary and permanent erosion control measures will be implemented to limit erosion and soil loss.
- All disturbed locations except rock cuts will be reseeded with native plant seed mixtures.
- An acceptable revegetation plan will be developed with the CDOT Landscape Architect and Boulder County.

Based on these actions and correspondence, and taking into consideration the harm minimization/mitigation measures that have been incorporated into the proposed action as documented in Section 3.19.3 of the EA, it is the conclusion of the FHWA that the proposed action would have *de minimis* impacts (see concurrence letter dated November 28, 2007 in Appendix G) and that an analysis of feasible and prudent avoidance alternatives under Section 4(f) is not required. CDOT, on behalf of FHWA, notified the Boulder County Resource Planning Manager (the official with jurisdiction) of the *de minimis* determination in a letter dated November 27, 2007 (see Appendix G).

The public will have the opportunity to comment on the *de minimis* determination during the 30-day public review period for the environmental assessment.

4.4.2 Historic Resources

With regard to Section 4(f) resources that are historic resources, Section 6009 of SAFETEA-LU adds the following language to Section 4(f)[1]:

> (b) *De Minimis* Impacts. --
>
> (1) REQUIREMENTS.--
>
> (A) REQUIREMENTS FOR HISTORIC SITES.--The requirements of this section shall be considered to be satisfied with respect to an area described in paragraph (2) if the Secretary determines, in accordance with this subsection, that a transportation program or project will have a *de minimis* impact on the area.
>
> ******
>
> (C) CRITERIA.--In making any determination under this subsection, the Secretary shall consider to be part of a transportation program or project any avoidance, minimization, mitigation, or enhancement measures that are required to be implemented as a condition of approval of the transportation program or project.
>
> (2) HISTORIC SITES.--With respect to historic sites, the Secretary may make a finding of *de minimis* impact only if--
>
> (A) the Secretary has determined, in accordance with the consultation process required under section 106 of the National Historic Preservation Act (16 U.S.C.470f), that--
>
> (i) the transportation program or project will have no adverse effect on the historic site; or
>
> (ii) there will be no historic properties affected by the transportation program or project;
>
> (B) the finding of the Secretary has received written concurrence from the applicable State historic preservation officer or tribal historic preservation officer (and from the Advisory Council on Historic Preservation if the Council is participating in the consultation process); and
>
> (C) the finding of the Secretary has been developed in consultation with parties consulting as part of the process referred to in subparagraph (A).

FHWA's December 13, 2005 *de minimis* guidance that clarifies the SHPO role in *de minimis*, states that the SHPO must concur in writing on the Section 106 determination of "no adverse effect" or "no historic properties affected" and that CDOT must notify the SHPO of the FHWA intention to make a *de minimis* finding based on concurrence with the Section 106 finding.

[1] This provision will be codified as 23 U.S.C. § 138(b). Section 6009(a)(2) of SAFETEA-LU adds identical language at 49 U.S.C. § 303(d).

FHWA has made a determination, and the Colorado SHPO has concurred , that the use of the Enterprise Ditch segments (5BL4164.2 and 5BL4164.4), the Cottonwood Ditch #2 segment (5BL4488.3), the Butler/Smith property (5BL8917), the Gas Station and Small House property (5BL9021), the Harburg House property (5BL9024), and the DeBacker-Tenenbaum House property (5BL9029) that would be affected by the proposed action would result in "no adverse effect" for purposes of Section 106 of the NHPA (see description below). These determinations are documented in Appendix G in letters dated August 4, 2005 and August 15, 2005 for Enterprise Ditch segment 5BL4164.2, the Butler/Smith property (5BL8917), the Gas Station and Small House property (5BL9021), the Harburg House property (5BL9024), and the DeBacker-Tenenbaum House property (5BL9029); June 24, 2006 for Enterprise Ditch segment (5BL4164.4); and March 24, 2006 for Cottonwood Ditch #2 segment (5BL4488.3). They are also described in Section 3.17 of the Environmental Assessment.

The following measures to avoid, minimize, mitigate, and enhance the below listed 4(f) resources were taken into consideration in making the *de minimis* finding for project impacts to these historic properties:

Cottonwood Ditch #2 Segment (5BL4488.3)

The temporary BNSF alignment will require a temporary bridge to be constructed over the Cottonwood Ditch. The temporary bridge will be removed when the temporary alignment is removed. The surrounding area where the temporary alignment and bridge over the ditch was located will be restored to its original appearance. The ultimate railroad alignment will be along its current alignment and will not result in a direct impact to this segment of the Cottonwood Ditch since it will be restored to its original function and appearance.

Enterprise Ditch Segments (5BL4164.2 and 5BL4164.4)

The section of the ditch that includes segment 5BL4164.2 will be realigned and reconstructed as an open ditch. This will be an enhancement to the current condition of the ditch which has a low degree of integrity. In addition, the deteriorating existing box culvert that a portion of this segment flows through will be replaced.

A 100-foot section of the ditch located north of SH 7 that includes segment 5BL4164.4 will be placed into a pipe due to the construction of the temporary railroad alignment. Once the temporary alignment is removed, the ditch will be restored to its original function and appearance.

Butler/Smith Property (5BL8917)

The proposed design for the improvements to SH 7 was specifically created to avoid direct impacts to the house or barn, and to stay within the current right-of-way. Any disturbed area adjacent to the property will be revegetated with native plant seed mixtures.

Gas Station and Small House (5BL9021)
The proposed design for the improvements to SH 7 was specifically created to avoid direct impacts to the gas station and small house, and to stay within the current right-of-way. A new private access from 63rd that is proposed to be constructed for the property would be an enhancement measure. Any disturbed area adjacent to the property will be revegetated with native plant seed mixtures.

The Harburg House, Barn and Gazebo (5BL9024)
The proposed design for the improvements to SH 7 was specifically created to avoid direct impacts to the house, barn and gazebo, and to stay within the current right-of-way. Two private drives that access the property are proposed to be reconstructed for the property in order to match the improvements to SH 7. This would be an enhancement measure. Any disturbed area adjacent to the property will be revegetated with native plant seed mixtures.

DeBacker-Tenenbaum House (5BL9029)
The proposed design for the improvements to SH 7 was specifically created to avoid direct impacts to the house, and to stay within the current right-of-way. The temporary fill slope that may be required on the property will be removed at the end of construction and the area will be restored to its original function and appearance. Any disturbed area adjacent to the property will be revegetated with native plant seed mixtures.

This findings of "no adverse effect" with regard to these six properties reflect a conclusion that these impacts will not "alter, directly or indirectly, any of the characteristics of the historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" as described in 36 CFR § 800.5(a)(1). This conclusion takes into consideration the measures above that have been incorporated into the proposed action. It is the conclusion of the FHWA that the proposed action would have *de minimis* impacts and that an analysis of feasible and prudent avoidance alternatives under Section 4(f) is not required. CDOT, on behalf of FHWA, notified the SHPO of the *de minimis* determination in letters dated April 25, 2007 and November 2, 2007, and March 7, 2008 (see Appendix G).

4.5 Avoidance Alternatives

The Cottonwood Ditch #2 (Site #5BL4488) is eligible under NRHP Criterion A as one of the oldest intact ditches in this area, for its importance in the agricultural history in Boulder County. This ditch, begun in 1863, still retains integrity of design, setting, feeling and association. It still flows past farms in a rural setting that has not been redeveloped. The entire ditch is considered NRHP- eligible. The existing siphon pipe

and adjacent open ditch sections of the Cottonwood Ditch can currently only accommodate the existing two-lane, substandard roadway section, which does not meet the purpose and need. The purpose and need for improvements are to reduce congestion, enhance roadway deficiencies and safety, and to improve mobility for multiple modes of transportation. These are described in detail in Chapter 1.

The Colorado and Southern Railroad-Burlington Northern Railroad (Site #5BL400.5) is eligible under NRHP Criterion A for its association with the history of rail transportation in Boulder County. This railroad line served to transport freight in the 19th century and both freight and passengers in the early part of the 20th century. The entire Colorado and Southern Railroad-Burlington Northern Railroad is considered eligible and this segment of the railroad was found to retain sufficient integrity to support the overall significance of the railroad. The existing BNSF railroad bridge can currently only accommodate the existing two-lane, substandard roadway section, which does not meet the purpose and need.

A range of alternatives, including those outlined in Chapter 2 of this report, were considered and analyzed in order to determine if they were reasonable avoidance alternatives to these resources. All of the alternatives screened out in the alternatives evaluation process outlined in Chapter 2 did not meet the purpose and need. Also, as part of this EA, improvements to roadway corridors either north or south of SH 7 were considered in order to avoid the ditch and railroad. These corridors include Valmont Road/Pearl Parkway, approximately 1.5 miles north of SH 7, and Baseline Road, approximately one mile south of SH 7 (see **Figure 1-2** in Chapter 1 for a regional map). Due to the linear nature of the ditch and railroad, improvements to these other roadway corridors would still not avoid impacts to these historic resources.

Avoidance Alternative Number 1

In order to completely avoid the impacts to the BNSF railroad (segment 5BL400.5) and the Cottonwood Ditch (segment 5BL4488.2), and stay on the current roadway alignment, SH 7 would have to be reconstructed over both of these resources. This would require SH 7 to be raised approximately 55 feet on a bridge structure. To avoid impacts to other 4(f) resources in the vicinity, retaining walls would have to be incorporated into the design of the approaches to the bridge which would traverse over the BNSF railroad. The approaches to the bridge would have to begin approximately 1500 to 2000 feet in advance of the bridge location. Access to the Valtec commercial development would likely not be feasible since it is located between the BNSF railroad, Legion Park and SH 7, and the vertical grade change on SH 7 would not allow direct access, which would take away the ability of the property to remain operational. Similarly, access to other adjacent land uses would become very difficult, including access to the Tenenbaum property, the Jacobs property and the Aldridge property, which raises safety concerns. At the intersection of SH 7 and 75th, the vertical alignment change would require the reconstruction of the intersection due to the

required change in vertical grade required to traverse the railroad. It is likely that the Conoco convenience store and the commercial development would not be able to remain operational due to access issues. In addition to the access and safety concerns, the raised profile of SH 7 in this vicinity would have major impacts to the visual quality and view shed in the study area.

This alternative would be feasible as a matter of sound engineering judgment, and could possibly be prudent by meeting purpose and need, however, it would not be prudent due to unacceptable safety and operational problems because of access changes. In addition, after mitigation, it causes severe visual impacts, and would likely require the closure of SH 7 during the construction resulting in impacts to the traveling public possibly lasting 1 year or more. Finally, the additional cost of this avoidance alternative is likely $20 to $30 million above the cost of the Preferred Alternative. Therefore this avoidance alternative would not be feasible and prudent.

Avoidance Alternative Number 2

In order to completely avoid the impacts to the BNSF railroad (segment 5BL400.5) and the Cottonwood Ditch (segment 5BL4488.2), and stay on the current roadway alignment, SH 7 would have to be reconstructed beneath both of these resources along a depressed roadway alignment and through a tunnel. This would require SH 7 to be lowered approximately 60 feet on a depressed alignment and through a 500 foot long tunnel. To avoid impacts to other 4(f) resources in the vicinity, retaining walls would have to be incorporated into the design of the approaches to the tunnel. The approaches to the tunnel would have to begin approximately 2000 feet in advance of the tunnel location from the west and approximately 1000 feet in advance of the tunnel from the east. Access to the Valtec commercial development would likely not be feasible since it is located between the BNSF railroad, Legion Park and SH 7, and the vertical grade change on SH 7 would not allow direct access, which would take away the ability of the property to remain operational. Similarly, access to other adjacent land uses would become very difficult, including access to the Tenenbaum property, the Jacobs property and the Aldridge property, which raises safety concerns.

This alternative would be feasible as a matter of sound engineering judgment, and could possibly be prudent by meeting purpose and need, however, it would not be prudent due to unacceptable safety and operational problems because of access changes. In addition, after mitigation, it would likely require the closure of SH 7 during the construction resulting in impacts to the traveling public possibly lasting 1 year or more. Finally, the additional cost of this avoidance alternative is likely $30 to $35 million above the cost of the Preferred Alternative. Therefore this avoidance alternative would not be feasible and prudent.

No-Action Alternative

With the No-Action Alternative, congestion (approaching maximum capacity in 2030) and the current unsafe condition of the roadway (currently accidents occur related to the substandard roadway conditions) would continue. The No-Action Alternative also does not improve the corridor for multiple modes of transportation including busses, bicycles and pedestrians. Finally, the No-Action does not meet the purpose and need of the project. Due to these reasons, this would not be a feasible and prudent avoidance alternative.

Due to the effect that these avoidance alternatives would have on surrounding properties, the cost of the alternatives, impact to the traveling public, or the fact that they do not meet the purpose and need of the project, and due to the limited use of, and the value of the two Section 4(f) resources (i.e. while important for association with railroad and agricultural history, the railroad bridge is non-contributing and the parts of the resources that are being used are not unique for these resources), do not outweigh the problems with the avoidance alternatives that make them not prudent. The Preferred Alternative would result in the least harm while still achieving project goals. This Preferred Alternative would be feasible and prudent.

4.6 Measures to Minimize Harm

Since there are no prudent and feasible alternatives to the impacts to Cottonwood Ditch (segment 5BL4488.2) and the BNSF railroad (segment 5BL400.5), the proposed action must demonstrate that it includes all possible planning to minimize harm to both resources. Planning measures incorporated into the proposed action include the following:

- A Memorandum of Agreement regarding the Cottonwood Ditch #2 (segment 5BL4488.2) and the BNSF railroad (segment 5BL400.5) has been prepared which incorporates the views of the SHPO on the proposed action. A copy of the MOA is located in Appendix G.
- CDOT shall ensure that the ditch and railroad are documented in accordance with the guidance for Level II documentation found in OAHP Form #1595, *Historical Resource Documentation: Standards for Level I, II, III Documentation*.
- The new siphon would be designed to be as short as possible. The new siphon will include reconstructed wingwalls, headwalls and short transition sections to the existing ditch.
- Retaining walls will be constructed along SH 7 which will minimize the length of the siphon.

- The rebuilt section of the ditch would be designed to carry no less than the minimum flow requirements as determined by the ditch owner.
- Construction would occur at such times as the ditch is not in use. If this is not possible, the hydraulic integrity of the ditch would be maintained through the use of temporary systems.
- The contractor's work area around the ditch would be limited to only the area that is directly impacted.
- For the railroad, the use of vertical bridge abutments would be employed to minimize the length of the new overpass bridge.
- The contractor's work area around the railroad would be limited to only the area that is directly impacted.
- In general, all efforts will be made during final project design to minimize impacts to the ditch and the railroad.

4.7 Coordination

In consultation with the SHPO, the FHWA and CDOT have determined this project will have adverse effect on Cottonwood Ditch #2 (segment 5BL4488.2) and Colorado and Southern Railroad-Burlington Northern Railroad (segment 5BL400.5). FHWA, CDOT and the SHPO have agreed this project will have no adverse effects on the Cottonwood Ditch #2 (segment 5BL4488.3), Enterprise Ditch (segments 5BL4164.2 and 5BL4164.4), the Butler/Smith property (5BL8917), the Gas Station and Small House property (5BL9021), the Harburg House property (5BL9024), and the DeBacker-Tenenbaum House property (5BL9029).

Agreement among the SHPO, Advisory Council on Historic Preservation (ACHP), FHWA, and the Certified Local Government, represented by the Boulder Landmarks Preservation Board, has been reached through the Section 106 process of the National Historic Preservation Act on measures to minimize harm and those measures are incorporated into the project. A Memorandum of Agreement was signed by FHWA on December 4, 2006. There are no federal interests on any of the historic sites, so there are no appropriate agencies to be contacted for their comments on the proposed action.

The impacts to Legion Park have been determined by FHWA and CDOT, and concurred by Boulder County (letter dated May 17, 2005 in appendix G), to have *no adverse effect* to the park.

A requirement under Section 4(f) is that the public has the opportunity to specifically comment on a *de minimis* finding for a park. At the public hearing for the EA,

information about Legion Park will be presented, including the effects of the project on the protected activities, features, and attributes. The public will have an opportunity to comment at that time. Any comments received will be addressed in the decision document for the project.

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Chapter 5.0: Public Participation

A critical element of the SH 7 environmental assessment (EA) process is an extensive public and agency involvement program. This section describes the method of communication between the public, public agencies, and other project stakeholders during the EA process. These methods included public open houses, a newsletter, a Web site, general public agency meetings and meetings with Regional Transportation District (RTD) and Burlington Northern Santa Fe (BNSF) railroad. Finally, this chapter describes the input that was received.

5.1 General Public Communication Tools

5.1.1 SH 7 – Cherryvale Road to North 75th Street Improvement Assessment Study Public Open Houses

Prior to the EA, two public open houses were held in July 2001 and February 2002. These open houses provided an opportunity for the public to provide input regarding improvements to the corridor. A total of 135 people attended these two meetings. The Colorado Department of Transportation (CDOT) received 87 written comments and two e-mails. The most common comments received were requests for bike lanes, turn lanes, a four-lane typical section, and improved signalization. Requests were also made for improved transit and pedestrian facilities. During the SH 7 *Improvement Assessment Study*, coordination with public agencies and other stakeholders was completed through additional meetings and written correspondence.

A mailing list of over 250 individuals was compiled during the SH 7 *Improvement Assessment Study* and individuals were added to this list during the entire EA process. Persons were added to the mailing list from information gathered at the public open houses and through comments that were received by CDOT and the consultant team. The mailing list was used for the distribution of newsletters, distribution of project information and notification of public open houses.

5.1.2 Environmental Assessment Public Open Houses

Two additional public open houses were held during the EA to inform the public about the project and obtain input. The first was held in June 2004 and the second was in November 2004. The meetings also provided an opportunity for participants to interact with planners, engineers, CDOT and other project team members. The two public open houses for the EA were:

- June 17, 2004, at the Platt Middle School, 6069 Baseline Road, Boulder, Colorado. The project was advertised in the local section of the Boulder Daily Camera. A

press release was issued by CDOT to the local media and an article was included in the Boulder Daily Camera. Twelve signs advertising the open house were placed along the project at major intersections several days prior to the meeting. Newsletters summarizing the project to date were mailed to over 250 public agency representatives, residents, and business owners along the project. The mailing list included all attendees of the previous public meeting for the SH 7 *Improvement Assessment Study*. Fliers were hand-delivered to the Columbine mobile home park located within the study area.

The intent of the first meeting was to educate the public about the history and Purpose and Need of the project, present technical data and show existing conditions, present environmental issues, and provide a forum for both general and scoping input and questions from the public. Copies of the display boards presented at this meeting are shown in **Appendix H**. A total of 71 people signed in at the meeting. A comment sheet was provided and written comments were handed in at the meeting or mailed or faxed to the project team at a later date. A total of 29 comment sheets were received.

- Nov. 9, 2004, at the Platt Middle School, 6069 Baseline Road, Boulder, Colorado. Similar to the first open house, this open house was advertised in the Boulder Daily Camera and signs were placed along the corridor. Postcards were mailed to 268 public agency representatives, residents, and business owners along the corridor. Postcards were hand-delivered to the Columbine mobile home park located within the study area.

  The focus of the second meeting was to present updated project information, receive ideas and suggestions and answer questions about issues and concerns. Copies of the display boards presented at this meeting are shown in Appendix H. Eighty-two people signed in at the meeting. The comment sheet contained three questions to gather feedback on specific issues in addition to space for general comments. The three questions included which alternative was preferred; whether cut slopes or retaining walls were preferred in the area of Legion Park and City of Boulder Open Space; and finally, what pedestrian improvements should be incorporated between Westview Drive and 75th Street.

5.1.3 Project Contacts

Project team members were available to answer questions from the public at the public open houses. In advertisements and at the public open houses, the public was given the main contacts who were available for questions or comments via fax, phone, or E-mail:

Melinda Urban
Operations Engineer
Federal Highway Administration
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5.1.4 Web Site

Information on the SH 7 EA was presented on the Colorado Department of Transportation Web site at http://www.dot.state.co.us/SH7EA/index.asp. The Web site contains the informational boards presented at both EA public open houses.

5.2 Public Input Obtained

General public comments from the two public open houses held on July 11, 2001 February 19, 2002 for the SH 7 *Improvement Assessment Study* included:

- 46 respondents wanted bicycle lanes and facilities incorporated.
- 33 respondents suggested turn lanes be added at intersections.
- 25 respondents wanted SH 7 to be a four-lane facility.

- 23 respondents noted that signalization should be improved at various intersections.
- 19 respondents recommended improvements to transit facilities and service.
- 10 respondents suggested improved pedestrian facilities be included.
- 9 respondents indicated that they had difficulty making maneuvers at intersections due to traffic volumes.

General public comments from the June 17, 2004 Public Open House included:

- Preferences for improvements from Cherryvale to Westview (5 comments).
  - Option W-2 – Two-Lane Section with Turn Lanes as required (1 comment).
  - Option W-3 – Six-Lane Urban Section with Transit/Auxiliary Lanes in each direction (2 comments).
  - Option W-4 – Four-Lane Urban Section with continuous Auxiliary Transit Lane west of VoTec School (1 comment).
  - Option W-5 – Six-Lane Urban Section with Transit/Auxiliary Lanes in each direction and reconfigured alignment (1 comment).
- Preferences for improvements from Westview to 75th (9 comments).
  - Option E-2 – Intersection safety improvements at Westview Drive and Valtec Lane (1 comment).
  - Option E-3 – Two-Lane Rural Section with Shoulders and Turn Lanes (2 comments).
  - Option E-4 – Four-Lane Rural Section with Shoulders and Turn Lanes (4 comments).
  - Option E-5 – Four-Lane Urban Section with Bike Lanes, Sidewalks and reconfigured Alignment (2 comments).
- Preferences for improvements to Burlington Northern Railroad alignment (2 comments).
  - Option R-3 – Realign Tracks east of existing location (1 comment).
  - Option R-3 is best for buildings at 7209 Valtec Court. Septic system is east of buildings. (1 comment).
- Bicycle lanes/facilities should be incorporated into the project (18 comments).
- Improve traffic flow and congestion (13 comments).

- Currently use or would consider another mode of travel (12 comments).
  - Use bicycle (7 comments).
  - Ride bus (5 comments).
  - Carpool (3 comments).
  - Used to bike until it became too dangerous (2 comments).
  - Will use light rail to Denver (2 comments).
- Add turn lanes at intersections (11 comments).
  - Valtec intersection (3 comments).
  - Westview intersection (2 comments).
  - Acceleration lane at Westview (3 comments).
- Don't use another mode of travel (10 comments).
- Incorporate pedestrian facilities (sidewalks, bus stops) (9 comments).
- SH 7 should be a four-lane facility (8 comments).
- Improve safety and decrease accidents (7 comments).
- Provide safe access to and from businesses and side roads (6 comments).
- Steep grades at hill create problems in snowy weather (5 comments).
- Property impact concerns (6 comments).
  - Consider property impacts to businesses north of road (1 comment).
  - Berkelhammer property has row of large elm trees (1 comment).
  - Kent property has two rows of trees they were forced to plant (1 comment).
  - Myron property has row of trees they were forced to plant (1 comment).
  - Integrated Auto Services is concerned about loss of business due to difficult access during construction (1 comment).
- SH 7 should be a four-lane facility further east than 75th (to 95th or SH 287) (3 comments).
- Do not incorporate pedestrian facilities (3 comments).
- Correct/flatten slope at Westview Drive (3 comments).

- Bicycle lanes should extend further east than 75th (to 95th or SH 287) (3 comments).
- Don't expand SH 7 to four lanes (2 comments).
- Improve transit facilities (2 comments).
  - Incorporate Queue Jump Lanes (1 comment).
  - Add park-n-Rides east of 75th (1 comment).
- Don't significantly lower roadway at highpoint (Legion Park) (2 comments).
- Historic gas station is an eyesore and should be removed (2 comments).
- Maintain rural setting and environment (3 comments).
- Consider impact of new housing east of SH 287 (2 comments).
- The study process is too slow (2 comments).
- Protect cottonwoods in vicinity of 75th Street (2 comments).
- Noise from Arapahoe Road is a concern (2 comments).
  - Noise from Arapahoe can be heard in Ridgely Hills and Crestview (1 comment).
- Improved/enhanced signalization required (2 comments).
  - Improve signal timing at VoTec and 63rd (1 comment).
  - New signal required at Valtec Lane (1 comment).
- Difficulty experienced at intersections making maneuvers (1 comment).
- Transit/bike improvements should be given priority (1 comment).
- Right-in/right-out access is inconvenient (1 comment).
- Leave Valmont alone (1 comment).
- Don't realign road or railroad (1 comment).
- Consolidate private drives to reduce access points (1 comment).
- Spread out peak demand or reduce it (1 comment).
- Consider reversible travel lane to accommodate peak hour traffic (1 comment).

- Reduce the number of buses and waste trucks using 63rd Street (1 comment).
- Connect Westview to the signal at VoTec (1 comment).
- Do not build right-hand lane from northbound 75th to eastbound Arapahoe (1 comment).
- Place "Trucks use lower gears" sign at top of hill to keep speeds at 45 mph (1 comment).
- Move huge light pole on southeast corner of 63rd Street and SH 7 (1 comment).
- Bury approximately 500 feet of Xcel transmission lines near the mobile home park (1 comment).
- Prefers riding bike on sidewalk as on-street bike lane is dangerous for high-speed roadway (1 comment).
- Correct push-buttons at SH 7/75th Street intersection so that cyclists can push the buttons without having to dismount (1 comment).
- Add "Yield to Bikes" signs to right-merge lanes so that motorists will yield to straight-thru cyclists (1 comment).
- Owner of business on Valtec Lane says sidewalks are needed for the entire corridor because their employees walk along SH 7 shoulder to the west (1 comment).
- Designate the Stangle farm as a historic property on graphics (1 comment).

General public comments from the November 9, 2004 Public Open House included:

Question 1: Three alternatives are presented at this meeting. Alternative 1 is the No-Action with no improvements. Alternative 2 is a four-lane section to VoTec and a two-lane section between VoTec and the 75th improvements. Alternative 3 is a four-lane section for the study area. Which do you prefer?

- Alternative 3 (Four-Lane) (53 responses)
- Alternative 2 (Two-Lane) (12 responses)
- Alternative 1 (No-Action) (5 responses)

Question 2: In the area of Legion Park and the City of Boulder Open Space (top of the hill), both cut slopes and retaining walls are being considered. Cut slopes would require

a larger construction impact area affecting more vegetation and trees, while retaining walls would be up to 20 to 23 feet tall. Which do you prefer?

- Cut Slopes (43 responses)
- Retaining Walls (18 responses)

Question 3: What pedestrian improvements should be incorporated between Westview and 75th?

- 12-foot Multi-Use Path (44 responses)
- None (10 responses)
- 8-foot Sidewalk (8 responses)

General Comments

- SH 7 should be improved further east than 75th (to 95th or SH 287) (19 comments)
- Concerns at Westview (15 comments)
  - Left turn in/out of Westview difficult. (5 comments)
  - Widen Westview to incorporate a right-turn-only lane. (4 comments)
  - Consider signal at Westview. (3 comments)
  - Connect Westview to the signal at VoTec. (3 comments)
- Pedestrian/Bicycle Improvements (7 comments)
  - Happy Bicycle lanes/facilities have been incorporated into the project. (4 comments)
  - Multi-use path should be fine crusher gravel. (1 comment)
  - Sidewalks should be continuous on both sides throughout the alignment. (1 comment)
  - Add "Yield to Bikes" signs to right-merge lanes so that motorists will yield to straight-thru cyclists and continue bike striping through intersections. (1 comment)
- Project is overdue. (7 comments)
- Comments regarding other modes of travel (5 comments)
  - In favor of rail and multimodal use. (1 comment)

  - Provide bus priority lanes. (1 comment)
  - Bus lane at 63rd eastbound should be incorporated. (2 comments)
  - Bus lane at 63rd eastbound not needed. (1 comments)

- Property impact concerns (4 comments)
  - Myron property has row of trees they were forced to plant and want to be saved. (1 comment)
  - The improvements are encroaching on the detention pond on the Conway property. There is a septic tank next to the detention pond. (1 comment)
  - Concern that rail will move closer to Tenenbaum property. (1 comment)
  - Right in/right out a concern for business access. (1 comment)

- Concern regarding walls. (4 comments)
  - Graffiti will be a problem if walls are built. (2 comments)
  - Concerned about aesthetics of walls. Possibly incorporate birds on them. (1 comment)
  - Concern with sight restrictions and icing problems from shadow. (1 comment)

- High traffic speed is a concern. (4 comments)
- Don't significantly lower roadway at highpoint (Legion Park) (4 comments)
- Concern regarding trees. (3 comments)
  - Save as many trees as possible and replace trees that are removed. (1 comment)
  - Take down trees at 75th. (1 comment)
  - Sad cottonwoods are being taken down in vicinity of 75th Street (1 comment)
- Noise is a concern. (3 comments)
- Turn in/out of Park Lake is a concern signal and/or turn lanes should be considered. (3 comments)
- Concern about light pollution. (2 comments)
- Concern about access/congestion during construction. (2 comments)

- Narrowing to two lanes will cause a bottleneck. (2 comments)
- Cut slopes appear more natural/rural. Trees can be re-grown. (2 comment)
- Horse crossing of SH 7 (possibly below SH 7at Enterprise Ditch) is needed. (2 comments)
- Maintain rural character of road. (No sidewalks/city trees) (2 comments)
- SH 7 should not be four lanes at 95th. (1 comment)
- Left-turn signal for eastbound traffic at 63rd should only operate at the beginning of the cycle and not stop westbound traffic. (1 comment)
- Consider impact on SH 7 of new housing east of SH 287 (1 comment)
- Lane merge at Cherryvale and 55th are confusing. More signage would be helpful. (1 comment)
- Both build plans are too wide. Arapahoe Road in the City should be narrowed. (1 comment)
- SH 7 does not warrant cost and impacts of widening. (1 comment)
- CDOT should have more public outreach instructing people how to use merge lanes and drive in snow. (1 comment)
- VoTec School should have only one entrance due to near accidents. (1 comment)
- City/county parks should pay for multi-use path. (1 comment)
- Willow and Arapahoe needs turn lanes. (1 comment)

Copies of comment letters are available for review by contacting one of the individuals listed in Section 5.1.3.

5.3 Coordination with Public Agencies

Local, state and federal agencies were contacted to request that they attend a formal scoping input meeting on April 15, 2004, to identify issues of concern. A second meeting was held with these agencies on June 9, 2004, to update the agencies on the alternatives being considered and the impacts of those alternatives. A third meeting was held on November 2, 2004, to discuss a preliminary recommendation for a preferred alternative and mitigation requirements. Coordination with public agencies was ongoing throughout the EA process. **Table 5-1** lists the agency contacts:

Table 5-1
Agency Contact List

Agency	Contact name
Boulder County Transportation Department	Clark Misner
Denver Regional Council of Governments	George Scheuernstuhl
City of Boulder Transportation Department	Tracey Winfree & Bill Cowern
Town of Erie Public Works	Gary Behlen
Boulder City Open Space	Jim Schmidt
Regional Transportation District (RTD)	Jeff Dunning
City of Louisville Public Works	Thomas Phare
City of Lafayette Public Works	Doug Short
Boulder Parks and Open Space	Therese Glowacki
United States Fish and Wildlife Service (USFWS)	Alison Deans Michael
Environmental Protection Agency (EPA)	Deborah Lebow
Colorado Division of Wildlife (CDOW)	Claire Solohub
Colorado Department of Public Health and Environment (CDPHE)	Pat Martinek
United States Army Corps of Engineers	Scott Franklin
Colorado Historical Society	Dan Corson

For all three meetings, agency representatives were sent packets of information on the project with an invitation to the public agency meetings. In addition to the three general public agency meetings, coordination meetings were held with SHPO, RTD and the US 36 Environmental Impact Statement (EIS) representatives, BNSF, Boulder County, and City of Boulder Open Space to address specific issues on the project (See **Table 5-2**). All public agency contacts were also individually invited to attend the June 17, 2004 and November 9, 2004 Open Houses.

Table 5-2
Agency Meetings

Meeting Date	Meeting	Invitees	Meeting Purpose
3/19/04	Project Kickoff with Local Agencies	CDOT/City of Boulder/Boulder County	Project kickoff
4/9/04	Scoping Meeting with SHPO	SHPO	Initiate merger with SHPO
4/15/04	Public Agency Scoping/Coordination Meeting 1	Public Agencies	Initiate coordination, prior work, purpose and need, resources, alternatives
5/11/04	Field Meeting with SHPO / Historic Staff	SHPO	Ongoing merger with SHPO
5/12/04	Coordination Meeting with BNSF	BNSF / PUC	Coordinate impact to railroad
6/9/04	Public Agency Coordination Meeting 2	Public Agencies	Public meeting, alternatives and purpose and need
6/17/04	Public Open House 1	General Public & Public Agencies	Process, purpose and need, prior work, alternatives
7/6/04	RTD Meeting	RTD & US 36 EIS Representatives	Coordination of US36 EIS and SH 7 EA
7/27/04	Corps Coordination Meeting	Corps of Engineers	Wetland and purpose and need discussion
9/9/04	BNSF Meeting 2	BNSF	Update BNSF on selected alternative
10/04	Access Discussion	CDOT & Boulder County	Access on NE and SW corner of SH 7 and 63rd
11/2/04	Public Agency Meeting	Public Agencies	Feedback from public agencies on preferred alternative
11/4/04	CLG	CLG	Presentation to Boulder on historic issues
11/9/04	Public Open House 2	General Public & Public Agencies	Presentation and gathering of input on refined alternatives
12/3/04	Coordination Meeting with US36 EIS/RTD	RTD & US 36 EIS Representatives	Discussion of FasTracks passing and the affects on rail alignment options
4/26/05	Legion Park Impacts	CDOT & Open Space	Cut slope and access impact Legion Park
9/28/06	Public Agency Meeting	Boulder, Boulder County, CDOT & FHWA	Feedback from public agencies on preferred alternative
6/12/07	Public Agency Meeting	Boulder, Boulder County & CDOT	Feedback from public agencies on preferred alternative

5.4 Public Agency Input Obtained

Input received from public agencies included the following:

- City of Boulder requested multimodal improvements (multi-use 12-foot path, bike lanes, and bus lanes) as outlined in the Regional Transportation Task Force (RTTF) study.
- CDOW requested avoidance or mitigation for prairie dogs, and nesting birds (specifically in box culverts).
- City of Boulder expressed concern with the four-lane Alternative 3 including concerns regarding right-of-way, capital cost, and vegetation impacts.
- USFWS and Boulder County Open Space preferred the use of walls instead of cut slopes over the hill to avoid vegetation loss.
- City of Boulder and Boulder County requested the selection of the two-lane Alternative 2.
- City of Boulder and Boulder County requested that improvements be phased as needs arise.

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