APPENDIX A SH 7 PEL CORRIDOR CONDITIONS ASSESSMENT REPORT

This page intentionally left blank.

CORRIDOR CONDITIONS ASSESSMENT REPORT
FOR
STATE HIGHWAY 7 (SH 7)
PLANNING ENVIRONMENTAL LINKAGE (PEL) STUDY

CDOT PROJECT NO. STA 007A-012 (16725)

Prepared for:

Colorado Department of Transportation
Region 6
2000 South Holly Street
Denver, CO 80222

Prepared by:

Felsburg Holt & Ullevig
6300 South Syracuse Way, Suite 600
Centennial, CO 80111

In association with:

ArLand Land Use Economics
Atkins North America, Inc.
CDR Associates
Frank Miltenberger Landscape Architect
Hermsen Consultants
PKM Design Group, Inc.

JUNE 2012

FHU Reference No. 11-178-01

TABLE OF CONTENTS

Page

List of Acronyms and Abbreviations iv

Executive Summary vi

1.0 Introduction 1

1.1 Study Location and Description 1

1.2 Transportation Planning Context 1

1.3 Other Transportation Projects in the Vicinity 8

2.0 Land Use 11

2.1 Current Land Use 11

2.2 2035 Land Use 13

3.0 Existing Transportation System 22

3.1 Roadway Characteristics 22

3.2 Travel Characteristics 29

3.3 Traffic Operations 31

3.4 Transit 45

3.5 Bicycle and Pedestrian Facilities and Operations 47

4.0 Future Transportation Conditions 53

4.1 No-Action Alternative 53

4.2 2035 No-Action Conditions 54

4.3 South Boulder Road Sensitivity Analysis 66

5.0 Environmental Overview 68

5.1 Parks and Recreational Resources 68

5.2 Traffic Noise 74

5.3 Historic Resources 76

5.4 Floodways and 100-year Floodplains 83

5.5 Wetlands and Waters of the US 85

5.6 Wildlife/Threatened and Endangered Species 88

5.7 Hazardous Materials 93

6.0 References 100

LIST OF FIGURES

Page

Figure 1.1 Study Corridor and Vicinity Map 2
Figure 1.2 Study Area 3
Figure 1.3 North I-25 EIS Preferred Alternative for SH 7/I-25 Interchange 9
Figure 2.1 Transportation Analysis Zones 12
Figure 2.2 Generalized Existing Land Uses (west of I-25) 14
Figure 2.3 Generalized Existing Land Uses (east of I-25) 15
Figure 2.4 Generalized Future Land Uses West of I-25 16
Figure 2.5 Generalized Future Land Uses East of I-25 17
Figure 2.6 Household Growth (2010-2035) 20
Figure 2.7 Employment Growth (2010-2035) 21
Figure 3.1 Existing Through Travel Lanes and Right-of-Way 23
Figure 3.2 Existing Cross Sections (facing east) 24
Figure 3.3 Current Access Categories 25
Figure 3.4 Existing Posted and Observed Speeds 32
Figure 3.5 Average Travel Times (Between US 287/Arapahoe and I-25) 33
Figure 3.6 Average Travel Times (Between I-25 and US 85) 33
Figure 3.7 2012 Daily Traffic Volumes and Truck Percentages 35
Figure 3.8 Existing AM and PM Peak Hour Traffic Volumes (SH 7) 36
Figure 3.9 Existing AM and PM Peak Hour Traffic Volumes (Parallel Routes) 37
Figure 3.10 Existing Intersection Geometry and Levels of Service (SH 7) 39
Figure 3.11 Existing Intersection Geometry and Levels of Service (Parallel Routes) 40
Figure 3.12 Corridor Crash Overview (2008 – 2010) 41
Figure 3.13 Intersection Crash Patterns (2008 – 2010) 43
Figure 3.14 Intersection Crash Time of Day Trends 44
Figure 3.15 Non - Intersection Rear End Time of Day Trends 45
Figure 3.16 Existing Transit Service 46
Figure 3.17 Existing Sidewalks and Multi-Use Trails 48
Figure 3.18 Existing Bicycle Segment Level of Service 50
Figure 3.19 Existing Pedestrian Segment Level of Service 52
Figure 4.1 Corridor Trip Distribution 55
Figure 4.2 Screenline Travel Demand (2010 and 2035) 56
Figure 4.3 2035 No Action Daily Traffic Volume Forecasts and Capacity Thresholds 57
Figure 4.4 Corridor Travel Paths (2010 and 2035) 59
Figure 4.5 Regional vs. Local Travel (2010 and 2035) 60
Figure 4.6 Trip Purpose (2010 and 2035) 61
Figure 4.7 2035 No Action AM Signalized Intersection Congestion Hot Spots 62

LIST OF FIGURES

Page

Figure 4.8 2035 No Action PM Signalized Intersection Congestion Hot Spots 63
Figure 4.9 2035 No Action AM Speeds 64
Figure 4.10 2035 No Action PM Speeds 65
Figure 5.1 Parks, Open Space, and Trails 73
Figure 5.2 Previously Identified Historic Sites 79
Figure 5.3 Generalized Future Land Uses and Floodplains/Floodways 84
Figure 5.4 Wetlands and Waters of the US/Floodplans/Floodways 86
Figure 5.5 Wildlife Corridors, Threatened and Endangered Species 89
Figure 5.6 Hazardous Materials - Sites with Recognized Potential Environmental Conditions 97

LIST OF TABLES

Page

Table 2.1 2010 Households and Employment 11
Table 2.2 Household and Employment Growth, 2010-2035 18
Table 2.3 2035 Land Use Capacities 19
Table 3.1 Summary of Irrigation Ditches 28
Table 3.2 2006-2010 Travel Characteristics 30
Table 3.3 Intersection and Non-Intersection Related Crashes by Location 42
Table 4.1 SH 7 2035 Daily Traffic Forecasts with and without South Boulder Road Extension 67
Table 5.1 Existing Park, Trail, and Open Space Resources 69
Table 5.2 Future Master Planned Recreation Resources 72
Table 5.3 CDOT Noise Abatement Criteria 75
Table 5.4 Noise Sensitive Areas 76
Table 5.5 Previously Identified Historic Sites (Listed from West to East) 77
Table 5.6 Potential Historic Sites (Listed from West to East) 80
Table 5.7 Summary of Drainageways 83
Table 5.8 Summary of Surveyed Wetlands 87
Table 5.9 Existing Wildlife Resources 90
Table 5.10 Sites with Recognized and Potential Environmental Conditions Adjacent within 500 feet of SH 7 and 168th Avenue within the Project Area 93
Table 5.11 Known Coal Mine Features 99

LIST OF ACRONYMS AND ABBREVIATIONS

ACS	US Census Bureau American Community Survey
AM	morning
AVC	Animal vehicle collisions
BGPA	Bald and Golden Eagle Protection Act
BNSF	Burlington Northern Santa Fe Railway
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CDPW	Colorado Department of Natural Resources Division of Parks and Wildlife
CDSS	Colorado's Decision Support System
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
dB	decibels
DIA	Denver International Airport
DRCOG	Denver Regional Council of Governments
DUS	Denver Union Station
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	FEMA Flood Insurance base maps
FIS	Flood Insurance Studies
GIS	Geographic Information System
HCM	Highway Capacity Manual
I-25	Interstate 25
I-76	Interstate 76
IGA	intergovernmental agreement
LOS	level of service
MBTA	Migratory Bird Treaty Act
MP	milepost
Mph	miles per hour
MS4	Municipal Separate Storm Sewer System
MVRTP	DRCOG Metro Vision Regional Transportation Plan
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NDIS	Natural Diversity Information
NR-A	Non-Rural Principal Highway
NR-B	Non-Rural Arterial
NR-C	Non-Rural Arterial
NRHP	National Register of Historic Places
OSP	Outfall Systems Plans
PDO	property damage only
PEL	Planning Environmental Linkage
PM	evening
R-A	Regional Highway
ROD	Record of Decision
RTD	Regional Transportation District
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SH 7	State Highway 7

SSS	sideswipe (same direction) crash
SSO	sideswipe (opposite direction) crash
TAZ	transportation analysis zone
TWG	technical working group
TWSC	two-way stop controlled intersection
UDFCD	Urban Drainage Flood Control District
UPRR	Union Pacific Railroad
US 36	US Highway 36
US 85	US Highway 85
US 287	US Highway 287
USDOT	US Department of Transportation
USFWS	US Department of Interior Fish and Wildlife Service
vpd	vehicles per day
WCR	Weld County Road

EXECUTIVE SUMMARY

The Colorado Department of Transportation (CDOT) is conducting a Planning and Environmental Linkage (PEL) study for State Highway 7 (SH 7) between US Highway 85 (US 85) in the City of Brighton and US Highway 287 (US 287) in the City of Lafayette. The SH 7 PEL is being conducted to identify existing conditions and anticipated problem areas, and to develop/evaluate multimodal improvements to reduce congestion, improve operations, and enhance the safety of the roadway within the study corridor.

The study area extends approximately 16 miles along SH 7 from US 85 (milepost [MP] 76.98) on the west side of the City of Brighton to the intersection of Arapahoe Road/SH 7/US 287 (MP 60.68) on the north side of the City of Lafayette. East of I-25, the study area extends approximately two miles north of SH 7 to include 168th Avenue with E-470 as the southern boundary. West of I-25, the study area extends approximately one mile north of SH 7 with Northwest Parkway as the southern boundary.

This Corridor Conditions Assessment Report has been prepared to document current and anticipated future conditions of the corridor with regard to land use, the transportation system, and environmental resources. The information presented in this report will be the basis for developing and evaluating possible transportation improvements in the corridor.

Land Use

Development of agricultural land to residential and employment uses has been occurring as the Denver metropolitan area continues to grow. County, city and town governments along the corridor have been proactively planning for this transition. Despite recent downturns in the economy, which have slowed development, long-term projections indicate that the communities along the SH 7 corridor will continue to grow and develop at a rapid rate.

Current Land Use

In 2010, there were approximately 16,000 households and nearly 13,000 jobs in the study area, while in the larger 3-mile buffer area there were nearly 38,000 households and 25,000 jobs. Compared to the rest of the DRCOG region, the study area currently has a higher ratio of households to jobs, indicating that many residents in the study area must travel outside the study area for work.

2035 Land Use

By 2035, DRCOG projects an additional estimated 28,000 households and 43,000 jobs in the study area. In the larger 3-mile buffer area, an additional 54,000 households and nearly 70,000 jobs are projected. The area around the SH 7 corridor is forecast for significant growth with expected employment increases of particular note.

The 2035 household forecasts are relatively close to the capacity estimates provided by the local jurisdictions; within the study area, the 2035 household forecasts represent 92% of the buildout capacities. Conversely, the employment numbers vary significantly. The 2035 employment forecasts represent just over half of the buildout capacity in both the study area and the 3-mile buffer area. This comparison indicates the potential for significant growth in employment in the area beyond 2035.

Existing Transportation System

Within the project limits of the SH 7 PEL (US 287 to US 85), the geometric characteristics of SH 7 are highly variable. SH 7 consists of two-lane and four-lane cross sections with right-of-way ranging from 60 feet through Lafayette to as wide as 185 feet on the very eastern portion of the corridor. Typical right-of-way along the corridor is 130-150 feet.

Shoulder widths vary significantly along the corridor, primarily due to various auxiliary lane configurations, but all shoulders that exist are paved. They are most commonly between 6 and 12 feet wide. Areas with shoulders less than six feet are typically curbed, have guardrails, or are along auxiliary lanes. Auxiliary lanes for vehicle movements are provided throughout the corridor and typically use the available shoulders. Auxiliary lanes exist at both signalized and stop-controlled public street intersections for deceleration and acceleration movements.

Much of the corridor has no median, but when present, median configurations vary significantly. Raised medians exist briefly near major intersections in urban/suburban areas; painted medians predominate. Widths of painted medians range from 4 feet to more than 20 feet, with most measuring between 8 and 12 feet wide.

Access Categories

SH 7 east of I-25 is currently categorized as a Regional Highway (R-A), and most of the western half of the corridor is categorized as Non-Rural Principal Highway (NR-A), which is similar to R-A, but for more urban/suburban settings. R-A and NR-A are the highest (and most restrictive in terms of allowable access) categories along the corridor. A small segment of SH 7 in Brighton is categorized as Non-Rural Arterial (NR-B), and the segment through Lafayette is Non-Rural Arterial (NR-C), which is the least restrictive category and is generally assigned to state highway segments in downtown areas.

Travel Characteristics

Over 75 percent of residents in both the study and 3-mile buffer areas commute to their jobs by driving alone. A slightly higher percentage of residents in the 3-mile buffer area either carpool or take public transportation than do so in the study area. The majority of commute times in both the study and 3-mile buffer areas are 30 minutes or less. On average, however, commute times in the 3-mile buffer area are significantly lower, at an average of 18 minutes compared to the average commute time in the study area at 24.9 minutes.

Traffic Operations

The existing daily traffic volumes along SH 7 range from approximately 11,400 vehicles per day (vpd) on the west end through Lafayette to 22,000 vpd in the vicinity of I-25. Daily traffic volumes through Broomfield and Erie are approximately 18,000 to 19,000 vpd, and through Adams County and Thornton the daily traffic volumes are in the range of 15,000 vpd.

Storage lengths for auxiliary lanes at some intersections are too short to handle the peak hour demands, resulting in turning queues blocking through traffic. This results in increased congestion to through traffic, reducing the efficiency of traffic signals.

The majority of the study intersections along the corridor are signalized. The unsignalized intersections are two-way stop-controlled, with the exception of the on and off-ramp intersections at US 85 which are controlled by roundabouts.

Due to the amount of through traffic on SH 7 during the peak hours, drivers from the side streets at unsignalized intersections have difficulty finding a gap in traffic, and therefore have increased delays. The signalized intersections of US 287/Arapahoe Road and US 287/Baseline Road are the only signalized intersections with LOS E or F. These intersections have high entering traffic volumes and are over capacity.

Crash Data Analysis

Safety performance functions indicate that some intersections along SH 7 experience higher than expected rear-end and approach turn/broadside crashes when compared to other similar facilities. Existing storage lengths for auxiliary lanes at some intersections are too short to handle the peak hour demands, resulting in turning queues blocking through traffic and resulting in rear-end crashes. In addition, protected left turn phase movements are not included at most intersections along the corridor resulting in a high number of approach turn/broadside crashes.

Transit Service and Pedestrian and Bicycle Facilities

East-west transit service along SH 7 between the Cities of Brighton and Lafayette does not exist. Bus service along SH7 is anticipated to be implemented in the short term, prior to completion of the North Metro Corridor project. Continuous pedestrian and bicycle facilities are missing or deficient along the corridor. Multimodal connectivity between pedestrians, bicyclists, vehicles, and bus transit to the planned North Metro Corridor project station at SH 7/162nd Avenue is limited.

Future Transportation Conditions

The DRCOG 2035 fiscally constrained regional travel demand model was used to develop the 2035 traffic forecasts. A comparison of the 2010 and 2035 trip distribution patterns reveals a decrease in the percentage of trips traveling through the study area (neither originating nor terminating within the study area) over time; by 2035, 80 percent of the trips using the corridor are expected to have at least one trip end (origin and/or destination) within the study area (compared to 58 percent in 2010).

Traffic Forecasts

Planning level roadway capacities were used to estimate when the travel demand along SH 7 would exceed the existing capacity. While the travel demands on eastern and western portions of the corridor currently exceed the existing planning-level capacities, nearly all of the corridor is expected to have travel demands that exceed existing capacity by 2020. The only exceptions are the westbound section between Sheridan Parkway and Lowell Boulevard and the eastbound section between Riverdale Road and Havana Street. Both of these sections have two lanes in the subject direction, providing adequate capacity for the 2035 travel demands.

Due to the growth on and around the SH 7 corridor, traffic volumes through the corridor are projected to increase by 2035, especially on the eastern portion of the corridor where there are more development opportunities. If no operational improvements are made to the corridor, many intersections are projected to be over capacity in both the AM and PM peak periods. Most of these

congestion hot spots are locations where regional arterials that provide north/south connectivity through the area intersect with SH 7. The traffic volumes on these regional facilities are also projected to increase, resulting in intersections that are over capacity.

Transit Service and Pedestrian and Bicycle Operations

When the North Metro Corridor project is implemented, the fixed-guideway rapid transit system will become the trunk service in the area, and surrounding local, express, and regional bus routes will be restructured to become feeder/circulator services to the North Metro Corridor project. The forecasted increase in traffic volumes in 2035 would result in some reduction in bicycle and pedestrian LOS along the corridor. In general, the bicycle and pedestrian LOS would be reduced by one level of service (e.g., from LOS E to LOS F) in the 2035 No Action Alternative in comparison to the current LOS on the western section of the corridor (along US 287 and through Lafayette) and in the vicinity of the I-25 interchange.

Environmental Overview

The environmental resources studied were selected based on the characteristics of the study area and on input from stakeholders. The resources that were considered are generally consistent with NEPA, its implementing regulations, and with FHWA and CDOT guidelines. The following sections describe resources that are considered red flag environmental resources with separate regulatory drivers, such as the Endangered Species Act or Clean Water Act, or are typically resources of concern for the general public, such as traffic noise.

Parks and Recreation Resources

Some of the park properties present within the project area are publicly owned and are afforded protection under Section 4(f) of the US Department of Transportation (USDOT) Act of 1966, as defined in 23 Code of Federal Regulations (CFR) 774. A Section 4(f) resource is a property that functions or is designated as a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site. If one of these properties is impacted as part of the proposed action, a Section 4(f) evaluation may be required for that particular resource. While a variety of parks, trails, and open space are located along the corridor, the largest concentration of parks and open space is located north of SH 7 in Boulder County between the City of Lafayette and the Town of Erie.

Traffic Noise

The potential for noise or vibration impacts from vehicles to the receptors (i.e., properties) near transportation facilities are a general concern. Thresholds for determining noise impacts have been established by state and federal transportation agencies to guide these conclusions. When impacts are identified from an improvement, mitigation actions for the impacted receptors are typically considered for the project design. This is an important consideration for this project because many properties are along the project corridor and may be impacted by noise. Numerous residential neighborhoods (NAC Category B) can be found in the PEL study area between US 85 and SH 287. Likewise, a number of Category C areas (parks, schools, churches, etc.) are also spread throughout the PEL study area.

Historic Resources

Significant historic resources are afforded considered by Section 106 of the National Historic Preservation Act of 1966, as amended, as well as Section 4(f) of the Department of Transportation Act of

1966. Significant historic resources are those that are listed or may be eligible for inclusion on the National Register of Historic Places (NRHP). For purposes of this study, only properties on the NRHP or officially eligible for the NRHP are listed as previously identified historic sites. There are nine existing historic properties within the SH 7 corridor. These include one eligible historic district in the City of Lafayette, two residences, two railroads, three ditches, and one farm.

Floodways and 100-year Floodplains

There are six drainageways that have FEMA designated floodplains in the project area. Of these six drainageways, three are designated as Zone AE floodplains and three are designated as Zone A floodplains. Of these drainageways, the Coal Creek, Big Dry Creek, and the South Platte River 100-year floodplains overtops SH 7. It should be noted that Todd Creek Drainage Way 1 is shown on FEMA maps, but does not have a FEMA designated floodplain. A 100-year floodplain has been documented in the Flood Hazard Area Delineation for Todd Creek. The upstream limit of the designated floodplain is located at the southeast corner of SH 7 and Yosemite Street, but does not cross SH 7.

Wetlands and Waters of the US

Wetland resources are protected under Section 404 of the Clean Water Act and Executive Order 11990 *Protection of Wetlands*. CDOT has incorporated FHWA environmental guidance into its *Environmental Stewardship Guide* (CDOT, 2005d), which emphasizes efforts to avoid and minimize wetland impacts. The majority of wetlands identified within the corridor are small palustrine emergent, palustrine scrub/shrub, and palustrine scrub/shrub-emergent mix wetlands with most occurring along existing waterways and drainages and in roadside ditches. The majority of these roadside and irrigation ditch wetlands were considered low quality wetlands in prior studies. Wetlands associated with the South Platte River, Big Dry Creek and Coal Creek however provide a moderate quality wetland value.

Wildlife/Threatened and Endangered Species

Various federal laws have been established to protect wildlife, including: the Endangered Species Act (ESA); the Migratory Bird Treaty Act (MBTA); the Bald and Golden Eagle Protection Act (BGPA); and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Threatened and endangered species habitat that is present in the project area includes habitat for the Colorado butterfly plant (*Gaura neomexicana coloradensis*), the Ute ladies'-tresses orchid (*Spiranthes divulialis*), the common shiner (*Notropis cornutus*) and the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). The primary drainages that were identified from the field survey and which contained suitable habitat for these species include Coal Creek, Community Ditch, Big Dry Creek, and the South Platte River. Major wildlife corridors, which facilitate wildlife movement, were noted through a field survey. These corridors include: Coal Creek, Big Dry Creek, Brighton Ditch, and the South Platte River.

Hazardous Materials

For this hazardous materials assessment summary, sites within the project area were identified as having known (current and historic) soil or groundwater contamination and are distinguished in this report as sites with recognized environmental conditions. A total of 39 sites with recognized and potential environmental conditions were identified within 500 feet of the SH 7 project area. The majority of these sites (13) were leaking underground storage tank (LUST) sites adjacent to the project area.

1.0 INTRODUCTION

The Colorado Department of Transportation (CDOT) is conducting a Planning and Environmental Linkage (PEL) study for State Highway 7 (SH 7) between US Highway 85 (US 85) in the City of Brighton and US Highway 287 (US 287) in the City of Lafayette. The SH 7 PEL is being conducted to identify existing conditions and anticipated problem areas, and to develop/evaluate multimodal improvements to reduce congestion, improve operations, and enhance the safety of the roadway within the study corridor.

This Corridor Conditions Assessment Report has been prepared as part of the SH 7 PEL study to document current and anticipated future conditions of the corridor with regard to land use, the transportation system, and environmental resources. The information presented in this report will be the basis for developing and evaluating possible transportation improvements in the corridor.

This report has drawn information from a number of sources, including the North I-25 Final Environmental Impact Statement (EIS) and Record of Decision (ROD), CDOT traffic and safety evaluations, and information obtained from other state, regional, and local agencies. Information gathering has benefited from a comprehensive agency coordination effort, which is expected to continue as the PEL study proceeds.

1.1 Study Location and Description

SH 7 is an east-west principal arterial roadway that is under CDOT jurisdiction. SH 7 spans approximately 25 miles between US 85 to the east and US Highway 36 (US 36) to the west on the north side of the Denver metropolitan area and provides access to a number of major north-south roadways, including US 85, Interstate 25 (I-25), US 287, and US 36 (**Figure 1.1**).

The study area extends approximately 16 miles along SH 7 from US 85 (milepost [MP] 76.98) on the west side of the City of Brighton in the east to the intersection of Arapahoe Road/SH 7/US 287 (MP 60.68) on the north side of the City of Lafayette in the west (**Figure 1.2**). East of I-25, the study area extends approximately two miles north of SH 7 to include 168th Avenue with E-470 as the southern boundary. West of I-25, the study area extends approximately one mile north of SH 7 with Northwest Parkway as the southern boundary.

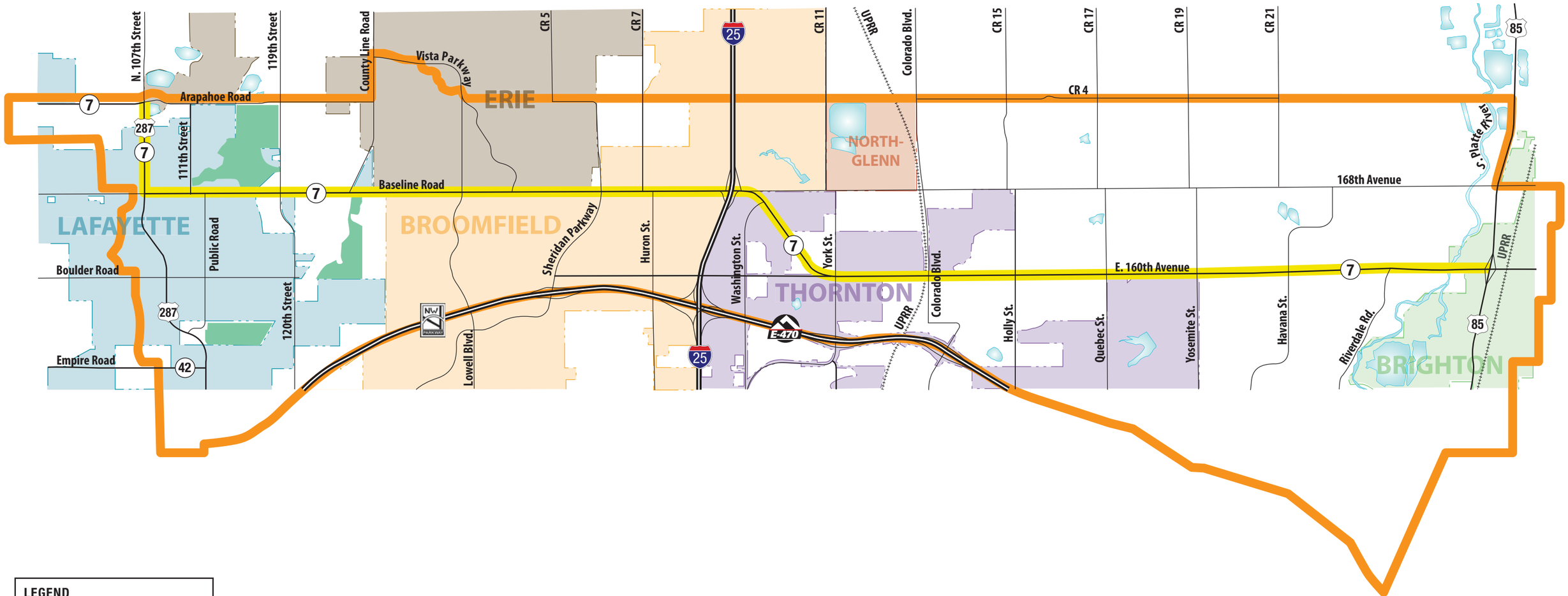
1.2 Transportation Planning Context

A number of transportation plans have been developed that relate to the project corridor. These plans include:

- *City and County of Broomfield Transportation Plan* (Broomfield, 2005)
- *City of Thornton Transportation Plan* (Thornton, 2009)
- *Town of Erie, City and County of Broomfield, CDOT; SH 7 Access Control Plan and Amendments* (Erie, Broomfield, CDOT 2002, as amended)
- *Town of Erie, Transportation Master Plan* (Erie, 2008)
- *Town of Erie, Erie Municipal Tri-County Airport, Airport Master Plan* (Erie, 2002)

Figure 1.1 Study Corridor and Vicinity Map

Figure 1.2. Study Area



LEGEND

- Study Area
- Project Corridor

NORTH

- Town of Erie *SH 7 Corridor Study* (FHU, 2009)
- *Boulder County Transportation Master Plan* (Boulder County, in progress)
- *Weld/Adams County Line Crossroads Alignment Study* (Weld County, Adams County, Northglenn, and Thornton; 2008)
- 2035 Metro Vision Regional Transportation Plan (DRCOG, 2007, as amended).

The following provides a brief summary of the relevant aspects of each of these plans.

City and County of Broomfield Transportation Plan

The City and County of Broomfield completed an update to its transportation plan in November 2005, outlining existing road and traffic conditions along with household and employment forecasts for 2015, 2030 and Buildout (Broomfield, 2005).

The plan identifies:

- SH 7 is a major arterial roadway through the City and County of Broomfield
- SH 7 runs slightly over capacity in its existing condition
- A *2002-2004 Accident Study* indicated the second-highest number of accidents in the municipality occurred at the junction of I-25 and SH 7
- Predicted future traffic volumes will require four additional lanes to SH 7

Major and minor arterials support longer-distance traffic flow for regional, intercommunity, and major commuting purposes. Arterials have a limited number of at-grade intersections and, when other alternatives do not exist, direct property access. Arterials tend to carry significant traffic volumes at higher speeds for longer distances, and intersections are seldom spaced closer than one-mile intervals.

City of Thornton Transportation Plan

The City of Thornton completed an update to its transportation plan in July 2009, which evaluates future road needs based on land use projections and the overall vision for the City (Thornton, 2009). This plan also looks at a broad range of issues including bicyclists, pedestrians and public transit that influence travel and mobility.

The *2009 Transportation Plan* identifies SH 7 as a Major Arterial roadway in the 2035 future scenario. This includes expanding areas that are currently two lanes to four lanes. In the Buildout scenario, SH 7 is upgraded to a Major Regional Arterial, expanding from four lanes to six lanes.

Major Regional Arterial roads are defined as similar to freeways but can include some at-grade intersections at cross-streets. Access may be either full or partial control with a small number of locations with direct land access. Major Regional Arterials are intended to provide higher levels of mobility rather than local property access.

Town of Erie Transportation Master Plan

The Town of Erie completed its transportation plan in January 2008, which outlines the community's vision and goals for the Town's future transportation system and its connections to the rest of the Denver metropolitan region (Erie, 2008). This plan presents the roadway system plan, discusses transit

services, identifies planned bicycle and pedestrian facilities, and proposes a plan for implementation of future transportation improvements.

The roadway system plan was modeled with the realignment of SH 7 east of the SH 7/County Line Road intersection with the US 287/SH 7/Arapahoe Road intersection; however, the new alignment was not proposed. SH 7 is identified as a Principal Arterial and expanded from two lanes to four lanes in the 2030 roadway system plan.

Town of Erie Airport Master Plan

The Town of Erie prepared the airport master plan in February 2002 to serve as a guide for future development of the Erie Municipal Tri-County Airport (Erie, 2002). North of SH 7 on the south side of the airport is a runway protection zone. The Federal Aviation Administration standards for the runway protection zone area are an inner width of 250 feet, outer width of 450 feet, and a horizontal distance of 1,000 feet.

Town of Erie SH 7 Corridor Study

The Town of Erie evaluated eight preliminary corridors for the proposed realignment of SH 7 in the vicinity of the Town of Erie between the SH 7/County Line Road intersection with the US 287/SH 7/Arapahoe Road intersection (FHU, 2009). Of the eight alignments, four alignments were recommended for study in more detail. A single alignment was not identified as part of the study.

Town of Erie, City and County of Broomfield, CDOT State Highway 7 Access Control Plan and Amendments

An *Access Control Plan*, dated July, 2002, was developed for SH 7, from Tennyson Drive (milepost [MP] 64.96) to Huron Street (MP 67.50), and adopted by intergovernmental agreement (IGA) among the City and County of Broomfield, the Town of Erie, and the State of Colorado (Erie, Broomfield, CDOT; 2002, as amended). An amendment request was submitted in March 2010 by the Town of Erie due to several development proposals along the SH 7 corridor from west of Bonanza Drive to Sheridan Parkway. Among these development proposals were requests for new access points and changes in access configuration.

The following is a description of the existing and proposed access points on SH 7:

- MP 64.96 Existing right-in/right-out at Tennyson Street; this is a low volume access serving a water treatment plant
- MP 65.15 Proposed three-quarter access on the north side of SH 7 with Sierra Vista Drive
- MP 65.40 Existing full movement signalized intersection with Weld County Road 3 (Bonanza Drive)/Lowell Boulevard
- MP 65.65 Proposed right-in/right-out access on the north side of SH 7 with West Vista Ridge Access, as part of the Vista Ridge development
- MP 65.90 Existing signalized intersection with Vista Parkway
- MP 66.20 Proposed right-in/right-out access on the north side of SH 7 with Vista Promenade
- MP 66.40 Existing signalized intersection with Mountain View Boulevard

- MP 66.68 Proposed three-quarter access on the north side of SH 7 with East Vista Ridge Access, as part of the Vista Ridge development
- MP 66.90 Existing signalized intersection with Sheridan Parkway
- MP 67.2 Proposed three-quarter access
- MP 67.4 Proposed full movement signalized intersection at Pecos Street/WCR 7
- MP 67.5 Existing signalized intersection relocated to MP 67.4
- MP 67.6 Proposed full movement signalized intersection at Palisade Parkway
- MP 67.9 Proposed full movement signalized intersection at Huron Street
- MP 68.1 Proposed full movement signalized intersection at Village Lane

Based on 2030 projected long-range plans for SH 7, six through-lanes are shown with signalized intersections at one-half mile spacing and continuous auxiliary lanes provided between access intersections. Since funding was not identified for implementation of the 2030 Plan, an interim plan was proposed to guide access improvements to SH 7. This was to be constructed by developers or by local jurisdictions and would provide two through-lanes in each direction on SH 7 plus auxiliary turn lanes. Portions of the interim plan have been constructed, but the interim plan has not been constructed in its entirety.

Boulder County Transportation Master Plan

Boulder County is currently preparing the *Boulder County Transportation Master Plan*. The East-West Mobility and Southeast Area working groups for the plan identified SH 7 (Arapahoe/Baseline Road) as a key roadway facility in the east-west travel corridor, which also includes Isabelle/Valmont, Baseline, South Boulder Road and other local roads. Of these facilities, improvements to SH 7 from the city of Boulder to I-25 are the highest priority for Boulder County to best meet future regional travel demand. The master plan will recommend several multimodal improvements and demand-side services, with the goal of increasing person-trip capacity on SH 7. Improvements, which include the Arapahoe (US 287 – City of Boulder) and Baseline (US 287 to East County Line Road) segments, include:

- Transit service from SH 7 (Baseline) to I-25 park-n-Ride and RTD FasTracks North Metro rail station to link Boulder County to the I-25 corridor and regional transit;
- Increased transit service frequencies along the corridor between Erie, Lafayette, and Boulder;
- Travel Demand Management services along the corridor;
- Operational improvements at key intersections;
- Inclusion of on-street bicycle shoulders along the corridor;
- Inclusion of transit lanes in roadway infrastructure;
- Extension of multi-use pathway though the 75th Street intersection for future connection to the East Boulder Trail; and
- Dry Creek bridge improvements at Arapahoe to accommodate a future East Boulder Trail underpass.

Many of the improvements listed above were identified in the 1998 Boulder County and Broomfield Consortium of Cities Regional Transportation Task Force (RTTF) report. The RTTF recommended an alternative for SH 7 (Arapahoe Road segment) that included operational improvements, bicycle shoulders, and transit enhancements. The RTTF also expressed a desire to see further study of the eastern segment of the corridor, particularly the proposed realignment of SH 7 around Lafayette.

Weld/Adams County Line Crossroads Alignment Study

The border between Weld County and Adams County also known as Weld County Road (WCR) 2 or 168th Avenue lies on a survey section correction line which offset the north-south roadways. This offset of adjoining roads creates a transportation difficulty as local agencies within the area try to create transportation plans that complement each other and permit a smooth flow of north/south traffic. The Weld/Adams County study identified alternative alignment corrections for each intersection identified that gives transportation engineers and planners the tools they need to help preserve the right-of-way required for the improvements or work with incoming development to construct the improvements.

The Weld/Adams County study focuses on the intersections contained within the corridor boundaries consisting of a twenty mile section of WCR 2 beginning near I-25 and extending east to WCR 49. As it pertains to the SH 7 corridor, WCR 2 or 168th Avenue can be considered as an alternate east-west roadway east of I-25 that runs parallel to SH 7. In order to make this a viable option, the deficiencies within the 168th Avenue corridor including those identified in the *Weld/Adams County Line Crossroads Alignment Study* must be addressed.

2035 Metro Vision Regional Transportation Plan

The Denver Regional Council of Government's (DRCOG) current long-range regional plan, the *2035 Metro Vision Regional Transportation Plan* (MVRTP) defines the vision for the region and the projects that are included within the Fiscally Constrained Plan (DRCOG, 2007, as amended). The following summary is from the 2035 MVRTP as it pertains to the SH 7 corridor:

- The 2035 MVRTP shows much of SH 7 will be upgraded to a four lane principal arterial as funding becomes available. The portion from 107th Street (US 287) to 199th Street through the City of Lafayette will remain as a two lane facility. The portion from Sheridan Parkway to I-25 is planned for six lanes.
- There are four areas within the study corridor which are designated by DRCOG as urban centers. There are two urban centers in the vicinity of the I-25/SH 7 interchange, one at the planned North Metro Corridor project station (at SH 7/Colorado Boulevard), and one in Brighton near SH 7/US 85. Service to urban centers is one of the criteria considered for prioritizing regional funding in DRCOG's fiscally constrained plan.
- SH 7 is designated as a regional bicycle corridor in the 2035 MVRTP.
- The study area includes three SH 7 capacity improvements in the 2035 Fiscally Constrained Plan with 100 percent locally derived funding: I-25/SH 7 interchange reconstruction, widening of SH 7 from Boulder County Line to Sheridan Parkway, and widening of SH 7 from Sheridan Parkway to I-25.

- There are two SH 7 projects in the 2035 Fiscally Constrained Plan which have been identified for regional funding: 1) widening of SH 7 from 164th Avenue to Dahlia Street; and 2) widening of SH 7 from Riverdale Road to US 85.

1.3 Other Transportation Projects in the Vicinity

In addition to the corridor-specific, citywide, and metropolitan area plans that include the project corridor, a series of transportation projects are planned or under construction in and within the vicinity of the study area. These include:

- North I-25 (Denver to Wellington, Colorado) project,
- North Metro Corridor project, and
- SH 7 (Cherryvale Road to 75th Street) project.

North I-25 (Denver to Wellington, Colorado) project

FHWA and CDOT recently completed a Final EIS to examine improvements to the I-25 corridor from Denver to Wellington in northern Colorado (FHWA and CDOT, 2011a). The improvements are needed to provide modal alternatives, correct geometric deficiencies, improve safety, mobility and accessibility, and replace aging and obsolete infrastructure. A Record of Decision (ROD) for Phase 1 of the Preferred Alternative was signed in December 2011 (FHWA and CDOT, 2011b).

Projected changes to the area surrounding I-25/ SH7 include:

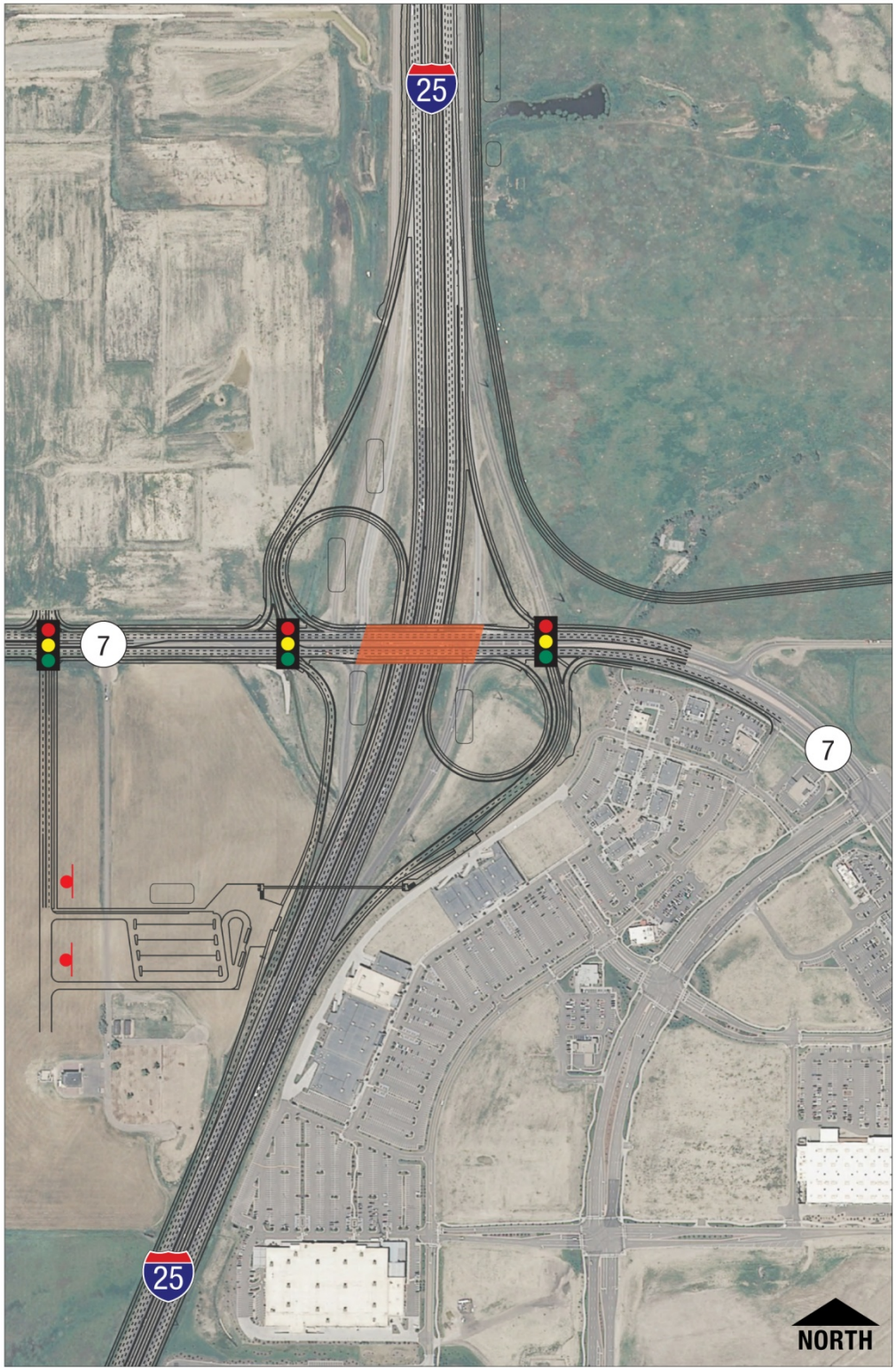
- I-25 traffic volumes for the horizon-year 2035 are projected to be much higher than existing conditions in the area between SH 1 and SH 7 interchanges.
- The SH 7 bus station at I-25 is predicted to generate higher-than-average ridership activity.
- The SH 7 commuter rail station is predicted to be one of the most active stations in northern Colorado.

Future North I-25 improvements at the SH 7 interchange include upgrades, such as a widened bridge and additional ramps that would accommodate multiple turn and through lanes for higher traffic loads. **Figure 1.3** depicts the I-25/SH 7 Interchange configuration identified in Phase I (FHWA and CDOT, 2011a; FHWA and CDOT, 2011b).

North Metro Corridor project

The Federal Transit Administration (FTA) and RTD recently completed a Final EIS and ROD for the North Metro Corridor project (FTA and RTD, 2011a; FTA and RTD, 2011b). The North Metro Corridor project is part of the RTD 2004 FasTracks Plan, which outlines the RTD's 12-year comprehensive plan to build and operate high-speed rail lines and expand and improve bus service and park-n-Rides throughout the region. The North Metro Corridor project is a proposed 18-mile, high-capacity, fixed-guideway transit corridor between Denver Union Station (DUS) and the 162nd Avenue area. The North Metro Corridor project study area includes parts of the City and County of Denver, Adams County, and the Cities of Commerce City, Northglenn, Thornton, and Brighton.

Figure 1.3 North I-25 EIS Preferred Alternative for SH 7/I-25 Interchange



Three transportation improvements are planned within the vicinity of the SH 7/ 162nd Avenue station area. These improvements, which would be in place by different planning horizon years, would be local projects funded by sources other than the North Metro Corridor project.

The three projects are as follows:

- Relocation of the south leg of the 160th Avenue (SH 7)/Colorado Boulevard intersection about one-half mile to the east, including widening to four lanes from 152nd Avenue to 160th Avenue (SH 7). As part of this relocation, it is assumed that the existing south leg of this intersection would be removed and the existing eastbound right- and westbound left-turn lanes would be converted to eastbound left- and westbound right-turn lanes feeding to the remaining north leg of Colorado Boulevard (by 2020).
- Relocation of the remaining north leg of the 160th Avenue (SH 7)/Colorado Boulevard intersection to the east to line up with the south leg, including widening to four lanes from 160th Avenue (SH 7) to 168th Avenue. The Colorado Boulevard (existing north leg) intersection would be converted to a right-in/right-out configuration. It is assumed that the recomposed 160th Avenue (SH 7)/Colorado Boulevard intersection would be reconstructed with double left-turn lanes and a right-turn lane on each approach except for southbound, which would have a single left-turn lane and a right-turn lane. At the 168th Avenue/Colorado Boulevard intersection, it is assumed that eastbound, westbound, and northbound left-turn lanes; an eastbound right-turn lane; and a northbound receiving lane for a two-lane northbound through movement would be constructed as part of this project (2035 or sooner).
- Widening of 160th Avenue from two to four lanes from the current end of the four-lane section west of this area to the relocated Colorado Boulevard intersection (2035 or sooner).

SH 7 (Cherryvale Road to 75th Street) project

The SH 7 (Cherryvale Road to 75th Street) project includes improvements to reduce congestion, enhance safety, and improve mobility for multiple modes of transportation. FHWA and CDOT recently completed an Environmental Assessment (EA) for the project, which resulted in a Finding of No Significant Impact (FONSI) (FHWA and CDOT, 2008a; FHWA and CDOT, 2008b). The Preferred Alternative for the project includes 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 Burlington Northern Santa Fe (BNSF) railway bridge. 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. Additionally, bicycle facilities are included by the use of the ten-foot shoulder or five-foot on-street bicycle lanes.

2.0 LAND USE

This section describes the existing and future land use conditions along the SH 7 corridor. Development of former agricultural land to residential and employment uses has been occurring as the Denver metropolitan area continues to grow. County, city and town governments along the corridor have been proactively planning for this transition. Despite recent downturns in the economy, which have slowed development, long-term projections indicate that the communities along the SH 7 corridor will continue to grow and develop at a rapid rate.

For transportation planning purposes, the Denver Regional Council of Governments has divided the entire Denver metropolitan region into Transportation Analysis Zones (TAZ). Socio-economic variables including population, household, employment, and income are estimated for each TAZ and projected through 2035 for local and regional planning purposes. DRCOG incorporates a wide variety of variables in their estimates and projections including, but not limited to: overall regional growth, each jurisdiction's potential share of future growth, and current and long range development plans.

The SH 7 corridor covers a broad regional area. Our study area examines land use conditions along SH 7 in Lafayette, Erie, Broomfield, Thornton, and Brighton and parts of unincorporated Boulder, Adams and Weld Counties. Each of these local governments have its own comprehensive plans that incorporate a discussion of current and future land uses within each respective boundary.

2.1 Current Land Use

Figure 2.1 shows the study area (outlined in black) which includes the TAZs immediately surrounding the SH 7 corridor from just west of US 287 to just east of US 85. The boundary of the study area to the south is E-470 and the Northwest Parkway. The boundary to the north is approximately one mile from the corridor. To provide a broader context for the land use analysis, a slightly broader 3-mile buffer area is also shown.

Households, Employment and Demographic Characteristics

In 2010, study area household and employment comprise less than half of the 3-mile buffer area household and employment as seen in **Table 2.1**. In 2010, there were approximately 16,000 households and nearly 13,000 jobs in the study area, while in the larger 3-mile buffer area there were nearly 38,000 households and 25,000 jobs. In the entire DRCOG region, the number of jobs is greater than the number of households, while in the study and buffer areas, the number of jobs lags behind the number of households. Compared to the rest of the DRCOG region, the study area currently has a higher ratio of households to jobs indicating that many residents in the study area travel outside the study area for work.

Table 2.1 2010 Households and Employment

Area	2010 Households	2010 Employment
Study Area	15,931	12,896
3-Mile Buffer	37,657	25,259
DRCOG Region	1,163,778	1,351,473

Source: DRCOG

Figure 2.1. Transportation Analysis Zones

Source: DRCOG Regional Model

Existing Conditions

Figures 2.2 and **2.3** show generalized existing land uses along the corridor. The maps represent current conditions along the corridor.

West of I-25

Traveling east from the City of Boulder, Arapahoe Road (SH 7) crosses through rural properties and residential subdivisions. At US 287, there are a number of commercial centers anchored by retailers including Safeway, Wal-Mart, King Soopers, and Walgreens, along with a number of other newer commercial establishments. A variety of commercial establishments line SH 7 approaching Public Road and Lafayette's downtown core area, while older single family residential houses are clustered along the corridor on the east side of the City of Lafayette. A multifamily building is being constructed on the north side of SH 7 near Public Road. The Erie Municipal Airport is east of County Line Road north of SH 7. East of the airport, SH 7 passes through agricultural parcels, undeveloped land, and residential subdivisions. As the corridor moves into Broomfield, additional subdivisions, including Anthem, are located on the south side of the corridor. Residential subdivisions are located north of SH 7 in Erie, west of Sheridan, as well as neighborhood commercial uses near the Vista Ridge subdivision. A few businesses and a Children's Hospital are located near the I-25/SH 7 interchange.

East of I-25

<u>168th Avenue</u>

The area along 168th is characterized primarily by agricultural uses. Some residential subdivision activity exists, although it is not as intensive as along the SH 7 corridor. The northern edge of the Todd Creek subdivision extends to 168th Avenue. Mining activity is taking place along 168th Avenue near the City of Brighton and US 85.

<u>160th Avenue (SH 7)</u>

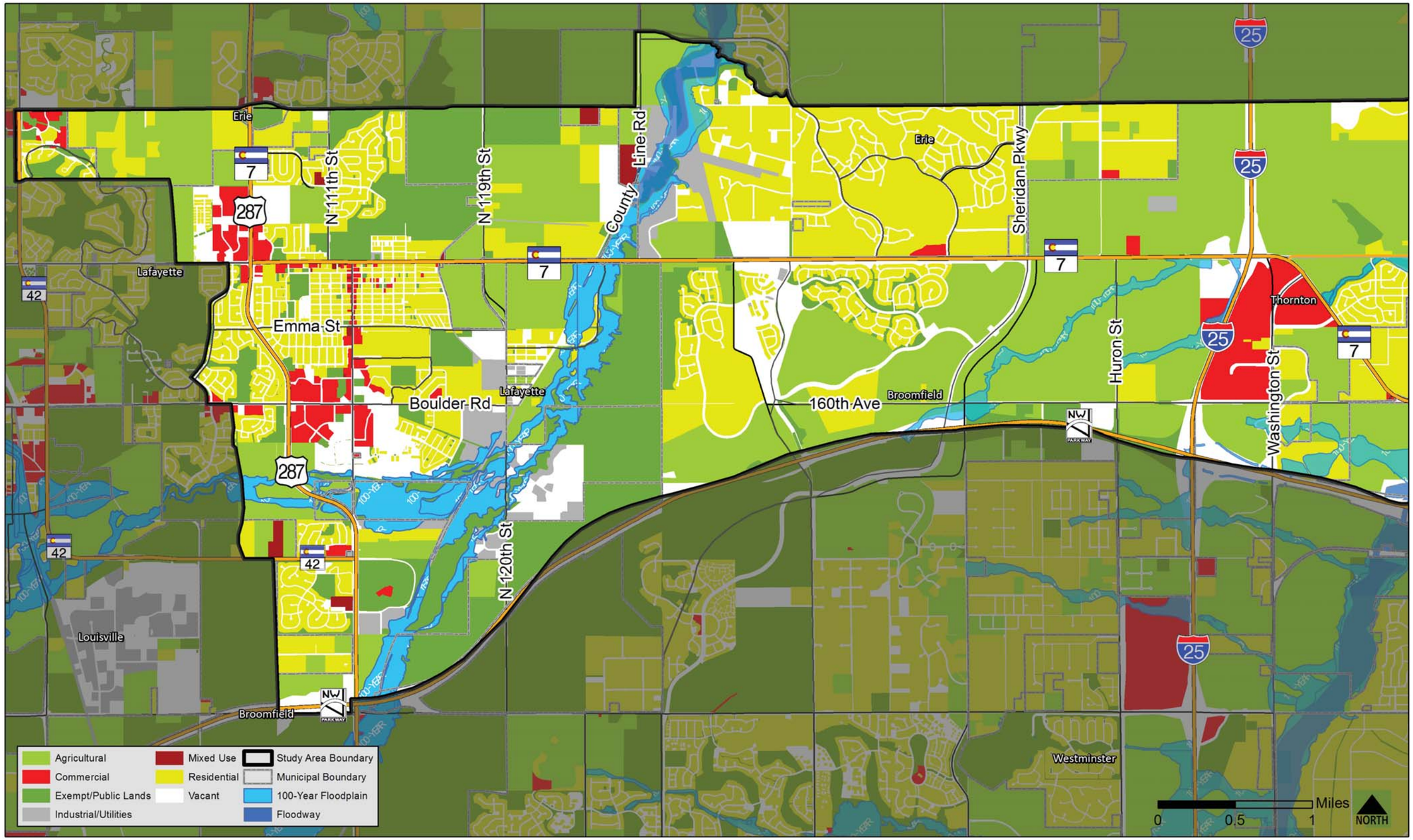
The Larkridge shopping center, to the immediate east of I-25 and SH 7, is a regional commercial center anchored by a number of big box retail stores, restaurants, and other commercial establishments. The area to the east of Larkridge is characterized by agricultural uses and single family residential subdivisions to the north and south of SH 7. A railroad and bridge crossing at Colorado Boulevard mark the area where the future North Metro Corridor project is planned with the end of line station being located at approximately 162nd Avenue and Colorado Boulevard. One of the area's major subdivisions, Todd Creek, is located near Yosemite Street and SH 7. Approaching US 85 and the City of Brighton, residential, commercial, and industrial uses appear with more regularity. The entrance to the City of Brighton and its downtown occurs when SH 7 intersects with US 85.

2.2 2035 Land Use

Figures 2.4 and **2.5** depict how communities along the SH 7 corridor are envisioned to build out with locations of future land uses based on each community's comprehensive plan.

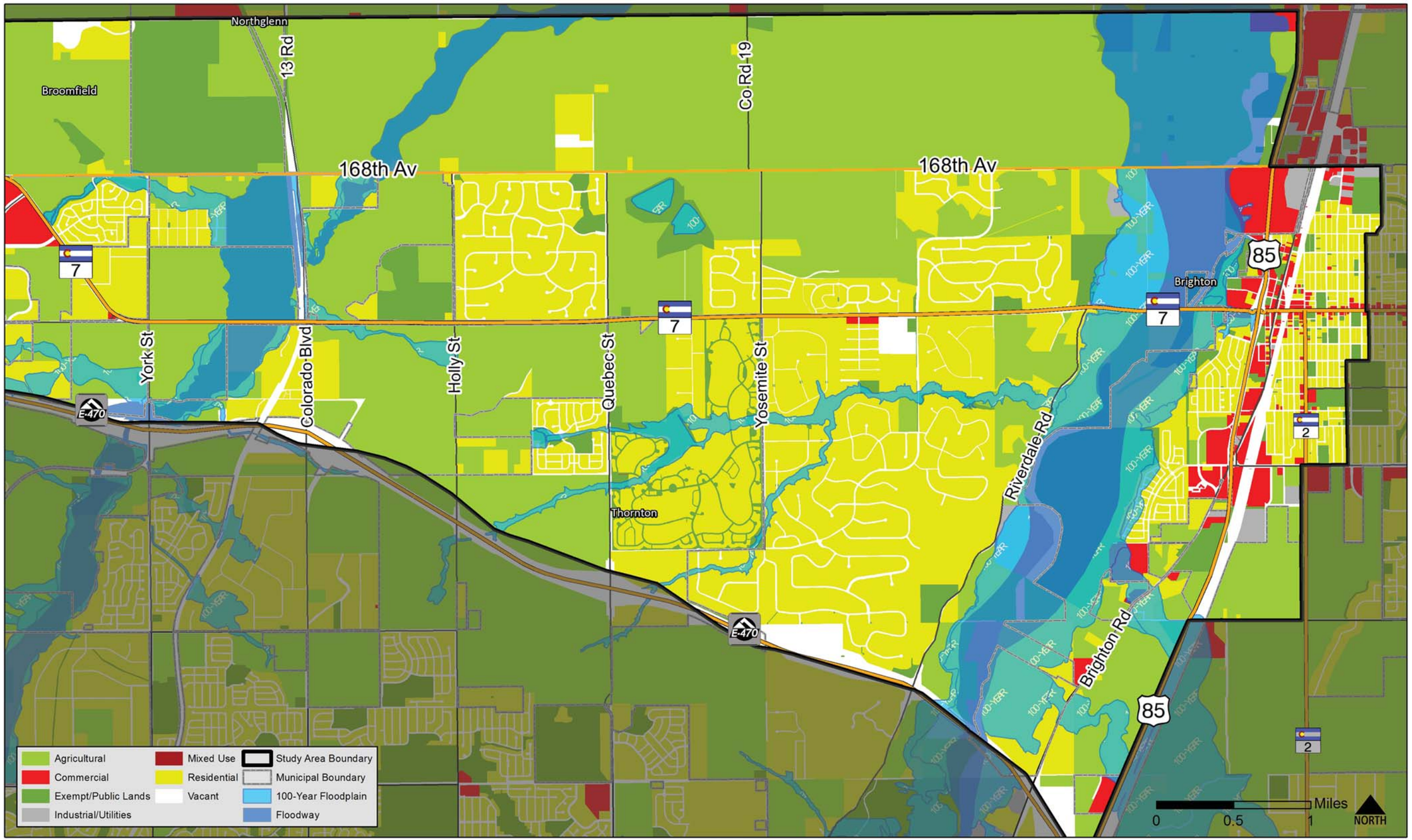
Each community has its own land use categories. For purposes of this analysis, some categories have been combined to provide consistency across communities. For example, regional and neighborhood commercial have been combined into "Commercial." Most communities have single family and multifamily residential categories; these both have been included as "Residential."

Figure 2.2. **Generalized Existing Land Uses (west of I-25)**



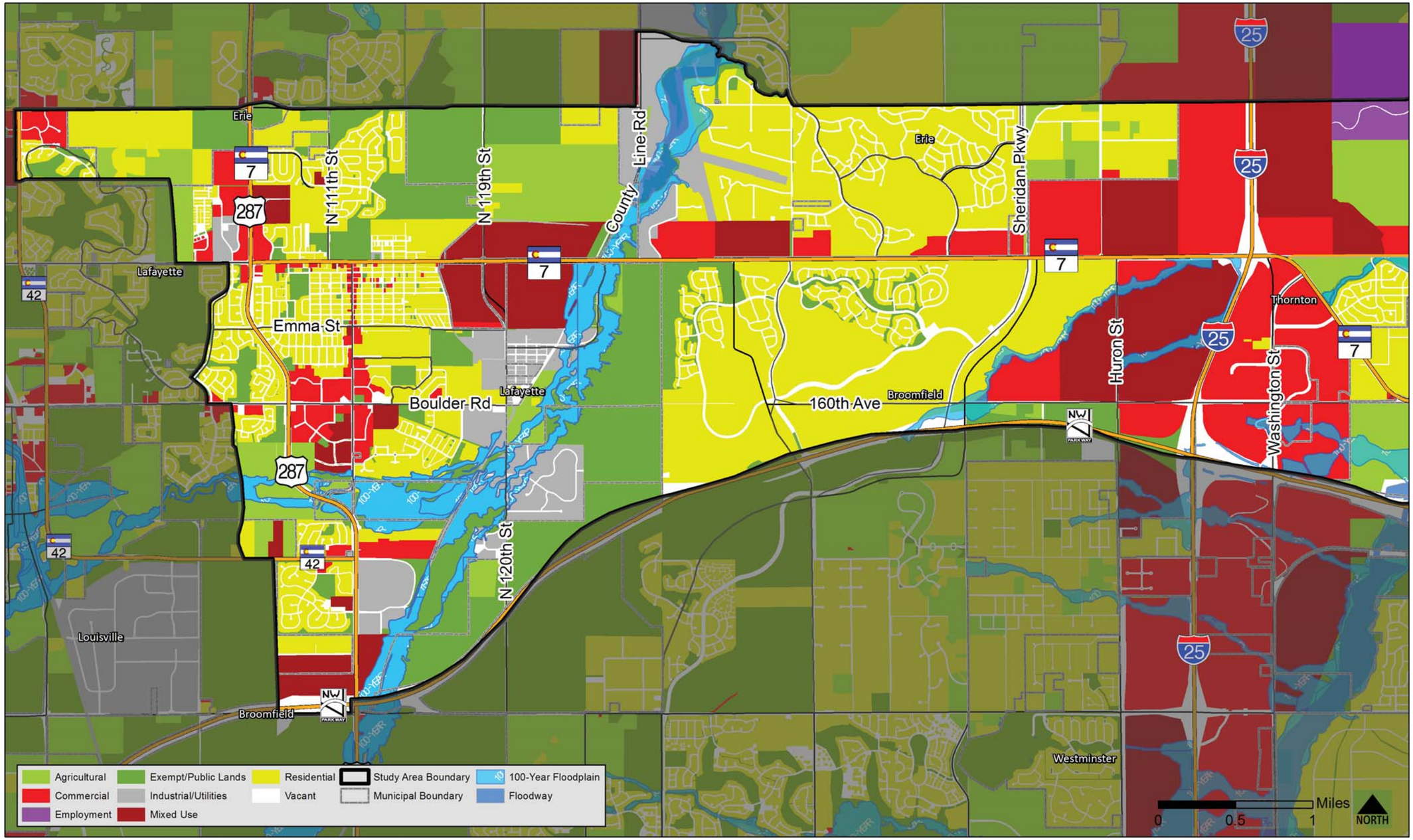
NORTH

Figure 2.3. **Generalized Existing Land Uses (east of I-25)**



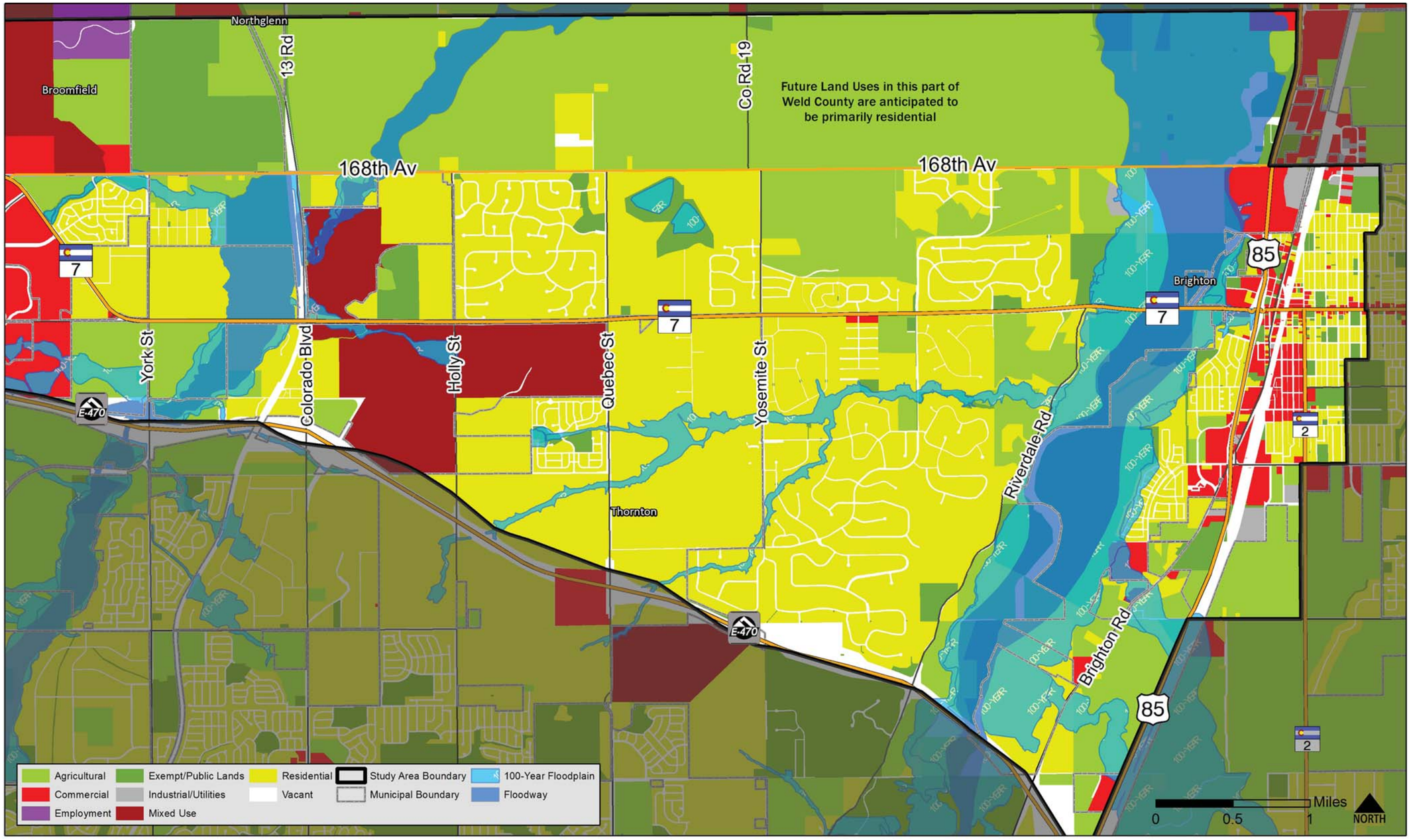
NORTH

Figure 2.4. **Generalized Future Land Uses (west of I-25)**



NORTH

Figure 2.5. Generalized Future Land Uses (east of I-25)



NORTH

The "Mixed Use" category often designates areas near a future transit hub or town center area. While a number of communities have a specific "Industrial" designation, many also have an "Employment" designation which covers retail, office, and industrial land uses. Although both include an employment designation, the "Industrial" and "Employment" categories were not combined.

The future land use maps (**Figures 2.4** and **2.5**) show that the communities along the SH 7 corridor are forecast to fill in and build out significantly. Many of the areas currently designated as "Agricultural" or "Vacant" are planned for future development.

- West of I-25, Broomfield in particular, is forecast for additional residential, commercial, and mixed use developments.
- The corridor area east of Lafayette is projected to continue to be developed with a combination of residential, commercial, industrial, and mixed-use growth.
- The interchange area near I-25 and SH 7 is planned for a significant amount of commercial and employment growth both east and west of I-25.
- The areas east of I-25 are expected to see predominantly residential growth with some commercial services and jobs. The area west of Riverdale Road south of SH 7 is expected to remain primarily agricultural as a buffer area outside of the City of Brighton.
- Interviews with Weld County planners indicate that the area north of SH 7 is forecast for primarily residential growth.

Household and Employment Growth

Table 2.2 shows the projections for household and employment growth in the study area, the 3-mile buffer area, and the region based on DRCOG projections for growth.

Table 2.2 Household and Employment Growth, 2010-2035

	2010	2035	Growth 2010-2035	Percentage Growth 2010-2035	Annual Growth Rate
Households					
Study Area	15,931	44,182	28,251	177%	4.2%
3-Mile Buffer	37,657	91,767	54,110	144%	3.6%
DRCOG Region	1,163,778	1,822,209	658,431	57%	1.8%
Employment					
Study Area	12,896	55,874	42,978	333%	6.0%
3-Mile Buffer	25,259	94,950	69,691	276%	5.4%
DRCOG Region	1,351,473	2,243,784	892,311	66%	2.0%

Source: DRCOG

Between 2010 and 2035, DRCOG projects an additional estimated 28,000 households and 43,000 jobs in the study area. In the larger 3-mile buffer area, an additional 54,000 households and nearly 70,000 jobs are projected. The area around the SH 7 corridor is forecast for significant growth with expected employment increases of particular note.

Figure 2.6 shows projected household growth between 2010 and 2035 in each TAZ. In general, the darker the color, the greater the number of additional households forecast.

- West of I-25, areas in northern Lafayette and Erie are forecast to add a large number of new households, as are the areas in Broomfield both north and south of SH 7. A fewer number of additional households are forecast in existing residential neighborhoods because these areas are built out.
- East of I-25, areas of greater projected household growth include mixed-use and residential areas adjacent to the future North Metro Corridor station near Colorado Boulevard and SH 7. Other areas of greater forecast residential growth are near E-470, which is the southern boundary of the study area.

Figure 2.7 shows projected employment growth between 2010 and 2035 in each TAZ. As with the household maps, the darker the color, the greater the number of additional jobs forecast. While the entire corridor is generally forecast for future employment growth, the area of the greatest expected growth is located near I-25 and SH 7. **Figures 2.4** and **2.5** indicate that this area is designated to be the commercial and employment growth center for the area.

Capacity

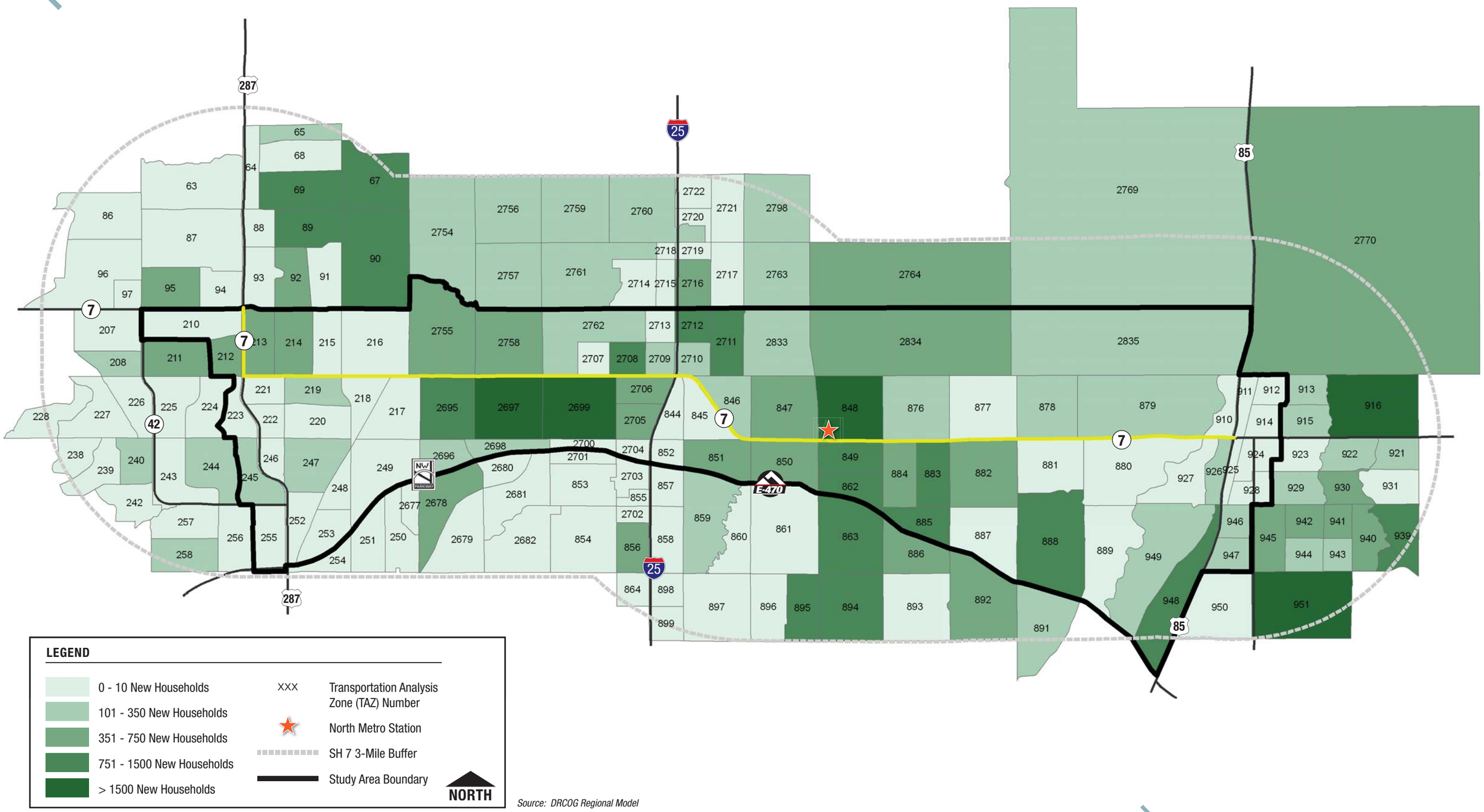
In order to develop household and employment projections for each of the TAZ areas, DRCOG requests local jurisdictions to provide their estimates of the buildout capacity in each TAZ based on each jurisdiction's future land use plans. DRCOG calculates an overall forecast of household and employment for the entire region (the control total) based on a variety of local, state, and federal sources. It then adjusts the household and employment forecasts in each of the TAZs in order to better align them with the overall metro regional total for 2035.

Table 2.3 shows the buildout capacities for the TAZs within the study area and 3-mile buffer area. The 2035 household forecasts are relatively close to the capacity estimates provided by the local jurisdictions; within the study area, the 2035 household forecasts represent 92% of the buildout capacities. Conversely, the employment numbers vary significantly. The 2035 employment forecasts represent just over half of the buildout capacity in both the study area and the 3-mile buffer area. This comparison indicates the potential for significant growth in employment in the area beyond the DRCOG 2035 forecasts.

Table 2.3 2035 Land Use Capacities

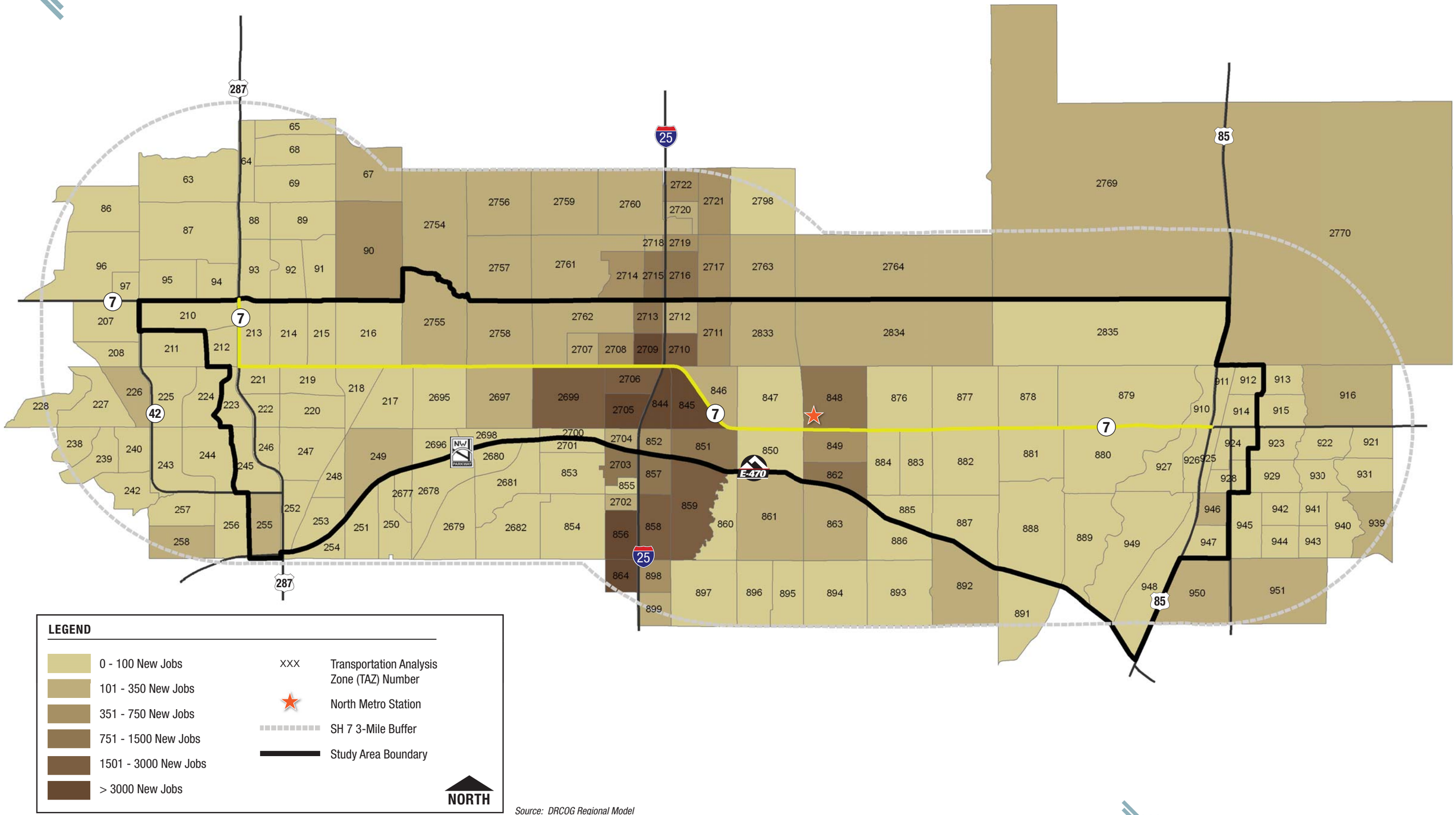
	2035 DRCOG Forecasts	Buildout Capacity	Difference	2035 Percent of Buildout Capacity
Households				
Study Area	44,182	48,035	3,853	92%
3-Mile Buffer	91,767	95,631	3,864	96%
Employment				
Study Area	55,874	101,054	45,180	55%
3-Mile Buffer	94,950	174,312	79,362	54%

Figure 2.6. Household Growth (2010-2035)



Source: DRCOG Regional Model

Figure 2.7. Employment Growth (2010-2035)



Source: DRCOG Regional Model

3.0 EXISTING TRANSPORTATION SYSTEM

This chapter documents the existing transportation system in the study area, including roadway characteristics, travel characteristics, traffic operations, transit, and bicycle/pedestrian facilities and operations.

3.1 Roadway Characteristics

This section presents the existing SH 7 roadway characteristics of existing typical cross-sections, SH 7 right-of-way widths, access categories along SH 7, roadway facilities to parallel SH 7, and drainage.

Typical Cross Sections and Right-of-Way

Within the project limits of the SH 7 PEL (US 287 to US 85), the geometric characteristics of SH 7 are highly variable. SH 7 consists of two-lane and four-lane cross sections (**Figure 3.1**), with right-of-way ranging from 60 feet through Lafayette to as wide as 185 feet on the very eastern portion of the corridor. Typical right-of-way along the corridor is 130 – 150 feet. The surface type for the corridor is asphalt, except for the shared stretch of roadway with US 287, which is concrete. The short stretch of roadway shared with US 287 and the segment between I-25 and East 166th Avenue are four lanes divided by a painted or raised curb median. Two segments (between Lowell Boulevard and Sheridan Parkway and between Havana Street and Riverdale Road) have configurations with two through lanes in one direction, and a single through lane in the opposite direction. The remainder of the corridor has a single travel lane in each direction.

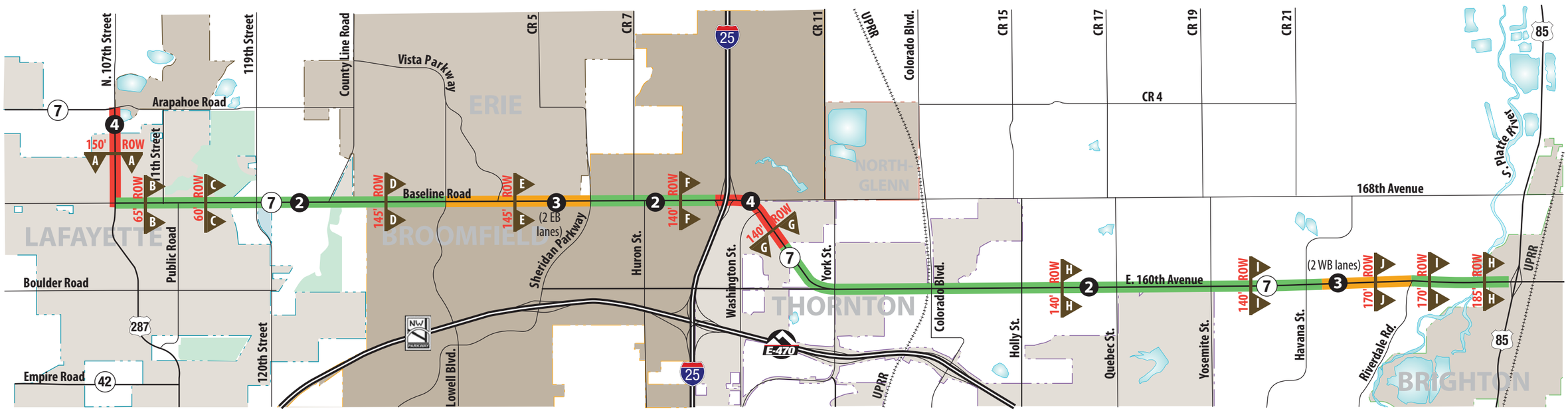
Typical cross sections are shown on **Figure 3.2**, along with corridor constraints and deficiencies that have been noted by the project team. Shoulder widths vary significantly along the corridor, primarily due to various auxiliary lane configurations, but all shoulders that exist are paved. They are most commonly between 6 and 12 feet wide. Areas with shoulders less than six feet are typically curbed, have guardrails, or are along auxiliary lanes. Auxiliary lanes for vehicle movements are provided throughout the corridor and typically use the available shoulders. Auxiliary lanes exist at both signalized and stop-controlled public street intersections for deceleration and acceleration movements.

Much of the corridor has no median, but when present, median configurations vary significantly. While raised medians exist near major intersections in urban/suburban areas, painted medians predominate. Widths of painted medians range from 4 feet to more than 20 feet, with most measuring between 8 and 12 feet wide.

Access Categories

CDOT has assigned access categories for all segments of each state highway in Colorado. These categories relate to the requirements and thresholds for access spacing and auxiliary lane requirements documented in the *State Highway Access Code*. **Figure 3.3** shows the current access categories along the SH 7 corridor, along with a description of the characteristics associated with each category. The section of SH 7 east of I-25 is currently categorized as a Regional Highway (R-A), and most of the western half of the corridor is categorized as Non-Rural Principal Highway (NR-A), which is similar to R-A, but for more urban/suburban settings. R-A and NR-A are the highest (and most restrictive in terms of allowable access) categories along the corridor. A small segment of SH 7 in Brighton is categorized as Non-Rural Arterial (NR-B), and the segment through Lafayette is Non-Rural Arterial (NR-C), which is the least restrictive category and is generally assigned to state highway segments in downtown areas.

Figure 3.1. Existing Through Travel Lanes and Right-of-Way



LEGEND

- XXX' Approximate Right-of-Way
- X X Cross Section Location (refer to typical cross sections, Figure 3.2)
- X 2 Through Travel Lanes
- X 3 Through Travel Lanes
- X 4 Through Travel Lanes

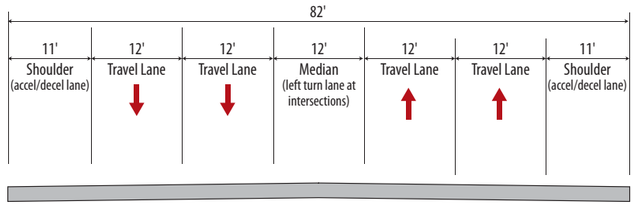
NORTH

Figure 3.2. Existing Cross Sections (facing east)

CORRIDOR CONSTRAINTS and DEFICIENCIES

A

- Narrow shoulders near intersections

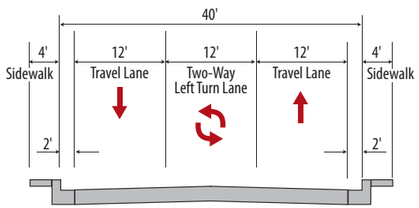


A

US 287 / SH 7: Baseline Road to Arapahoe Road

B

- Constrained ROW
- Narrow sidewalks

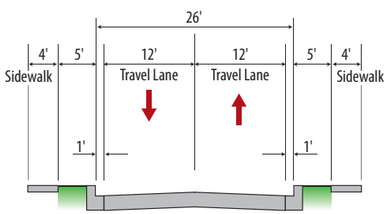


B

SH7: US 287 to Public Road

C

- No median / left turn lanes
- Constrained ROW
- Narrow sidewalks

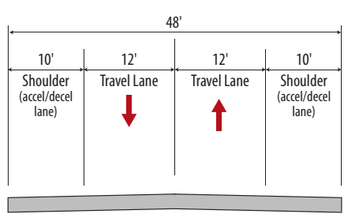


C

SH7: Public Road to Burlington Avenue

D

- Narrow shoulders near intersections

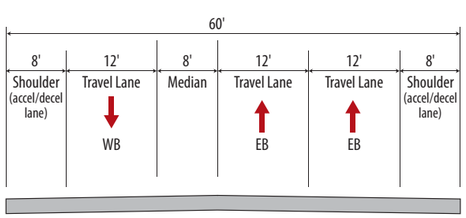


D

SH7: Burlington Avenue to Lowell Boulevard

E

- Narrow shoulders near intersections



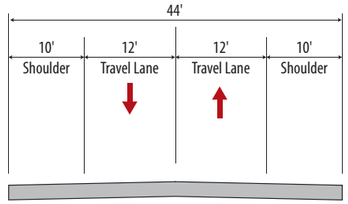
E

SH7: Lowell Boulevard to Sheridan Parkway

CORRIDOR CONSTRAINTS and DEFICIENCIES

F

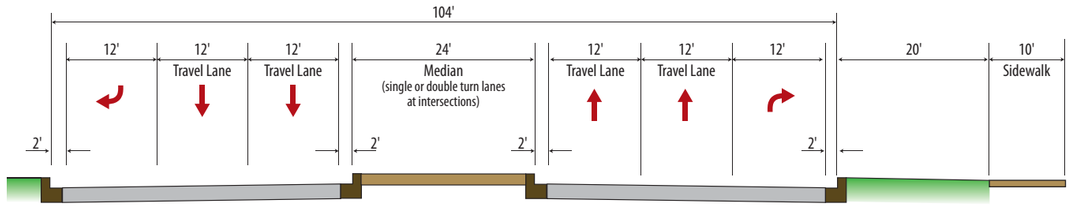
- No median
- Offset intersection at CR 7 / Huron Street



F

SH7: Sheridan Parkway to I-25

G

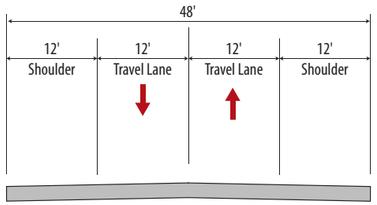


G

SH 7: I-25 to 166th Avenue

H

- No median
- Inadequate EB merge at SH 7 / 160th Ave.
- Inadequate sight distance at Colorado Blvd.
- No turn lanes at Colorado Blvd. due to Railroad bridge
- Vertical sight distance on eastbound approach to Quebec St.

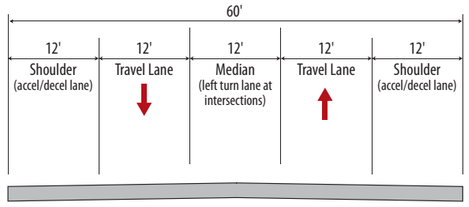


H

SH7: 166th Avenue to Yosemite Street and Tucson to US 85

I

- Narrow shoulders at intersections

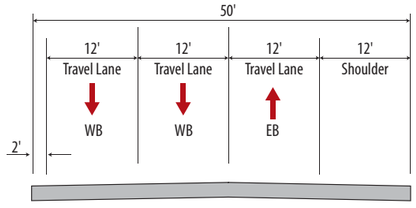


I

SH7: Yosemite Street to Havana Street and Riverdale Road to Tucson

J

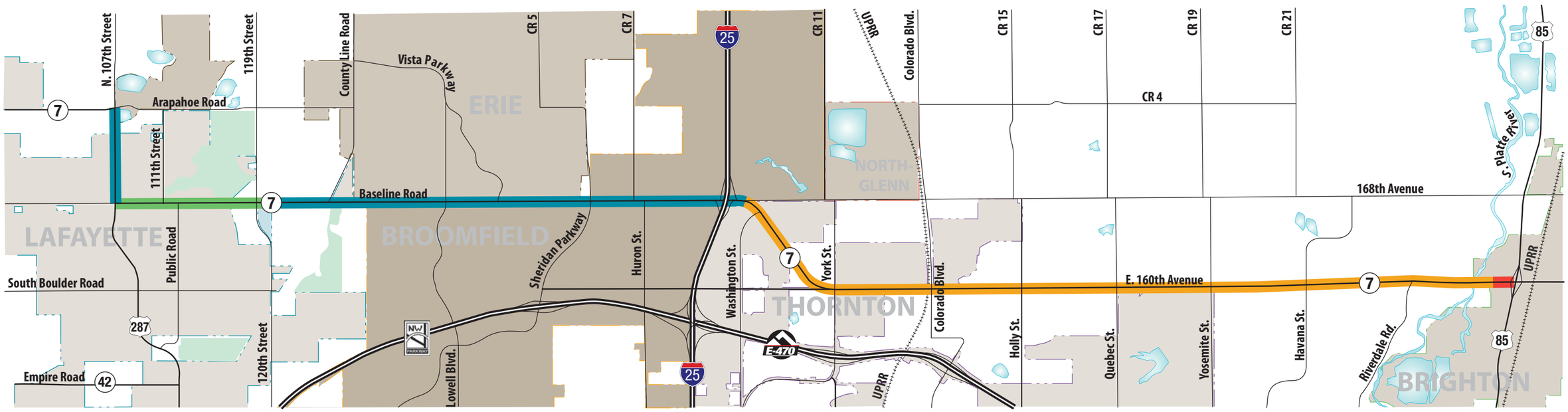
- Narrow shoulder on north side
- No median



J

SH7: Havana Street to Riverdale Road

Figure 3.3. Current Access Categories



LEGEND

- R-A Regional Highway
- NR-A Non-Rural Principal Highway
- NR-B Non-Rural Arterial
- NR-C Non-Rural Arterial

NORTH

ACCESS CATEGORY CHARACTERISTICS

	Setting	Speeds	Volumes	Distances	Travel Types	Priority Movement	Access per Parcel	½ mi. Spacing Exceptions and Unsignalized Left Turns	Auxiliary Lane Thresholds
R-A	Rural	Medium / High	Medium / High	Medium / Long	Inter-regional Intra-regional Inter-city	Through	1	Limited	Lower
NR-A	Urban / Suburban	Medium / High	Medium / High	Medium / Long	Inter-regional Intra-regional Inter-city Intra-city	Through	1	Limited	Lower
NR-B	Urban / Suburban	Medium	Medium / High	Medium / Short	Inter-city Intra-city Inter-community	Through with more direct access	1+	Moderate	Higher
NR-C	Urban / Downtown	Low / Medium	Medium	Medium / Short	Inter-city Intra-city Inter-community	Balanced	1+	None	Higher

Parallel Roadway Facilities

There are a number of roadway facilities that are parallel to SH 7 and also provide for east-west travel in the northern Denver metropolitan area. Some of these facilities provide relief to SH 7 today, and others have potential to relieve SH 7 in the future. The following is a description of each of the parallel roadway facilities in the study area and their potential for providing relief to SH 7.

- **E-470/Northwest Parkway** – These two tollways are located just to the south of SH 7. Between York Street and Colorado Boulevard, the E-470 tollway is within a mile of SH 7. The potential for these facilities to relieve SH 7 is the highest in the central portion of the corridor, where E-470/Northwest Parkway travels along an east-west alignment. On the eastern and western ends of the study area, both E-470 and Northwest Parkway divert to the south, providing less opportunity to serve as an east-west reliever to SH 7. Since these facilities are tolled, any diversion from SH 7 would likely need to offer a significant time savings for drivers to be willing to pay the toll.
- **Arapahoe Road** – West of US 287, Arapahoe Road (one mile north of Baseline Road) is designated as SH 7. East of US 287, the SH 7 right-of-way through Lafayette (between US 287 and 119th Street) is very constrained. Arapahoe Road provides an opportunity for travelers to divert away from this constrained section; particularly for extended travel to the west on SH 7. The City of Lafayette and the Town of Erie have both discussed the possibility of a realignment of SH 7 to Arapahoe Road to disperse the traffic through the Lafayette area. Preserving the rural character of the area surrounding Arapahoe Road/SH 7 and potential impacts to Boulder County Open Space to the west and east of 119th Street are substantial issues for increasing the use or realigning SH 7.
- **South Boulder Road** – Currently, South Boulder Road terminates at 120th Street, and 160th Avenue terminates at Sheridan Parkway. There is a gap of approximately three miles between these two roadways. The Northwest Parkway Intergovernmental Agreement (dated February 1999) states that "The Parties [Boulder County, the City and County of Broomfield, the City of Lafayette, and the City of Louisville] will support extension of South Boulder Road from S. 120th St. eastward to Lowell Boulevard to provide access to a future Northwest Parkway interchange. The Parties will support an application through the DRCOG process for inclusion of this project on the TIP, with Lafayette as the sponsoring agency." The extension of South Boulder Road would provide a continuous east-west parallel facility to SH 7, and would likely divert some traffic from SH 7. A sensitivity analysis is included in chapter 4 that addresses the impact of South Boulder Road on SH 7.
- **168th Avenue** – East of I-25, 168th Avenue extends to US 85, through the City of Brighton to I-76, where a full interchange is provided. Within the study area, 168th is the boundary between Weld and Adams Counties. The north-south section line roads are offset at 168th Avenue, resulting in a series of closely spaced offset intersections. As described previously, Adams County and Weld County completed the *Weld/Adams County Line Crossroads Alignment Study* to address realignment of these intersections. The extent to which 168th Avenue can relieve SH 7 in the future is somewhat limited until the intersection and corridor recommendations can be implemented.

Drainage

The following narrative describes the existing drainage, irrigation, and water quality facilities within the SH 7 corridor. The literature search for this section included the North I-25 EIS and the North Metro Corridor project Final EIS. A field investigation on March 28, 2012 supplemented the analysis.

Existing Drainage Facilities

Drainage within the corridor includes six Federal Emergency Management Agency (FEMA) regulatory floodplains. These are Coal Creek, Big Dry Creek, South Fork of Preble's Creek, Preble's Creek, Morris Creek, and the South Platte River. These crossings are described further in **Section 5.4**.

Many secondary drainageways pass through the corridor via smaller conduits, which eventually outfall to one of the above major drainageways. When SH 7 was constructed during the 1960s most of the nearby properties between the Brighton and Lafayette city limits were undeveloped. The corridor has gradually developed and is now about 50 percent residential (predominantly large lot), 45 percent farm land and 5 percent commercial. Curb and gutter sections are located within the urbanized west and east edges of the corridor at Lafayette and Brighton where storm drainage facilities include only a few inlets. The intersection of SH 7/119th Street and adjacent properties on the north side of SH 7 currently experience frequent flooding during heavy rainfall events. Storm drainage improvements at SH 7/119th Street have been proposed but not installed at this time. Storm drainage improvements at the Larkridge Shopping Center near I-25 are recent and include curb and gutter, inlets, and a pond at the eventual outfall near the South Fork of Preble's Creek. Storm drainage sheet flows off of the road and into a parallel roadside ditch along the remaining areas of SH 7 and 168th Avenue. These road side ditches appear to be stable even though the vegetative cover is sparse. Accesses to farms and residential areas cross over culverts in the road side ditches.

The corridor falls within the Urban Drainage and Flood Control District (UDFCD) boundaries. The UDFCD has prepared many studies for the corridor that include Flood Insurance Studies (FIS), Outfall Systems Plans (OSP), and other pertinent studies.

Existing Irrigation Facilities

Existing irrigation facilities within the corridor are listed in **Table 3.1** below. Irrigation companies are always concerned about roadway drainage and how the quantity and quality of runoff impacts their facilities. They also want to protect their water rights and have access to their right-of-way. Roadway crossings must be coordinated with the irrigation companies to determine if a conduit can be extended in-kind or replaced with a particular size and type of conduit. If roadway improvements require modifications to irrigation facilities, the construction must occur during the non-irrigation season or at a time when the ditch can be placed out of service. **Table 3.1** lists the irrigation crossings that are shown on the Colorado Division of Water Resources, CDSS Map Server. The open areas along the corridor consist mainly of dry land crops such as wheat, barren areas (possibly grazed) with weeds and native grasses, and some rotary irrigated crops. Irrigation laterals are present just outside the right-of-way in several reaches of the roadway. These laterals are either concrete or earthen-lined. It does not appear that any of the SH 7 or 168th Avenue roadway drainage enters these laterals.

Table 3.1 Summary of Irrigation Ditches

Location	Name	Owner	Notes
SH 7 MP 76.729	McCann Ditch/Third Ck.	McCann Ditch & Res. Co P.O. Box 38 Brighton, CO 80601	From South Platte River
SH 7 (W. of Riverdale Road)	Brighton Ditch	Brighton Ditch 3286 WCR 23 Ft. Lupton, CO 80621	From South Platte River
SH 7 MP 75.751 (W. of Riverdale Rd.)	Brantner Ditch	Brantner Ditch Company Alvin Dechant, President, 4936 Weld County Road 23, Ft. Lupton, Colorado 80621	Oldest irrigation system in Water District No. 2 of the S. Platte River Drainage
SH 7 (W. of Quebec St.)	Signal Ditch	Signal Ditch % Bryce Steele, Attorney 25 South 4th Ave. Brighton, CO 80601	From Big Dry Creek
SH 7 (East of Colo. Blvd.)	German Ditch	German Ditch % FRICO 80 S. 27th Avenue Brighton, CO 80601	From Big Dry Creek
SH 7 MP 68.276 (I-25 Area)	Bull Canal/Stanley Ditch	Bull Canal % FRICO 80 S. 27th Avenue Brighton, CO 80601	From Big Dry Creek
SH 7 (1500' W. of Sheridan Blvd.)	Community Ditch	Community Ditch Farmer's Reservoir and Irrigation 80 S. 27th Avenue Brighton, CO 80601 (303) 944-6761	From Coal Creek
(5500' S. of Arapahoe Road)	Goodhue Ditch	Goodhue Ditch & Reservoir Rich Koopmann, President c/o Boulder County Parks & Open Space 5201 St. Vrain Road Longmont, CO 80503 (303) 678-6270 rkoopmann@bouldercounty.org	From South Boulder Creek Priority No. 29
(1000' S. of Arap. Rd.)	South Boulder Canyon Ditch	South Boulder Canon Ditch Company Jody Lambert, President c/o Town of Erie P.O. Box 750 Erie, CO 80516 (303) 926-2882 Email: jodyl@ci.erie.co.us	From South Boulder Creek Priority No. 21
168th West of Holly St.	Thompson Ditch		From Big Dry Creek

Existing Water Quality Facilities

A large pond for the Larkridge Shopping Center at SH 7 and I-25 appears to accept some SH 7 stormwater along its frontage for detention and treatment. No other private temporary or permanent water quality facilities within the SH 7 or adjacent I-25 right-of-way were observed during the field investigation. Several of the newer adjacent developments such as Anthem, appear to have detention and/or water quality ponds. CDOT has a Phase I Municipal Separate Storm Sewer System (MS4) permit from the Colorado Department of Health and Environment (CDPHE). The SH 7 corridor includes portions of Brighton, Thornton, Adams County, Weld County, Lafayette, Erie, Broomfield, and Boulder County. All of these jurisdictions have Phase II MS4 Permits. Jurisdictions that have Phase I or Phase II MS4 Permits are required to provide permanent water quality facilities for new development or redevelopment where there will be one acre or greater of new paved areas.

3.2 Travel Characteristics

Table 3.2 shows various travel characteristics for the census tracts in the study and 3-mile buffer areas (**Figure 2.1**) from the US Census Bureau 2006-2010 American Community Survey (ACS). The ACS is an ongoing annual survey conducted by the Census Bureau covering a variety of different demographic and economic indicators including information about where residents work, length of commute, and means of transportation.

Over 75 percent of residents in both the study and 3-mile buffer areas commute to their jobs by driving alone. A slightly higher percentage of residents in the 3-mile buffer area either carpool or take public transportation than do so in the study area. The majority of commute times in both the study and 3-mile buffer areas are 30 minutes or less. On average, however, commute times in the 3-mile buffer area are significantly lower, at an average of 18 minutes compared to the average commute time in the study area at 24.9 minutes.

The majority of households have two or more vehicles. The majority of all households in both the study and the 3-mile buffer areas leave their homes between 7:00 and 8:00 am for work. Study area commuters, on average, leave their homes earlier for work compared to commuters in the larger 3-mile buffer area. A majority of residents in the study area work in a county outside of their county of residence while in the 3-mile buffer area, the majority of residents work within their county of residence.

Table 3.2 2006-2010 Travel Characteristics

	Study Area	3-Mile Buffer
Primary Means of Transportation to Work		
Car/Truck (alone)	76.7%	77.1%
Carpool	9.6%	10.0%
Public Transit	2.7%	2.8%
Other	11.0%	10.2%
Total	**100.0%**	**100.0%**
Commute Time		
0-29 Minutes	56.3%	57.1%
30-59 Minutes	36.9%	36.7%
60+ Minutes	6.9%	6.3%
Total	**100.0%**	**100.0%**
Average Commute Time	**24.9 Minutes**	**18.0 Minutes**
Vehicle Availability		
0 Vehicles	0.8%	0.9%
1 Vehicle	13.8%	13.4%
2 Vehicles	44.8%	45.0%
3+ Vehicles	40.6%	40.6%
Total	**100.0%**	**100.0%**
Workers by Time Leaving Home		
5:00 am to 5:59 am	8.7%	8.3%
6:00 am to 6:59 am	20.0%	19.9%
7:00 am to 7:59 am	32.2%	32.1%
8:00 am to 8:59 am	16.5%	18.1%
Other	22.6%	21.6%
Total	**100%**	**100%**
Place of Work		
In County of Residence	49.6%	52.2%
Outside County of Residence	50.4%	47.8%
Total	**100.0%**	**100.0%**

Source: American Community Survey, US Census Bureau, ArLand

3.3 Traffic Operations

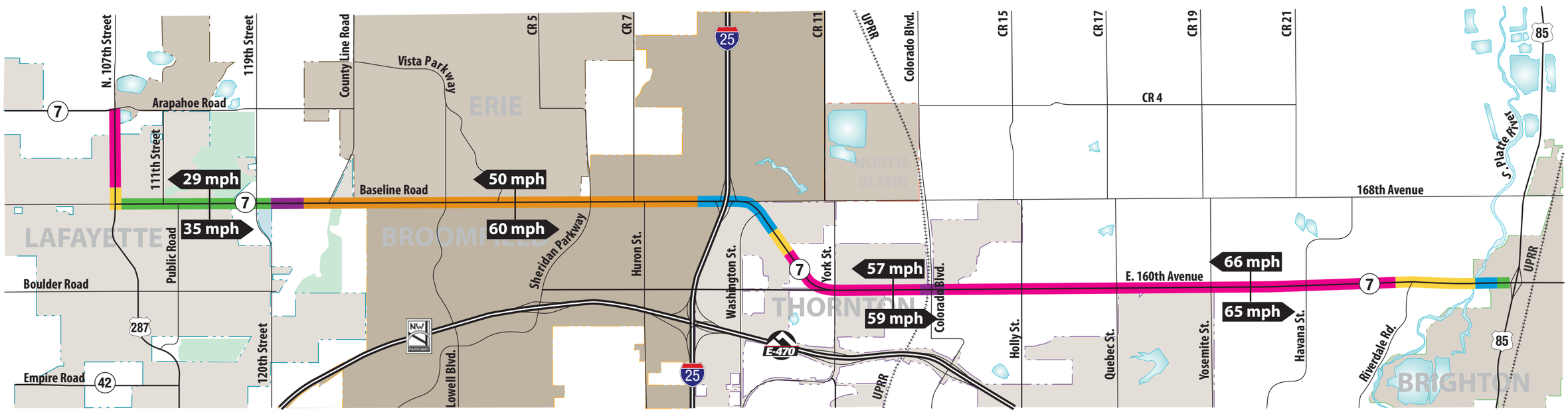
This section presents the existing SH 7 travel speeds, travel times, traffic volumes, intersection geometry intersection levels of service (LOS), and crash data analysis.

Travel Speeds and Travel Times

The posted speed limits along SH 7 vary from 55-60 mph in rural areas, 40-50 mph in suburban areas, and 30-40 mph in more urban areas, as shown on **Figure 3.4**. Actual speeds were recorded at four locations along the corridor. The resulting 85th percentile speeds (over a 24-hour period) are shown on **Figure 3.4**. Along the western half of the corridor, 85th percentile speeds in the westbound direction are at or below the posted speed limit, while eastbound speeds are approximately five miles per hour above the posted speed. This disparity in speeds by direction is likely a result of westbound traffic slowing as they approach the more urbanized area through Lafayette, and the presence of two westbound travel lanes between Lowell Boulevard and Sheridan Parkway.

Travel time was recorded in each direction of the corridor during the AM peak hour, midday, and during the PM peak hour. **Figures 3.5 and 3.6** show the average travel times for the western half and the eastern half of the corridor, respectively. For each time period, the travel time represents the average of three travel time runs, by direction. **Figure 3.5** shows slower speeds (higher average travel time) in the westbound direction during the AM peak hour, and slower speeds in the eastbound direction during the midday and PM peak hour. In the eastbound direction, travel time during the PM peak hour is approximately two minutes longer than during the AM peak hour as a result of higher PM peak hour volumes in the eastbound direction.

Figure 3.4. Existing Posted and Observed Speeds



LEGEND

Posted Speed Limit

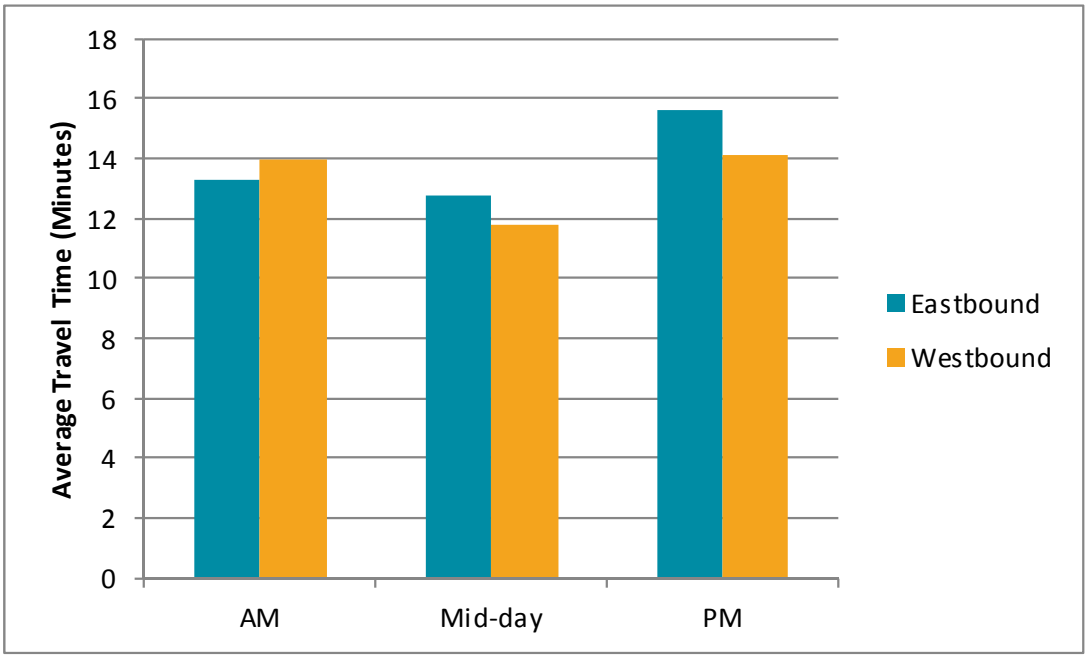
- 30 mph
- 40 mph
- 45 mph
- 50 mph
- 55 mph
- 60 mph

Observed Speeds

- XX mph — Westbound 85th percentile speed
- XX mph — Eastbound 85th percentile speed

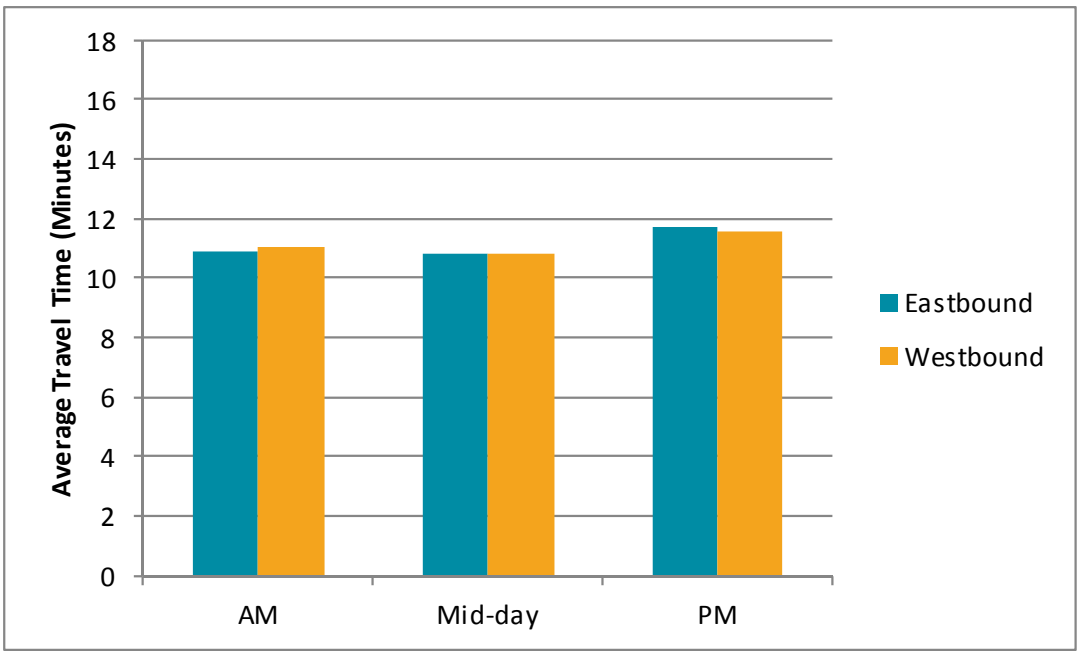
NORTH

Figure 3.5 Average Travel Times (Between US 287/Arapahoe and I-25)



The travel times along the eastern half of the corridor (shown below) are much more consistent than those along the western half. As shown on **Figure 3.6**, eastbound and westbound travelers experience nearly the same travel times, and the difference in average travel time between the AM peak hour, mid-day, and PM peak hour time periods is minimal.

Figure 3.6 Average Travel Times (Between I-25 and US 85)



Traffic Volumes

The existing daily traffic volumes along SH 7 range from approximately 11,400 vehicles per day (vpd) on the west end through Lafayette to 22,000 vpd in the vicinity of I-25, as shown on **Figure 3.7**. Daily traffic volumes through Broomfield and Erie are approximately 18,000 – 19,000 vpd, and through Adams County and Thornton, the daily traffic volumes are in the range of 15,000 vpd.

Most of the SH 7 study corridor is defined by FHWA as a national truck route, with the exception of the portion within the City of Brighton that has no truck route distinctions or restrictions. Heavy truck traffic on the corridor is typically two percent or less of traffic, but some areas around I-25 have between three percent to more than five percent of traffic as heavy trucks (**Figure 3.7**).

SH 7 during the peak hours of operations is a commuter corridor with traffic primarily traveling west during the morning and east during the evening peak period. Traffic volumes for the AM and PM peak periods are shown on **Figures 3.8** and **3.9**. The intersections east of York Street have few vehicles (less than 100) turning onto side streets during the peak hours. West of York Street, turning movements increase as the highway passes through more developed areas.

Intersection Geometry and Level of Service

In order to conduct the existing conditions analysis, a traffic model of the SH 7 corridor was built using Synchro 7 traffic analysis software. Field visits were conducted to inventory roadway geometry along the corridor to be included in the modeling effort. Signal timing data were collected from CDOT and local agencies, and traffic volumes were input to the model from the counts that were completed along the corridor.

Geometry

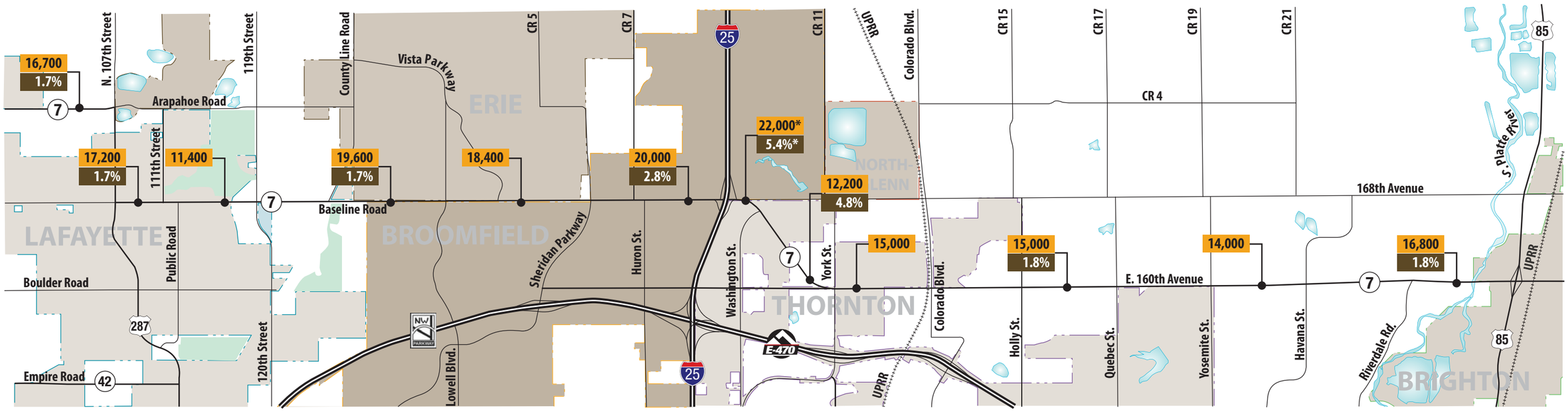
SH 7 is primarily a two-lane highway with auxiliary lanes. Storage lengths for auxiliary lanes at some intersections are too short to handle the peak hour demands, resulting in turning queues blocking through traffic. This results in increased congestion to through traffic, reducing the efficiency of traffic signals. The Union Pacific Railroad (UPRR) crosses SH 7 at Colorado Boulevard and is grade separated. The bridge structure over SH 7 constrains the ability to provide auxiliary lanes at the SH 7/Colorado Boulevard intersection.

The majority of the study intersections along the corridor are signalized. The unsignalized intersections are two-way stop-controlled, with the exception of the on and off-ramp intersections at US 85 which are controlled by roundabouts.

Model Calibration

After the model was developed to reflect current geometry and traffic control conditions, the model was then calibrated to accurately reflect existing conditions from the field. This was done through the use of travel times that were collected during the data collection phase of the study.

Figure 3.7. 2012 Daily Traffic Volumes and Truck Percentages



LEGEND

XXXX Daily Traffic Volumes
X.X% Percent Truck Traffic

Counts recorded in January 2012

* *CDOT 2010 count*

NORTH

Figure 3.8.

Existing AM and PM Peak Hour Traffic Volumes (SH 7)

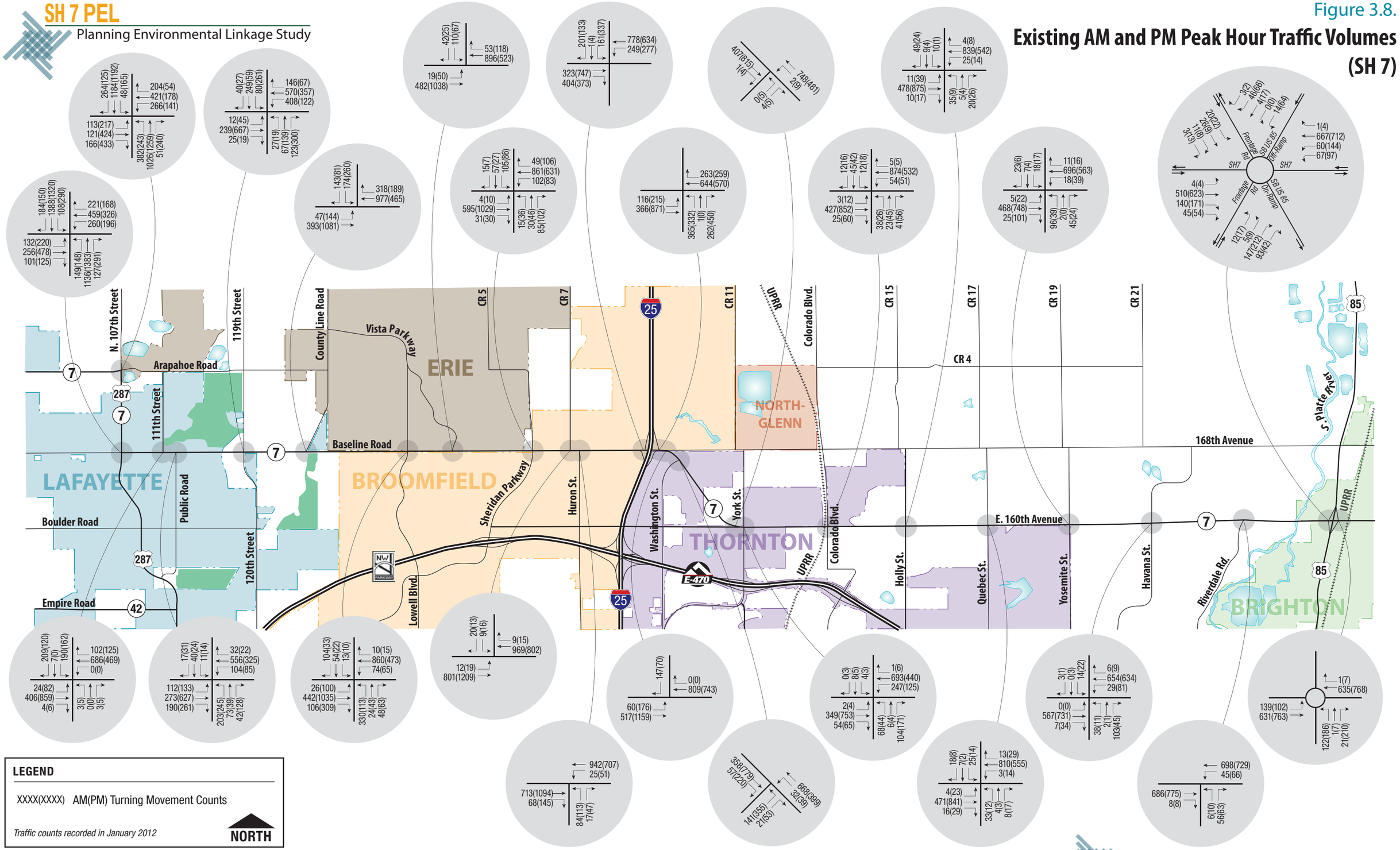
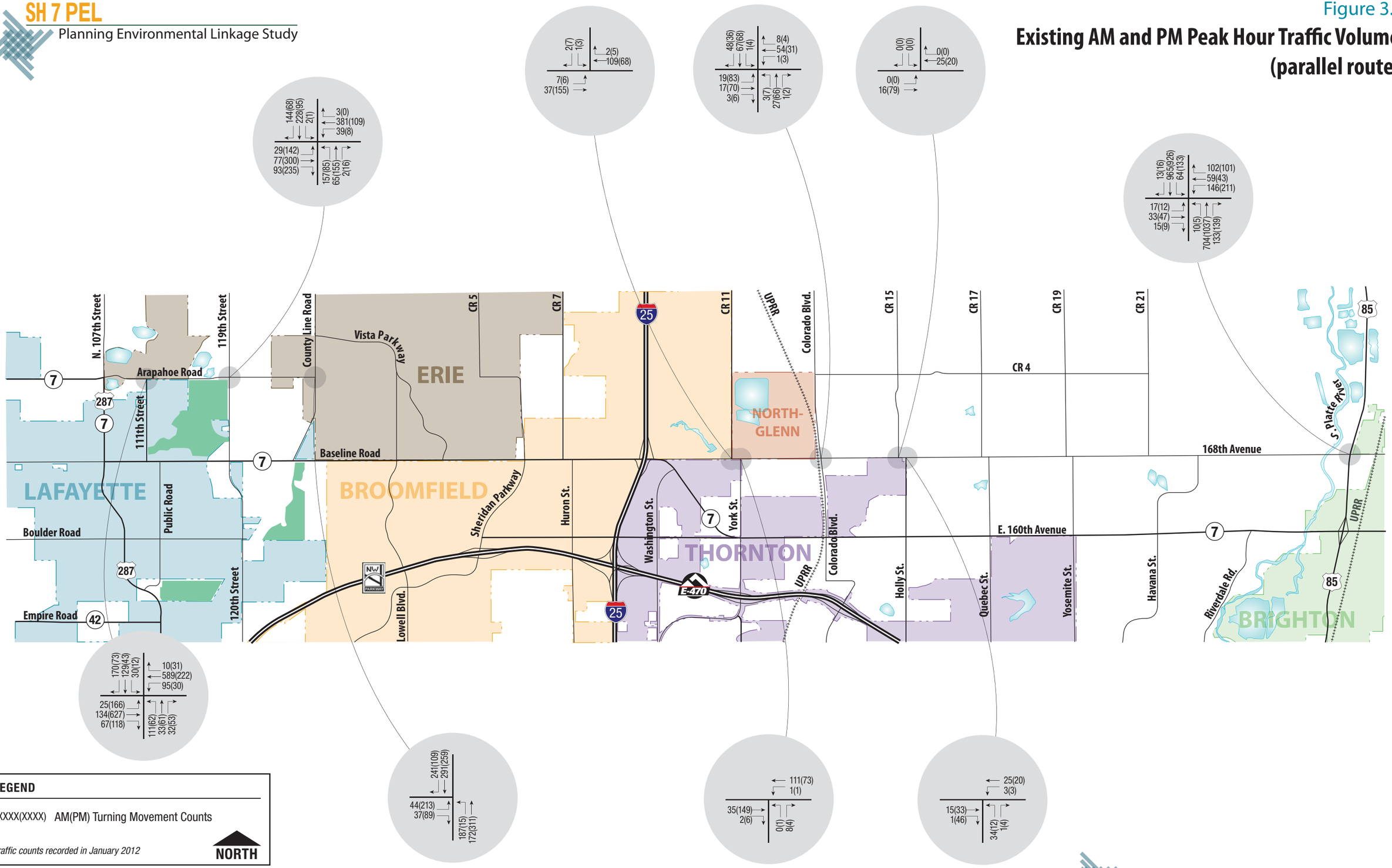


Figure 3.9.

Existing AM and PM Peak Hour Traffic Volumes (parallel routes)



Once the travel time runs were completed and the Synchro traffic model was built, travel times from the field were compared with those from SimTraffic, a traffic simulation program contained within Synchro. A calibration method using engineering judgment was used in which minimal changes to the model were made. For example, queue lengths in the simulation were compared to field observations during the peak hours. If queue lengths were much longer in SimTraffic than in the field, the model was modified to match field conditions. One example would be if the model showed queuing in the left turn lane that was impeding through traffic along SH 7, causing longer queues than were observed in the field. In this case, the left turn storage was increased slightly until the model matched observed field conditions.

Summary of Existing Conditions Analysis

Traffic operations for each of the signalized and unsignalized intersections were analyzed using the methods described in the *Highway Capacity Manual (*HCM) and reported from the Synchro 7 model output. According to the HCM, the overall performance of an intersection is determined by the level of delay experienced by motorists at the intersection. Depending on the level of delay that is experienced, each intersection can be scored on a LOS scale and given a letter grade from A to F, with A being the best possible grade for the intersection. Level of service A describes intersections with low control delay. Level of service F is associated with high delays and is considered unacceptable to most drivers. This most often occurs with oversaturation, high congestion, poor progression of traffic signals, and/or long cycle lengths.

As part of the existing conditions analysis, the LOS for the signalized and unsignalized intersections was determined for the AM and PM peak periods. **Figures 3.10 and 3.11** show the lane configuration and intersection control at each intersection in the study area and the results of the existing condition LOS analysis. During the AM and PM peak periods, most intersections operate at LOS D or better. Most of the intersections that operate at LOS E or F are two-way stop controlled intersections. The worst LOS for each approach is the determining factor for the LOS at that intersection; therefore, SH 7 traffic is still flowing through these locations freely. Due to the amount of through traffic on SH 7 during the peak hours, drivers from the side streets have difficulty finding a gap in traffic, and therefore have increased delays.

The signalized intersections of US 287/Arapahoe and US 287/Baseline Road are the only signalized intersections with LOS E or F. The US 287/Arapahoe and US 287/Baseline Road intersections have high entering traffic volumes and are over capacity, with their current geometric configuration and signal timing resulting in LOS E/F.

Crash Data Analysis

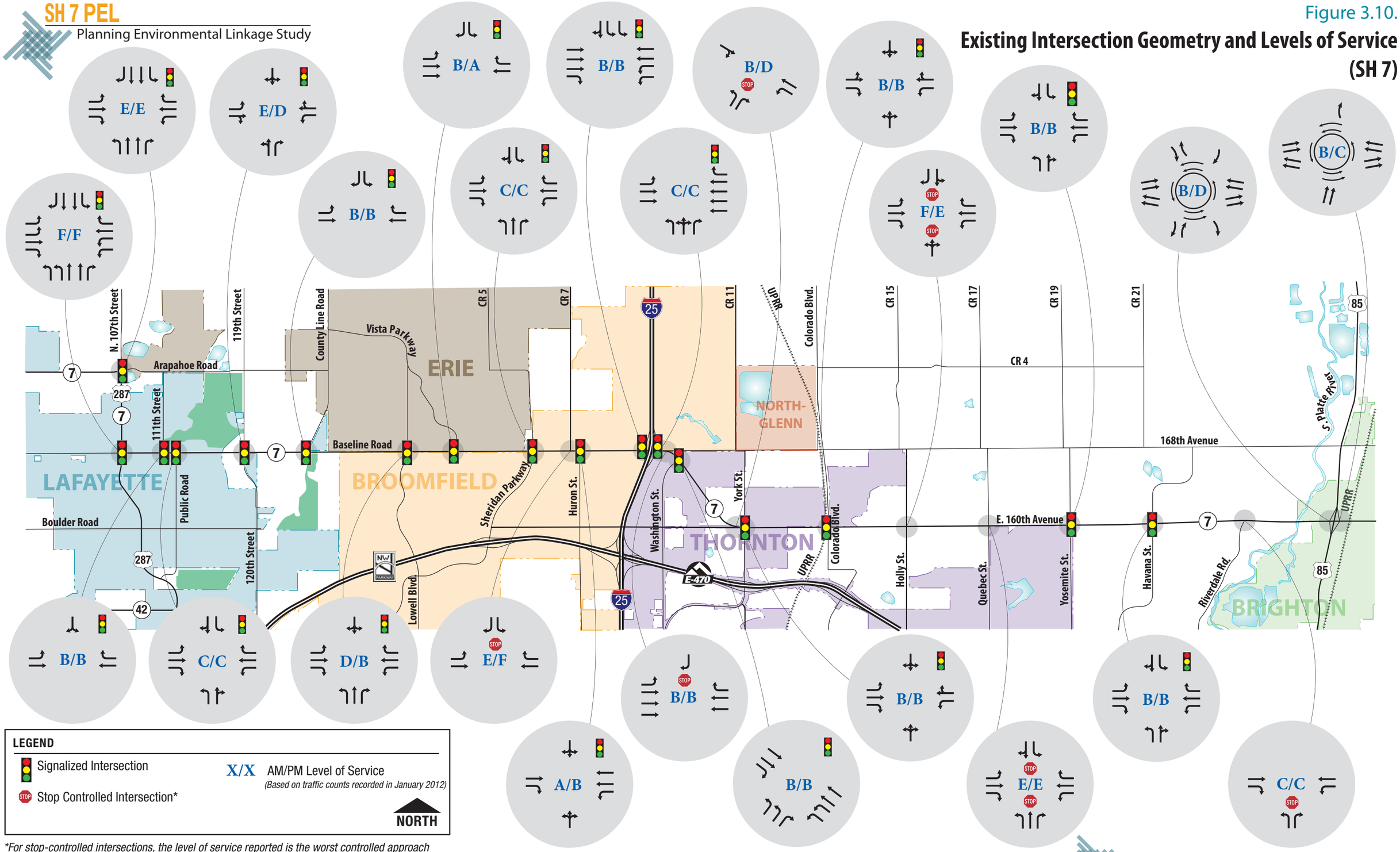
Crash history for the three-year period, from January 1, 2008 through December 31, 2010, was examined for the study corridor to locate crash clusters and identify crash causes.

Crash History

During the three-year study period, there were 675 reported crashes on SH 7 within the project limits. The majority (about 90 percent) were property damage only (PDO) crashes. In addition, there were 61 injury crashes and 2 fatal crashes. Both fatal crashes occurred in 2008 with one at an intersection (a broadside crash at Holly Street) and the other at a non-intersection location (a sideswipe opposite direction crash, east of Quebec). **Figure 3.12** presents graphical representations of the crash types and crash severity for this corridor. Rear-end type crashes (52 percent) were the predominant crash type, followed by broadside type crashes (15 percent).

Figure 3.10.

Existing Intersection Geometry and Levels of Service (SH 7)



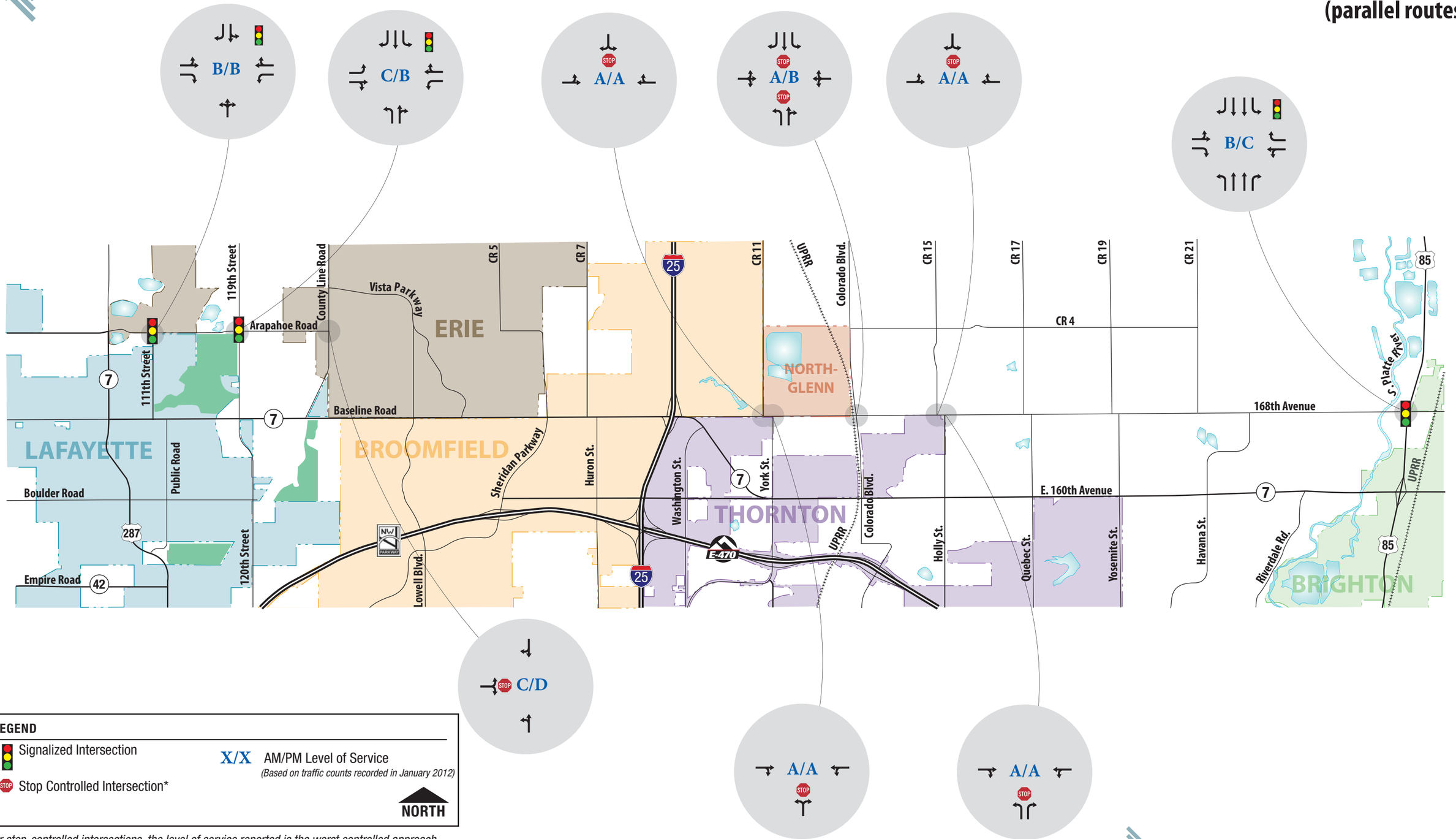
LEGEND

- Signalized Intersection
- Stop Controlled Intersection*
- X/X AM/PM Level of Service (Based on traffic counts recorded in January 2012)
- NORTH

*For stop-controlled intersections, the level of service reported is the worst controlled approach

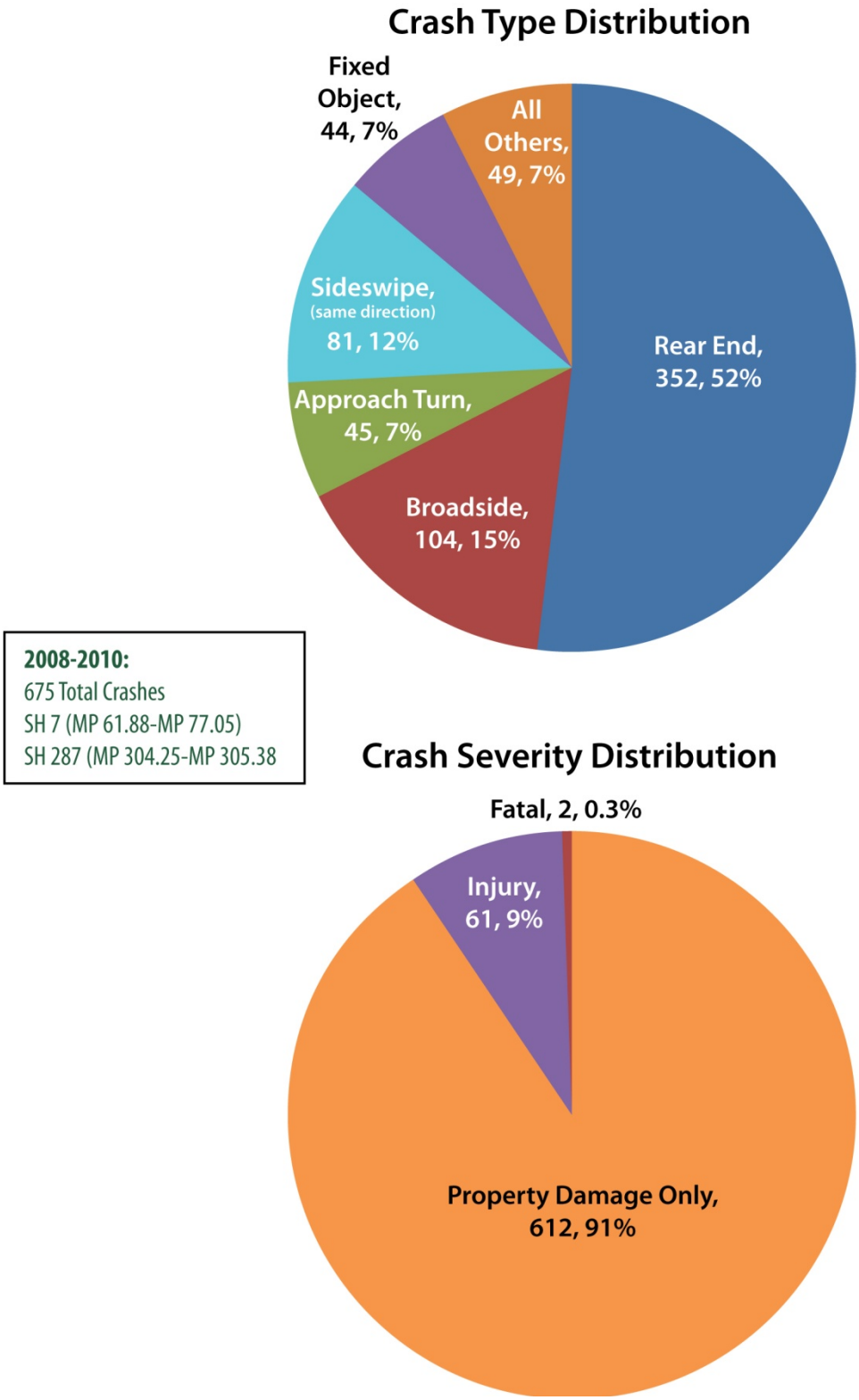
Figure 3.11.

Existing Intersection Geometry and Levels of Service (parallel routes)



*For stop-controlled intersections, the level of service reported is the worst controlled approach

Figure 3.12 Corridor Crash Overview (2008 – 2010)



A hot spot analysis was also conducted to determine locations (primarily intersections) where a total of 10 or more crashes occurred during the three-year study period. Direct diagnostic analyses, which compare the crash history at a given location to an expected average crash total for a similar type of intersection or roadway facility, were also completed in order to determine the significant crash types along the corridor. **Table 3.3** provides a summary of the locations where the majority of the crashes along the corridor occurred and the most significant crash types at the locations.

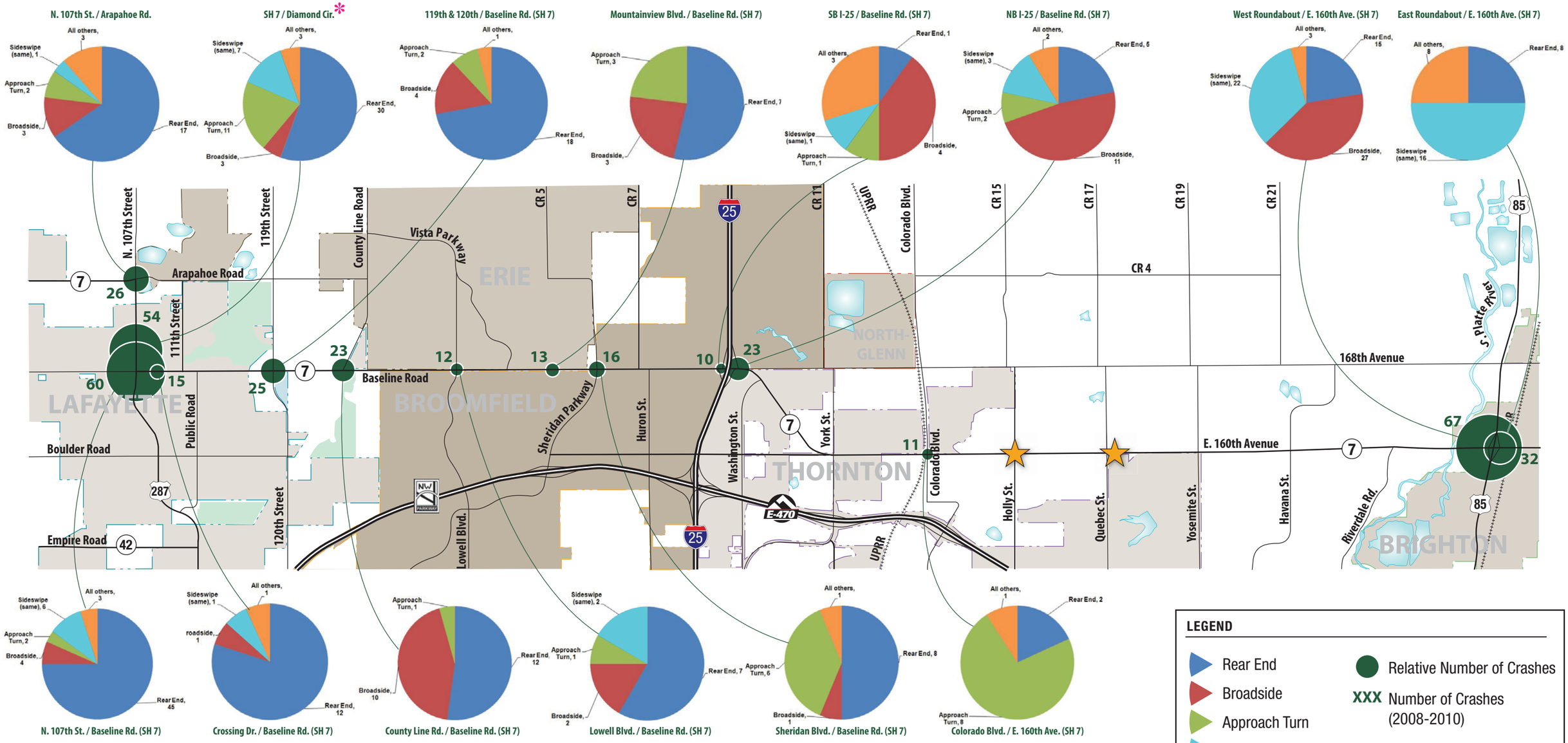
Table 3.3 Intersection and Non-Intersection Related Crashes by Location

Location	MP	PDO	Injury	Fatal	Total	Significant Crash Types
US 85 West Roundabout/SH 7	76.92	66	1	0	67	Frequent: Broadside (27), SSS (22)
Baseline (SH 7D) / US 287 (SH 287C)	61.88	60	0	0	60	Rear end (45)
Diamond Cir / US 287	304.56	49	5	0	54	Rear end (30)
US 85 East Roundabout/SH 7	77.03	31	1	0	32	Frequent: SSS (16), Rear end (8)
Arapahoe (SH 7) / US 287	60.68	24	2	0	26	Rear end (17)
119th / 120th St. / SH 7	63.22	23	2	0	25	Rear end (18)
E. County Line Rd./SH 7	64.14	18	5	0	23	Rear end (12) and broadside (10)
NB I-25/SH 7	68.38	20	3	0	23	Broadside (11)
Sheridan Blvd./SH 7	66.93	11	5	0	16	Approach turn (6)
Crossing Dr. / SH 7	62	14	1	0	15	Rear end (12)
Mountainview Blvd./SH 7	66.41	13	0	0	13	Rear end (7) and approach turn (3)
Lowell Blvd./SH 7	65.35	11	1	0	12	Rear end (7)
Colorado Blvd./SH 7	70.97	10	1	0	11	Approach turn (8)
SB I-25/SH 7	68.32	8	2	0	10	Broadside (4)
Intersection Sub Total		**358**	**29**	**0**	**387**	
Other Intersections (9 or fewer crashes each)		117	17	1	135	
Total Intersection Crashes		**475**	**46**	**1**	**522**	
Non-Intersection Crashes		**137**	**15**	**1**	**153**	**Rear ends(90), SSS(14), SSO(7)**
Overall Total		**612**	**61**	**2**	**675**	

SSS = Sideswipe (same direction), **SSO =** Sideswipe (opposite direction)

As can be seen in this table, of the 14 intersections identified as having 10 or more crashes during the three-year study period, the majority have a higher than expected occurrence of rear-end type crashes, with several also experiencing a higher than expected number of approach turn and/or broadside type crashes. The overall crash distribution at each of these 14 intersections can be seen on **Figure 3.13**.

Figure 3.13. Intersection Crash Patterns (2008 - 2010)



* *A protected only phase for the northbound left turn lane was added at this intersection in 2011.*

LEGEND

- Rear End
- Broadside
- Approach Turn
- Sideswipe (same direction)
- All Others
- Fatal Crash Location
- Relative Number of Crashes
- XXX Number of Crashes (2008-2010)

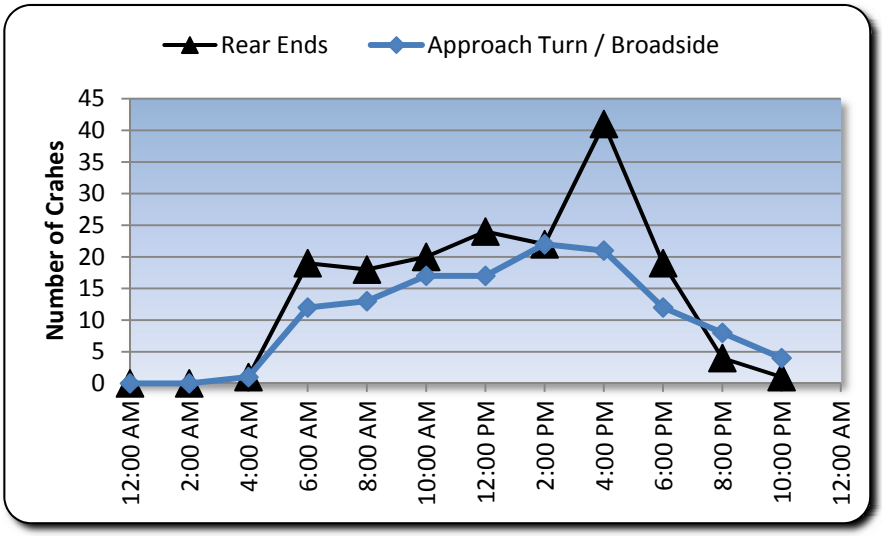
NORTH

Approximately 75 percent of the crashes occurring along the corridor happened at intersections. In urban areas, CDOT categorizes crashes as intersection-related if they occur within the intersection influence area, which is defined as 0.02 miles (105 feet) on either side of the intersection, and have been coded by the attending officer as "intersection" or "intersection related" on the crash form. For the non-intersection locations, the majority of the crashes (approximately 60 percent) are rear-end type crashes. Many of these rear-end crashes that have occurred outside of the intersection influence are likely a result of congestion and queuing from nearby intersections. The other frequent non-intersection crash types are sideswipe crashes.

Summary of Observations/Recommendations

As mentioned, the frequency of rear-end type crashes was higher than expected at many of the intersection locations along the corridor. A review of the crash history indicated that the majority of these crashes occurred during the afternoon peak hour as can be seen in the trends on **Figure 3.14**.

Figure 3.14 Intersection Crash Time of Day Trends

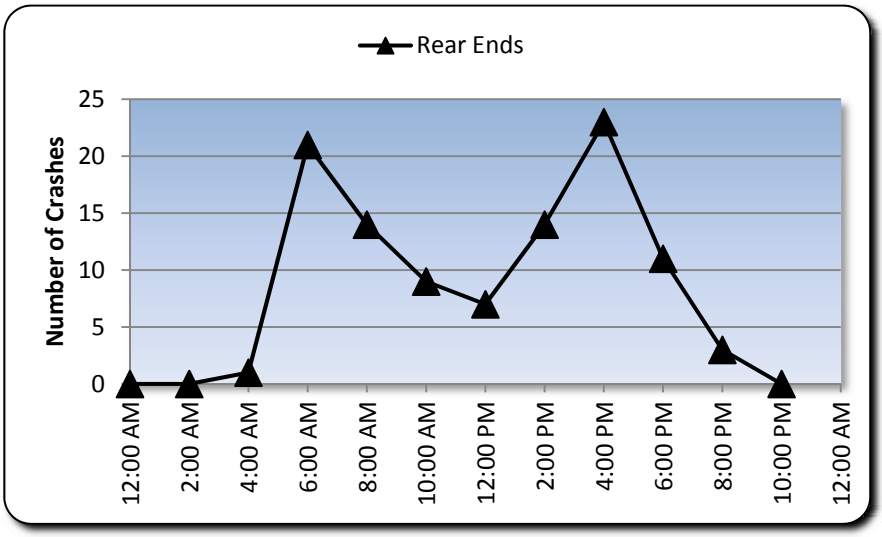


In addition, as can also be seen on **Figure 3.14**, the highest number of approach turn and broadside crashes at the intersections along the corridor also occurred mid to late in the afternoon.

Finally, for the non-intersection locations, the peak hour crash pattern is even more pronounced as can be seen on **Figure 3.15** with the AM peak hour also experiencing a high occurrence of rear-end crashes.

This pattern at both the intersection and non-intersection locations is not entirely unexpected as the occurrence of rear-end and approach turn/broadside crashes tend to coincide with peak traffic conditions.

Figure 3.15 Non - Intersection Rear End Time of Day Trends



3.4 Transit

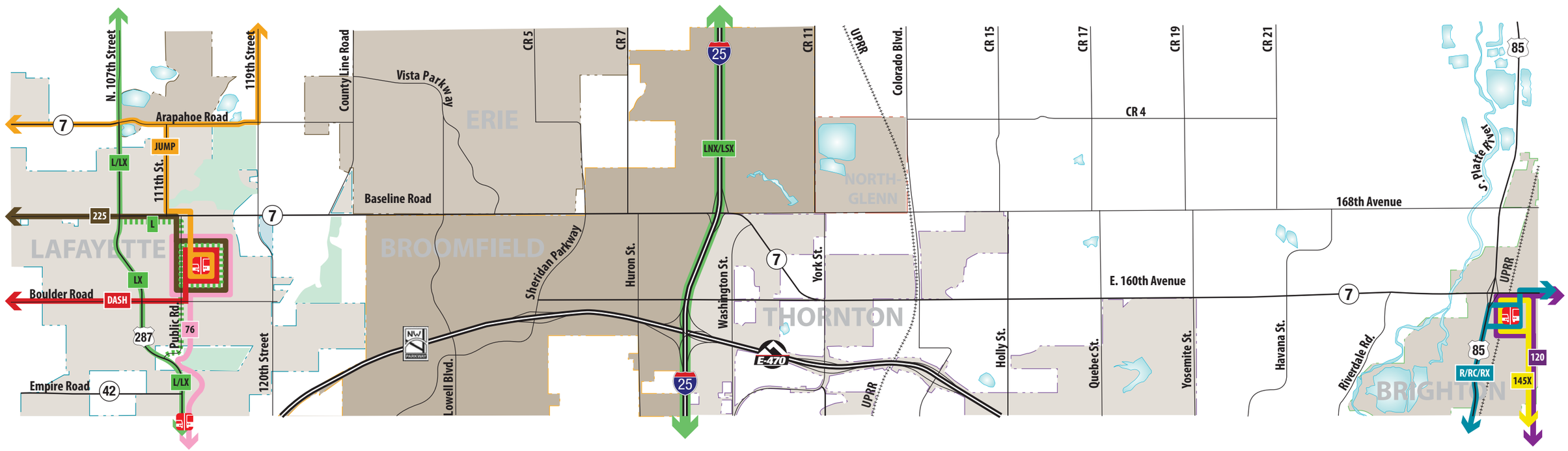
With the exception of the shared stretch of roadway with US 287 and a short segment of SH 7 in Lafayette, no transit service currently operates along the SH 7 study corridor. RTD bus routes do serve each terminus of the corridor, as both Lafayette and Brighton have park-n-Ride facilities close to their respective ends of the study corridor (**Figure 3.16**).

Lafayette's park-n-Ride is located just south of the study corridor's western terminus. It is currently served by the following bus routes:

- 76 – provides north-south service between Lakewood and Lafayette
- 225 – provides east-west service between the University of Colorado in Boulder and Lafayette via Baseline Road
- DASH – provides east-west service between the University of Colorado in Boulder and Lafayette on South Boulder Road
- JUMP – provides east-west service between downtown Boulder, the University of Colorado in Boulder and Lafayette/Erie along SH 7 (Arapahoe Road)
- L – provides regional local stop service between Longmont, Niwot, Lafayette, and downtown Denver via US 36 and US 287 (LX, LNX, and LSX do not serve the Lafayette park-n-Ride)

The LX route is similar to the L route, but does not stop at the Lafayette park-n-Ride. The LNX and LSX routes also provide service between Longmont and downtown Denver, but travel along I-25 without stops in the SH 7 study area.

Figure 3.16. Existing Transit Service



LEGEND

- park-n-Ride
- L/LX/LNX/LSX — Longmont / Denver
- R/RC/RX — Brighton / Denver
- 120 — 120th Avenue / Brighton
- 145X — Brighton / DIA Express
- JUMP — Bloulder / Lafayette via Arapahoe / Erie
- DASH — Boulder / Lafayette via Louisville
- 225 — Boulder / Lafayette via Baseline
- 76 — Wadsworth Crosstown

NORTH

Brighton's park-n-Ride (US 85/Bridge Street) is located just south of the study corridor's eastern terminus. It is currently served by the following bus routes:

- 120 – provides east-west service between Broomfield and the Platte Valley Medical Center in Brighton via 120th Avenue
- 145X – provides express service between Denver International Airport (DIA) and Brighton
- R/RC/RX – provides regional express service between Brighton and downtown Denver via three similar routings that use I-76 and US 85

Along SH 7, transit signal priority systems have been installed at the following intersections:

- Baseline Road/Public Road
- Baseline Road/111th Street
- US 287/Arapahoe Road
- Arapahoe Road/95th Street
- Arapahoe Road/75th Street
- Arapahoe Road/63rd Street
- Arapahoe Avenue/55th Street

Short-Term Transit Service Considerations

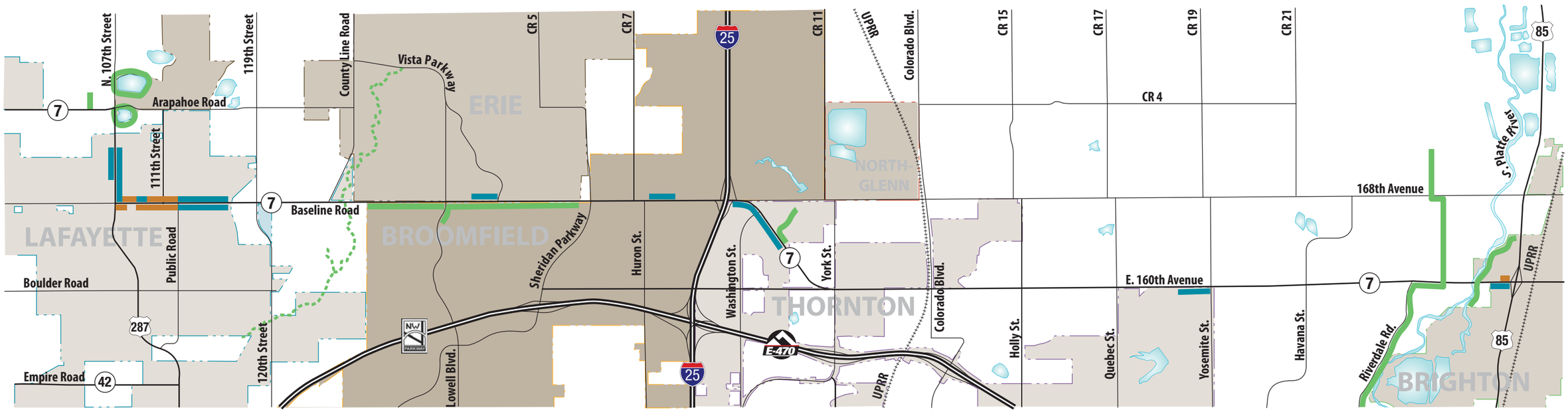
Bus service along SH7 is anticipated to be implemented in the short term, prior to completion of the North Metro Corridor project. RTD Service Planning will be working with the communities over the next year or two to define the actual need, to conduct origin/destination studies, to collect data for determining population density, and to address infrastructure needs responsive to near-term development. Once RTD collects that data, service planners will assess what type of service would make most sense, such as an express route during AM/PM peak times only, a one-directional route, or a bi-directional route. In association with this type of service, they will also identify locations for stops and assess the need for a park-n-Ride. Once RTD has made these types of decisions, it will most likely be another year or two before actually implementing a route and improvements along SH 7.

3.5 Bicycle and Pedestrian Facilities and Operations

SH 7 is designated as a regional and community bicycle corridor in the 2035 fiscally constrained MVRTP. Sidewalks exist sporadically along the SH 7 corridor, as shown on **Figure 3.17**. Through Lafayette, detached sidewalks exist along both sides of the street in most locations; however, where the right-of-way is constrained, the sidewalk is attached to the curb. Detached sidewalks also exist in short stretches along other segments of the corridor, including adjacent to the Larkridge Shopping Center east of I-25. Along the south side of SH 7 in Broomfield, a wide multiuse trail exists adjacent to the Anthem neighborhood. The trail is meandering and is separated from the road by 20 to 40 feet.

Today, bicycle travel can be accommodated by the shoulders along SH 7. While much of the corridor has wide shoulders, they are typically used to develop auxiliary lanes at intersections, resulting in a lack of bicycle accommodation in proximity to intersections.

Figure 3.17. Existing Sidewalks and Multi-Use Trails



LEGEND

- Attached Sidewalk
- Detached Sidewalk
- Multi-Use Trail
- Multi-Use Trail (to be Constructed Summer 2012)

NORTH

Over the three year period (2008 – 2010) for which crash data was collected along SH 7, there were four bicycle or pedestrian accidents along the corridor:

- Pedestrian crash at US 287/SH 7 (Arapahoe Road)
- Pedestrian crash at SH 7/Carr
- Bicycle crash at SH 7/Sheridan Parkway
- Bicycle crash approximately 0.2 miles west of the County Line Road intersection

Bicycle LOS

The 2010 *Highway Capacity Manual* (Transportation Research Board) includes bicycle LOS calculations that quantify how well a facility operates from the traveler's perspective. LOS scores should be viewed as a measure of how comfortable a bicyclist in a variety of skill levels would be using the facility. For example, an experienced bicyclist may be comfortable using a facility rated as C, but a novice user may be unwilling to use such a facility.

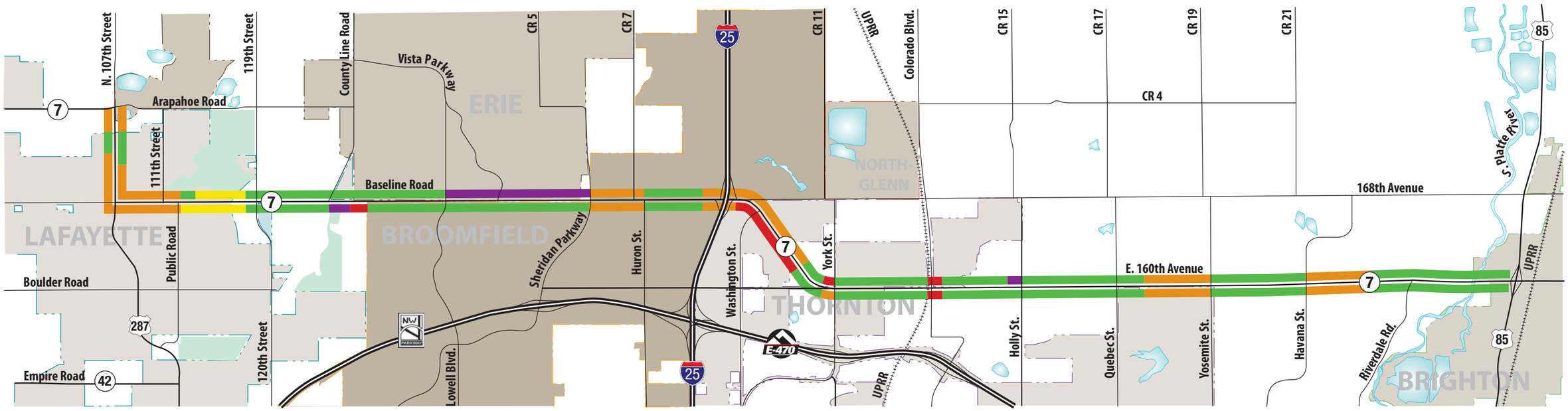
Conditions that affect bicycle level of service include:

- Effective travel width for the bicyclists (how much space is available to maneuver within the bikeway)
- On-street parking encroachments (drivers opening the door of their parked vehicles is a hazard for bicyclists)
- Volume of motor vehicles and percent heavy vehicles (less vehicular traffic and fewer heavy vehicles creates a more comfortable environment for bicyclists)
- Speed of traffic (slower vehicular speeds create a more comfortable environment for the bicyclist)
- Pavement surface condition (poor surface conditions require bicyclists to maneuver around pot holes and cracks)

The existing bicycle levels of service along SH 7 are shown on **Figure 3.18.** Data for LOS calculations were obtained from the CDOT Straight Line Diagram database, and confirmed or refined using Google Earth. No dedicated bicycle facilities exist along the corridor; thus shoulder width was the primary factor in determining LOS scores. Rural segments typically have wider shoulders (often 10-12 feet) and thus have a higher LOS (A or C) than many of the urban areas.

Areas with low LOS scores (D-F) likely have narrow shoulders with high traffic volumes and/or speeds, or no shoulders at all. LOS calculations do not factor the uniqueness of intersections into the score, as these areas are highly variable for a short span. Intersections often have right turn lanes, which bicyclists riding through are to ride along the solid white stripe separating the outermost through lane and the right turn lane. Since shoulders are often not being used by bicyclists at such intersections and are usually low to non-existent, they do not accurately reflect on bicycle LOS. Rural areas have many intersections with auxiliary lanes, so LOS scores were generalized through intersections based on conditions leading to the intersection.

Figure 3.18. Existing Bicycle Segment Level of Service



EXAMPLE BICYCLE SEGMENT LEVELS OF SERVICE

LOS A/B

LOS C/D

LOS E/F

Source: Florida DOT Quality / Level of Service Handbook, 2009

LEGEND

Segment Level of Service

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E
- LOS F

NORTH

Pedestrian LOS

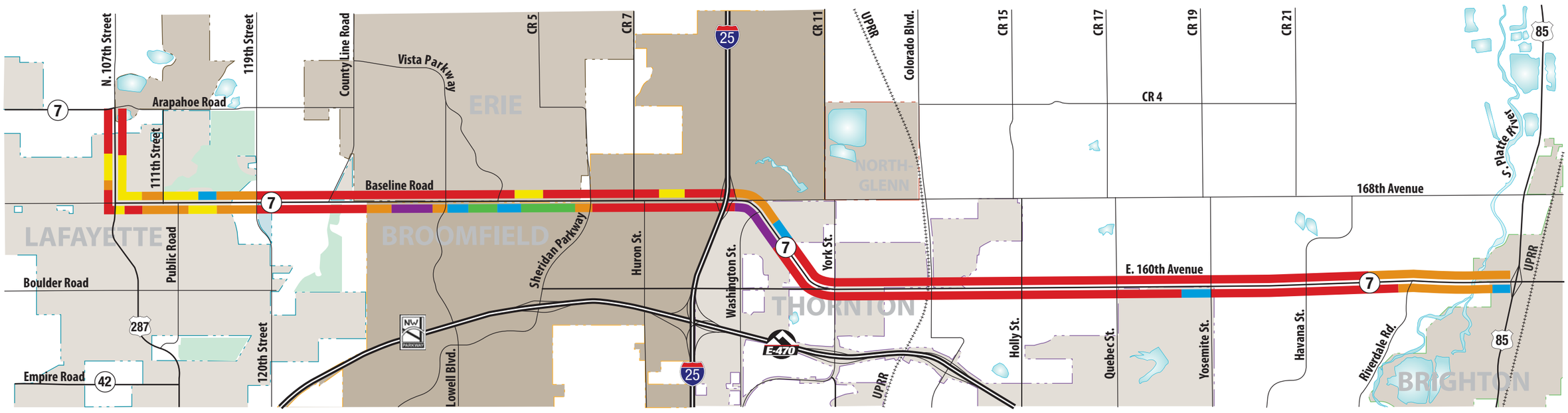
Pedestrian level of service can likewise be quantified to reflect the comfort experienced by pedestrians. Conditions that affect pedestrian level of service include:

- Width of the sidewalk (a wider sidewalk allows pedestrians to travel two or more abreast and pass comfortably)
- Width of buffer separation and presence of barriers within buffer (a buffer increases the distance between pedestrians and vehicular traffic creating a more comfortable and safe walking environment; the presence of trees or other barriers within the buffer further enhances pedestrians' feeling of separation from vehicular traffic)
- Amenities on adjacent roadway (a wider outside vehicular travel lane, the presence of bike lanes and on-street parking increases the separation between pedestrians and vehicular traffic, creating a more comfortable environment)
- Volume and speed of motor traffic (less vehicular traffic and slower speeds create a more comfortable environment)

The existing pedestrian levels of service along SH 7 are shown on **Figure 3.19.** Data for LOS calculations were obtained from the CDOT Straight Line Diagram database, and confirmed or altered using Google Earth. Where sidewalks are provided, LOS scores range from A to E, with the highest LOS scores existing where the sidewalk is substantially separated from the street and/or traffic volumes and travel speeds are lower. Areas with a sidewalk that have a poor LOS are likely due to little to no buffer and/or high traffic volumes and speeds. Such is the case for portions of eastbound SH 7 between Airport Dr and Sheridan Parkway, where wide sidewalks with wide buffers exist, but high volumes and speeds along cause the LOS to be poor. Areas of that same stretch of eastbound SH 7 with high LOS scores are rated as such because of continuous embankments and/or shrubbery as part of the buffer. The lack of a barrier, high traffic volumes, and high speeds also contribute to poor LOS scores for sidewalks in Lafayette, but small sidewalk widths and some areas without buffers contribute as well.

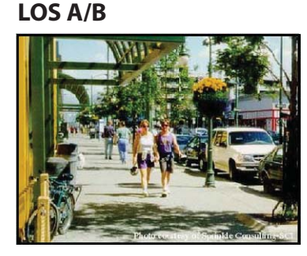
In areas where a sidewalk is not provided on one side of the street, the segment typically has a pedestrian LOS of E or F. Segments without a sidewalk but having a LOS score better than F do so because of a wide shoulder and low traffic volumes and speeds. The majority of the corridor has a LOS of F because no sidewalks are provided and because there are high traffic volumes and speeds.

Figure 3.19. Existing Pedestrian Segment Level of Service



EXAMPLE PEDESTRIAN SEGMENT LEVELS OF SERVICE

LOS A/B



LOS C/D

LOS E/F

Source: Florida DOT Quality / Level of Service Handbook, 2009

LEGEND

Segment Level of Service

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E
- LOS F

NORTH

4.0 FUTURE TRANSPORTATION CONDITIONS

The DRCOG 2035 fiscally constrained regional travel demand model (including the 2035 land use forecasts described in **Chapter 2**) was used to develop the 2035 traffic forecasts. The project team made minor modifications to the DRCOG model to better reflect the existing and planned roadway network along SH 7.

4.1 No-Action Alternative

The No-Action Alternative is the alternative that would be selected, if CDOT does not select a build alternative as the Proposed Action, and is used as a baseline comparison for alternative development and screening and environmental analysis purposes. The No-Action Alternative would leave SH 7 as it currently is and would not provide any improvements beyond the existing transportation system; however, the No-Action Alternative includes safety and maintenance activities that are required to sustain an operational transportation system.

For the purpose of travel demand forecasting and identifying resource impacts that are directly related to traffic volume, such as noise, transportation projects currently planned in the vicinity of the project are included along with the No-Action Alternative. These other transportation projects have committed or identified funds for construction and would be built regardless of any other improvements that are identified as part of the SH 7 PEL study. Travel demand forecasting predicts traffic conditions that are expected to occur on the transportation system in the design year (2035). Committed fiscally constrained regional improvements that are included in the travel demand forecasting for the No-Action Alternative are discussed in the following sections.

North Metro Corridor project

The North Metro Corridor project is a proposed 18-mile, high-capacity, fixed-guideway transit corridor between DUS and the 162nd Avenue area. RTD has planned local, limited, and regional bus routes to serve the end of the line station at SH 7/162nd Avenue. In support of the planned station and the surrounding mixed-used development, Colorado Boulevard is planned to be relocated approximately one-half mile to the east of its current intersection with SH 7. This reconfiguration will be a local project with funds from sources other than the North Metro Corridor project. The North Metro Corridor project commuter rail, supporting bus service, and the associated roadway infrastructure improvements have been included in the No-Action travel demand model.

Other Fiscally Constrained Regional Improvements

The DRCOG regional travel demand model has been used to develop 2035 traffic forecasts for SH 7, accounting for growth along the corridor and throughout the Denver region. The DRCOG Fiscally Constrained Plan has several projects within the SH 7 area that have been maintained in the model, including:

- Extension of South Boulder Road from 120th Street to Sheridan Parkway
- Realignment of Colorado Boulevard to the east of the SH 7 North Metro Corridor project Station
- Widening to four lanes: Erie Parkway, 144th Avenue, Sheridan Parkway, Huron Street, Washington Street, 152nd Avenue, York Street, Colorado Boulevard, and Quebec Street
- Widening to six lanes: E-470

4.2 2035 No-Action Conditions

A series of graphics have been developed to depict the travel demand, travel patterns, and travel users along the SH 7 corridor now and in the future. The results described in the following sections are from the DRCOG 2010 base year model and the DRCOG 2035 model. The project study area is generally bound by US 287 on the west, Arapahoe Road/Weld County Road 4 on the north, US 85 on the east, and E-470/Northwest Parkway on the south.

Study Area Travel Trends

Figure 4.1 provides a high-level depiction of the distribution of trips using the SH 7 corridor in 2010 and 2035. Internal-Internal trips are those trips that have both an origin and a destination within the project study area. The Internal-External trips have one trip end within the study area and one trip end outside of the study area, and the External-External trips have both an origin and a destination outside of the study area. A comparison of the 2010 and 2035 trip distribution patterns reveals a decrease in the percentage of External-External trips over time; by 2035, 80 percent of the trips using the corridor are expected to have at least one trip end (origin and/or destination) within the study area (compared to 58 percent in 2010).

A screenline analysis is used to understand general travel demand in a subarea. Screenlines A-A through D-D shown on **Figure 4.2** represent the demand for east-west travel along two or more roadways (across the screenline). The corresponding graphs show the total daily travel demand in 2010 and 2035 in comparison to the existing total capacity of the subject roadways. The graphs for Screenlines B-B and C-C provide the travel demands and capacities with and without Northwest Parkway/E-470 traffic volumes. Excluding the demand and capacity of the tollroads, the four east-west screenlines show that 2035 travel demand in the east-west direction will exceed the existing capacity of the subject roadways.

Screenlines E-E and F-F represent the demand for north-south travel–connecting the SH 7 study area to the greater Denver area. The model results show demand for north-south travel is expected to increase significantly over the next 25 years.

Corridor Traffic Forecasts and Capacity Thresholds

Figure 4.3 shows the preliminary daily traffic forecasts along SH 7 within the study area. Planning level roadway capacities were used to estimate when the travel demand along SH 7 would exceed the existing capacity. While the travel demands on eastern and western portions of the corridor currently exceed the existing planning-level capacities, nearly all of the corridor is expected to have travel demands that exceed the existing capacity by 2020. The only exceptions are the westbound section between Sheridan Parkway and Lowell Boulevard and the eastbound section between Riverdale Road and Havana Street. Both of these sections have two lanes (in the subject direction), providing adequate capacity for the 2035 travel demands.

Figure 4.1 Corridor Trip Distribution

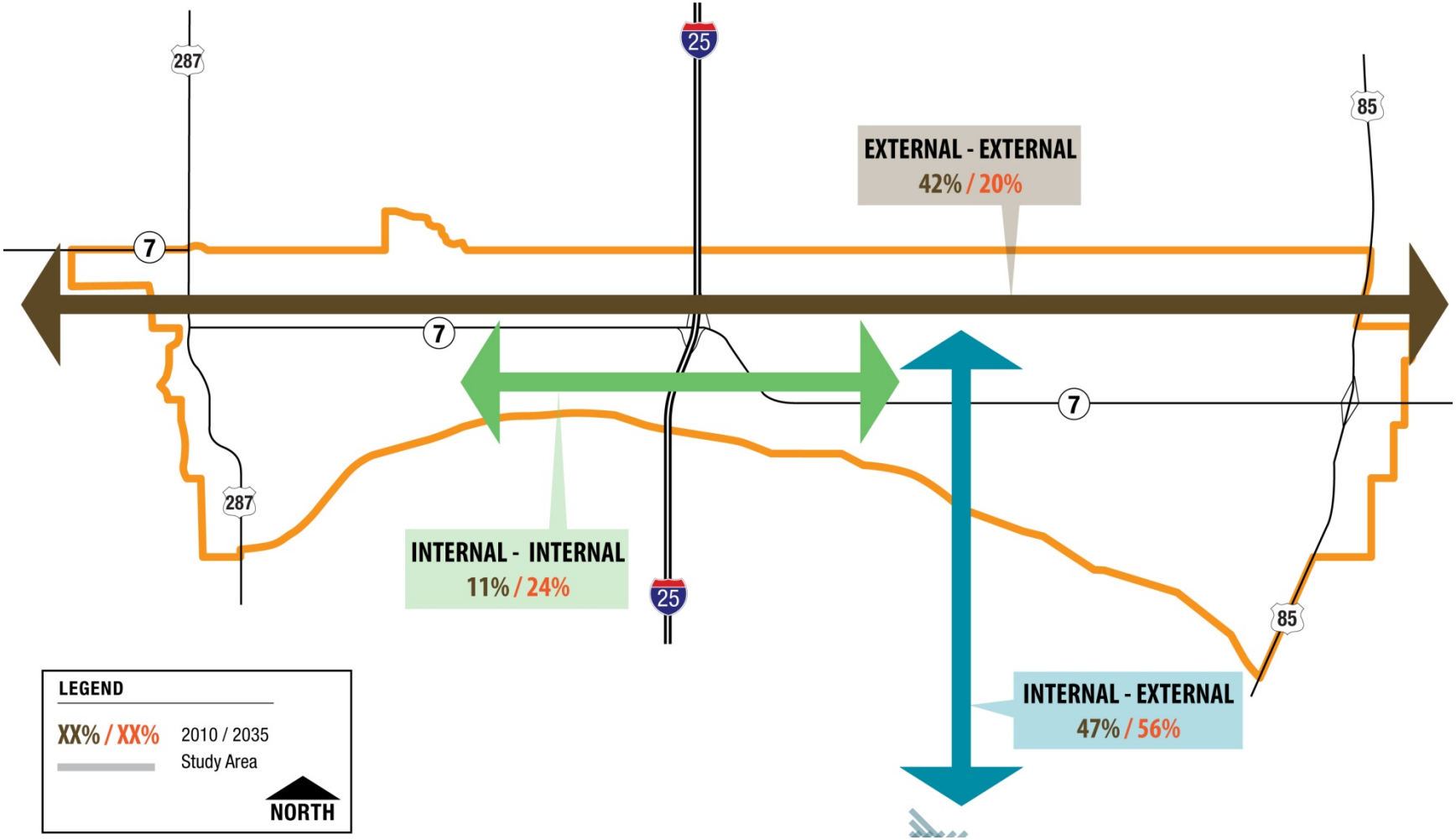
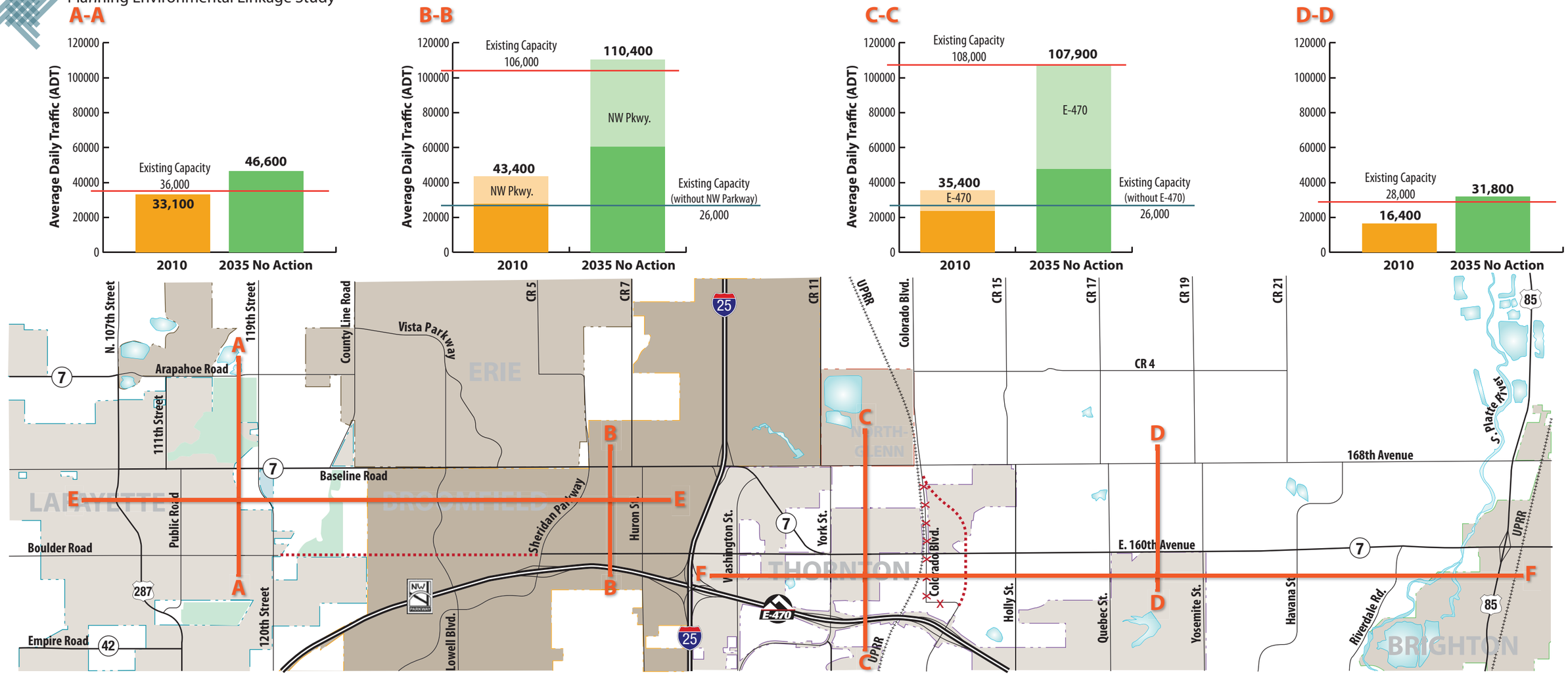
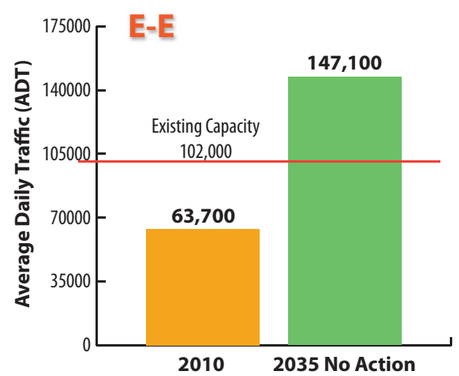
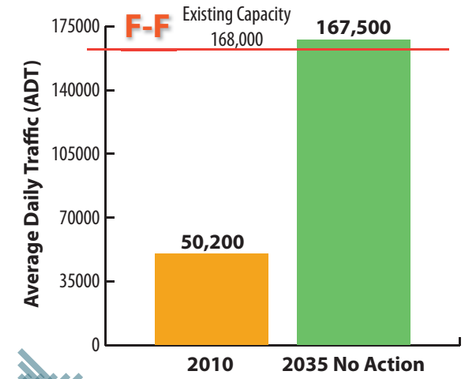


Figure 4.2. Screenline Travel Demand (2010 and 2035)





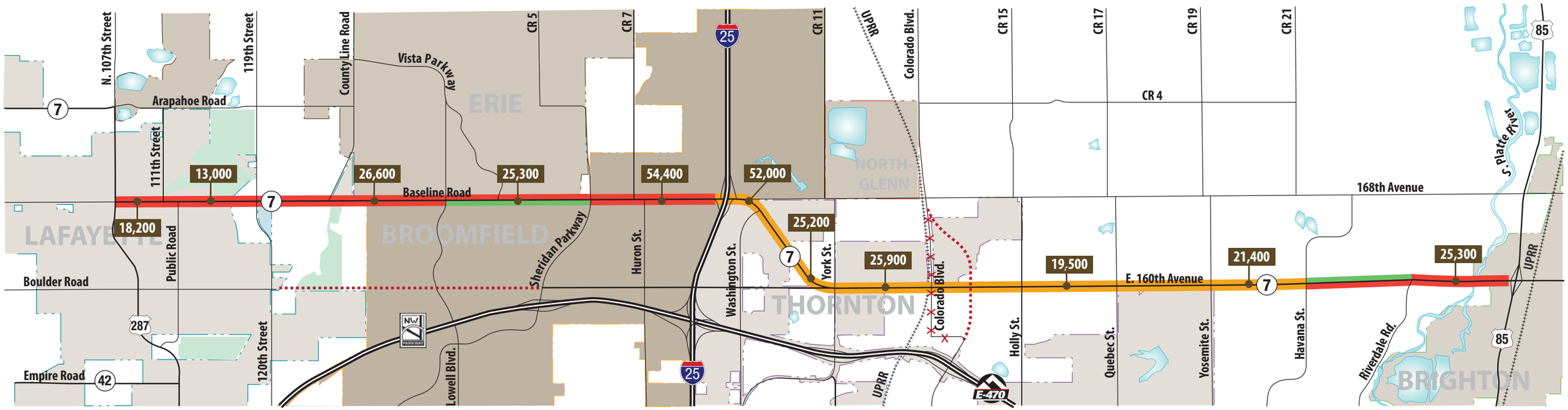


LEGEND

Planned Roadways
(DRCOG Fiscally Constrained Plan)

NORTH

Figure 4.3. 2035 No Action Daily Traffic Volume Forecasts and Capacity Thresholds



NOTE: Based on existing planning level roadway capacities and straight-line growth between 2012 and 2035.

LEGEND

- XXXX — 2035 No Action Daily Traffic Forecast
- Currently Over Capacity
- Over Capacity in 2020
- 2035 Travel Demand Less than Existing Capacity
- Planned Roadways (DRCOG Fiscally Constrained Plan)

NORTH

Travel Patterns

A select link analysis was conducted at several locations along the corridor. The purpose of this analysis is to understand the travel paths on a particular link in the roadway network. **Figure 4.4** summarizes the percent of traffic on a particular link of SH 7 (east of US 287 on the top graphic and west of US 85 on the bottom graphic) that travel the entire length of the corridor and the percent that travels half of the corridor in 2010 and 2035. For example, the top graphic shows that of all the traffic on SH 7 just east of US 287 in 2010, 40 percent travel the full western half of the corridor to I-25, while the remaining 60 percent travel only a portion of the western half of the corridor and access land uses along this section. In 2035, the expected percent of traffic using the full western half of the corridor falls to 24 percent. This analysis demonstrates that trips along the SH 7 corridor are expected to be shorter in the future.

The select link analyses described previously were also used to understand the origins and destinations of the travelers using SH 7. **Figure 4.5** shows the distribution of locally based trips versus regional trips at several locations along SH 7 as well as on the extension of South Boulder Road and on 168th Avenue. For this purpose, locally based trips have one or both trip ends within the subject half (east or west of I-25) of the study area. The graphs show an increased proportion of locally based trips using SH 7 over time.

Figure 4.6 displays the purpose for travel along SH 7. Specifically, it shows the percent of commuter trips using during the peak periods. Along the eastern portion of the corridor, minimal change is expected on the percent of commuter trips using the corridor over time. However, on the western portion of the corridor, and immediately east of I-25, the model results show an increase in commuter trips over time. This is likely a result of the projected increase in employment along the corridor in the future.

Intersection Operations

Future (2035) traffic operations were evaluated along SH 7 based on projected traffic volumes using the DRCOG travel demand model and anticipated future development. A congestion hot spot analysis was conducted using Synchro/SimTraffic to evaluate signalized intersections based on HCM volume to capacity ratios.

Due to the growth on and around the SH 7 corridor, traffic volumes through the corridor are projected to increase by 2035, especially on the eastern portion of the corridor where there are more development opportunities. If no operational improvements are made to the corridor, many intersections are projected to be over capacity in both the AM and PM peak periods. Most of these congestion hot spots are locations where regional arterials that provide north/south connectivity through the area intersect with SH 7. The traffic volumes on these regional facilities are projected to increase, resulting in intersections that are over capacity. The projected future congestion hot spots are presented on **Figures 4.7** and **4.8**.

These congestion hot spots impact intersection operations and corridor travel times. As congestion at intersections increases, travel times also increase. The impacts to travel time are displayed in **Figures 4.9** and **4.10** which show average speeds as a percentage of the posted speed limit. As speeds drop, travel times increase. At intersections that are over capacity (where volume to capacity ratios is above 1.0) there are correlated speed reductions on the approaches to the intersections. In some cases, the effects from these over capacity intersections impact adjacent upstream intersections. One example of this is the eastbound direction during the AM peak period in which the intersection of 120th Street is over capacity and results in congestion and speed reductions that extend past Lowell Boulevard.

Figure 4.4 Corridor Travel Paths (2010 and 2035)

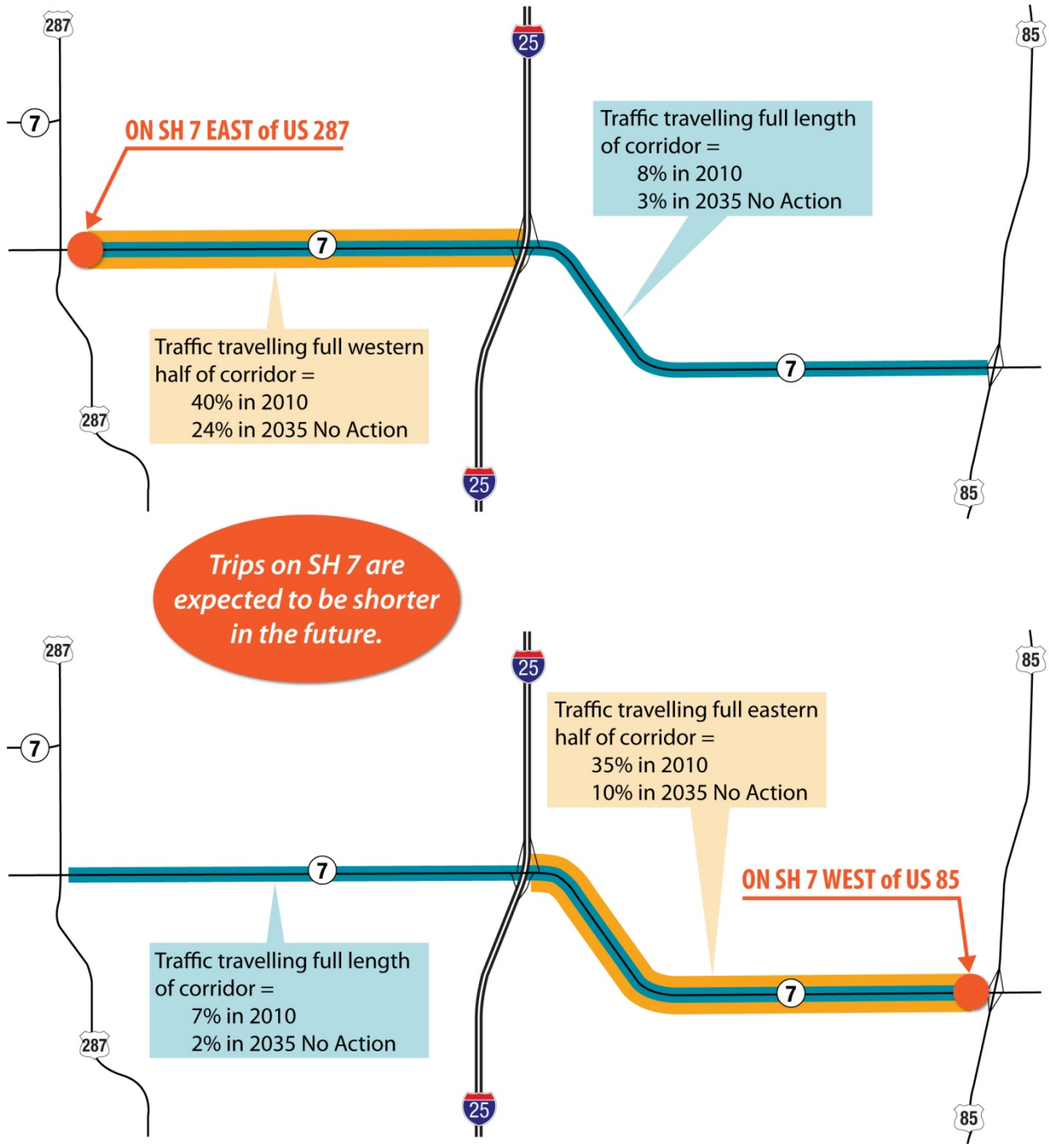
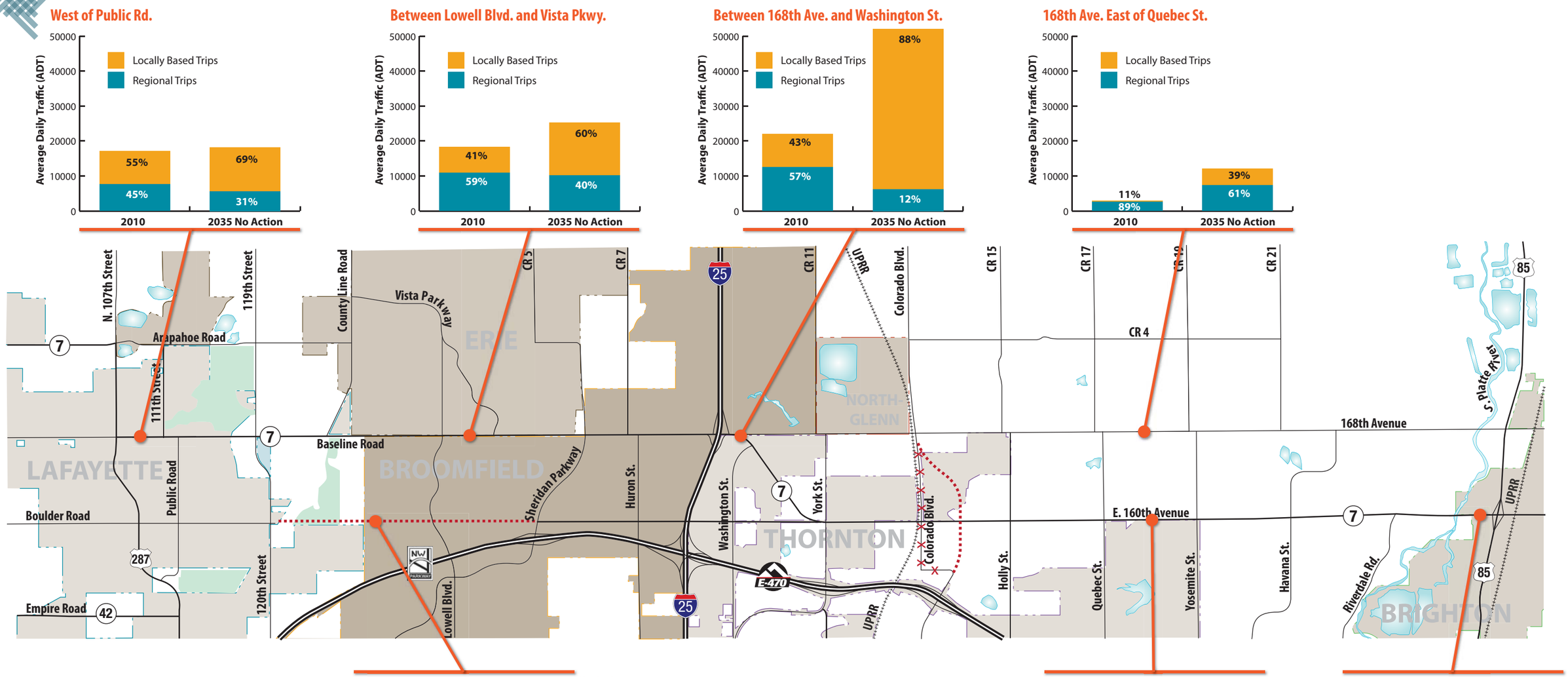


Figure 4.5. Regional vs. Local Travel (2010 and 2035)



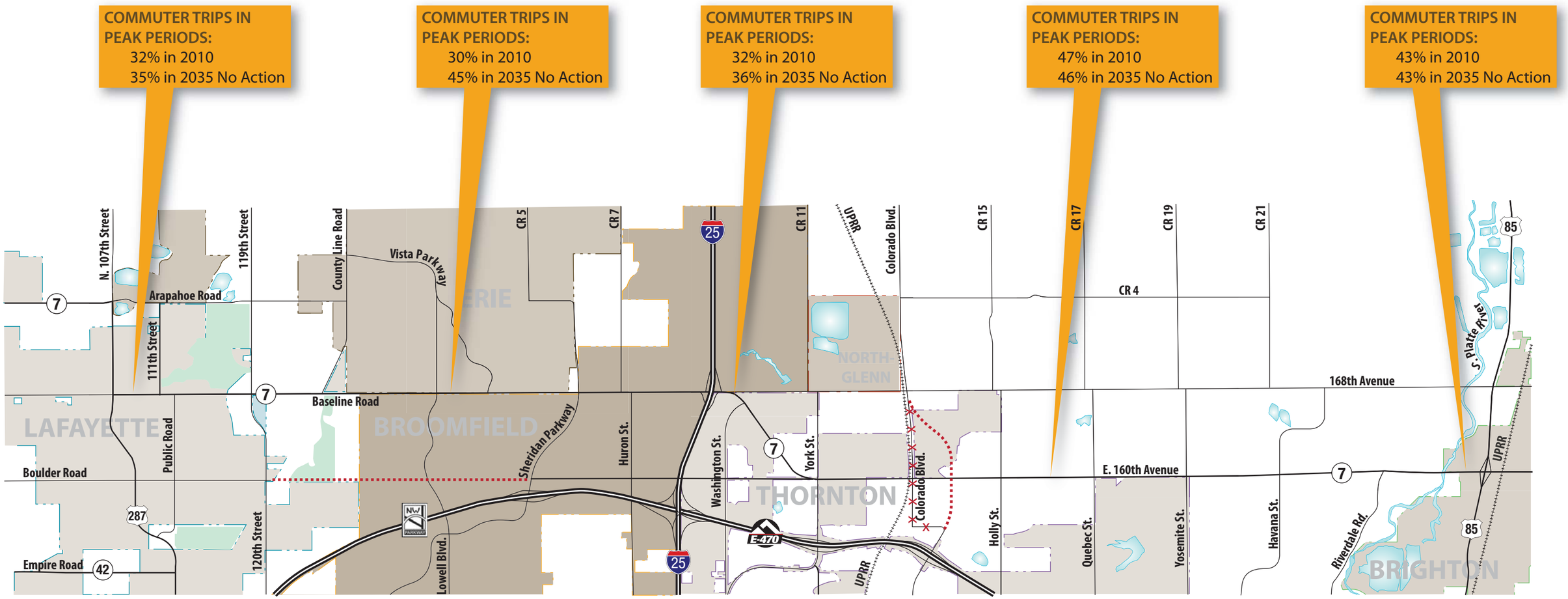
Locally based trips have one or both trip ends within the subject half (east or west of I-25) of the study area.

LEGEND

Planned Roadways (DRCOG Fiscally Constrained Plan)

NORTH

Figure 4.6. Trip Purpose (2010 and 2035)

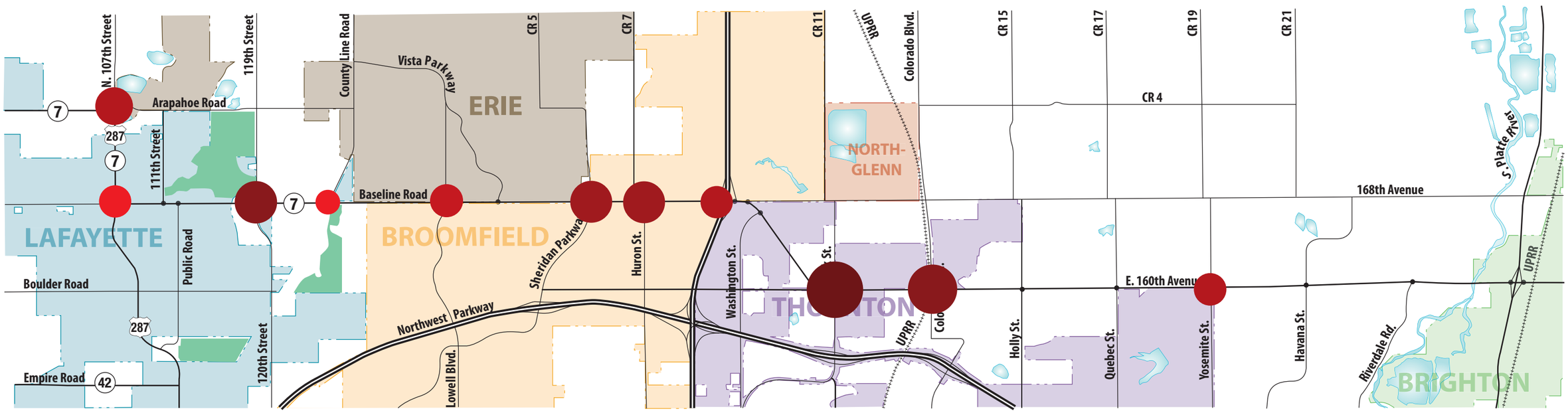


LEGEND

Planned Roadways
(DRCOG Fiscally Constrained Plan)

NORTH

Figure 4.7. 2035 No Action AM Signalized Intersection Congestion Hot Spots



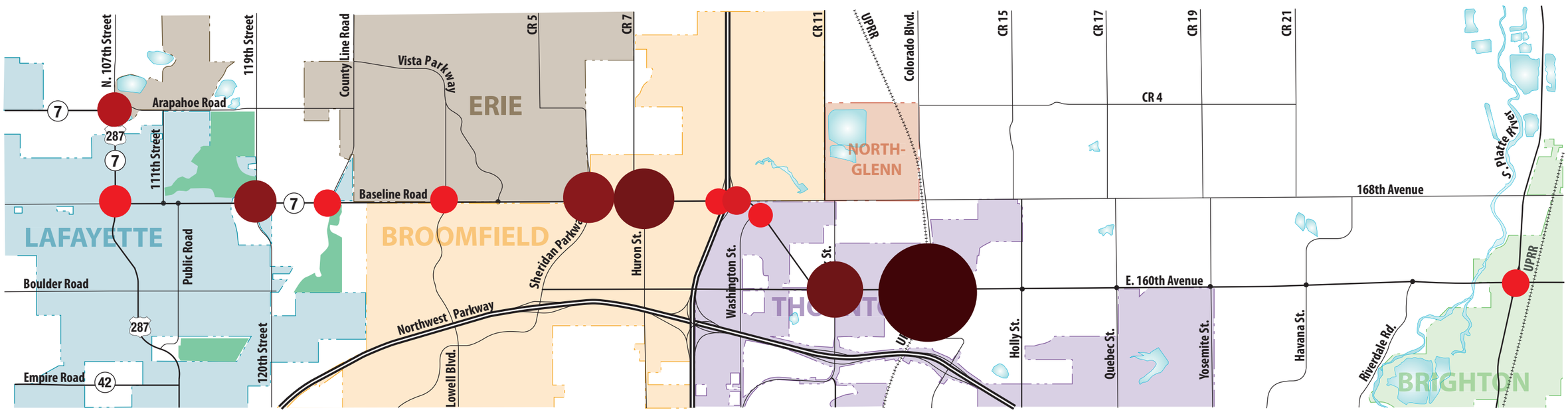
LEGEND

Volume to Capacity Ratio

1.0 1.5 2.0 3.0 4.0

NORTH

Figure 4.8. 2035 No Action PM Signalized Intersection Congestion Hot Spots



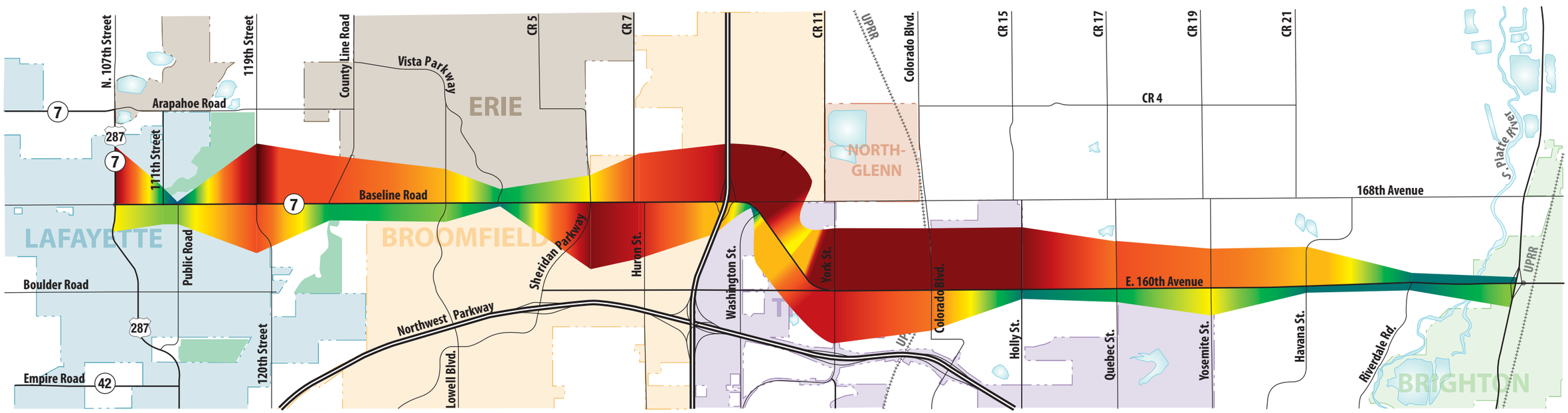
LEGEND

Volume to Capacity Ratio

1.0 1.5 2.0 3.0 4.0

NORTH

Figure 4.9. 2035 No-Action AM Speeds



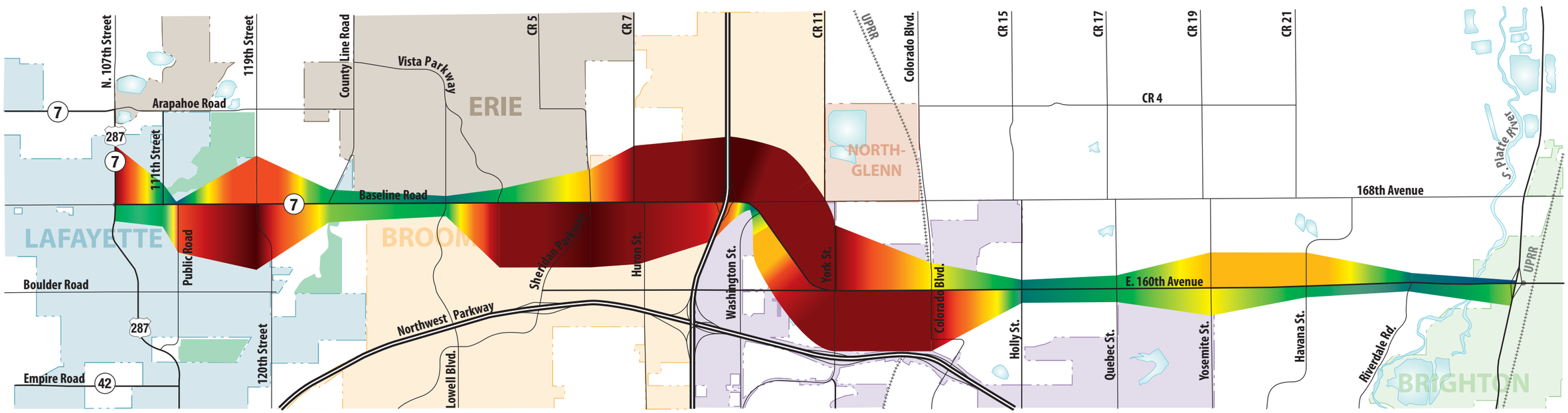
LEGEND

Speed as a Percent of Posted Speed Limit

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

NORTH

Figure 4.10. 2035 No-Action PM Speeds



LEGEND

Speed as a Percent of Posted Speed Limit

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

NORTH

Transit

The North Metro Corridor project is a proposed 18-mile, high-capacity, commuter rail transit corridor between Denver Union Station (DUS) and the SH 7 area. With its end of the line station near SH 7 and Colorado Boulevard, this commuter rail line will provide an important connection between the SH 7 study area and RTD's planned FasTracks network and the existing light rail network. Final design for the first segment of the North Metro Corridor project (from Denver Union Station to National Western Stock Show Station) is underway. While funding for the North Metro Corridor project is uncertain, the full line is included in DRCOG's 2035 Fiscally Constrained Plan, with an estimated opening day in 2020.

The North Metro Corridor Project Final EIS shows an initial 960 surface parking spaces at the SH 7/162nd Avenue station east of the platform. By 2035, the Final EIS estimates 2,460 parking spaces. Ridership on the North Metro Corridor project is projected to be more than 24,000 average daily riders in 2035 (RTD September 2010 North Metro Times).

When the North Metro Corridor project is implemented, the fixed-guideway rapid transit system will become the trunk service in the area, and surrounding local, express, and regional routes will be restructured to become feeder/circulator services to the North Metro Corridor project. The North Metro Corridor Transit Operations Plan (January 2011) identifies three bus routes in the SH 7 study area that are expected to serve the North Metro SH 7/162nd Avenue station. Route 160L would be a new Limited service and would travel along SH 7 between Lafayette and Brighton, with 30 minute headways during the peak times and 60 minute headways during the off-peak times. Route 92, a Local route which currently serves Westminster, Federal Heights, and Thornton, would be extended north along Colorado Boulevard to the SH 7 station with 30 minute headways. Route LX Regional service between Denver and Longmont would also stop at the SH 7 station.

There are other RTD routes that are expected to be modified in the future including Route 7 and 8 to provide service to a future park-n-Ride at I-25/SH 7. On the west end of the SH 7 study area, bus route modifications are likely in support of the Northwest Rail line. However, because of the uncertainly of that line, the feeder bus routing is undecided.

Bicycle and Pedestrian

As described in **Section 3.4**, the bicycle and pedestrian LOS are impacted by the level of traffic on the adjacent roadway. The forecasted increase in traffic volumes in 2035 would result in some reduction in bicycle and pedestrian LOS along the corridor. In general, the bicycle and pedestrian LOS would be reduced by one level of service (e.g., from LOS E to LOS F) in the 2035 No Action Alternative in comparison to the current LOS (**Figures 3.18 and 3.19**) on the western section of the corridor (along US 287 and through Lafayette), and in the vicinity of the I-25 interchange. The bicycle and pedestrian LOS on the remainder of the corridor would remain approximately at the same level as today.

4.3 South Boulder Road Sensitivity Analysis

South Boulder Road is a parallel route to SH 7 from US 36 to its current eastern terminus at 120th Street. West of Sheridan Parkway it reemerges as 160th Avenue and continues eastward, eventually merging with SH 7 east of I-25. An extension to connect the two segments (between 120th Street and Sheridan Parkway) has been agreed upon by the City of Broomfield, the City of Lafayette, the City of Louisville, and Boulder County through an Intergovernmental Agreement (IGA) effective February 18th, 1999, with an expiration date of February 2029. The IGA states that, "The Parties will support extension of South

Boulder Road from S. 120th St. eastward to Lowell Boulevard to provide access to a future Northwest Parkway interchange. The Parties will support an application through the DRCOG process for inclusion of this project on the TIP, with Lafayette as the sponsoring agency." Since the IGA is in place and the connection is included in DRCOG's 2035 Fiscally Constrained Plan, the 2035 model includes the South Boulder Road extension.

As a parallel route to SH 7, the South Boulder Road extension has the potential to provide some relief to travel demands along SH 7. Because of the uncertainty of the timing and funding of the South Boulder Road extension, a sensitivity analysis has been completed that evaluates the 2035 forecasts without the South Boulder Road extension.

The model results without the South Boulder Road extension show minimal change in 2035 daily traffic forecasts on SH 7 west of Public Road and east of Sheridan Parkway. However, the 2035 daily traffic forecasts on SH 7 between Public Road and Sheridan Parkway would increase, as shown in **Table 4.1.** Without the extension of South Boulder Road, a portion of the travel demand that is projected to use the extension is re-routed along SH 7, resulting in as much as a 20 percent increase in traffic volumes on SH 7. Model results also show an increase of daily traffic volume on Public Road and 120th Street, while daily traffic volumes on Sheridan Parkway would decrease. These results suggest that South Boulder Road extension would attract some travelers to bypass the parallel portion of SH 7 by using Sheridan Parkway.

Table 4.1 SH 7 2035 Daily Traffic Forecasts with and without South Boulder Road Extension

From	To	2035 Forecast w/ Boulder Road Extension	2035 Forecast w/out Boulder Road Extension	% Difference
107th Street	Public Road	18,200	17,900	-1.6%
Public Road	120th Street	13,000	13,700	+5.4%
120th Street	Lowell Boulevard	26,600	31,000	+16.5%
Lowell Boulevard	Sheridan Parkway	25,300	30,200	+19.4%
Sheridan Parkway	I-25	54,400	54,800	+0.7%

To better understand how the absence of South Boulder Road could affect SH 7, additional operational analyses were completed. The signalized intersections along SH 7 between 120th and Sheridan Parkway were analyzed using the 2035 forecasts without the South Boulder Road extension. Without the extension of South Boulder Road, each of the five signalized intersections would have increased delay during the AM and PM peak periods. The levels of service would generally degrade by one level of service. Overall, traffic operations on SH 7 would be worse without the extension of South Boulder Road due to the increased travel demand on SH 7; however, the incremental travel demand on SH 7 associated with the absence of the South Boulder Road extension is relatively isolated along the corridor and is not likely to warrant substantial improvement needs beyond those needed with the South Boulder Road extension.

5.0 ENVIRONMENTAL OVERVIEW

This chapter summarizes the existing environmental conditions of the project corridor. The environmental resources that were studied were selected based on the characteristics of the study area and on input from stakeholders. The resources that were considered are generally consistent with NEPA, its implementing regulations, and with FHWA and CDOT guidelines. The following resources are considered red flag environmental resources with separate regulatory drivers, such as the Endangered Species Act or Clean Water Act, or are typically resources of concern for the general public, such as traffic noise:

- Parks and Recreation Resources
- Traffic Noise
- Historic Resources
- Floodways and 100-year Floodplains
- Wetlands and Waters of the US
- Wildlife/Threatened and Endangered Species
- Hazardous Materials

This chapter presents the results of the analysis for each of these resource topics. Within each resource subsection, the resource is introduced and followed by the methodology and existing conditions.

5.1 Parks and Recreational Resources

Parks and recreational resources are important community facilities that warrant consideration during federally funded projects. These resources include parks, trails, and open space areas that offer opportunities for recreation, including both passive and active activities. For purposes of this project, park and recreational resources can be categorized into one of the following categories:

- **Regional Park and Recreational Facility** – Regional parks typically involve jurisdiction partnerships that contribute to the development and maintenance of the regional park. These areas serve residents throughout the Front Range and are regionally recognized. Privately and publicly owned and managed golf courses in the study area qualify as regional resources.
- **Community Park** – These facilities are typically smaller in size than regional facilities and serve as an attraction for residents and communities within approximately 3 miles of the facility. Community parks are typically managed and maintained by one entity.
- **Neighborhood Park** – Neighborhood parks typically serve residents and community members within a half mile radius of the park. These parks are typically accessed by nonmotorized means and are managed by one jurisdiction.
- **Open Space** – Open space areas include land and water parcels that remain in a predominantly natural or undeveloped state. The intention of open space acquisition varies from growth management to habitat protection and/or passive recreation. However, it must be noted that not all open space allows public access or use. Many areas defined as open space are used as conservation easements on agricultural lands. Smaller open space parcels are often coordinated

with neighboring open space acquisitions to create buffers or corridors. Jurisdictional authority belongs to either the county open space department or municipal parks and recreation departments. In certain instances management and ownership may span multiple jurisdictions.

- **Trails** – Municipalities typically manage numerous miles of trails, including paved and nonpaved trails. Trails often extend beyond one jurisdictional boundary into an adjacent boundary making them regional trails. It is typical for trails to follow existing linear features such as a ditch, river, or railroad.

Existing Park, Trail and Open Space Resources

Details and characteristics of existing parks and recreational resources along the project corridor were identified through GIS and then field verified. Additional inventory details about the resources, such as ownership, size, and amenities were obtained from accessing individual municipalities' websites in January 2012. Research was centered on utilizing the most current version of information available online (**Table 5.1** and **Figure 5.1**).

Table 5.1 Existing Park, Trail, and Open Space Resources

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
Veteran's Park	405 West Bridge Street 4.5 acres	Paved and gravel trails, parking, pavilions, playground equipment, restrooms, benches and picnic tables. Regionally connected with the Colorado Front Range Trail Corridor. Park has been funded with Adam's County Open space sales tax funds, Land and Water Conservation Funds, and the Colorado Lottery.	Regional Park	City of Brighton Parks and Recreation Department
Colorado Front Range Trail Corridor	SH 7 east of the South Platte River	A regional segment of the trail system initiated by Colorado State Parks passes beneath SH 7 parallel to South Platte River with a trail head in Veteran's Park.	Regional Trail	City of Brighton
Berry Property	SH 7 and 89 Miller Street 5 acres	No apparent public access. Undeveloped in natural state.	Open Space	City of Brighton
Morgan Smith Nature Area	SH 7 west of the South Platte River	Adjacent and north of Veteran's Park accessible by crusher fines trail. Primarily nature area utilized for passive recreation (bird and animal watching).	Open Space	City of Brighton

Table 5.1 Existing Park, Trail, and Open Space Resources (Continued)

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
American Discovery Trail	Tucson Street and SH 7	The nation's first coast-to-coast, non-motorized recreation trail stretches south from Tucson Street crossing SH 7 and extending west to Riverdale Road where it extends south. The trail is unimproved along SH 7.	Regional Trail	
Heritage Todd Creek Golf Course	8455 Heritage Drive	18 hole semiprivate golf course between Yosemite Street and Ulster Street.	Golf Course	Lennar Colorado LLC
Signal Ditch Open Space	SH 7 west of Quebec Street 60 acres	Open space that parallels the Signal Ditch corridor. Received Adams County Open Space sales tax.	Open Space	City of Thornton
German Ditch Open Space	SH 7 and German Ditch	Open space that parallels the German Ditch corridor and reservoirs	Open Space	City of Thornton
Preble Creek Open Space and Trail	SH 7 and 166th Avenue	Open space with multiuse (hard surface) trail servicing the North Creek Farms residential Subdivision Park	Open Space and Trail	City of Thornton
Broomfield Open Space		Undeveloped open space	Open Space	City and County of Broomfield
Broomfield Trail	SH 7 extending south into residential community	Network trail system connecting to the Anthem Neighborhood Trail and other regional trails	Trail	City and County of Broomfield
Anthem Neighborhood Trails	SH 7 from Sheridan Boulevard west to Airport Drive	Network trail system along SH 7 that provides connection into and within the adjacent residential community. Network is not complete.	Trail	City and County of Broomfield
Two Creeks Open Space	540 acres	The Two Creeks Open Space is comprised of nine properties, two of which are adjacent to the project area	Open Space	Joint ownership with City of Lafayette and Boulder County
	59 acres	Haselwood Property - The upland portion of the property is currently being restored to native grassland. It has been identified as a future prairie dog receiving site. Coal Creek passes through the property.	Open Space	Joint ownership with City of Lafayette and Boulder County

Table 5.1 Existing Park, Trail, and Open Space Resources (Continued)

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
Two Creeks Open Space (Continued)	144 acres	Mountain View Egg Farm Property – Former agricultural lands, grassland, and former egg production operation. The property is currently leased for grazing.	Open Space	Joint ownership with City of Lafayette and Boulder County
Coal Creek/Rock Creek Trail	Trail	Opening in 2012 extends from. Received funding from Great Outdoors Colorado	Trail	Multi-jurisdictional management
Millican Open Space		Undeveloped open space	Open Space	City of Lafayette
The Great Bark Dog Park	6 acres	Native grass dog park with restrooms, benches and shelters	Community Park	City of Lafayette
Great Park Open Space		Currently undeveloped open space but master planned for a park with regional amenities	Open Space	City of Lafayette
Josephine Roche Open Space	SH 7 and Burlington Avenue	Undeveloped open space	Open Space	City of Lafayette
CMN – Kirch	157 acres Northeast corner 119th Street and Arapahoe Road	County closed undeveloped open space	Open Space	Boulder County
CMN - Futhey	58 acres Northwest corner 119th Street and Arapahoe Road	County closed undeveloped open space and county conservation easement. Marfell Lakes	Open Space	Boulder County
Rothman Open Space	70 acres	Open space with soft-surface trails and several informal trails	Open Space	City of Lafayette
Lindenwood Park	800 Glenwood Drive 1 acre	Small park with picnic tables and playground equipment	Neighborhood Park	City of Lafayette
Lafayette City Park	450 North 11th Street 14 acres	Park contains baseball fields, basketball, in-line hockey rink, parking, picnic amenities, outdoor classroom, Bob L. Burger Recreation Center	Community Park	City of Lafayette
Lafayette Cemetery	111 Baseline Road	Established in the late 1800s. It is located adjacent to and within City Park	Cemetery	City of Lafayette
Kneebone Open Space	30 acres Arapahoe Road and 111th Street	Open space with information trail system	Open Space	City of Lafayette
Sunset Maple Park	1.3 acres	A small park with picnic tables, playground equipment	Neighborhood Park	City of Lafayette

Table 5.1 Existing Park, Trail, and Open Space Resources (Continued)

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
Autumn Ash Park	3 acre 401 Lucerne Drive	A small park with picnic tables, grills, and playground equipment	Neighborhood Park	City of Lafayette
Erie Lakes Trails	Arapahoe Road and US 287	Each has an existing crusher fines trail present around the perimeter of the lake	Open Space	Town of Erie
Prince Lake	Arapahoe Road and US 287	Lake with existing crusher fines trail present around the perimeter of the lake	Open Space	Town of Erie

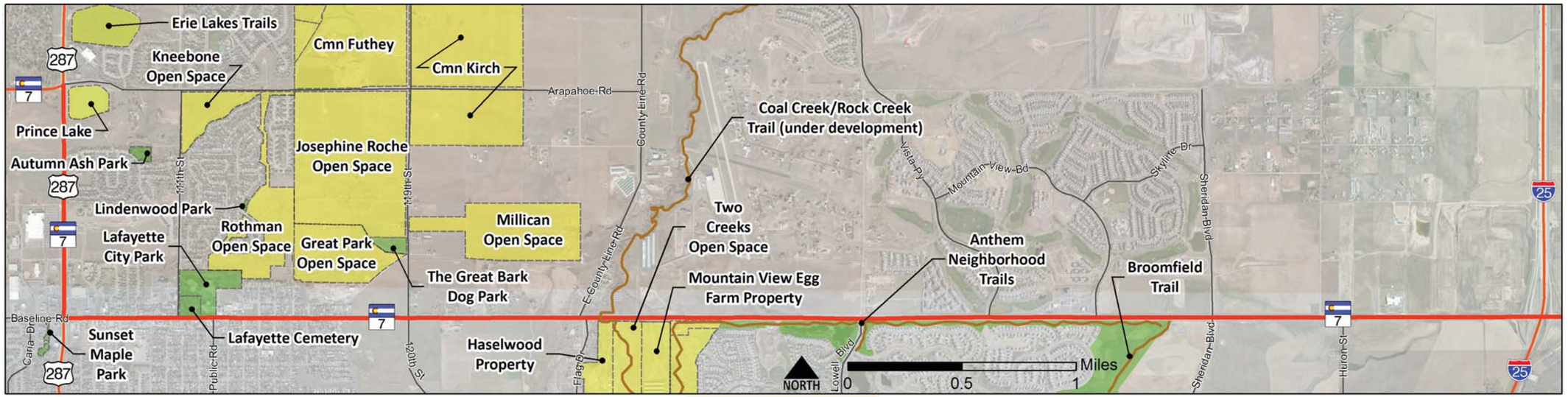
Future or Planned Recreation Resources

Given the developing nature of the corridor it should be noted that many of the municipalities have master plans established for future trails, parks, and open space areas within or adjacent to the project area. The majority of these resources span jurisdictional boundaries and follow linear features within the project area. **Table 5.2** contains a list of those resources that have been identified for future implementation. This list should not be considered exhaustive as master plans may be updated while this project is progressing. However, efforts should be made to not preclude previous planning efforts made by local jurisdictions.

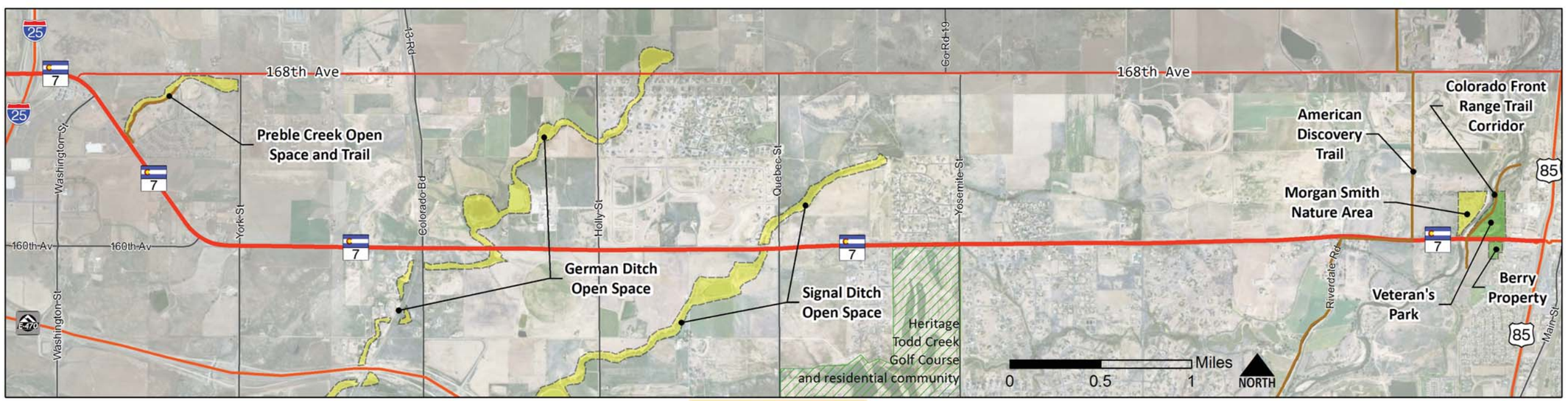
Table 5.2 Future Master Planned Recreation Resources

Name	Description & Location	Owner
SH 7 trail	Future trail extending west from US 85 on the north side of SH 7.	City of Brighton
Signal Ditch Corridor Trail	Proposed missing trail link trending along the Signal Ditch crossing SH 7 at Quebec.	City of Thornton
Community Park	Park in progress by future developer at the southwest corner of 160th Ave. and Holly St. Future trail connectors to Signal Ditch and German Ditch trail corridors.	City of Thornton
German Ditch Corridor Trail	Proposed missing trail link trending along the German Ditch crossing SH 7 west of Colorado Boulevard and adjacent to the railroad.	City of Thornton
Big Dry Creek Park/Open Space	Proposed missing trail link trending along Big Dry Creek crossing SH 7 between Colorado Boulevard and York Street.	City of Thornton
Bull Canal Ditch Trail	Proposed missing trail link trending north/south along the Bull Canal.	City of Thornton
Regional Trail 5	This regional trail connection has been identified as a possible joint project with surrounding municipalities.	City and County of Broomfield
Broomfield Trail	This proposed trail crosses SH 7 just west of I-25. It trends west along the south side of SH 7 until it swings south past Sheridan Boulevard.	City and County of Broomfield
Coal Creek/Rock Creek Trail Project – Eastern Link	The Eastern Link trail will have an underpass at SH 7 and Coal Creek. Special Opportunity Grant was received from by GOCO. Construction expected 2011 – 2012.	Boulder County, City of Lafayette, Town of Erie

Figure 5.1. Parks, Open Space, and Trails



US-287 to I-25



I-25 to US-85

Resource Type

- Park / Golf Course
- Open Space
- Trail

NORTH

Section 4(f) and Section 6(f) Evaluation

Some of the park properties present within the project area are publicly owned and are afforded protection under Section 4(f) of the US Department of Transportation (USDOT) Act of 1966, as defined in 23 Code of Federal Regulations (CFR) 774. A Section 4(f) resource is a property that functions or is designated as a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site. If one of these properties is impacted as part of the proposed action then a Section 4(f) evaluation may be required for that particular resource.

In addition to Section 4(f), there are some properties within the project study area that are afforded protection under Section 6(f) of the Land and Water Conservation Fund Act. Section 6(f) of the Act assures that once an area has been funded with Land and Water Conservation Fund assistance, it is continually maintained in public recreation use unless the National Park Service approves substitution property. Importantly, Section 6(f) applies to all transportation projects involving possible conversions of the property whether or not federal funding is being utilized for the project.

5.2 Traffic Noise

The potential for noise or vibration impacts from vehicles to the receptors (i.e., properties) near transportation facilities are a general concern. Thresholds for determining noise impacts have been established by state and federal transportation agencies (e.g., CDOT or FHWA) to guide these conclusions. When impacts are identified from an improvement, mitigation actions for the impacted receptors are typically considered for the project design. This is an important consideration for this project because many properties are along the project corridors and may be impacted by noise.

Existing Noise Sensitive Areas

The current CDOT Noise Abatement Criteria (NAC) is presented in **Table 5.3.** Numerous residential neighborhoods (NAC Category B) can be found in the PEL study area between US 85 and SH 287. Likewise, a number of Category C areas (parks, schools, churches, etc.) are also spread throughout the PEL study area. A summary of noise sensitive areas is presented in **Table 5.4.**

Table 5.3 CDOT Noise Abatement Criteria

Land Use Category	CDOT NAC (Leq dB)	Description of Land Use 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	Residential
C	66 Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	51 Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	Not Applicable	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	Not Applicable	Undeveloped lands that are not permitted for development.

Source: CDOT 2011a

Table 5.4 Noise Sensitive Areas

Location Description	Distance From Project Area	Property Description	CDOT Land Use Category
South of SH 7 Between South Kuner Road and Miller Avenue	Within 500 Feet	Apartment Homes	B
North of SH 7, West of Miller Avenue	Adjacent	Veterans Park	C
South of SH 7, East of Riverdale Road	Adjacent	Residential Neighborhood	B
North of SH 7 at Lima Street	Adjacent	Church	C
South of SH 7 at Lima Street	Adjacent	Residential Neighborhood	B
South of SH 7 at Elmira Street	Adjacent	Residential Neighborhood	B
North of SH 7 at Lomand Circle	Adjacent	Residential Neighborhood	B
South of SH 7, east of Yosemite Street (Todd Creek)	Adjacent	Residential Neighborhood	B
North of SH 7, West of Yosemite Street (Todd Creek)	Adjacent	Residential Neighborhood	B
South of SH 7, West of Yosemite Street	Adjacent	Heritage Todd Creek Golf Course	C
North of SH 7 Between Quebec Street and Holly Street	Adjacent	Residential Neighborhood	B
North of SH 7, west of Holly Street	Within 500 Feet	Northern Hills Christian Church	C
Northeast of SH 7 at East 166th Avenue	Adjacent	Residential Neighborhood	B
North of SH 7 between Sheridan Boulevard. and Lowell Boulevard	Adjacent	Residential Neighborhood	B
South of SH7 between Sheridan Boulevard and Airport Drive	Adjacent	Residential Neighborhood	B
North of SH 7 at Iowa Street	Within 500 Feet	Park	C
SH 7 at North 11th Street	Adjacent	Cemetery	C
East of SH 7 at West Lucerne Drive	Adjacent	Residential Neighborhood	B

5.3 *Historic Resources*

This section includes information on previously identified historic properties and potential historic properties along the SH 7 corridor. Historic resources encompass man-made features and physical remains of past human activity, generally at least 45 years old (Properties constructed in 1967 or earlier). Historic resources include buildings, bridges, railroads, roads, and other structures.

Significant historic resources are afforded considered by Section 106 of the National Historic Preservation Act of 1966, as amended, as well as Section 4(f) of the Department of Transportation Act of 1966. Significant historic resources are those that are listed or may be eligible for inclusion on the National Register of Historic Places (NRHP). Sites qualifying for the NRHP must retain sufficient integrity (of location, design, setting, materials, workmanship, feeling, and association) and meet one or more of the eligibility criteria specified in 36 CFR 60.4.

Important historic resources must be identified and considered during planning for federally-assisted transportation projects, in accordance with Section 106. This information was collected from a variety of sources including the following:

- Lists of properties on the NRHP
- Lists of properties on the Colorado State Register of Historic Properties
- Lists of Local Landmarks from communities and counties with local historic landmark programs
  - Boulder County Registered Historic Landmark Sites
  - City of Lafayette Historic Register.
- A file search at the Colorado Historical Society for all properties which had previously been surveyed and officially designated as properties eligible for inclusion on the NRHP
- A file search at the Colorado Historical Society for all properties which had previously been surveyed and had been field assessed as properties eligible for inclusion on the NRHP
- A field assessment to identify properties with architectural character and integrity that may be potential historic resources

Previously Identified Historic Sites

For purposes of this study, only properties on the NRHP or officially eligible for the NRHP are listed as previously identified historic sites. There are nine existing historic properties within the SH 7 corridor. These include one eligible historic district in the City of Lafayette, two residences, two railroads, three ditches, and one farm. **Table 5.5** lists the previously identified historic sites in the corridor. **Figure 5.2** shows previously identified historic sites in the corridor.

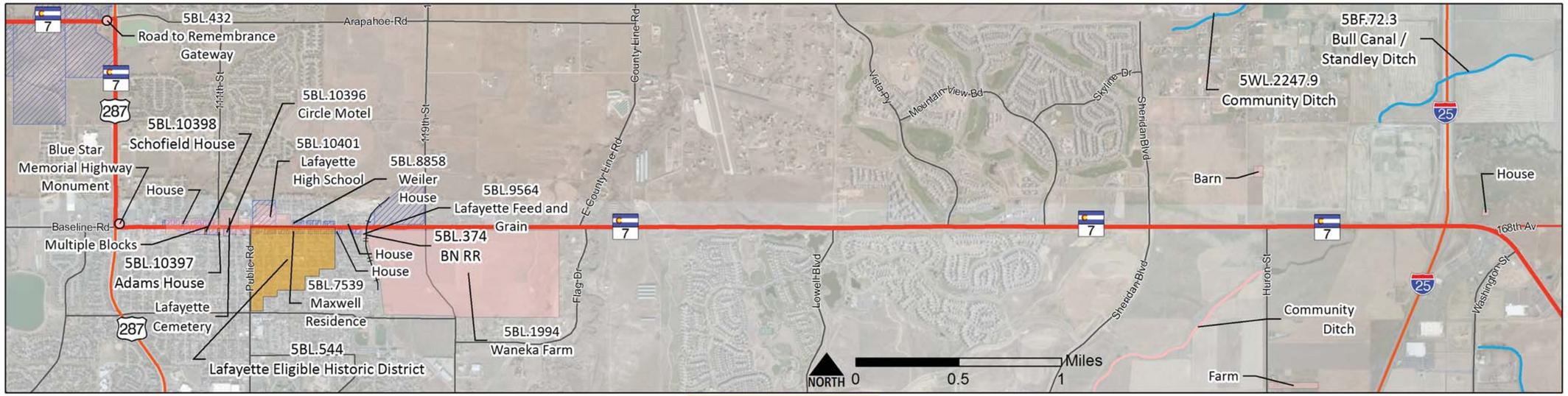
Table 5.5 Previously Identified Historic Sites (Listed from West to East)

Site #	Name	Address	Description	Status
5BL.10398	Schofield House	310 West Baseline Road, Lafayette	1908 Stone Craftsman Bungalow Dwelling – Significant for Architecture under Criterion C.	Officially Eligible for NRHP 7/7/2008
5BL.10397	Adams House	210 West Baseline Road Lafayette	1908 Hipped-roof Box Dwelling – Significant for Architecture under Criterion C.	Officially Eligible for NRHP 7/7/2008
5BL.544	Lafayette Eligible Historic District	Includes properties on the south side of Baseline Rd. from Public Rd. east to Foote Ave.	An historic district encompassing almost all of the original town of Lafayette was delineated in a 1979 survey and determined officially eligible that year. The City of Lafayette has never designated this historic district.	Officially Eligible for NRHP 8/7/1979

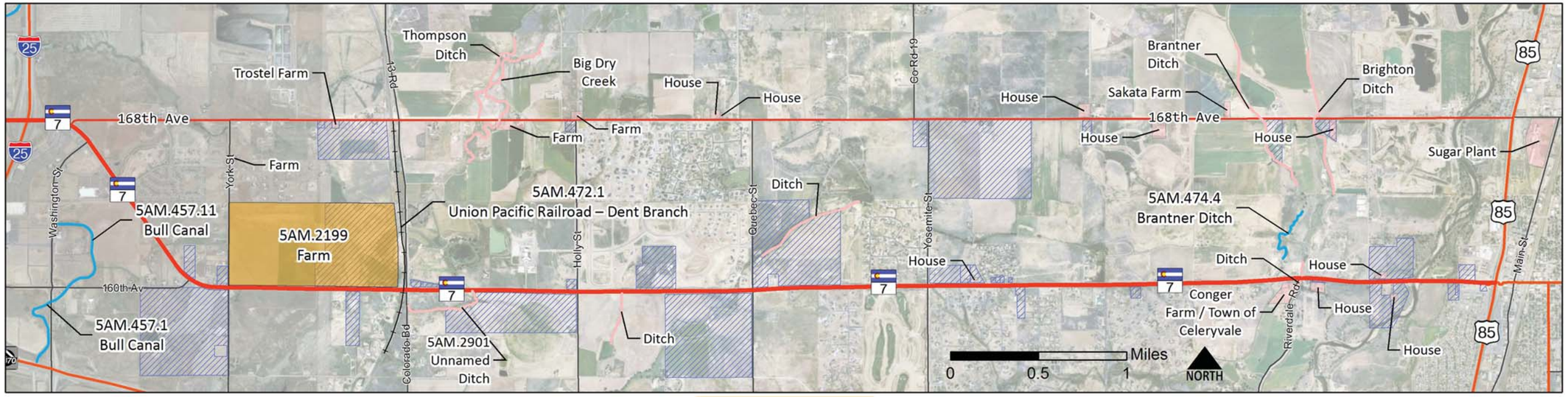
Table 5.5 Previously Identified Historic Sites (Listed from West to East) (Continued)

Site #	Name	Address	Description	Status
5BL.374	Burlington Northern Santa Fe (BNSF) Railway	Crosses SH 7 about 0.6 miles east of US 287	The entire railroad was officially determined eligible for the NRHP under Criterion A for the key role it played in the settlement of Colorado. The railroad is not in operation in this portion of the railroad line and the tracks have been removed where it crosses SH 7 in Lafayette. Two segments, one to the north of SH7 (5BL.374.12) and one to the south of SH7 (5BL.374.6) were previously surveyed in the project area. The segment north of Baseline Rd. (5BL.374.12) was determined officially not eligible on 6/10/2010. The segment south of Baseline Rd. (5BL.374.6) has not had an official determination of eligibility, but was field assessed as eligible on 2/6/1990.	Officially Eligible for NRHP 3/14/1990
5WL.2247.9	Community Ditch	Approximately 0.9 mile north of SH 7 and 1.5 miles west of I-25	Historic Irrigation Ditch	Officially Eligible for NRHP 2/7/1996
5BF.72.3	Bull Canal/ Standley Ditch	Crosses I-25 0.7 miles north of SH 7	Historic Irrigation Canal	Officially Eligible for NRHP 8/9/2007
5AM.457.1	Bull Canal	Approximately 0.7 mile southeast of SH 7 at Washington Street	Historic Irrigation Canal	Officially Eligible for NRHP 1/2/2001
5AM.457.1 1	Bull Canal	Approximately 0.3 miles southeast of SH 7 between SH 7 and Washington St.	Historic Irrigation Canal	Officially Eligible for NRHP 5/27/2010
5AM.2199	Farm	3225 E. 160th Avenue	1909 Farm Significant for its role in early agricultural production under Criterion A.	Officially Eligible for NRHP 2/26/09
5AM.472.1	Union Pacific Railroad – Dent Branch	Crosses SH 7 just west of Colorado Boulevard	The entire railroad was officially determined eligible for the NRHP in 1988 under Criterion A for the key role it played in the settlement of Colorado. The segment that crosses SH 7 was officially determined as eligible on 10/20/2009.	Officially Eligible for NRHP 10/20/2009
5AM.474.4	Brantner Ditch	0.1 miles northwest of SH 7 and Riverdale Road	Historic Irrigation Ditch segment just north of SH 7.	Officially Eligible for NRHP 12/4/2006

Figure 5.2. Previously Identified Historic Sites



US-287 to I-25



I-25 to US-85

NRHP Listed or Eligible Properties

- Property/Structure
- Railroad
- Ditch/Canal
- Property Exceeds 45 Years of Age*
- Potential Historic Sites

*Does not include Weld and Broomfield Counties due to no data available

Potential Historic Sites

Because not all historic sites within this large corridor have been previously surveyed, it is important to identify potential historic sites. Potential historic sites include:

- Properties that have been previously surveyed and field assessed as eligible.
- Properties that have been previously surveyed many years ago and assessed as not eligible, but with the passage of time may now be potentially assessed as historic.
- Local historic landmarks.
- Properties over 45 years of age that have not yet been surveyed but based on a visual reconnaissance, appear to possess architectural qualities that may make them eligible for the NRHP under Criterion C – Architecture.

All of the properties in this list will need additional research to determine whether or not they are eligible for the NRHP. The following table lists the potential historic properties in the corridor. This list includes residences, commercial properties, farms, irrigation ditches, a railroad, a school, and two monuments.

Table 5.6 Potential Historic Sites (Listed from West to East)

Site #	Name	Address	Description	Status
SH7/160th Ave.				
5BL.432	Road to Remembrance Gateway	On Arapahoe Road (SH 7) just west of US 287	Monument erected in 1928 to honor those who served in World War I	FE 5/1/1980
	Blue Star Memorial Highway Monument	NE corner SH 7 and US 287, Lafayette	Stone monument with plaque for Blue Star Memorial Highway	
	House	511 W. Baseline Road, Lafayette	1910 Stone House	
		100-600 blocks W. Baseline Road, Lafayette	A variety of properties on the north and south sides of these blocks will need assessment for historic potential	
5BL.10396	Circle Motel	200 W. Baseline Road, Lafayette	1920s-1930s motel	Included on Self-Guided Tour of Boulder County Historic Sites ONE 7/3/2008
	Lafayette Cemetery	111 W Baseline Road, Lafayette	Established in 1891	Local Landmark - Lafayette
5BL.10401	Lafayette High School	101 E. Baseline Road, Lafayette	Currently Pioneer Bilingual Elementary School	Local Landmark - Lafayette
		400-700 blocks W. Baseline Road, Lafayette	A variety of properties on the north side of these blocks will need assessment for historic potential.	

Table 5.6 Potential Historic Sites (Listed from West to East) (Continued)

Site #	Name	Address	Description	Status
SH7/160th Ave.				
5BL.8858	Weiler House	401 E. Baseline Road, Lafayette	1900 Dwelling	Local Landmark – Lafayette FNE 5/2004 ONE11/22/85
5BL.7539	Maxwell Residence	406 E. Baseline Road, Lafayette	1898 Dwelling	FE 7/1999
	House	700 E. Baseline Road, Lafayette	1910 Dwelling	
	House	711 E. Baseline Road, Lafayette	1925 Dwelling	
5BL.9564	Lafayette Feed and Grain	816 E. Baseline Road	1955 Grain Elevator	ONE 8/10/2004
5BL.374.6	BN RR	Crosses SH 7 about 0.6 miles east of US 287	Segment south of Baseline Rd. is not in operation. Tracks removed at Baseline Rd. Note: Segment north of Baseline (5BL.374.12) was determined officially not eligible on 6/10/2010.	FE 2/6/1990
5BL.1994	Waneka Farm	11716 and 12076 E. Baseline Road, Lafayette	1883 Farm The farm buildings are significant under Criteria A and C for their role in dairy farming in southeast Boulder County.	FE 9/2008 Centennial Farm – 4/29/1987
	Community Ditch	Slightly west of Huron Street and SH 7	Irrigation Ditch	
	Farm	16601 Huron Street		
	Weldford Barn	On Weld County Road 7 approximately 0.2 miles north of SH 7	Barn Part of Palisade Park Filing # 2	
	House	4185 County Road 2		
5AM.2901	Unnamed Ditch	Southeast corner of Colorado Boulevard and SH 7	Irrigation Ditch	
	Ditch	Approximately 0.2 miles east of Holly Street	South of Ashwood Reservoir	
	Ditch	Approximately 0.1 miles east of Quebec Street		
	House	9315 E. 160th Avenue	1934 House and 2 farm outbuildings	

Table 5.6 Potential Historic Sites (Listed from West to East) (Continued)

Site #	Name	Address	Description	Status
SH7/160th Ave.				
5AM.474	Brantner Ditch	0.1 miles west of SH 7 and Riverdale Road	Historic Irrigation Ditch segment	
	Conger Farm/ Town of Celeryvale	16001 Riverdale Road	1944 Hipped-box House	
	Ditch	Immediately east of Riverdale Road and SH 7	Irrigation Ditch with headgate	
	House	12420 E. 160th Avenue	1943 House	
	House	13115 E. 160th Avenue	1915 House	
	House	13200 E. 160th Avenue	1914 House	
168th Ave.				
	Farm	16610 York	1956 house and 2 old outbuildings	
	Trostel Farm	3400 Weld County Road 2	1954 House	
	Ditch	Slightly east of Colorado Boulevard	Irrigation Ditch	
	Ditch	Slightly east of first ditch east of Colorado Boulevard	Irrigation Ditch	
	Farm	5100 Weld County Road 2	1934 House and outbuildings	
	Farm	7065 Weld County Road 2	1906 House	
	House	7865 Weld County Road 2	1934 House	
	House	7900 Weld County Road 2	1935 House	
	House	9965 Weld County Road 2	1929 House	
	House	11102 Weld County Road 2	1950 House	
	Sakata Farm	10775 Weld County Road 2	1915 House	
	Ditch	Slightly east of Lima Street	Irrigation Ditch	
	Ditch	Slightly east of first ditch east of Lima Street	Irrigation Ditch	
	House	12522 Weld County Road 2	1901 House	
	Sugar Plant	701 N. Main Street, Brighton	1912 Industrial Buildings	

5.4 Floodways and 100-year Floodplains

This section provides a summary of major drainageways in the project area. Drainageways were identified by the FEMA designated floodplain maps. FEMA designated floodplains are defined by zones AE, A or X, which are described below.

- Zone AE is part of the FEMA 100-year flood hazard area where base flood elevations have been determined.
- Zone A is part of the FEMA 100-year flood hazard area where base flood elevations have not been determined, but a shaded, generalized floodplain is shown on the FEMA Flood Insurance Rate Maps (FIRM). The 100-year flood is FEMA's base flood.
- Zone X is part of the FEMA 500-year flood area, 100-year flood area with average depths of less than one foot, or with drainage areas less than one square mile. There are no Zone X floodplains win the project area.

There are six drainageways that have FEMA designated floodplains in the project area. Of these six drainageways, three are designated as Zone AE floodplains and three are designated as Zone A floodplains. A summary of the drainageways within the project area and their corresponding FEMA designation is presented below in **Table 5.7** and **Figure 5.3.** Of these drainageways, the Coal Creek, Big Dry Creek, and the South Platte River 100-year floodplains cross SH 7.

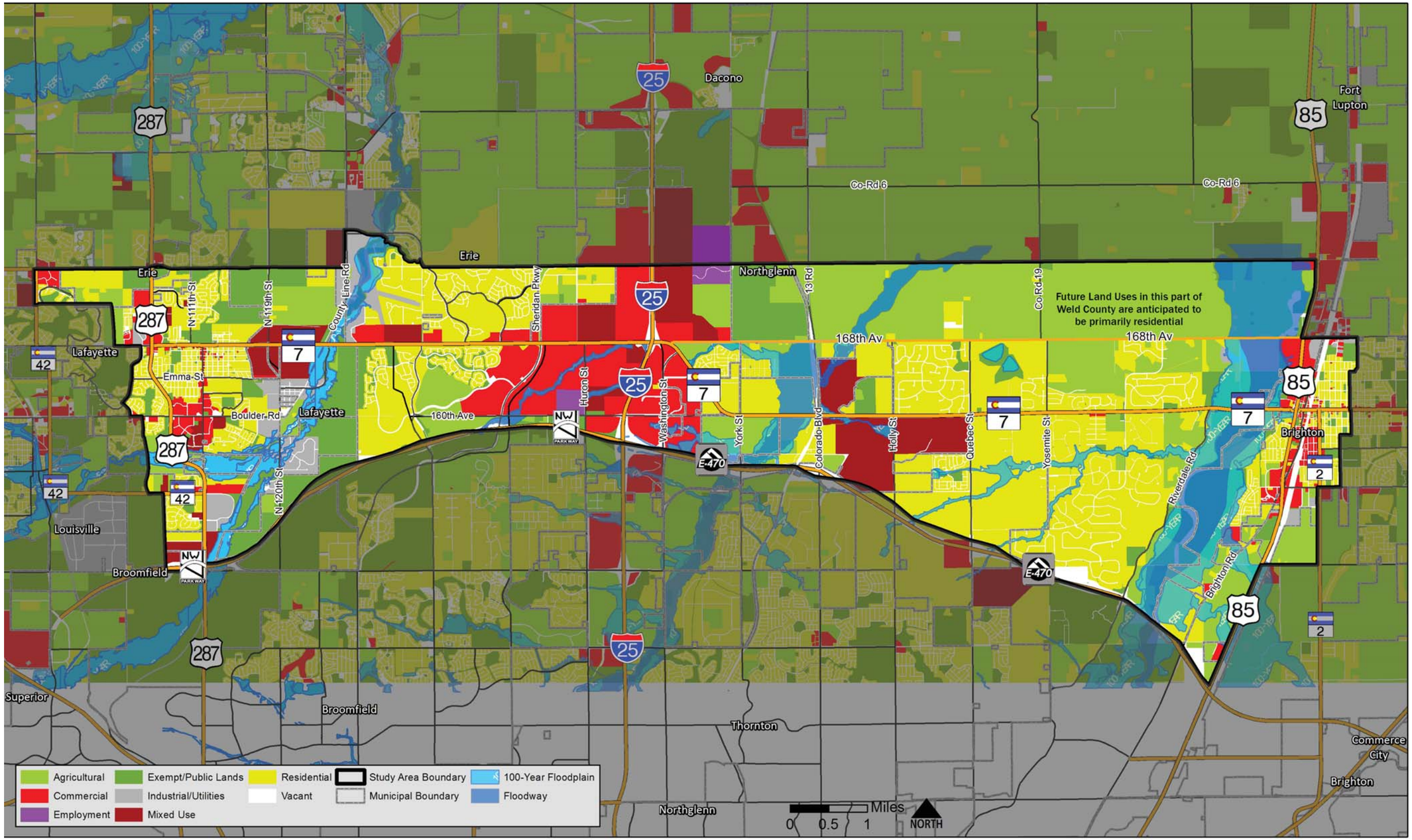
Table 5.7 Summary of Drainageways

Drainageway	FEMA Zone
Coal Creek	AE/Floodway
Big Dry Creek	AE/Floodway
S. Fork Preble Creek	A
Preble Creek	A
Morris Creek	A
South Platte River	AE/Floodway

A floodway designation in addition to the Zone AE floodplain delineation means that an area of the floodplain has been defined to be "reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." FEMA typically accomplishes this by prohibiting placement of fill in the floodway. If fill is proposed in a floodway, floodplain modeling must show that the fill placement will not adversely impact surrounding property.

The three drainageways that have Zone AE floodplains and floodways delineated are the most sensitive to any changes in the floodplain and will almost certainly require a CLOMR/LOMR process if any changes are proposed. The three drainageways that have a Zone A are sensitive to changes made in the floodplain. Floodplain modeling is required to assess significant changes. Some relatively small changes may be incorporated in the floodplain without triggering the CLOMR/LOMR process. Floodplain modeling will still be required to assess significant changes and will most likely require a CLOMR/LOMR.

Figure 5.3. Generalized Future Land Uses and Floodplains / Floodways



NORTH

It should be noted that Todd Creek Drainage Way 1 is shown on FEMA maps, but does not have a FEMA designated floodplain. A 100-year floodplain has been documented in the Flood Hazard Area Delineation for Todd Creek. The upstream limit of the designated floodplain is located at the southeast corner of SH 7 and Yosemite Street, but does not cross SH 7.

5.5 Wetlands and Waters of the US

Wetland resources are protected under Section 404 of the Clean Water Act (CWA) (33 US Code [USC] 1344) and Executive Order 11990 *Protection of Wetlands* (USEPA, 1977). The CWA requires coordination with the US Army Corps of Engineers (USACE) and resource agencies such as the USEPA and the USFWS when impacts occur to wetlands that are considered waters of the US. The US Department of Transportation (USDOT) Order 5660.1 *A Preservation of the Nation's Wetlands* (USDOT, 1978), provides guidance on wetland mitigation assessment. CDOT has incorporated this and other FHWA environmental guidance into its *Environmental Stewardship Guide* (CDOT, 2005d), which emphasizes efforts to avoid and minimize wetland impacts.

The following wetland analysis describes the inventory of wetlands and other waters within the SH 7 corridor. This analysis builds on the results of prior environmental studies completed or nearing completion in the project area, including the North I-25 EIS and the North Metro Corridor project Final EIS and ROD. The wetlands identified in the North I-25 Wetlands and Other Waters Technical Memorandum was utilized as a basis for this study. This analysis discusses the wetlands within the proposed project corridor and identifies current conditions.

Wetland Analysis Methodology

A limited site reconnaissance of the project corridor was conducted in January 2012. Previously identified wetlands as well as potential wetland areas that had not been mapped in prior studies were examined. Wetland vegetation and hydrology was reviewed at each potential site, data collected and wetland areas that had not been previously mapped were located.

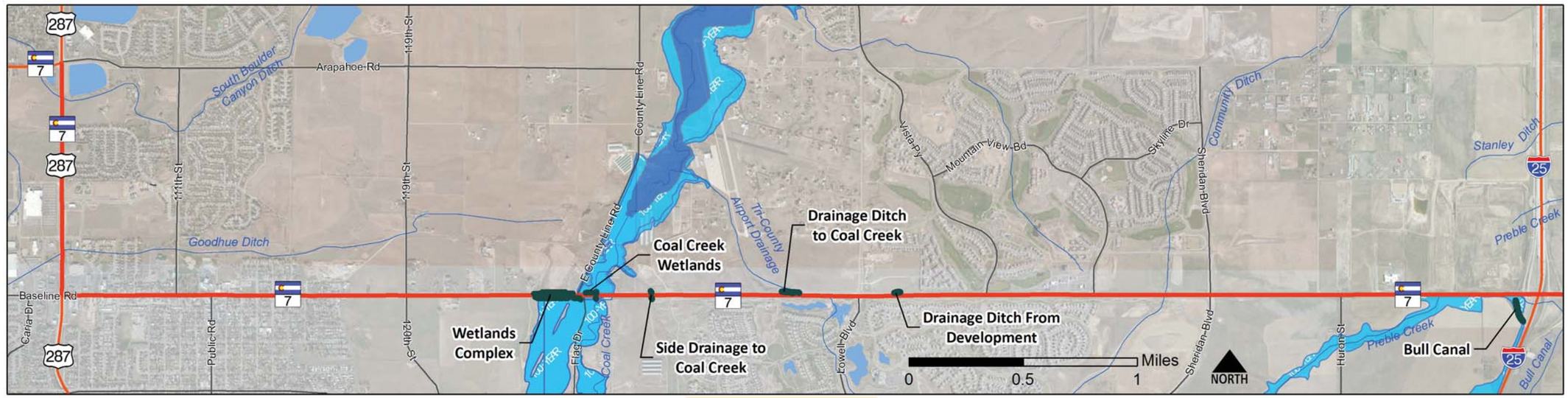
All field determinations were performed in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (Environmental Laboratory, 2010). Field surveys and reviews of vegetation followed the 1988 Region 5 (Central Plains) Wetland Indicator List (Reed 1988) and wetland community types were classified according to Cowardin et al. (1979) and the Field Guide to the Wetlands and Riparian Plant Associations of Colorado (Carsey et al. 2003).

Wetland Analysis Findings

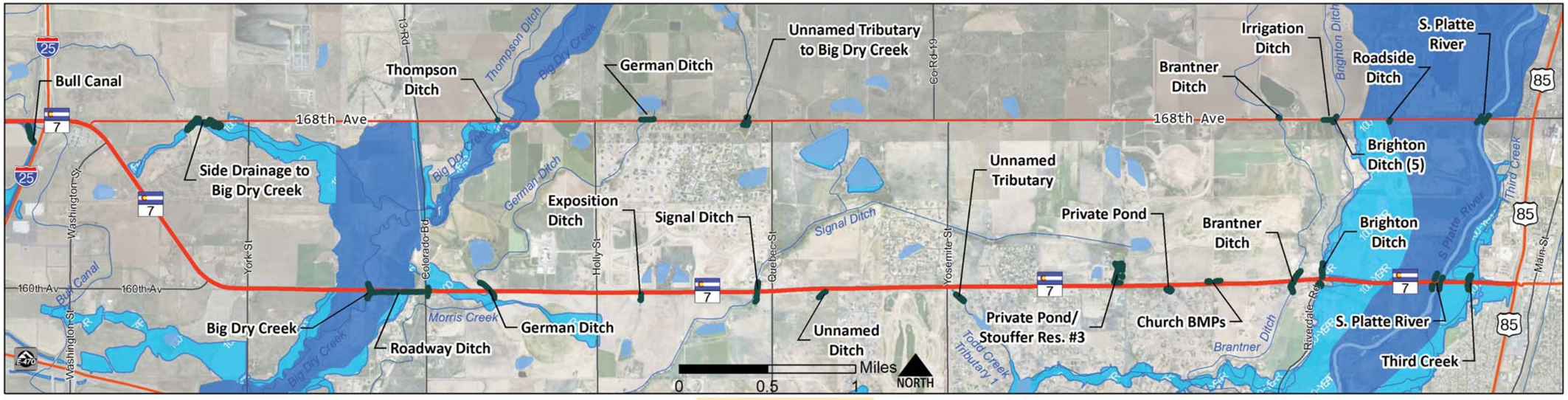
The majority of wetlands identified within the corridor are small palustrine emergent, palustrine scrub/shrub, and palustrine scrub/shrub-emergent mix wetlands with most occurring along existing waterways and drainages and in roadside ditches. The majority of these roadside and irrigation ditch wetlands were considered low quality wetlands in prior studies. The exception is for wetlands associated with the South Platte River, Big Dry Creek and Coal Creek which, depending on existing riparian conditions, provide a moderate quality wetland value.

All wetlands identified in this field review are listed in **Table 5.8**, which contains a listing of information for each wetland area including the corresponding Routine Determination Form number, wetland label number as shown on **Figure 5.4.**

Figure 5.4. Wetlands and Waters of the US / Floodplains and Floodways



US-287 to I-25



I-25 to US-85

Wetlands and Waters of the US

- Wetland Determination
- Lakes & Ponds
- Streams/Irrigation Ditches
- 100-Year Floodplain
- Floodway

NORTH

Table 5.8 Summary of Surveyed Wetlands

Wetland Label	Wetland Identification
31-32	McCann Ditch/Third Creek
27-30	South Platte River
14-15	Brighton Ditch
16-17	Brantner Ditch
18-19	Church Ponds
20	Pond
21	Stouffer Reservoir #3
22	Unnamed Tributary
23	Unnamed Ditch
24-25	Signal Ditch
26	Exposition Ditch
2002-2003	German Ditch
30-31	Highway Ditch
2000-2001	Highway Ditch
1998-1999	Big Dry Creek
792-802	Bull Canal
33	Drainage Ditch from Development
34	Drainage Ditch to Coal Creek
35	Side Drainage to Coal Creek
36	Coal Creek Wetlands
37-40	Wetland Complex
1-4	South Platte River
7	Roadside Ditch
5-6	Brighton/Irrigation Ditch
8	Brantner Ditch
9-10	Unnamed Tributary to Big Dry Creek
11	German Ditch
41	Thompson Ditch
12-13	Side Drainage to Big Dry Creek

Wetland hydrology for the identified wetlands in the corridor project area was based on field observations and was found to be a combination of irrigation ditches, groundwater, stormwater runoff and adjacency to water flows in the South Platte River, Big Dry Creek, and Coal Creek. Wetland types found in the corridor include palustrine emergent systems with persistent vegetation and palustrine scrub-shrub systems with broad-leaved deciduous shrubs. This field review confirmed earlier studies (North I-25 Draft EIS, 2008 and North I-25 Final EIS, 2011) that found the following wetland types and vegetation/hydrological conditions.

Palustrine Scrub/Shrub Wetlands

Vegetation/Hydrology – The vegetation identified in project scrub-shrub wetlands was found along the banks of the perennial creeks and river as well as along ponds, irrigation and roadside ditches, and intermittent drainages and tributaries. Typical vegetation included sandbar willow *(Salix exigua*), plains cottonwood (*Populus deltoides)*, crack willow (*Salix fragilis*), Siberian elm (*Ulmus pumila*), and Russian olive (*Elaeagnus angustifolia).* The project areas containing these wetlands were found adjacent to waterways or in roadside ditches which receive periods of temporary flooding or stormwater flows that contribute to a higher ground water table. Common hydrologic indicators found in the project corridor include drift lines, sediment deposits, and drainage patterns in wetlands.

Palustrine Emergent Wetlands

Palustrine emergent wetlands found in the project corridor were located along irrigation and roadway ditches, edges of detention ponds and adjacent to perennial and intermittent waterways. The typical vegetation includes a predominance of reed canarygrass (*Phalaris arundinaea*) and common cattail (*Typha latifolia*), as well as smaller populations of arctic rush (*Juncus articus),* Canada thistle (*Cirsium arvense*), 3-square bulrush (*Scirpus pungens*) and soft-stem bulrush (*Scirpus validus*).

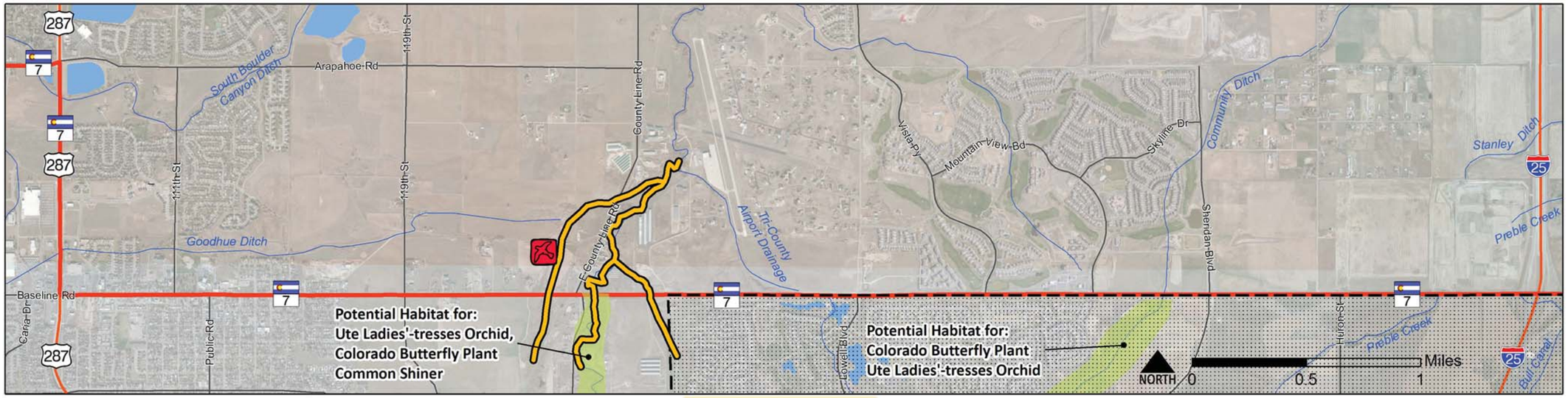
The primary hydrology for these wetlands is surface runoff, ground water flows, and adjacency to intermittent and perennial waterways. Hydrologic indicators observed include sediment deposits, areas of inundation and drainage patterns in wetlands.

5.6 Wildlife/Threatened and Endangered Species

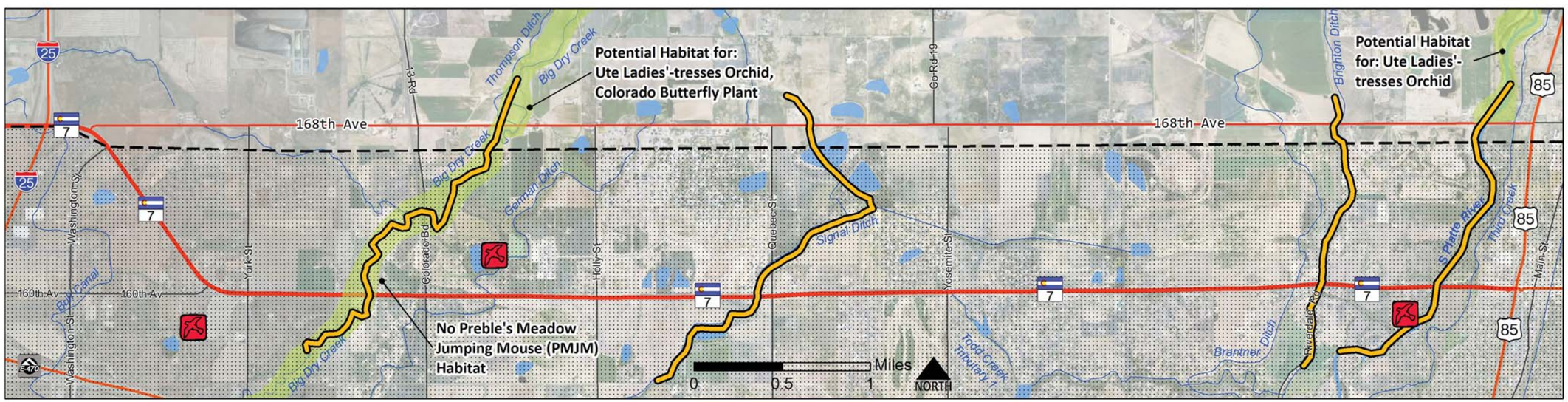
Wildlife is an important public resource that warrants consideration during federally funded projects and is documented during the National Environmental Policy Act (NEPA) process. Various federal laws have been established to protect wildlife, including: the Endangered Species Act (ESA); the Migratory Bird Treaty Act (MBTA); the Bald and Golden Eagle Protection Act (BGPA); and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

Details and characteristics of wildlife resources in the study area were identified using existing geographic information system (GIS) data and field verified (January 5th and 18th, 2012) (**Table 5.9** and **Figure 5.5**). Additional inventory details about the resources, such as protection status and presence of species were obtained from accessing the Colorado Department of Parks & Wildlife (CDPW) Natural Diversity Information Source (NDIS), the Colorado Natural Heritage Program (CNHP), and the US Fish & Wildlife Service (USFWS) websites in January 2012. Research was centered on utilizing the most current version of information available online. Data from the North I-25 EIS and ROD were utilized because the two study areas general overlap (CDOT & FHWA 2011).

Figure 5.5. Wildlife Corridors, Threatened and Endangered Species



US-287 to I-25



I-25 to US-85

Bald Eagle Nest
Major Wildlife Corridor
Lakes & Ponds
Protected Species
PMJM Block Clearance Zone
Streams

NORTH

Table 5.9 Existing Wildlife Resources

Resource Name	Protection Type	Habitat	Habitat Present?	Observed in Field?
Bald Eagle (*Haliaeetus leucocephalus)*	BGPA	Reservoirs and rivers. In winter they may also occur locally in semi deserts and grasslands, especially near prairie dog towns.	Yes, multiple areas with cottonwoods and creeks/rivers in project area.	Yes, three potential nests, one with bald eagle present.
Cliff Swallows (*Petrochelidon pyrrhonota)*	MBTA	Streams and creeks with readily available access to insects and locations for building nests.	Yes, multiple locations where structures can be used to build nests.	Yes, mud nests present on bridge structures.
Colorado Butterfly Plant (*Gaura neomexicana coloradensis*)	Federally Threatened Species - ESA	An early successional plant (although probably not a pioneer) adapted to use meandering stream channel sites that are periodically disturbed. It occurs on subirrigated, alluvial (stream deposited) soils on level or slightly sloping floodplains and drainage bottoms, does not occur in Adams County (USFWS 2011).	Yes, Coal Creek, Community Ditch, Big Dry Creek, and the South Platte River.	No Survey Conducted.
Common Shiner (*Notropis cornutus*)	State Threatened Species - ESA	Typically occurs in small and medium-sized streams with clear, cool water, and a moderate current. Streams usually with unvegetated gravel to rubble bottom. Prefer pools adjacent to rapids/cascades.	Yes, Coal Creek.	No Survey Conducted.
Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)	Federally Threatened Species - ESA	Inhabits riparian areas near standing or running water in lowland areas that are dominated by forested wetlands, shrub dominated wetlands, and grass/forb dominated wetlands between 4,000 and 8,000 ft in elevation.	Yes, Coal Creek. *Note: A block clearance zone for this species exists south of the Weld County/Adams County line and east of Coal Creek.	No Survey Conducted.
Red-tailed Hawk (*Buteo jamaicensis*)	MBTA	Nests in large trees (typically plains cottonwood [*Populus deltoides*]) in or near riparian areas, areas with abundant prey.	Yes, multiple drainages and several nests which have been used in the past by red-tailed hawks are present	Yes, several nests identified.

Table 5.9 Existing Wildlife Resources (Continued)

Resource Name	Protection Type	Habitat	Habitat Present?	Observed in Field?
Ute Ladies'-Tresses Orchid (*Spiranthes diluvialis*)	Federally Threatened Species - ESA	Occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams.	Yes, Coal Creek, Community Ditch, and Big Dry Creek. *Note: A block clearance zone for this species exists south of the Weld County/Adams County line for the South Platte River.	No Survey Conducted.
Western Prairie Fringed Orchid (*Platanthera praeclara*)	Federally Threatened Species - ESA	Occurs most often in mesic to wet unplowed tallgrass prairies and meadows but have been found in old fields and roadside ditches.	No habitat present.	No Survey Conducted.
Wildlife Corridors	SAFETEA-LU	Identified corridors/crossing locations for wildlife, typically along drainages, streams, and rivers.	Yes, numerous ditch and stream crossings are located throughout the project area.	Yes.

Note: All habitat information taken from CDOW-NDIS 2011 and USFWS 2011, unless otherwise noted.

The wildlife resources that were identified during the review can be categorized into one of the following categories:

- **Threatened & Endangered Species** – State and federal listed threatened & endangered species that are listed or are candidates for listing on the ESA. Habitat and range maps were collected from the above resources.
- **Protected Species –** Species or their habitat readily visible in the field at the time of the survey. They included species that are protected by the MBTA and BGPA.
- **Wildlife Corridors –** Identified corridors for wildlife to move through the landscape freely. Wildlife Corridors and wildlife crossings are identified, as part of SAFETEA-LU, as a source for safety risks to the general public. Identifying and planning for best management practices for wildlife crossings is also identified in SAFETEA-LU.

Generally, the project area is in a flat to rolling plains region of Colorado which consists of agricultural fields and individual farms, but is now experiencing an increase in both residential and commercial development throughout the corridor. There are numerous drainages throughout the project area, including eight ditches and canals, three creeks, and one river. During the field surveys, resources were identified that are within or adjacent to the road right-of-way within the project corridor.

Threatened and Endangered Species

Locations where possible protected T & E species habitat would be present were identified based on field surveys are listed in **Table 5.9**. This includes habitat for such plants as the Colorado butterfly plant (*Gaura neomexicana coloradensis*) and the Ute ladies'-tresses orchid (*Spiranthes divulialis*). Other species that were identified that have habitat present in the project area include the common shiner (*Notropis cornutus*) and the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). The primary drainages that were identified from the field survey and which contained suitable habitat for these species include Coal Creek, Community Ditch, Big Dry Creek, and the South Platte River. A detailed survey of these drainages is recommended for the species listed above to identify the presence or absence of these species in the project area.

Migratory Birds

During the field survey, any nests that were within or readily visible from the ROW, including migratory birds, raptors, and eagles, were noted. Multiple cliff swallow (*Petrochelidon pyrrhonota*) nests were found on structures over drainages and multiple raptor nests were found throughout the project area, including three individual bald eagle (*Haliaeetus leucocephalus*) nests. All of the bald eagle nests identified were within a half mile of the right-of-way. Several red-tailed hawk (*Buteo jamaicensis*) nests were found east of I-25 and within one third of a mile of the project area. The CDPW has recommended buffers for raptor nests to limit disturbance due to human encroachment of between a quarter and a half mile radius from active nests (CDOW 2008).

Thus, impacts to migratory birds (e.g., song birds, herons, other raptors, and bald eagles) may occur from design alternatives if construction occurs during the normal nesting season of these species. The normal nesting season is between February 15th and July 15th.

Wildlife Corridors

Wildlife is identified as a road safety hazard, causing billions of dollars annually in repairs and medical costs due to animal-vehicle collisions (AVCs) nationwide. These AVCs also result in a loss to wildlife populations and wildlife diversity. Typically the total number of AVCs is under-reported and only focus on large wildlife species. Existing land use in the project area is primarily agricultural, but land is being converted into residential and commercial development at a steady pace. Where wildlife had free movement through fields and along drainages in the past, their movements are now becoming more constricted and their habitat is more fragmented due to this development.

Currently, there are no parks or open space properties which included identified movement corridors for wildlife between protected tracts of land within or adjacent to the project corridor. However, major wildlife corridors, which facilitate wildlife movement, were noted through a field survey. These corridors include: Coal Creek, Big Dry Creek, Brighton Ditch, and the South Platte River. The construction of wildlife-friendly structures over these drainages will provide avenues for wildlife to move through the project area while keeping the general public safe.

5.7 Hazardous Materials

This section provides a summary of properties with potential or known hazardous materials issues located adjacent to the project area. The methodology used to identify sites with potential or known hazardous materials issues included the following steps:

- Review of readily available local, state, tribal, and federal environmental agency databases.
- Performance of a limited visual site reconnaissance of properties within the project area from public ROW to identify site activities and potential contamination sources adjacent to the project area.
- Identification of sites with recognized or potential environmental conditions.

For this hazardous materials assessment summary, sites within the project area were identified as having known (current and historic) soil or groundwater contamination and are distinguished in this report as sites with recognized environmental conditions. Recognized environmental conditions, include sites *with "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property"* (ASTM 2005).

Sites with the potential for soil and/or groundwater contamination that could not be confirmed without additional inspection or investigation are distinguished as sites with potential environmental conditions.

The SH 7 PEL project area has a variety of land uses, including agricultural, oil/gas development, residential, commercial, and light industrial. A total of 39 sites with recognized and potential environmental conditions were identified within 500 feet of the SH 7 project area (**Table 5.10** and **Figure 5.6**).

Table 5.10 Sites with Recognized and Potential Environmental Conditions Adjacent within 500 feet of SH 7 and 168th Avenue within the Project Area

Site Address/Name	Distance from Project Area	Site Description
SH 7 - West of I-25		
745 N. US 287, Lafayette/Walmart	Adjacent	Potential Environmental Condition (PEC). Tank (AST), Generator. Tire and Lube shop. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
740 N. US 287, Lafayette, Discount Tire	Adjacent	PEC. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
600 N. 107th St., Lafayette/Yellow Transportation System, Inc.	Adjacent	Recognized Environmental Condition (REC). Tank (UST), Tank Leak (Closed).
Baseline Rd. and US 287, Lafayette	Adjacent	REC. Spill. Unknown details concerning spill; residual contamination could be present.

Table 5.10 Sites with Recognized and Potential Environmental Conditions Adjacent within 500 feet of SH 7 and 168th Avenue within the Project Area (Continued)

Site Address/Name	Distance from Project Area	Site Description
SH 7 - West of I-25		
1100 W. Baseline Rd., Lafayette/Public Works Shop	Within 500 feet	REC. Tank (UST), Tank Leak (Closed).
991 W. Baseline Rd., Lafayette/Former Service Station	Adjacent	REC. Tank (UST), Tank Leak (Closed).
200 N. US 287, Lafayette/Just Brakes	Adjacent	PEC. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
480 N. 107th, Lafayette/King Soopers Gas Station	Adjacent	PEC. Operating gas station.
610 W. Baseline Rd., Lafayette/Lafayette U-Pump-It	Adjacent	REC. Operating gas station. Tank (UST), Tank Leak (Open) Implementing Corrective Action Plan (CAP). Remediation system observed behind property.
508 W. Baseline Rd., Lafayette/Baseline Gas Station	Adjacent	REC. Operating gas station (T3 Gas & Food Mart). Tank (AST), Tank Leak (Open) Implementing CAP.
506 W. Baseline Rd., Lafayette	Adjacent	REC. Spill. Unknown details concerning spill; residual contamination could be present. Old vehicle maintenance bay located in main building. Also, a vehicle maintenance bay located behind main building. Miscellaneous carpet debris in fenced-in area behind main building.
110 W. Baseline Rd., Lafayette/Eagle Service	Adjacent	REC. Tank (UST), Tank Leak (Closed). Automotive repair/maintenance. Vehicle maintenance bays. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
210 N. Public Rd., Lafayette/BVO/PAS Food & Gas	Within 500 feet	REC. Operating gas station (Conoco). Tank (UST and LPG) Tank Leak (Closed).
300 E. Baseline Rd., Lafayette/Art Dry Cleaners	Adjacent	PEC. Dry Cleaner facility with unknown cleaner and solvent handling and disposal practices.
408 Baseline Rd., Lafayette/Ray C. Imel/	Adjacent	REC. Tank (UST), Tank Leak (Closed)/Currently this site is the Take a Break Childcare center.
901 E. Baseline Rd., Lafayette/Bolyard's The Collision Center	Adjacent	PEC. Generator. Automotive repair/maintenance. Vehicle maintenance bays. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
11761 E Baseline Rd., Lafayette	Adjacent	PEC. Tank (UST). Potential for leaks.

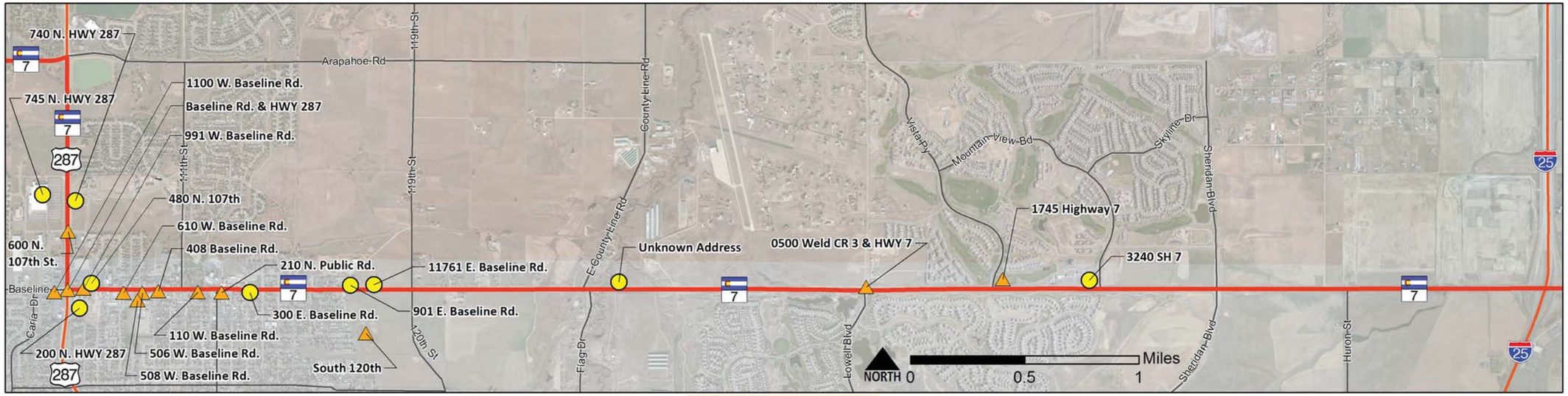
Table 5.10 Sites with Recognized and Potential Environmental Conditions Adjacent within 500 feet of SH 7 and 168th Avenue within the Project Area (Continued)

Site Address/Name	Distance from Project Area	Site Description
SH 7 - West of I-25		
South 120th, Lafayette, Rubble Dump Site.	Within 500 feet?	REC. Former rubble dump site.
Unknown Address, Main Street Power Facility, Lafayette	Adjacent	PEC. 2.8 megawatt solar power facility. Photovoltaic panels and solar power systems may contain hazardous materials. Unknown hazardous materials use, storage, and disposal.
0500 Weld CR 3 & SH 7, Lafayette	Adjacent	REC. Spill. Unknown details concerning spill; residual contamination could be present.
1745 SH 7, Erie/Mile High Shooting Range	Within 500 feet	REC. Voluntary Cleanup. Redeveloped as residential.
3240 SH 7, Erie/7-11	Adjacent	PEC. Operating gas station. No reported leaks.
SH 7 - East of I-25		
2021 E. 160th Ave., Broomfield/Tri County Store	Within 500 feet	REC. Tank (UST), Tank Leak (Closed).
9315 SH 7/Total Auto Coverage Corp.	Adjacent	PEC. Fenced in area with old machinery, equipment, ASTs. Unknown material handling, storage, and disposal practices.
United Power– Platte Valley Substation	Adjacent	PEC. Unknown hazardous materials use, storage, and disposal. Potential for polychlorinated biphenyls (PCBs) – containing equipment and other materials such as transformer oil, battery acid, maintenance chemicals, waste transformer oil, and other waste (e.g., batteries, fluorescent lights).
70 W. Bridge St., Brighton/Brighton Conoco/Brighton Sinclair	Adjacent	REC. Operating gas station (Conoco) Tank, Tank Leak (Closed).
125 W. Bridge St., Brighton/Twin Peaks Ltd./Ace Auto Repair	Adjacent	PEC. Light industrial facility and automotive repair/maintenance facility. Vehicle maintenance bays. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.
SH 7 and US 85, Brighton	Adjacent	REC. Spill. Unknown details concerning spill; residual contamination could be present.
5 S. 1st Street, Brighton/Bear Frame and Axle	Adjacent	REC. Closed site. Tank Leak. Vehicle maintenance bays. Unknown material handling, storage, and disposal practices. Potential materials include: fuel, motor oils, hydraulic fluids, degreasers, paints and solvents.

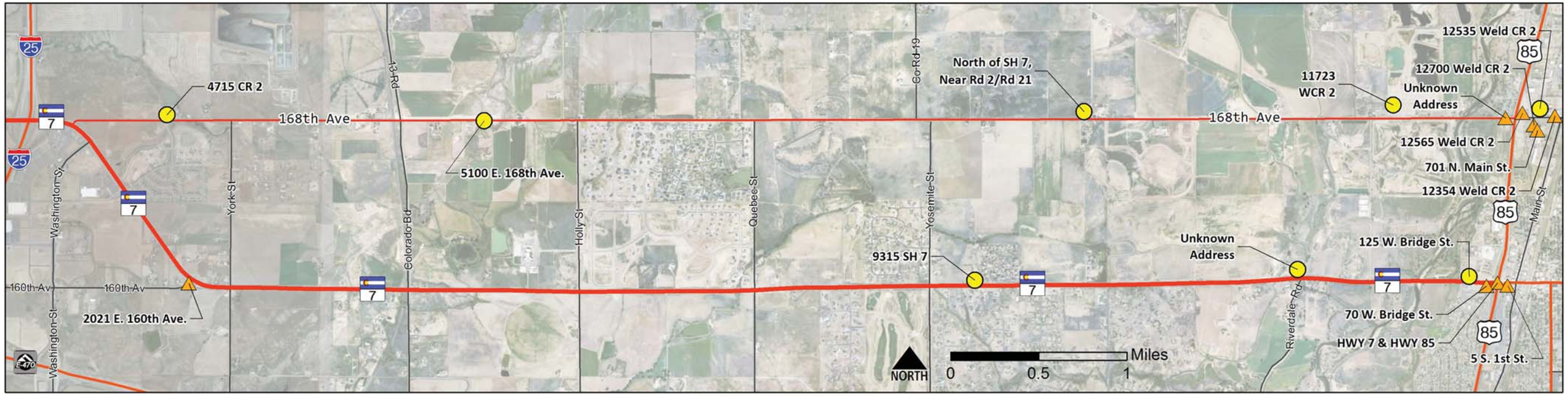
Table 5.10 Sites with Recognized and Potential Environmental Conditions Adjacent within 500 feet of SH 7 and 168th Avenue within the Project Area (Continued)

Site Address/Name	Distance from Project Area	Site Description
168th		
4715 CR 2/RV Storage	Adjacent	PEC. Vehicle storage. Potential for petroleum leaks. Unknown if repair/maintenance activities occur at the facility.
5100 E. 168th Ave., Brighton	Adjacent	PEC. Tank (UST). Potential for leaks.
Old Farm Property, North of SH 7, Near Rd. 2/Rd. 21	Adjacent	PEC. This site has a large amount of old equipment, tanks, old rusted vehicles, debris piles. Unknown materials handling, storage, and disposal practices.
11723 WCR 2, Bestway Concrete and Hall-Irwin Aggregate & Landscape Materials	Adjacent	PEC. ASTs, aggregate piles, heavy equipment, fueling area, and operations/maintenance garage.
12354 Weld CR 2, Brighton/Pynergy Brighton/Conoco	Adjacent	REC. Tank (UST), Tank Leak (Closed)
Unknown address. Baseline Rd. and West of Hwy 85/Brighton Industrial Park.	Adjacent	REC. Voluntary Cleanup.
12700 Weld CR 2, Southeast corner of Baseline Rd. and US 85/Great Western Parts	Adjacent	REC. Auction yard. Vehicle storage. Miscellaneous debris piles.
701 N. Main Street, Southeast corner of Baseline Road and US 85/Amalgamated Sugar Company	Adjacent	REC. Sugarmill facility. Railroad and railroad cars were observed. Unknown hazardous materials due to sugar mill processing. Potential for soil and groundwater contamination due to sugar processing activities.
12535 WCR 2, Brighton/LEED Fabrication	Adjacent	PEC. Light industrial facility. Unknown materials handling, storage, and disposal practices.
12565 WCR 2, Brighton/Jody's Welding/Leed Tool Co.	Within 500 feet	REC. Tank (UST), Tank Leak (Closed)

Figure 5.6. Hazardous Materials - Sites with Recognized Potential Environmental Conditions



US-287 to I-25



I-25 to US-85

- Sites with Potential Environmental Conditions
- Sites with Recognized Environmental Conditions (Leaking Underground Storage Tank Sites)

NORTH

Leaking Underground Storage Tanks

The Colorado Department of Labor and Employment, Division of Oil and Public Safety defines a LUST site as closed/clean-up complete when "the owner and/or operator has not necessarily removed all contamination, but instead actions taken have met the criteria that the State uses for determining adequate clean up." As a result, residual surficial and subsurface soil contamination and/or groundwater contamination may be present at closed sites and could be encountered on-site or downgradient of these closed sites during subsurface construction activities. There are 13 leaking underground storage tank (LUST) sites adjacent to the project area. Two of these LUST sites are still open, while the remaining 11 sites have been closed and clean-up has been completed.

Oil and Gas Facilities

Numerous oil and gas well facilities are situated adjacent to the SH 7 corridor. The potential exists for subsurface releases of gas exploration, development, and production wastes (i.e., drilling fluids) and petroleum or gas products into surrounding soils and groundwater; however, these releases may not be directly visible/observable at the oil and gas facilities, or along the associated gathering and transmission pipeline. As a result, all oil and gas facilities/associated transmission lines that may be impacted or disturbed constitute a site with potential environmental conditions. Therefore, these facilities present a potential explosion hazard and worker health and safety concern. The potential also remains to encounter subsurface wells not formerly located or identified.

Farm Properties

Numerous farm properties are located adjacent to the SH 7 corridor (**Figure 5.5**). Historically, it was not uncommon for these types of properties to have petroleum storage tanks and fuel equipment. During the site reconnaissance, many small- and medium-acreage farms were observed. Individual farm properties were not investigated during the site visit; however, in general, these properties often contain multiple structures, equipment storage, miscellaneous debris piles, 55-gallon drums, aboveground storage tanks, and propane tanks and unknown hazardous materials handling, storage, or disposal practices. Old cisterns and septic systems could also be present associated with the farm properties. The farm properties are identified as sites of concern due to unknown historical disposal practices and use of petroleum and other hazardous materials.

Railroad Corridor/Railroad Bridge

An existing railroad bridge crosses over SH 7 just west of Colorado Boulevard. Impacts to soil and groundwater along the railroad may exist due to undocumented events and an accumulation of drip, leaks, spills, and hydrocarbon exhaust over time. Asbestos and lead-based paint may also be present on the railroad bridge. Peeling paint was observed during the site visit.

Historic Coal Mines

The project area lies within a portion of the Boulder-Weld Coalfield, which has a well-documented history of problems associated with undermining and with the mines' surface access features. All of the mines are now abandoned. Problems include surface subsidence (generally slow and gently inclined depressions), surface collapse (relatively fast and steep-sided), encountering subsurface voids during construction, underground mine fires, and possibly, groundwater gas-contamination (Geocal 2004). The number of known coal mine features is included in **Table 5.11**.

Table 5.11 Known Coal Mine Features

Type of Feature	Number of Features
SH 7	
Existing and Terminated Coal Mine Sites within 1,500 feet	3
Adits within 1,500 feet of SH 7	5
Air Shafts within 1,500 feet	7
168th	
Existing and Terminated Coal Mine Sites within 1,500 feet	5

6.0 REFERENCES

City of Brighton. Parks, Open Space & Trails Map. Website accessed February 2012. http://www.brightonco.gov/egov/docs/1246385452_282257.pdf

City of Broomfield. 2005. Broomfield Transportation Plan. November.

City of Broomfield Open Space, Parks, Recreation and Trails Master Plan. Existing and Planned Local Trail System. Website accessed February 2012. http://www.broomfield.org/openspace/Exisitng%20Trail%20System.pdf

City of Broomfield. Open Space, Parks, Recreation and Trails Master Plan. Major Community and Regional Trails (proposed). Website accessed February 2012. http://www.broomfield.org/openspace/Proposed%20Community%20and%20Regional%20Trails.pdf

Boulder County. In Progress. Boulder County Transportation Master Plan.

Boulder County and Broomfield Consortium of Cities. 1997. Regional Transportation Task Force. June.

Boulder County. Coal Creek/Rock Creek Regional Trail System. Website accessed February 2012. http://www.bouldercounty.org/live/environment/land/roads/pages/ccrctrail.aspx

Jointly Owned Boulder County-Lafayette Open Space Management Plan for "Two Creeks" Open Space. 2004 amended 2010. Website accessed February 2012. http://www.cityoflafayette.com/Files/TwoCreeks%20Mngmt%20Plan.pdf

Carsey et al. 2003. *Field Guide to the Wetland and Riparian Plant Associations of Colorado*.

Colorado Department of Transportation. 2008. *Technical Memorandum, Wetlands and Other Waters of the U.S.* in *North I-25 Draft EIS.* U.S. Department of Transportation, Federal Highway Administration, Federal Transit Administration and Colorado Department of Transportation.

Colorado Department of Transportation (CDOT).2011a. CDOT Noise Analysis and Abatement Guidelines. June.

CDOT. 2011b. *Technical Memorandum Addendum, Wetlands and Other Waters of the U.S.* in *Final North I-25 EIS.* U.S. Department of Transportation, Federal Highway Administration, Federal Transit Administration and Colorado Department of Transportation.

Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT). 2008a. SH 7 (Cherryvale Rd. to 75th St.) Environmental Assessment and Draft Section 4(f) Evaluation. May.

FHWA and CDOT. 2008b. SH 7 (Cherryvale Rd. to 75th St.) Finding of No Significant Impact and Final Section 4(f) Evaluation. October.

FHWA and CDOT. 2011a. North I-25 Final Environmental Impact Statement, Final Section 4(f) Evaluation. August.

FHWA and CDOT. 2011b. North I-25 Record of Decision. December.

Federal Transit Administration (FTA) and Regional Transportation District (RTD). 2011a. North Metro Corridor Final Environmental Impact Statement and Final Section 4(f) Evaluation. January.

FTA and RTD. 2011b. Record of Decision North Metro Corridor Project. April.

Colorado Natural Heritage Program, College of Natural Resources, Colorado State University. Fort Collins, CO.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and DeepwaterHabitats of the United States*. (FWS/OBS-79/31) U.S. Fish and Wildlife Service. Washington D.C.

Colorado Division of Wildlife (CDOW). 2008. CDOW Raptor Guidelines. February.

Denver Regional Council of Governments (DRCOG). 2007 (as amended). 2035 Metro Vision Regional Transportation Plan. December.

Environmental Laboratory. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region*. Technical Report ERDC/EL TR-10-1, U.S. Army Corps of Engineer Waterways Experiment Station. Vicksburg MS.

Felsburg Holt and Ullevig (FHU). 2009. SH 7 Corridor Study, Revised Initial Evaluation of Alternative Alignments Technical Memorandum. February 25.

Town of Erie. 2002. Town of Erie, Erie Municipal Tri-County Airport, Airport Master Plan. February 7.

Town of Erie. 2008. Transportation Master Plan. January 8.

Town of Erie, City and County of Broomfield, and CDOT. 2002 (as amended). SH 7 Access Control Plan. July.

Geocal, Inc. 2004. North I-25 Front Range Environmental Impact Statement. Abandoned Mines Mapping, Preliminary Report. October 14.

City of Lafayette. Website accessed February 2012. http://www.cityoflafayette.com/page.asp?navid=939

City of Thornton October 2007 Parks and Open space Master Plan Map. Website accessed February 2012. http://www.cityofthornton.net/Departments/CityDevelopment/GisServices/Documents/Map_Catalog/ParksMP.pdf

City of Thornton. Parks Open Space Trails User Map. 2007. December. Website accessed February 2012. http://www.cityofthornton.net/Departments/CommunityServices/Parks/Documents/TrailMapUsersWeb.pdf

City of Thornton. 2009. City of Thornton Transportation Plan. July.

Natural Diversity Information Source (NDIS). 2012. Website: http://ndis.nrel.colostate.edu/conservationcnty.asp?cnty=031 .

United States Fish & Wildlife Service (USFWS). 2012. Information, Planning, and Conservation System (IPaC) internet mapping tool website: http://ecos.fws.gov/ipac/wizard/trustResourceList!prepare.action

Weld County, Adams County, City of Northglenn, and City of Thornton. 2008. Weld/Adams County Line Crossroads Alignment Study. October.