

APPENDIX A
CORRIDOR CONDITIONS ASSESSMENT FOR STATE HIGHWAY 7
PLANNING AND ENVIRONMENTAL LINKAGES STUDY
JANUARY 2017

**CORRIDOR CONDITIONS ASSESSMENT REPORT
FOR
STATE HIGHWAY 7
PLANNING AND ENVIRONMENTAL LINKAGES (PEL)
STUDY**



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LIST OF ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
AM	morning
AST	aboveground storage tank
AVC	animal-vehicle collision
BGPA	Bald and Golden Eagle Protection Act
BRT	bus rapid transit
CDOT	Colorado Department of Transportation
CPW	Colorado Department of Natural Resources Division of Parks and Wildlife
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CWA	Clean Water Act
dB	decibels
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EDR	Environmental Data Resources
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	FEMA Flood Insurance Rate Map
FIS	Flood Insurance Studies
FONSI	Finding of No Significant Impact
GIS	geographic information system
HCM	Highway Capacity Manual
I-25	Interstate 25
LF	landfill
LOS	level of service
LOSS	level of service of safety
LUST	leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MP	milepost
mph	miles per hour
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
NUPUD	Non-Urban Planned Unit Development
NWI	National Wetland Inventory
OSP	Outfall Systems Plans
PDO	property damage only
PEC	potential environmental contaminant
PEL	Planning and Environmental Linkages
PEM	palustrine emergent
PM	evening
PSS	palustrine scrub/shrub
R-A	Regional Highway
REC	recognized environmental condition
ROD	Record of Decision
RTD	Regional Transportation District
SH 7	State Highway 7
SH 119	State Highway 119
SHPO	State Historic Preservation Officer
SPF	safety performance function
SSS	sideswipe (same direction) crash
SSO	sideswipe (opposite direction) crash
TAZ	transportation analysis zone
TWSC	two-way stop controlled intersection
US 36	US Highway 36
US 85	US Highway 85
US 287	US Highway 287
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
USFWS	United States Department of Interior Fish and Wildlife Service
UST	underground storage tank
vpd	vehicles per day

EXECUTIVE SUMMARY

Boulder County is conducting a Planning and Environmental Linkages (PEL) study, in coordination with the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA), along SH 7 from 75th Street in Boulder County to US 287 in the City of Lafayette. The SH 7 PEL (75th Street to US 287) is being conducted to identify existing conditions, to identify anticipated problem areas, and to develop/evaluate multimodal improvements that will reduce congestion, improve operations, and enhance the safety of the roadway within the study corridor. The study area extends approximately 4 miles along SH 7 from the SH 7/75th Street intersection to SH 7 (Arapahoe Road)/US 287 intersection (milepost [MP] 60.68).

This Corridor Conditions Assessment Report has been prepared to document current and anticipated future conditions of the corridor in 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 within the region along the SH 7 corridor from the City of Boulder to the City of Brighton 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. This development will be tempered along SH 7 between 75th Street and US 287 by open space and conservation easement ownership of much of the agricultural and open space land.

The Denver Regional Council of Governments (DRCOG) travel demand model, which estimates the location of existing and future land use to generate trips onto the regional road network, projects nearly all of the expected growth along the study corridor to be residential. This growth is anticipated to be moderate and primarily south and east of the corridor, while little to no employment growth is expected adjacent to the corridor. Greater regional household and employment growth is expected further out from the corridor, particularly to the south and east.

Existing Transportation System

Within the study limits of the SH 7 PEL (N 75th Street to US 287), the geometric characteristics of SH 7 are highly variable. SH 7 primarily consists of two-lane cross-sections with 64 feet of right-of-way. Shoulder widths vary significantly on the roadway, primarily due to varying auxiliary lane configurations. All shoulders are paved, but most are not curbed. Typical shoulder widths range between 1 and 12 feet. Areas with shoulders less than 5 feet in width are typically found on segments of the highway with no access drives or auxiliary lanes. Auxiliary lanes are frequently provided throughout the corridor at both signalized and stop-controlled public street intersections for deceleration and acceleration movements.

Most of the corridor has no median, but when present, median configurations vary significantly. Raised medians exist at the SH 7/75th Street intersection, as well as for channelized right turn movements at other intersections, such as the SH 7/US 287 intersection. Most median configurations are painted and exist only near access drives and auxiliary lanes. Widths of painted medians range from 3 feet to 18 feet but typically range between 4 and 13 feet.

Access Categories

SH 7 from 75th Street to approximately Park Lake Drive is currently classified as a Regional Highway (R-A). The rest of the corridor is categorized as Non-Rural Principal Highway (NR-A). These categories are similar in terms of their restrictions for allowable access and auxiliary lanes; however, NR-A is reserved for more urban/suburban settings.

Traffic Operations

Existing daily traffic volumes along SH 7 range from 17,600 vehicles per day (vpd) to 21,700 vpd. Typically, a two-lane principal arterial can accommodate 16,000 vpd, meaning the study corridor is currently operating over capacity. During morning (AM) and evening (PM) peak hour operations, SH 7 is a commuter corridor for users travelling toward Boulder to the west and Lafayette, Brighton, and Denver to the east and south. The posted speed limits along SH 7 vary from 45 miles per hour (mph) to 50 mph along this corridor.

Storage lengths for auxiliary lanes at each of the three signalized intersections along the study corridor (75th Street, 95th Street, and US 287) are too short to handle peak hour demands, resulting in turning queues blocking through traffic. This results in increased congestion and corridor travel time for through traffic, reducing the efficiency of the signals. During the AM and PM peak periods, the intersections of SH 7 and N 95th Street and SH 7 and US 287 both operate at level of service (LOS) F. The intersection of SH 7 and N 75th Street operates at LOS C during AM peak period and LOS D during PM peak period.

Crash Data Analysis

A crash diagnostics analysis indicates that the three major intersections along the study corridor have a higher than expected frequency of rear end crashes. The non-intersection segments of the study area experiencing a higher than expected number of both rear end and total fixed object type crashes when compared to similar rural corridors. However, when compared to similar urban corridors, the frequency of rear-end crashes is close to the typical rate. Many of these rear end crashes that have occurred outside the intersections are likely a result of congestion and queuing from nearby intersections. A review of the crash history indicated that over half of the intersection rear end crashes occurred during the AM and PM commuter peak hours. This pattern is not entirely unexpected as the occurrence of rear end crashes tends to coincide with peak traffic conditions.

Safety performance functions indicate that there is a moderate potential for crash reduction east of 95th Street (LOSS III) when compared to other rural, flat, and rolling 2-lane undivided highways within Colorado. The one section that had a better than expected safety performance (LOSS II) was generally located between MP 57.5 and MP 58.75. The roadway was also compared to similar urban corridors, which produced similar results showing west of 95th Street is in the LOSS II category, while east of 95th Street is in the LOSS III category.

Transit Service and Bicycle and Pedestrian Facilities

RTD provides transit service along and across the corridor via two fixed-routebus lines. The JUMP provides east-west service between downtown Boulder, the University of Colorado in Boulder, and Lafayette/Erie along SH 7 (Arapahoe Road). The L/LX provides regional local stop service between Longmont, Niwot, Lafayette, and downtown Denver via US 36 and US 287 (LX runs as a supplement to L during peak periods), with the nearest stop to the corridor located on US 287 just north of its intersection with SH 7.

Bike lanes exist for 50 to 60 feet east of N 75th Street; however, the corridor lacks consistently wide enough shoulder widths to provide safe travel for bicyclists along the rest of the corridor. Today, bicyclists using the SH 7 must travel on extremely narrow shoulders or mixed with high speed vehicular traffic with a low level of comfort and safety. On-street bike lanes/wider shoulders currently exist on West Baseline Road one mile south of SH 7. Boulder County anticipates additional investment in the bicycle facilities along West Baseline Road to accommodate growing bicycle demand.

Pedestrian facilities consist of sidewalks concentrated around the three signalized intersections, with other sporadic sidewalk segments where residential and commercial land use is adjacent to the highway. However, most of the corridor in the study area does not provide sidewalks. Bus service on the corridor is largely accessed on foot and pedestrians accessing bus stops must travel on narrow shoulders or along the vegetated slope of the roadway, which creates a low level of comfort and perceived safety for the pedestrian.

Future Transportation Conditions

Traffic Operations

The DRCOG 2040 fiscally constrained regional travel demand model was used to develop 2040 traffic forecasts. Using the DRCOG model to adjust and grow existing traffic volumes to the year 2040, it's projected that daily traffic volumes will increase from 10 to 20 percent to between 19,900 vpd and 24,600 vpd along the corridor, meaning the corridor will remain above capacity.

The DRCOG model was also used to grow turning movements at each signalized intersection to analyze 2040 traffic operations. During the AM and PM peak periods, the SH 7/95th Street and SH 7/US 287 intersections both operate at LOS F. The SH 7/75th Street operates at LOS E during AM peak period and LOS F during PM peak period.

Transit Service and Bicycle and Pedestrian Facilities

The Northwest Rail Line continues to be planned to cross SH 7 west of N 75th Street and is currently funded for 2042. No station is planned near the study corridor. The 2014 SH 7 PEL, which was conducted for SH 7 from US 287 in the City of Lafayette to US 85 in the City of Brighton, recommended transit improvements along the SH 7 corridor. A BRT study along the entire SH 7 corridor between Boulder and Brighton is currently being conducted in conjunction with this study. The 2014 SH 7 PEL also recommended bicycle and pedestrian improvements along the SH 7 corridor between Lafayette and Brighton.

Environmental Overview

The environmental resources studied were selected based on the characteristics of the study area and on stakeholder input. The resources that were considered are generally consistent with the National Environmental Policy Act of 1969 (NEPA), its implementing regulations, and with Federal Highway Administration (FHWA) and CDOT guidelines. The following resources are those that may require avoidance or minimization of impacts, have separate laws and regulations protecting them, such as the Endangered Species Act 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 park properties or open space present within the study area are publicly owned and are afforded protection under Section 4(f) of the United States 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. A variety of parks, trails, and open space are located along SH 7 between US 287 and 75th St.

Traffic Noise

The potential for noise or vibration impacts from vehicles to the receptors (i.e., properties) near transportation facilities is a general concern. State and federal transportation agencies have established thresholds for determining noise impacts 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 noise may have an impact on many properties along the study area. Several residential neighborhoods (Noise Abatement Criteria Category B [NAC Category B]) can be found in the PEL study area between US 287 and 75th St. Likewise, a number of Category C areas (parks, schools, churches, etc.) are also spread throughout the PEL study area.

Historic Resources

Historic resources are afforded consideration by Section 106 of the National Historic Preservation Act of 1966, as amended, as well as Section 4(f) of the US DOT Act of 1966. Historic resources are those that are listed or may be eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP). Within the study area, 23 properties had been previously surveyed for eligibility, and 5 of those properties are officially eligible or potentially eligible for the NRHP. In addition, 48 properties along the corridor are greater than 45 years of age and would require a historic survey to determine their eligibility for the NRHP.

Floodways and 100-year Floodplains

Two drainageways have Federal Emergency Management Agency (FEMA) designated floodplains in the study area: Bullhead Gulch and Dry Creek. Both drainageways are designated as Zone AE floodplains and have 100-year floodplains that overtop 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, 2005), which emphasizes efforts to avoid and minimize wetland impacts. Most wetlands identified within the study area are small palustrine emergent (PEM), palustrine scrub/shrub (PSS), and palustrine scrub/shrub-emergent (Cowardin, 1979) mix wetlands with most occurring along existing waterways and drainages and in roadside and agricultural ditches. Most of these roadside and irrigation ditch wetlands were considered low quality wetlands due to their low plant diversity. Wetlands associated with Dry Creek, Bullhead Gulch, and South Boulder Canyon Ditch, however, provide a moderate quality wetland value when compared to higher quality wetlands in less disturbed settings.

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), and the Bald and Golden Eagle Protection Act (BGEPA). Threatened and endangered species habitat that is present in the study area includes habitat for the

Western Burrowing Owl (*Athene cunicularia*), the Colorado butterfly plant (*Oenothera coloradensis*), the Ute ladies'-tresses orchid (*Spiranthes diluvialis*), the common shiner (*Notropis cornutus*), and the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). The field survey identified Dry Creek as the primary drainage containing suitable habitat for these species. The Colorado butterfly plant can also be found along agricultural irrigation ditches. A field survey also noted Dry Creek, Bullhead Gulch, and South Boulder Canyon Ditch as potential wildlife corridors that facilitate wildlife movement.

Hazardous Materials

For the hazardous materials assessment summary, sites within the study area identified as having known (current and historic) soil or groundwater contamination are distinguished in this report as sites with recognized environmental conditions. Sites with the potential for soil and groundwater contamination were identified as sites with potential environmental conditions. A total of 16 sites with recognized and potential environmental conditions were identified within 500 feet of the SH 7 study area. Five of these sites were former auto shops or cleaners, and two sites contained leaking underground storage tank (LUST) sites adjacent to the study area.

1.0 INTRODUCTION

Boulder County is conducting a Planning and Environmental Linkages (PEL) study, in coordination with the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA), along SH 7 from 75th Street in Boulder County to US Highway 287 (US 287) in the City of Lafayette. The SH 7 PEL (75th Street to US 287) is being conducted to identify existing conditions; to identify anticipated problem areas; and to develop/evaluate multimodal improvements that will reduce congestion, improve operations, and enhance the safety of the roadway within the study corridor. The study area extends approximately 4 miles along SH 7 from the SH 7/75th Street intersection to SH 7 (Arapahoe Road)/US 287 intersection (MP 60.68)

This Corridor Conditions Assessment Report has been prepared to document current and anticipated future conditions of the corridor in 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.

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 Highway 85 (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. The study area extends approximately 4 miles along SH 7 from the intersection of SH 7/US 287 (MP 60.68) on the north side of the city of Lafayette on the west, to the intersection of SH 7/N 75th St to the east (**Figure 1.1**).

1.2 Transportation Planning Context

The following transportation plans relating to the project corridor have been developed:

- ▶ *City of Boulder Transportation Master Plan* (City of Boulder, 2014)
- ▶ *Boulder County Transportation Master Plan* (Boulder County, 2012)
- ▶ *Northwest Area Mobility Study* (RTD, 2014)
- ▶ *Arapahoe Transportation Plan* (City of Boulder, 2016)
- ▶ *North I-25 EIS* (FHWA and CDOT, 2011)
- ▶ *2040 Fiscally Constrained Regional Transportation Plan* (DRCOG, 2015)
- ▶ *SH 7 (Cherryvale Road to 75th Street) Project* (FHWA and CDOT, 2008)
- ▶ *SH 7 PEL Study* (CDOT, 2014)

City of Boulder Transportation Master Plan

Improvements to SH 7 from the City of Boulder to I-25 are a high priority for the City of Boulder to best meet future regional travel demand. This master plan recommends several multimodal improvements and demand-side services, with the goal of increasing person-trip capacity on SH 7. Improvements within the master plan include adding Bus Rapid Transit (BRT) service on SH 7 from US 287 to the City of Boulder.

The **vision** for the City of Boulder is to “create and maintain a safe and efficient transportation system meeting the sustainability goals of the community to accommodate increased person trips by providing travel choices and reducing the share of single occupant auto trips”
– City of Boulder, 2014

Boulder County Transportation Master Plan

The *Boulder County Transportation Master Plan* emphasizes safety, efficiency, and environmental sensitivity. The master plan identifies SH 7 (Arapahoe/Baseline Road) as a key corridor, along with State Highway 119 (SH 119) and US 36.

Northwest Area Mobility Study

The *Northwest Area Mobility Study* identified six corridors as candidates for possible BRT. Two of these corridors are within the study area: SH 7 (Boulder to Brighton) and US 287 (Longmont to US 36). These corridors were selected based on the evaluation of ridership, associated capital investment, potential operating plans, estimated capital and operations and maintenance costs, a high level environmental evaluation, and input from RTD and Northwest Area stakeholders.

The **vision** for Boulder County is to “provide high quality, safe, sustainable, and environmentally responsible transportation infrastructure and services across all modes, to meet the mobility and access needs of all users.”

– Boulder County, 2012

East Arapahoe Transportation Plan

The City of Boulder is currently developing the *East Arapahoe Transportation Plan* and will be evaluating several types of transportation improvements between 75th Street and downtown Boulder on east Arapahoe Road (SH 7) including this study area. The Complete Streets alternatives will be evaluated based on potential effects to community safety, health, socialness, livability, accessibility, as well as environmental and economic considerations. Initial findings from the planning process have indicated support for multimodal transportation, including BRT, lowering vehicle speeds, and better protection for bikers and pedestrians.

2040 Fiscally Constrained Regional Transportation Plan

The Denver Regional Council of Government’s (DRCOG) current long-range regional plan, the *2040 Fiscally Constrained Regional Transportation Plan* defines the vision for the region and the projects that are included within the Fiscally Constrained Plan. The *2040 Fiscally Constrained Regional Transportation Plan* does not include any improvements for the study area.

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 transportation modes. 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 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 with the use of the 10-foot shoulder or 5-foot on-street bicycle lanes. These improvements resulted in one general purpose through lane and one land dedicated to transit.

1.3 *Current Land Use*

Figure 1.1 shows the study area and the existing land use immediately surrounding the SH 7 corridor from east of US 287 to west of 75th St. Traveling east from the City of Boulder, Arapahoe Road (SH 7) and 75th St contain several commercial retailers including KT's BBQ and Heavenly Flour Bakery. Further east, SH 7 crosses through rural properties, residential subdivisions, and isolated retailers. There is another small residential center at 95th St, including a gas station, a 7-eleven, and several restaurants. Between 95th St. and US 287, there are several rural properties and residential subdivisions. At US 287, there are several commercial centers anchored by retailers including Safeway, Wal-Mart, King Soopers, and Walgreens, along with several other newer commercial establishments.

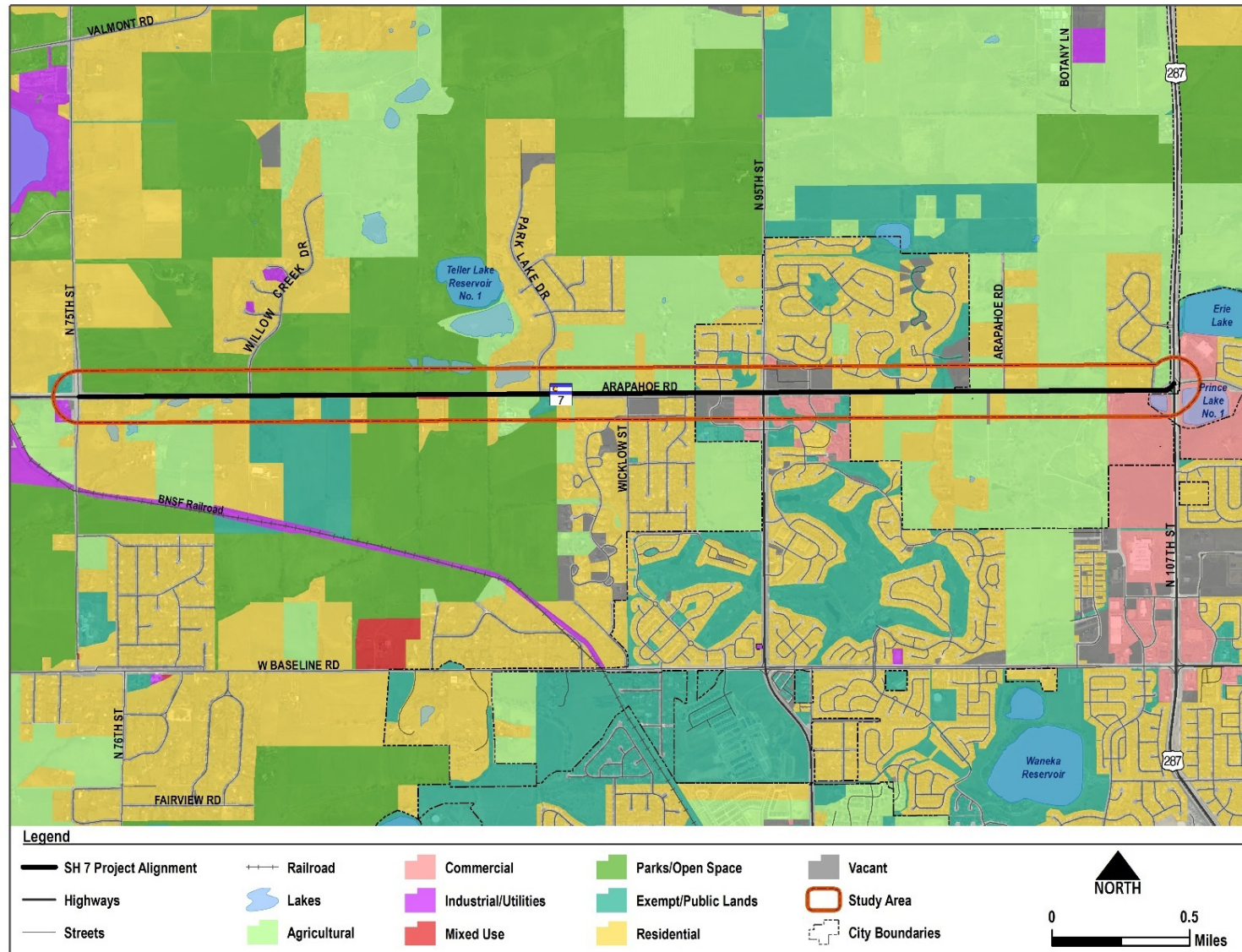
1.4 *Future Land Use*

Figure 1.2 depicts 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 categories have been combined into "Commercial." Most communities have single family and multifamily residential categories; these both have been included as "Residential." The "Mixed Use" category often designates areas near a future transit hub or town center area. While several communities have a specific "Industrial" designation, many also have an "Employment" designation that 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 map (**Figure 1.2**) shows that the communities along the SH 7 corridor will largely remain the same, with the exception of the south side of SH 7 between N 95th St. and US 287, which is forecast to fill in and build out significantly. Much of the area is already designated as "public land" or "residential" and, therefore, is not expected to be subject to a change in land use.

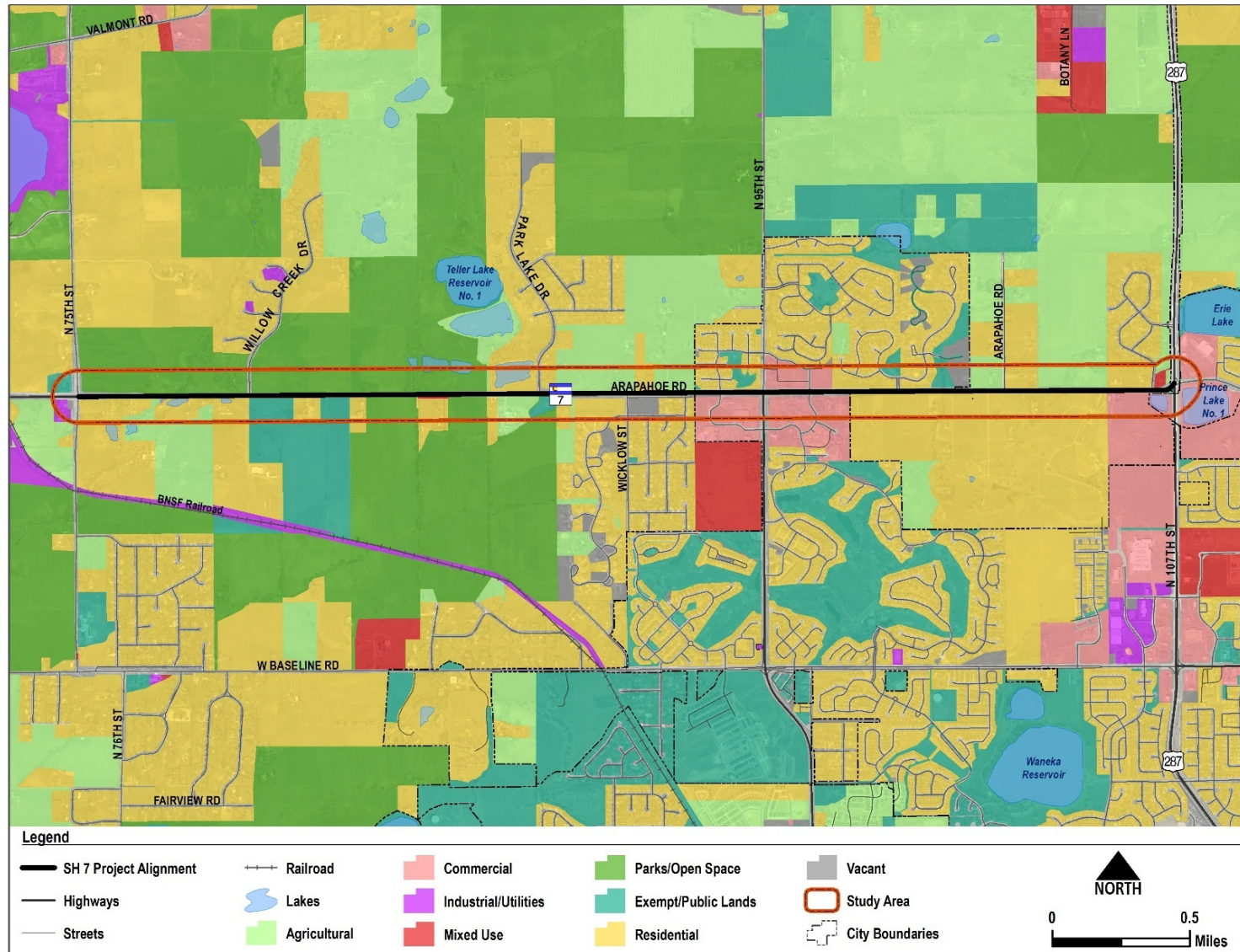
- ▶ West of N 95th St will not see many changes adjacent to SH 7. Neither will the north side of SH 7 between N 95th St and US 287.
 - ▶ East of N 95th St will see predominantly residential growth along the south side of SH 7, with the exception of a block of public land on the western side of US 287.
-

Figure 1.1 Existing Land Use



Source: City of Boulder, GIS; Town of Erie, GIS; City of Lafayette Comprehensive Plan, 2013.

Figure 1.2 Future Land Use



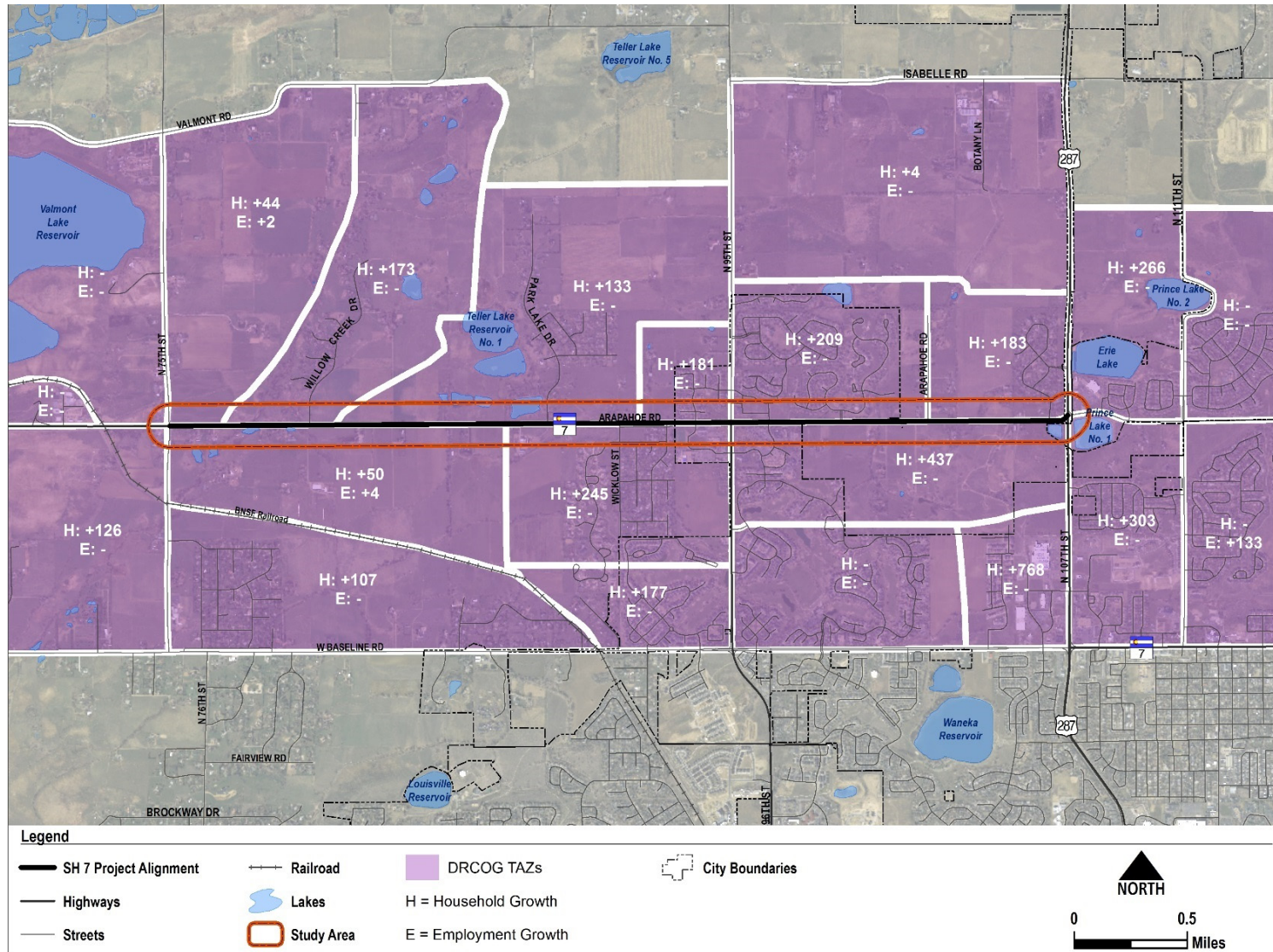
Source: City of Boulder, GIS; Town of Erie, GIS; City of Lafayette Comprehensive Plan, 2013.

Household and Employment Growth

DRCOG develops a travel demand model that is divided into Transportation Analysis Zones (TAZs) covering the entire metro region, including the study area. Each TAZ has existing (2015) and 2040 projected socioeconomic variables, including population, household, employment, and income to be used for local and regional planning purposes. DRCOG incorporates a wide variety of variables in its 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. However, the primary concern within the travel demand model related to the growth in trips for an area is the growth in households and employment.

Most TAZs adjacent to the corridor are projected to experience growth of around 50 to 200 households by 2040, with additional growth projected southeast of SH 7 along US 287. When looking further from the corridor, household growth is also primarily anticipated to be south and east within Lafayette. Little to no employment growth is projected within the TAZs along the corridor or surrounding area by 2040. TAZs with growth are again situated south and east of the corridor in Lafayette. The location and level of growth projected by the travel demand model appear consistent with the local land use plans for areas along the corridor. **Figure 1.3** illustrates the projected DRCOG growth in households and employment from 2015 to 2040 for TAZs within a mile of the study corridor.

Figure 1.3 Future Land Use



Source: DRCOG 2015 and 2040 models (Version: C2 2014)

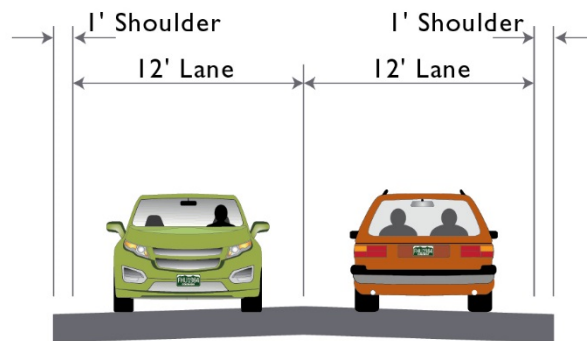
2.0 EXISTING TRANSPORTATION SYSTEM

2.1 Roadway Characteristics

Typical Cross Sections and Right-of-Way

Within the study limits of the SH 7 PEL (N 75th Street to US 287), the geometric characteristics of SH 7 are highly variable. SH 7 primarily consists of two-lane cross sections with approximately 64 feet of right-of-way. The surface type for the corridor is primarily asphalt, except for the intersection of SH 7 and US 287, which is concrete. Approaches from both directions on SH 7 at N 75th Street are configured with two through lanes in each direction, but the remainder of the corridor consists of a single travel lane in each direction. Typical cross sections are shown in **Figure 2.1**, along with corridor constraints and deficiencies that have been identified.

Figure 2.1 Typical Cross Section on SH 7 (N 75th St to US 287)



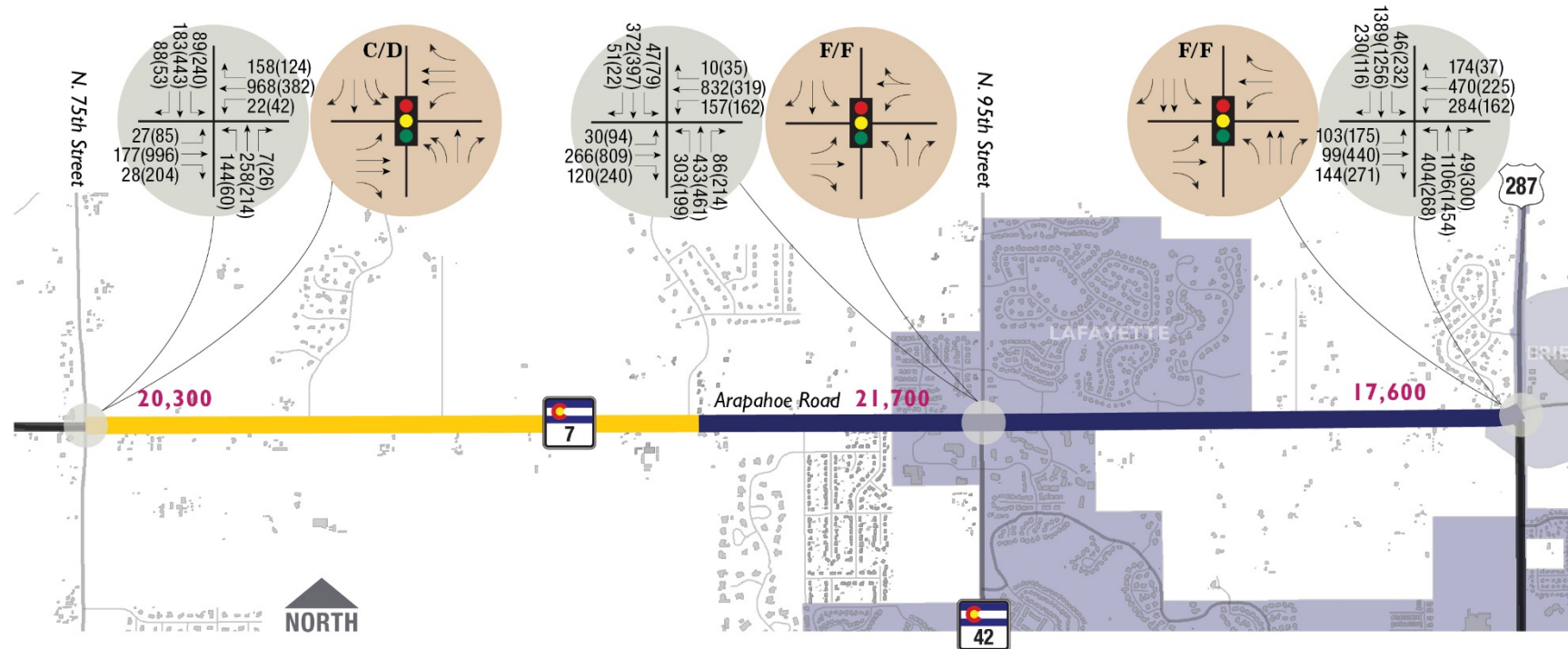
Shoulder widths vary significantly on the roadway, primarily due to varying auxiliary lane configurations. All shoulders are paved, but most are not curbed. Typical shoulder widths range between 1 and 12 feet. Areas with shoulders less than 5 feet in width are typically found on segments of the highway with no access drives or auxiliary lanes. Auxiliary lanes are frequently provided throughout the corridor at both signalized and stop-controlled public street intersections for deceleration and acceleration movements.

Most of the corridor has no median, but when present, median configurations vary significantly. Raised medians exist at the intersection of SH 7 and N 75th Street, as well as for channelized right-turn movements at other intersections including SH 7 and US 287. However, most median configurations are painted and exist only near access drives and auxiliary lanes. Widths of painted medians range from 3 feet to 18 feet but typically range between 4 and 13 feet.

Access Categories

CDOT has assigned access categories to all segments of each state highway in Colorado. These categories pertain to the requirements and thresholds for access spacing and auxiliary lane requirements as documented in the *State Highway Access Code*. **Figure 2.2** shows current access categories along the study area of SH 7 between N 75th street and US 287, as well as descriptions of each category. The segment of SH 7 from N 75th Street to the point 200 feet east of Park Lake Drive is currently classified as a Regional Highway (R-A). The rest of the corridor is categorized as Non-Rural Principal Highway (NR-A). These categories, defined on **Figure 2.2**, are similar in terms of their restrictions for allowable access and auxiliary lanes; however, NR-A is reserved for more urban/suburban settings.

Figure 2.2 Existing Traffic Conditions and Access Categories



LEGEND	
XXX(XXX)	= AM(PM) Peak Hour Traffic Volumes
XXXX	= Average Daily Traffic Volume
X/X	= AM/PM Peak Hour Signalized Intersection Level of Service
	= Traffic Signal

		Setting	Speeds	Volumes	Distances	Travel Types	Priority Movement	Access per Parcel	½ mi. Spacing Exceptions and Unsignalized Left Turns	Auxiliary Lane Thresholds
ACCESS CATEGORY	Regional Highway R-A	Rural	Medium / High	Medium / High	Medium / Long	Inter-regional Intra-regional Inter-city	Through	I	Limited	Lower
	Non-Rural Principal Highway NR-A	Urban / Suburban	Medium / High	Medium / High	Medium / Long	Inter-regional Intra-regional Inter-city Intra-city	Through	I	Limited	Lower

Source: CDOT Online Transportation Information System; DRCOG Regional Traffic Counts; CDOT State Highway Access Category Assignment Schedule (2 CCR 601-1A), 2013; CDOT State Highway Access Code, 2012.

2.2 *Travel Operations*

Traffic Volumes and Speed Limits

Existing daily traffic volumes along SH 7 range from 17,600 vehicles per day (vpd) to 21,700 vpd as shown in **Figure 2.2**. Typically, a two-lane principal arterial can accommodate 16,000 vpd, meaning the study corridor is currently operating over capacity. During peak hour operations, SH 7 is a commuter corridor for users travelling toward Boulder to the west and Lafayette, Brighton, and Denver to the east and south. AM and PM peak hour turning movements at each intersection in the study area are displayed in **Figure 2.2**. The posted speed limits along SH 7 vary from 45 mph to 50 mph along this corridor.

Intersection Geometry and Level of Service

To conduct the existing conditions analysis, a traffic model of the SH 7 corridor was built using Synchro 8 traffic analysis software. Recent satellite imagery was used to inventory roadway and intersection geometry along the corridor and included in the modelling effort. Signal timing data were collected from CDOT, and traffic volumes and turning movements were input into the model from counts completed along the corridor.

Geometry

SH 7 is primarily a two-lane highway with auxiliary lanes at major accesses and intersections; however, many accesses have no auxiliary lanes. Storage lengths for auxiliary lanes at each of the three study intersections are too short to handle peak hour demands, resulting in turning queues blocking through traffic. This results in increased congestion and corridor travel time for through traffic, reducing the efficiency of the signals. All three of the major study intersections are signalized.

Level of Service

Traffic operations for each of the three signalized intersections were analyzed using methods described in the *Highway Capacity Manual* (HCM) and reported from Synchro 8 output. According to the HCM, overall performance of an intersection is determined by the amount of delay experienced by motorists at the intersection. Depending on the level of delay experienced, each intersection can be scored on a Level of Service (LOS) scale and given a letter grade from A to F. LOS A describes intersections with low control delay, while LOS F is associated with high delays and is considered unacceptable to most drivers. LOS F occurs most often with oversaturation, high congestion, poor signal progression, and/or long cycle lengths.

As part of the existing conditions analysis, the LOS for the three signalized intersections was determined for the AM and PM peak periods. **Figure 2.2** shows lane configuration, intersection control, and existing LOS for each intersection in the study area. During AM and PM, the intersections of SH 7 and N 95th Street and SH 7 and US 287 both operate at LOS F. The intersection of SH 7 and N 75th Street operates at LOS C during morning peak period and LOS D during evening peak period. LOS for each intersection is determined by the worst LOS of its approaches; therefore, traffic from other legs may be flowing more freely than the intersection LOS dictates.

Crash Data Analysis

The crash summary is based on the comprehensive analysis of five years of crash history (1/1/10 to 12/312014), which was examined to locate crash clusters and identify collision causes. During this period, a total of 282 crashes were reported along SH 7 within the study section, including both intersection-related and non-intersection related crashes. The majority (about 70 percent) were property damage only (PDO) crashes. In addition, there were 81 injury crashes and one fatal crash, with 116 persons injured and one person killed overall. The fatal crash (a head on crash to the east of Arapahoe Road) occurred in June 2012. **Figure 2.3** presents graphical representations of the crash types and crash severity for this corridor. Rear end crashes (70 percent) were the predominant crash type, followed by broadside (8 percent) and fixed object (8 percent) crash types.

A hot spot analysis was also conducted to determine the locations (primarily intersections) where a total of 10 or more crashes occurred during the five-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 to determine the significant crash types along the corridor. **Table 2.1** summarizes the locations where most crashes along the corridor occurred and the most significant crash types at the locations.

Table 2.1 Intersection and Non-Intersection Related Crashes by Location

Location	Mile Post	Crashes				Significant Crash Types
		PDO	Injury	Fatal	TOTAL	
SH 7/N. 75 th St	56.77	11	1	0	12	Rear end (9)
SH 7/SH 42 (N. 95 th St)	59.29	44	15	0	59	Rear end (48)
SH 7/US 287	60.68	39	19	0	58	Rear end (41)
Intersection Sub Total		94	35	0	129	
Other intersections (≤ 9 crashes each)		26	7	0	33	
Total Intersection Crashes		120	42	0	162	
Non-Intersection Crashes		80	39	1	120	Rear end (77), Fixed object (16)
Overall Total		200	81	1	282	

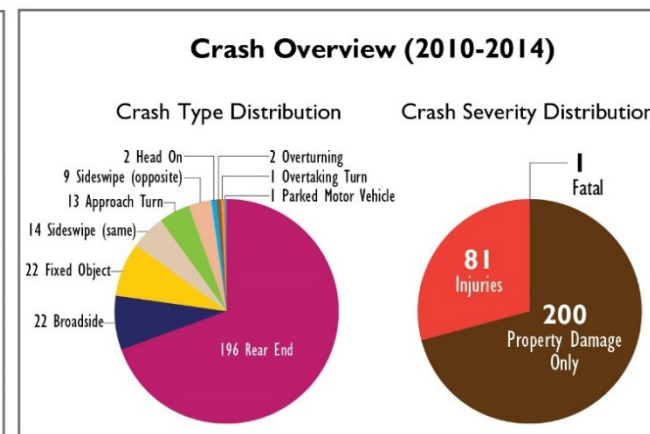
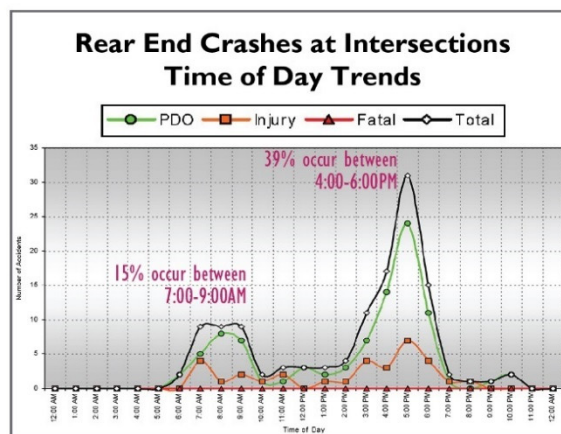
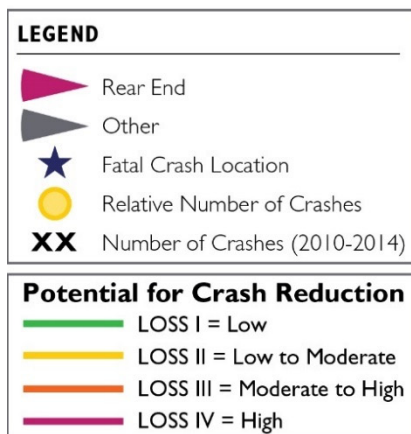
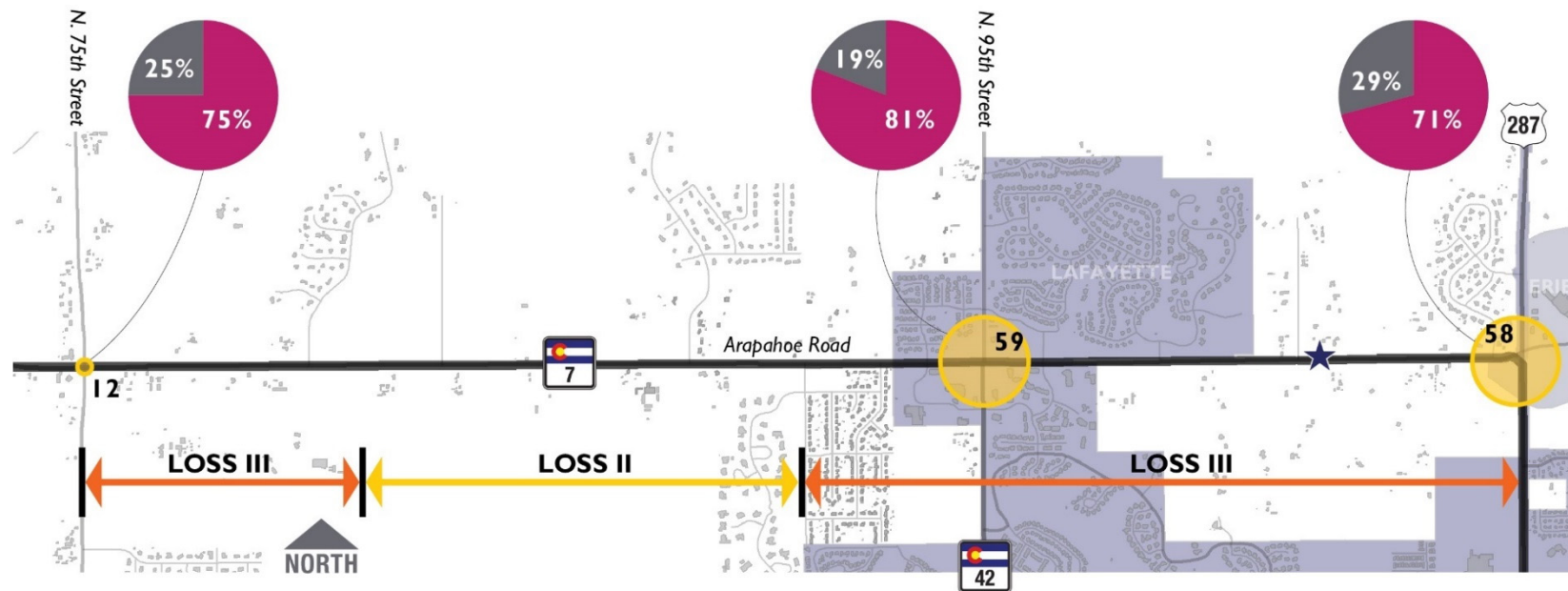
Source: CDOT crash data accessed via Vision Zero Suite (VZS) – Crash Summary Program by DiExSys, LLC, 2010-2014.

Of the three intersections identified as having 10 or more crashes during the five-year study period, all three have a higher than expected frequency of rear end crashes. The non-intersection segments of the study area experiencing a higher than expected frequency of both rear end and total fixed object type crashes, when compared to similar rural corridors. However, this corridor is similar to urban corridors due to the higher volume of traffic and number of access points. When compared to an urban corridor, the frequency of rear-ends crashes is close to typical. **Figure 2.3** shows the overall crash distribution at each of the intersections and along the corridor.

Approximately 57 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, most crashes (approximately 65 percent) are rear end type crashes. Many rear end crashes that have occurred outside the intersection influence are likely a result of congestion and

queuing from nearby intersections because these crashes primarily occurred during the peak hours. The other two most frequent non-intersection crash types are fixed object (13 percent) and sideswipe (same direction) (8 percent).

Figure 2.3 Safety Summary



Source: CDOT crash data accessed via Vision Zero Suite (VZS) – Crash Summary Program by DiExSys, LLC, 2010-2014.

Safety Performance Function

The safety performance function (SPF) reflects the complex relationship between traffic exposure, measured in average daily traffic (ADT), and crash count for a unit of road section measured in crashes per mile per year. The SPF models provide an estimate of the normal or expected crash frequency and severity for a range of ADT among similar facilities. The SPF was plotted over the course of the study segment. Two kinds of SPFs were calibrated. The first one addresses the total number of collisions, and the second one looks only at collisions involving an injury or fatality. It allows us to assess the magnitude of the safety problem from the frequency and severity standpoint.

Development of the SPF lends itself well to the conceptual formulation of the Level of Service of Safety (LOSS). The concept of level of service uses qualitative measures that characterize safety of a roadway segment in reference to its expected performance. If the level of safety predicted by the SPF will represent a normal or expected number of crashes at a specific level of ADT, selected percentiles within the frequency distribution can be stratified to represent specific levels of safety.

- ▶ LOSS I – Below 20th Percentile
Indicates a low potential for crash reduction.
- ▶ LOSS II – 20th Percentile to Mean
Indicates a low potential for crash reduction.
- ▶ LOSS III – Mean to 80th Percentile
Indicates a moderate to high potential for crash reduction.
- ▶ LOSS IV – Above 80th Percentile
Indicates a high potential for crash reductions.

LOSS reflects how the roadway segment is performing in regard to its expected crash frequency and severity at a specific level of ADT. It only provides a crash frequency and severity comparison with the expected norm. It does not, however, provide any information related to the nature of the safety problem itself. If the safety problem is present, LOSS will only describe its magnitude from the frequency and severity standpoint. The nature of the problem is determined through diagnostic analysis using direct diagnostic and pattern recognition techniques.

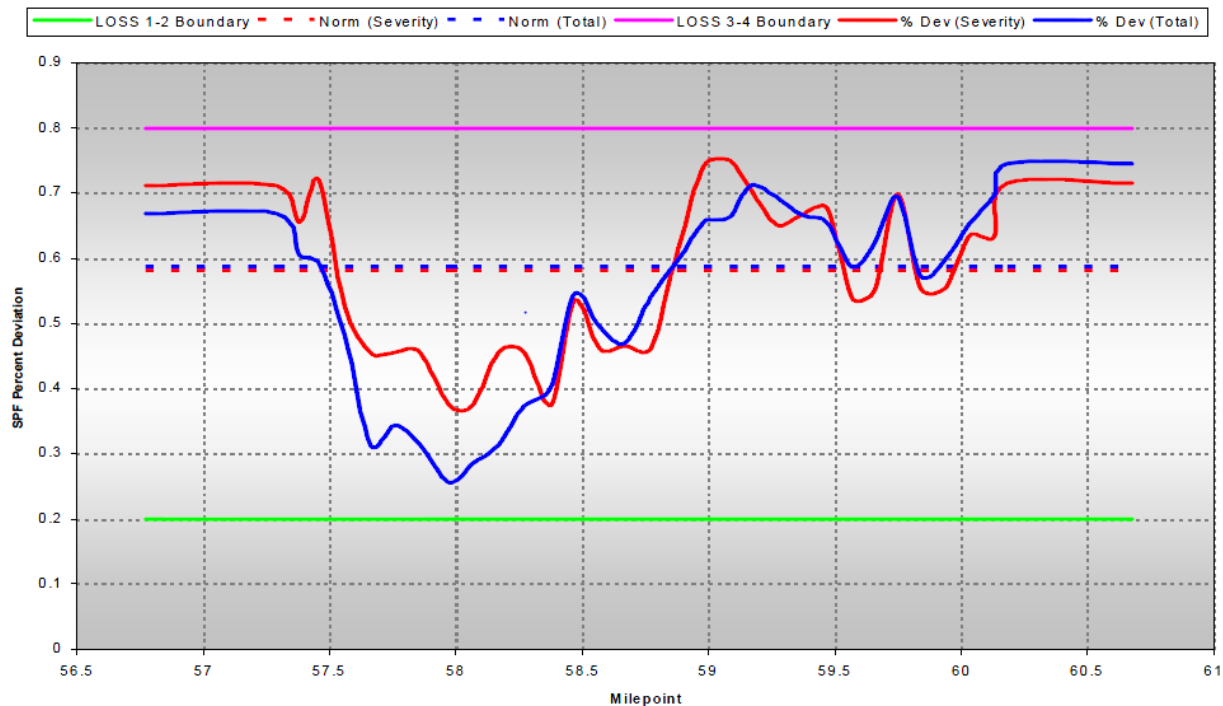
Figure 2.4 shows the cumulative safety performance of the highway. As illustrated, east of 95th Street is in the LOSS III category indicating moderate potential for crash reduction when compared to other rural, flat and rolling 2-lane undivided highways within Colorado. . The section that had a better than expected safety performance (LOSS II) was generally located between MP 57.5 and MP 58.75. An SPF analysis was also completed to compare the corridor to similar urban corridors because as mentioned previously, the corridor is similar to urban corridors due to the higher traffic volumes and density of access points. The urban SPF analysis had similar results, with the corridor west of 95th Street in the LOSS II category and east of 95th Street in the LOSS III category.

Summary of Observations

As mentioned, the frequency of rear end type crashes was higher than expected at many locations along the corridor. A review of the crash history indicated that many crashes occurred during the afternoon peak hour, as can be seen in the trends on **Figure 2.3**. In fact, 39 percent of all rear end crashes that happened at intersections within the corridor occurred between the hours of 4:00 to 6:00 PM. Fifteen percent of all rear end crashes that happened at intersections within the corridor occurred between the hours of 7:00 to 9:00 AM, meaning that over half of rear end crashes at intersections occur during what

are typically considered the AM and PM commuter peak hours. This pattern is not entirely unexpected because the occurrence of rear end crashes tends to coincide with peak traffic conditions.

Figure 2.4 Cumulative SPF Function for SH 7



Source: CDOT; CDOT crash data accessed via Vision Zero Suite (VZS) – Crash Summary Program by DiExSys, LLC, 2010-2014.

Transit

This section of SH 7 is served by RTD bus routes that provide service both along and across the highway. The following bus routes currently serve this study area and are displayed in **Figure 2.5**:

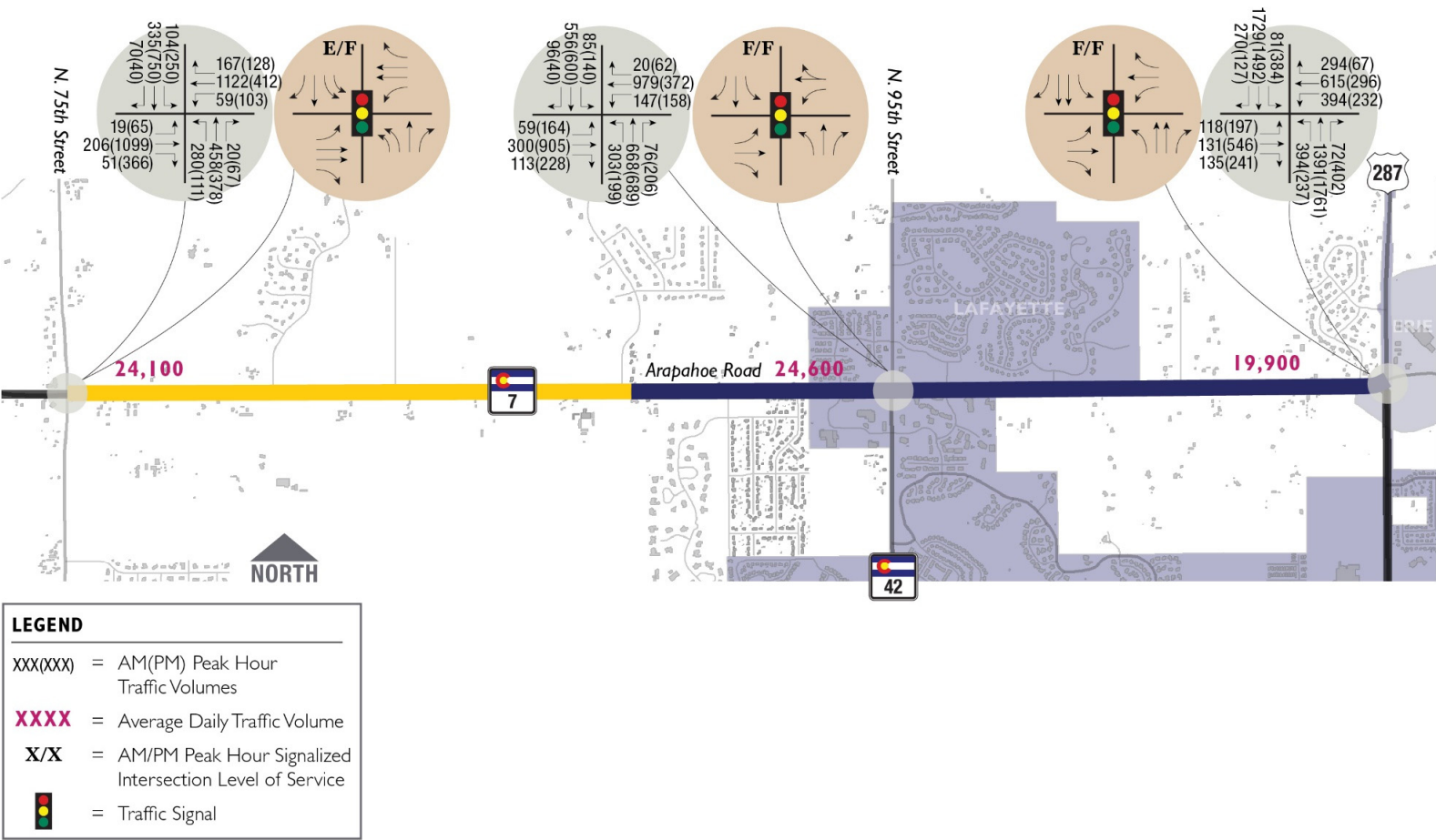
- ▶ JUMP – provides east-west service between downtown Boulder and the Lafayette Park-n-Ride along SH 7 (Arapahoe Road)
- ▶ L/LX – provides regional local stop service between Longmont, Lafayette, and downtown Denver via US 36 and US 287 (LX runs as a supplement to L during peak periods)

Pedestrian Facilities

Pedestrian facilities along this segment of SH 7 consist of sidewalks concentrated around the three signalized intersections at N 75th Street, N 95th Street, and US 287. Sidewalks also exist in some places along SH 7 where residential and commercial land use is adjacent to the highway. However, most of the corridor in the study area lacks sidewalks. **Figure 2.5** shows these missing sidewalk links.

Land uses and land use densities along the corridor generate limited pedestrian trips both today and in the future. However, bus service does exist along the corridor and demand for this service is expected to grow in the future. This service is largely accessed on foot and pedestrians accessing bus stops must travel on narrow shoulders or along the vegetated slope of the roadway, which creates a low level of comfort and perceived safety for the pedestrian.

Figure 1.4 Future (2040) Operational Conditions



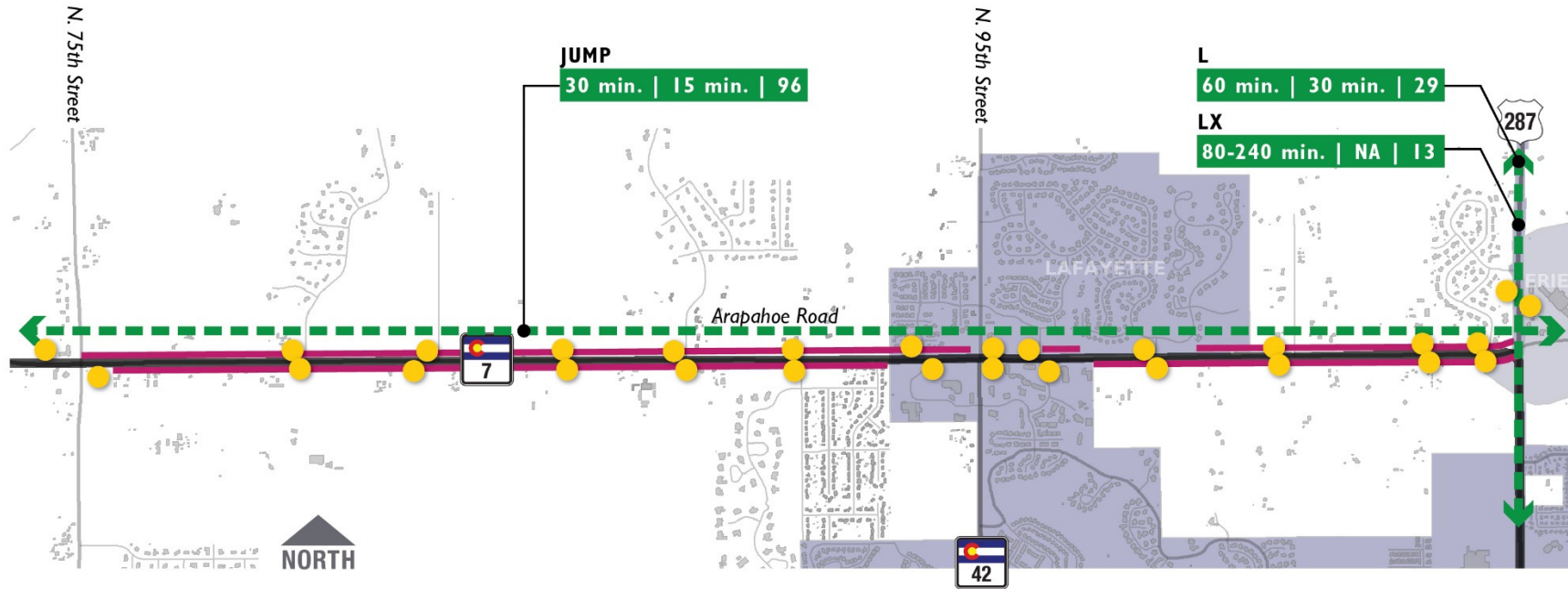
Source: Felsburg Holt & Ullevig, 2016

Bicycle Facilities

There are no bicycle facilities along this section of SH 7, save for 50 to 60 feet east of N 75th Street where bike lanes on north and south sides of SH 7 terminate. Narrow shoulder widths throughout the corridor are not encouraging to bicyclists as they are forced to interact with high volumes of traffic, especially during peak periods. These conditions create a highly uncomfortable environment for bicyclists. On-street bike lanes/wider shoulders currently exist on West Baseline Road one mile south of SH 7. Boulder County anticipates additional investment in the bicycle facilities along West Baseline Road to accommodate growing bicycle demand.



Figure 2.5 Existing Bus Routes and Missing Sidewalks



NOTE: No bike facilities exist along the corridor currently

LEGEND	
—	Missing Sidewalk
- - -	Bus Route
●	Bus Stop
Route	
Frequency Peak Frequency Total Daily Trips	

Source: RTD, 2016

3.0 FUTURE TRANSPORTATION CONDITIONS

3.1 *No-Action Alternative*

The No-Action Alternative is the alternative that would be selected, if a build alternative is not selected 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 would include 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 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 (2040). However, no committed fiscally constrained regional improvements that are included in the travel demand forecasting for the No-Action Alternative are in the vicinity of the study corridor. The nearest improvement is the widening to four lanes of Erie Parkway/Isabelle Road between US 287 and N 119th Street. The extension of South Boulder Road from 120th Street to Sheridan Parkway was a committed project at the time of the SH 7 PEL east of US 287, but has since been removed.

3.2 *2040 No-Action Conditions*

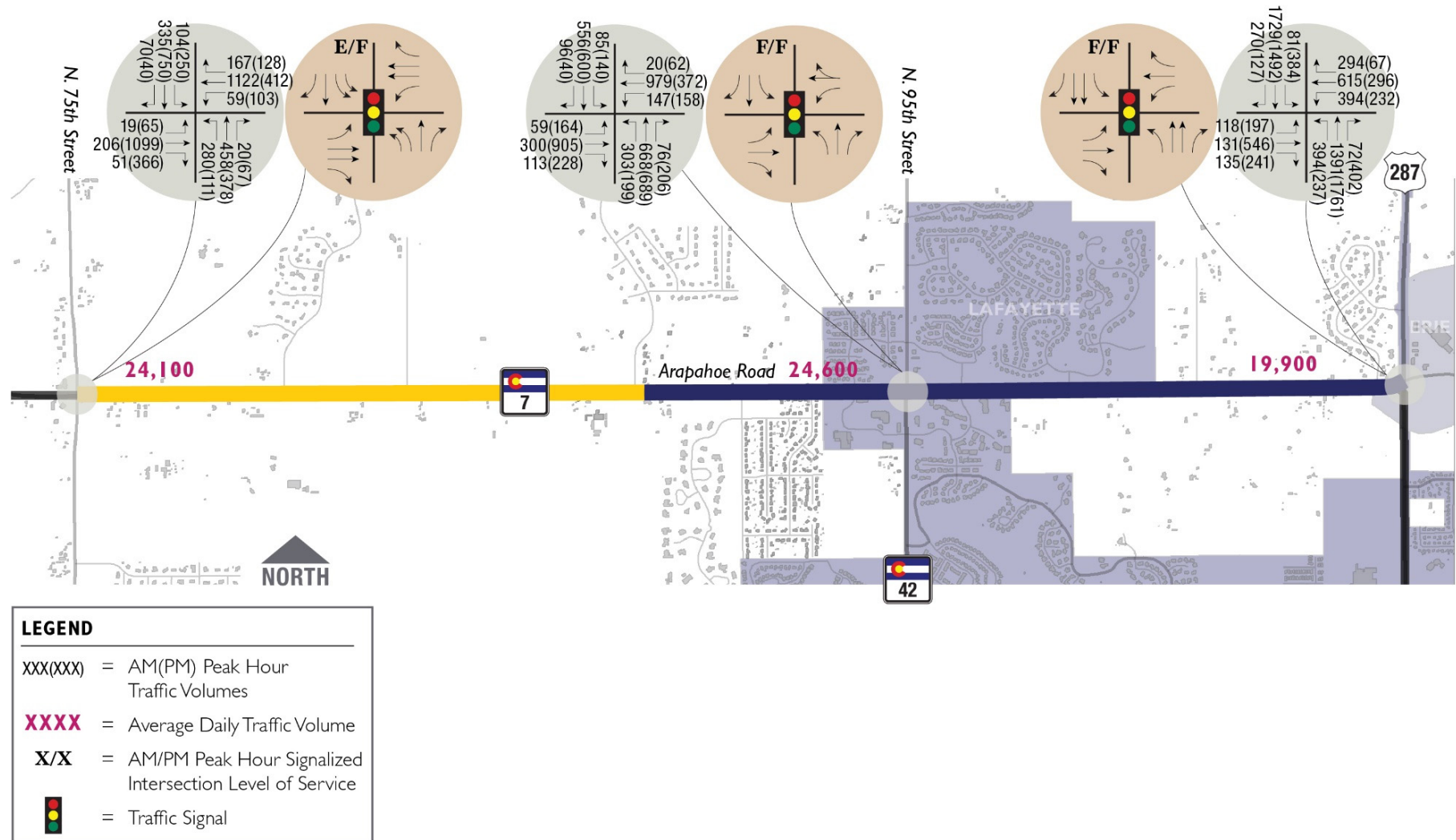
Traffic Operations

The DRCOG 2040 fiscally constrained regional travel demand model was used to develop 2040 daily and hourly traffic forecasts. **Figure 3.1** presents the projected 2040 No-Action Alternative traffic conditions for the study corridor, including estimated future intersection LOS and projected daily traffic volumes.

Existing daily traffic counts were grown to the year 2040 using the DRCOG model and the NCHRP 765 adjustment process, resulting in a growth of between 10 to 20 percent over existing volumes. The study corridor is over capacity at existing daily traffic levels, and with daily volumes projected to increase to between 19,900 vpd and 24,600 vpd in 2040, this condition will continue.

Existing turning movements were grown using the DRCOG model to projected future turning movements in 2040 for the three major intersections along the corridor (N 75th Street, N 95th Street, and US 287). Growth rates used mirror the growth rates for daily volumes – 10 to 20 percent. As was done at each signalized intersection with existing turning movements, future traffic operations at each of these intersections were analyzed using methods described in the HCM and reported from Synchro 8 output, providing LOS for each signalized intersection for the AM and PM peak periods. **Figure 3.1** shows the future LOS for each signalized intersection in the study area.

Figure 3.1 2040 Traffic Conditions



During the AM and PM peak periods, the intersections of SH 7 and N 95th Street and SH 7 and US 287 both continue to operate at LOS F in 2040. The intersection of SH 7 and N 75th Street is projected to deteriorate further during both peak periods, with the morning peak period LOS dropping from LOS C to LOS E and the evening peak period LOS dropping from LOS D to LOS F. LOS for each intersection is determined by the worst LOS of its approaches; therefore, traffic from other legs may be flowing more freely than the intersection LOS dictates. To further compare existing versus 2040 conditions, Table 3.1 shows the delay experienced at each intersection and the increase in delay between today and 2040.

Table 3.1 Existing vs 2040 Intersection Delays

Intersection	AM Delay (min:sec)			PM Delay (seconds)		
	Existing	2040	Δ	Existing	2040	Δ
SH 7/N. 75 th St	0:33	1:17	+0:44	0:47	1:27	+0:40
SH 7/SH 42 (N. 95 th St)	3:26	4:26	+1:00	2:36	2:57	+0:21
SH 7/US 287	2:19	4:02	+1:43	2:14	4:03	+1:49

As traffic volumes continue to grow along the corridor as projected and if no safety improvements are made to address noted crash patterns, it can be assumed that the LOSS along the corridor will continue at the levels reported or even deteriorate further.

Transit

In addition to the existing RTD bus routes (JUMP along SH 7 and L/LX along US 287), the Northwest Rail Line is the only FasTracks planned transit improvement near the corridor. However, the Northwest Rail Line is currently funded for 2042. The line is planned to cross SH 7 just west of N 75th Street, but no station is anticipated near the study corridor. Bus route modifications are likely in support of the Northwest Rail Line once it is built. However, because of the uncertainty of that line, the feeder bus routing is undecided.

An objective of the Boulder County Comprehensive Plan is to *“implement a transportation system that moves people safely and effectively independent of an assumed mode of travel.”*

– Boulder County, 2009

The 2014 SH 7 PEL recommended transit-related improvements along the SH 7 corridor between US 287 to US 85. In addition, the Northwest Area Mobility Study identified six corridors as candidates for possible BRT, including the SH 7 corridor from the City of Boulder to City of Brighton. A BRT feasibility study is currently underway in cooperation with this PEL study to analyze the possibility of BRT service between Boulder and Brighton along SH 7. However, BRT along SH 7 is not included in the DRCOG 2040 fiscally constrained regional travel demand model.

Bicycle and Pedestrian

No projects are currently planned to add or improve bicycle and pedestrian facilities along the corridor. Given that most of the corridor lacks bicycle and pedestrian facilities and future traffic growth will further push the corridor over capacity, travel by walking or biking will continue to be difficult and uncomfortable unless improved facilities are provided.

Baseline Road, a parallel road to SH 7 located approximately 1 mile to the south, is a bicycle route with existing shoulders. Isabelle Road, a parallel road to SH 7 located approximately 1.5 miles to the north, is scheduled to be improved with wider shoulders in approximately 2019/2020. In addition, Boulder County is evaluating a multi-use trail along a former UPRR corridor approximately 2 miles north of SH 7, which would connect the Town of Erie with the City of Boulder.

4.0 ENVIRONMENTAL OVERVIEW

Chapter 4.0 summarizes the existing environmental conditions of the study area. The environmental resources that were studied were selected based on the characteristics of the study area. The resources that were considered are generally consistent with NEPA, with its implementing regulations, and with FHWA and CDOT guidelines. The following resources are those that may require avoidance or minimization of impacts, have separate laws and regulations protecting them, 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 resource topic. Each resource subsection introduces the resource, the methodology, and existing conditions.

4.1 *Parks and Recreation Resources*

Parks and recreation 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 recreation resources can be placed into one of the following categories:

- ▶ **Regional Park and Recreation Facility** – Regional parks typically involve jurisdiction partnerships that contribute to the development and maintenance of regional parks. 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** – Community parks are typically smaller in size than regional facilities and serve as an attraction for residents and communities within approximately 3 miles of the facility. One entity typically manages and maintains community parks.
- ▶ **Neighborhood Park** – Neighborhood parks typically serve residents and community members within a half-mile radius of the park. These parks, typically accessed by non-motorized means, 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 protected by conservation easements on agricultural lands and are not used as parks. They may, however, be managed to protect wildlife habitat. 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 several miles of trails, including paved and non-paved 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 ditches, rivers, or railroads.

Existing Park, Trail, and Open Space Resources

Details and characteristics of existing parks and recreation resources along the study area were identified through geographic information system (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 May 2016. Research focused on using the most current version of information available online (**Table 4.1** and **Figure 4.1**).

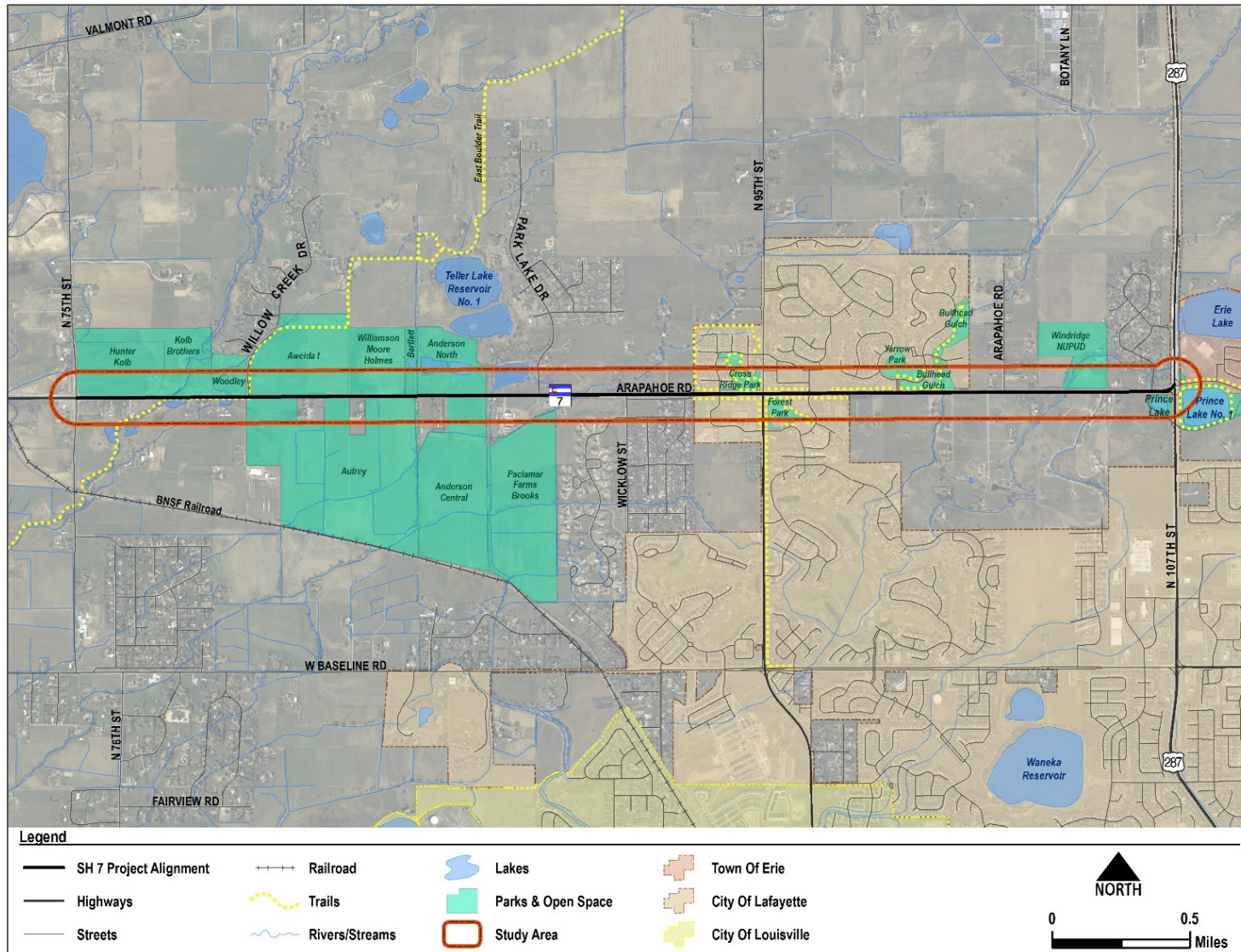
Table 4.1 Existing Park, Trail, and Open Space Resources

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
Prince Lake	Southeast quadrant of the intersection of SH 7/US 287 24.23 acres	Formerly Prince Reservoir, it has now been filled in for development of proposed Nine Mile Corner, a commercial development project.	Commercial Development	City of Erie
Prince Lake	Southwest quadrant of the intersection of SH 7/US 287 3.50 acres	The City of Erie allowed this water feature to drain. It is now a marsh/wetland.	Park	City of Erie
Outlot A Windridge NUPUD	10473 Arapahoe Rd, Lafayette 30.45 acres	This is a conservation easement on Windridge NUPUD (Non-Urban Planned Unit Development). Ownership is listed as private.	Conservation Easement	Private Ownership
Bullhead Gulch Open Space	SH 7 & Spring Creek Dr 3.31 acres	This small open space parcel follows a ravine along Bullhead Gulch. This area includes a biking trail, pet pickup station, running path, trail (fitness), walking, and waterway.	Open Space	City of Lafayette
Unnamed Trail	Adjacent to SH 7 3,150 feet	This unnamed trail goes from Bullhead Gulch along the north side of SH 7 and then crosses over SH 7 near N 95 th St.	Trail	City of Lafayette
Yarrow Park	SH 7 & Spring Creek Dr 6.32 acres	This park includes a basketball court, benches, paved path, pet pickup station, picnic shelter, picnic table, and playground.	Local Park	City of Lafayette
Forest Park	SH 7 & N 95 th St 4.5 acres	This small parcel of open space land abuts SH 7 and a commercial development.	Local Park	City of Lafayette

Table 4.1 Existing Park, Trail, and Open Space Resources (Continued)

Resource Name	Size/Location	Description & Location	Resource Type	Managed by
Cross Ridge Park	SH 7 & N 95 th St 6.27 acres	This park includes benches, pet pickup station, picnic shelter, picnic table, and playground.	Local Park	City of Lafayette
Paclamar Farms	SH 7 & Marshallville Ditch Rd 95.20 acres	W.R. "Dick" Brooks owned this farm, which became a leader in dairy cattle genetic advancement.	Open Space	City of Boulder
Anderson Central	SH 7 & White Rocks Trail Rd 86.69 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
Anderson North	South of Teller Lake Reservoir No. 1 33.60 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
Bartlett	SH 7 & White Rocks Trail Rd 6.92 acres	Currently used for agricultural purposes.	Conservation Easement	Private
Autrey	South of SH 7 and White Rocks Trail Rd 174.73 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
Williamson Moore Holmes	SH 7 & White Rocks Trail Rd 31.93 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
Aweida I	North of SH 7 & Willow Creek Dr 60.23 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
East Boulder Trail	SH 7 & Willow Creek Dr 19,309 feet	This informal trail goes along the south side of SH 7 east from Dry Creek. At Willow Creek Dr., the trail crosses SH 7 and makes its way northeast to connect to the Teller Lake Reservoir trailhead.	Trail	Boulder County
Woodley	SH 7 & White Rocks Trail 6.29 acres	This property is listed as both a conservation easement and an open space property. It is currently used for agricultural purposes.	Open Space	City of Boulder
Kolb Brothers	SH 7 & White Rocks Trail 37.76 acres	Currently used for agricultural purposes.	Open Space	City of Boulder
Hunter Kolb	SH 7 & N 7 th St 38.69 acres	Currently used for agricultural purposes.	Open Space	City of Boulder

Figure 4.1 Parks, Open Space, and Trails



Source: Boulder County GIS

Future or Planned Recreation Resources

Given the developing nature of the corridor, it should be noted that many municipalities have established master plans for future trails, parks, and open space areas within or adjacent to the study area. Most of these resources span jurisdictional boundaries and follow linear features within the study area. **Table 4.2** lists 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 4.2 Future Master Planned Recreation Resources

Name	Description & Location	Owner
Proposed Trail around Prince Lake development	Prince Lake 1 is in the process of being filled and converted to a commercial property. A trail system that goes around the perimeter of this subdivision will be put in to connect to Erie Lake, north of SH 7.	City of Erie
Potential Trail Corridor	This trail corridor is just south of Bullhead Gulch, on the southern side of SH 7. It will connect to areas north of Baseline Road. The City of Lafayette identifies it as having visual quality and trail potential. Boulder County Open Space identifies it as a potential corridor.	City of Lafayette, Boulder County
Teller Lakes Corridor Trail	City of Boulder Open Space and Mountain Parks identified a conceptual alignment for a trail in the area south of Teller Lakes. This trail system would cross SH 7 from Teller Lakes and continue southwest to connect to Baseline reservoir.	City of Boulder Open Space Mountain Parks

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

Some of the park properties present within the study area are publicly owned and are afforded protection under Section 4(f) of the 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. This study area contains no areas protected by Section 6 (f).

4.2 Traffic Noise

The potential for noise impacts from vehicles to receptors, that is, properties near transportation facilities, is a general concern. State and federal transportation agencies such as CDOT or FHWA have established thresholds for determining noise impacts to guide their projects. When impacts are identified from an improvement, mitigation actions for impacted receptors are considered for the project. Traffic noise is an important consideration for this project because many sensitive properties exist along the study corridor and may be impacted by traffic noise.

Existing Noise Sensitive Areas

Table 4.3 identifies CDOT Noise Abatement Criteria (NAC). Several residences (NAC Category B), places of worship (NAC Category C), and sensitive commercial developments (NAC Category E) can be found in the PEL study area between 75th Street and US 287. There are also agricultural properties (NAC Category F), which are not considered to be noise sensitive. **Table 4.4** summarizes noise sensitive areas.

Table 4.3 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, 2015

Table 4.4 Noise Sensitive Areas

Location Description	Property Description	CDOT Land Use Category
North of SH 7 and East of US 287	Commercial	E
North of SH 7 at Stonehenge Dr	Residential	B
South of SH 7 and West of Stonehenge Dr	Residential	B
South of SH 7 and Stonehenge Dr	Residential	B
North of SH 7 and Yarrow St	Residential	B
South of SH 7 and Forest Park Cir	Commercial and Residential	B/E
North of SH 7 and East of N 95 th St	Residential	B
South of SH 7 and East of N 95 th St	Commercial	E
South of SH 7 and West of N 95 th St	Commercial and Recreational Center	C/E
North of SH 7 and West of N 95 th St	Residential	B
SH 7 and Kilkenny St	Residential	B
North of SH 7 and East of Park Lake Dr	Residential	B
South of SH 7 and Park Lake Dr	Place of Worship	C
North of SH 7 at Park Lake Dr	Residential	B
South of SH 7 and West of Park Lake Dr	Residential	B
South of SH 7 at Marshallville Ditch Rd	Residential	B
SH 7 and White Rocks Tr	Residential	B
SH 7 and Willow Creek Dr	Residential	B
North of SH 7 and East of N 75 th St	Residential	B
South of SH 7 and East of N 75 th St	Residential	B
South of SH 7 and West of N 75 th St	Commercial	C/E
North of SH 7 and West of N 75 th St	Place of Worship and Residential	B/C

Note: These noise sensitive areas are generally within 500 feet of the study area.

4.3 Historic Resources

This section includes information on previously historic resources and properties greater than 45 years of age 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 1971 or earlier). Historic resources include buildings, bridges, railroads, ditches, roads, and other structures.

Significant historic resources are afforded consideration by Section 106 of the National Historic Preservation Act of 1966, as amended, as well as Section 4(f) of the USDOT 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 that 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 that 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

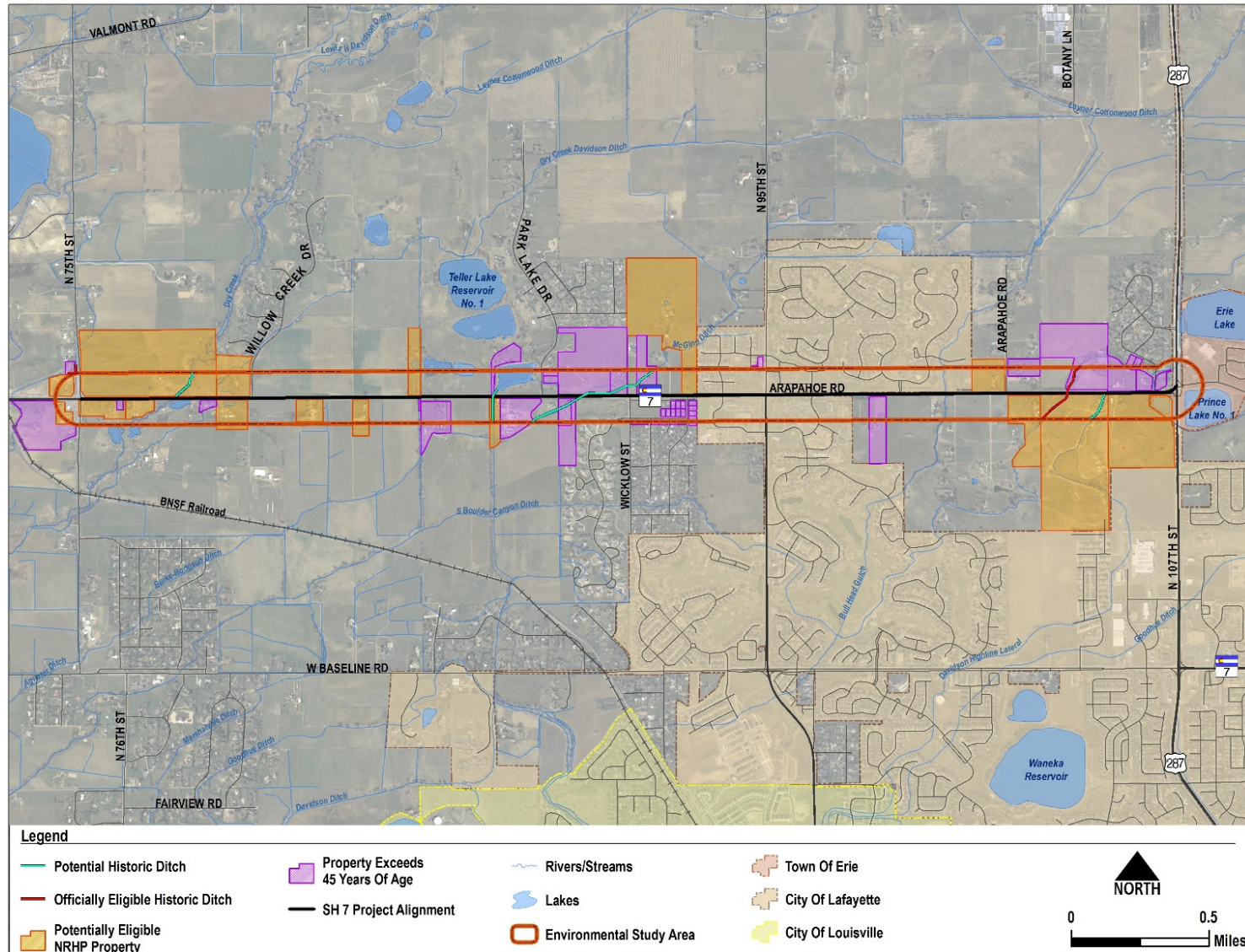
Previously Identified Historic Sites

For purposes of this study, only properties that are listed on the NRHP or officially eligible for the NRHP are shown as previously identified historic sites. There is one existing historic property within the SH 7 corridor, including 5BL4488.2 Cottonwood Ditch #2. The ditch, originally recorded in 2002 and again in 2005, was determined officially eligible to the NRHP. **Table 4.5** identifies this site. **Figure 4.2** shows previously identified historic sites in the corridor.

Table 4.5 Previously Identified Historic Sites

Site #	Name	Address	Description	Status
5BL4488.2	Cottonwood Ditch #2	N. 75 th St, approximately 500 feet north of SH 7	Irrigation ditch built in 1863 that derives its water from South Boulder Creek via New Dry Creek Carrier Ditch	Historic

Figure 4.2 Previously Identified and Potential Historic Sites



Source: Boulder County GIS; OAHP Compass Database 2016.

Potential Historic Sites

Because not all historic sites within this large corridor have been identified or previously surveyed, it is important to evaluate all properties along the corridor for NRHP-eligibility. Potential historic sites include:

- ▶ Properties that have been previously surveyed and field assessed as eligible to the NRHP.
- ▶ Properties that have been previously surveyed and that were determined not eligible to the NRHP, but with the passage of time may now be potentially assessed as eligible to the NRHP
- ▶ Local historic landmarks
- ▶ Properties with buildings or structures more than 45 years of age that have not been previously surveyed.

Table 4.6 lists 23 properties that have been previously surveyed for NRHP eligibility. This list includes residences, commercial properties, farms, irrigation ditches, a railroad, a school, and a monument structure. All of the properties in this list will need additional research and formal evaluations to determine whether or not they are eligible for the NRHP.

Table 4.6 Previously Surveyed Properties

Name	Address	Description
Arapahoe Elementary School	7483 E Arapahoe Rd	Art Deco-style school constructed in 1927 with irregular plan, flat roof, 2-stories, and clad in brick, with Ex-Religious Non Res Imps.
Kolb Farm	7715 E Arapahoe Rd	Bungalow-style single-family dwelling built in 1910. Site includes several outbuildings constructed between 1920 and 1936.
Woodley Property	7957 E Arapahoe Rd	Late Victorian-style dwelling built in 1870, with several farm outbuildings.
Holmes Farm	8495 E Arapahoe Rd	Bungalow-style dwelling built in 1916. Site includes a well house and granary.
Horn Property	9267 E Arapahoe Rd	1920-era dwelling with several outbuildings, including a garage built in the 1950s.
Healy Property	10167 E Arapahoe Rd	Single-family dwelling built in 1940 with several outbuildings and Farm/Ranch Residential Improvements.
Road to Remembrance Gateway	On Arapahoe Rd (SH 7) just west of US 287	Monument erected in 1928 to honor those who served in World War I.
Shirk Property	10538 E Arapahoe Rd	Single-family dwelling built in 1910.
Weems Property	10364 E Arapahoe Rd	Ranch-style single-family dwelling.
Arapahoe Hill Farm	10282 E Arapahoe Rd	Foursquare-style dwelling built in 1900. Site includes several outbuildings.
Young Property	8716 E Arapahoe Rd	Foursquare-style dwelling built in 1904. House was moved from original location and has Single Family Improvements.
Patterson Property	8338 E Arapahoe Rd	Hipped-roof box-style dwelling built in 1907. Several early-20 th century outbuildings also located on site.
Autrey Property	8202 E Arapahoe Rd	Late Victorian-style dwelling built in 1900, including several outbuildings built between 1900 and 1920.

Table 4.6 Previously Surveyed Properties (Continued)

Name	Address	Description
Anderson Property	7912 E Arapahoe Rd	Queen Anne-style dwelling built in 1905. Site includes several outbuildings built between 1905 and 1948.
Culvert D-16-BW	Located 0.34 miles east of SH7/N 75 th St intersection	2-span concrete box culvert built in 1928. Non-extant.
Eason Property	7648 E Arapahoe Rd	Late Victorian-style dwelling built in 1907. Site includes two barns built in 1907 and 1940.
Abner Brown Residence	7602–7620 E Arapahoe Rd	Late Victorian-style single-family dwelling constructed in 1870. Site includes several farm outbuildings
John Jacobs Property	7464 Arapahoe Rd.	1-story Bungalow-style dwelling built in 1938, converted into a restaurant.
Andrews-Farwell Ditch	Located 0.34 miles east of SH7/N 75 th St intersection	Irrigation ditch built in 1864 that derives its water from South Boulder Creek via New Dry Creek Carrier Ditch
Davidson Ditch	Located 1 mile west of SH 7/N 95 th St intersection	Irrigation ditch lateral flowing north along a section line, under SH 7 and feeding Burke Lake
McGinn Ditch	Located 0.62 miles west of SH 7/N 95 th St intersection	Irrigation ditch built in 1860 that derives its water from South Boulder Creek.
South Boulder Canyon Ditch	Vicinity of SH 7/ N 107 th St intersection	The original recording of South Boulder Canyon Ditch in the vicinity of the project area. Resource later resurveyed under resource number 5BL750.
Highline Lateral/Goodhue Ditch	Located 0.25 miles west of SH 7/N 107 th St intersection	Irrigation ditch known as Highline Lateral/Goodhue Ditch, constructed in 1873.

Table 4.7 lists 25 properties that are greater than 45 years old but have not been previously surveyed for NRHP eligibility. This list includes residences and farms/ranches. All of the properties in this list will need additional research and formal evaluations to determine whether or not they are eligible for the NRHP.

Table 4.7 Properties Greater Than Forty-Five Years Old

Name	Address	Description
Farm/Ranch	8778 Arapahoe Rd	Farm/ranch with several outbuildings.
Farm/Ranch	7878 Arapahoe Rd	Farm/ranch residence.
Single Family Residence	10535 Arapahoe Rd	Single family residence.
Single Family Residence	10611 Arapahoe Rd	Single family residence.

Table 4.7 Properties Greater Than Forty-Five Years Old (Continued)

Name	Address	Description
Single Family Residence	10695 Arapahoe Rd	Single family residence.
Single Family Residence	10191 Arapahoe Rd	Single family residence.
Single Family Residence	9175 Arapahoe Rd	Single family residence.
Single Family Residence	9215 Kerry Rd	Single family residence.
Farm/Ranch	9083 Arapahoe Rd	Farm/ranch residence, with several farm outbuildings.
Single Family Improvements	1724 Park Lake Dr	Single family residence, with several farm outbuildings.
Single Family Improvements	1688 Park Lake Dr	Single Family Improvements.
Single Family Improvements	8498 Arapahoe Rd	Single residence with a farm outbuilding.
Farm/Ranch Residential Improvements	8556 Arapahoe Rd	Farm/ranch residence with farm outbuildings.
Single Family Residence	8912 Arapahoe Rd	Single family residence with farm outbuildings.
Single Family Residence	1592 Kilkenny St	Single family residence.
Single Family Residence	1574 Kilkenny St	Single family residence.
Single Family Residence	1556 Kilkenny St	Single family residence.
Single Family Residence	1542 Kilkenny St	Single family residence.
Single Family Residence	9292 Arapahoe Rd	Single family residence.
Single Family Residence	9278 Arapahoe Rd	Single family residence.
Single Family Residence	9260 Arapahoe Rd	Single family residence.
Single Family Residence	9233 Kerry Rd	Single family residence.
Single Family Residence	9257 Kerry Rd	Single family residence.
Single Family Residence	9271 Kerry Rd	Single family residence.
Single Family Residence	1559 Kilkenny St	Single family residence.

4.4 Floodways and 100-year Floodplains

This section summarizes major drainageways in the study area. Drainageways were identified by the FEMA designated floodplain maps. FEMA designated floodplains are defined by Zones AE, A or X:

- ▶ 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 or an area of minimal flood hazard. The study area surrounding SH 7 that is not designated as a FEMA Zone AE is identified as Zone X.

Two drainageways have FEMA designated floodplains in the study area. Both are designated as Zone AE floodplains. No Zone A floodplains were found in the study area. **Table 4.8** identifies the drainageways within the study area and their corresponding FEMA designation. Both the Bullhead Gulch and Dry Creek 100-year floodplains cross SH 7.

Table 4.8 Summary of Drainageways

Drainageway	FEMA Zone
Bull Head Gulch	AE
Dry Creek	AE

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 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 Conditional Letter of Map Revision/Letter of Map Revision process if any changes are proposed.

4.5 Wetlands and Waters of the US

Wetland resources are protected under Section 404 of the Clean Water Act (CWA) (33 US Code [USC] 1344). They can also be protected under Executive Order 11990 *Protection of Wetlands* (USEPA 1977) when federal funding is used. The CWA requires coordination with the United States Army Corps of Engineers (USACE), resource agencies such as the United States Fish and Wildlife Service (USFWS), and the State Historic Preservation Officer (SHPO) when impacts occur to wetlands. CDOT has incorporated this and other FHWA environmental guidance into its *Environmental Stewardship Guide* (CDOT, 2005), 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 between US 287 and N 75th St. This analysis discusses the wetlands within the study area and identifies current conditions.

Wetland Analysis Methodology

Conducted in June 2016, a limited site reconnaissance of the study area examined previously identified wetlands and potential wetland areas. The site visit noted dominant vegetation types and collected limited hydrological data. No soils testing was conducted.

Before conducting the reconnaissance, a desktop review of available wetland mapping provided by the Colorado Natural Heritage Program's (CNHP's) Colorado Wetland Inventory (CNHP 2016), the USFWS's National Wetland Inventory (NWI) (USFWS 2016), and a review of aerial photography was conducted. Checking the CNHP and NWI data identified several wetlands as documented in **Table 4.9**.

Wetland Analysis Findings

Most 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. Most of these roadside and irrigation ditch wetlands were considered low quality wetlands due to low vegetative diversity and predominance of invasive species. The exception is wetlands associated with Dry Creek, Bullhead Gulch, and South Boulder Canyon Ditch, which, depending on existing riparian conditions, provide a moderate quality wetland value due to higher levels of vegetative diversity and predominance toward native plants.

Palustrine Scrub/Shrub Wetlands

Typical vegetation included sandbar willow (*Salix interior*), plains cottonwood (*Populus deltoides*), crack willow (*Salix fragilis*), Siberian elm (*Ulmus pumila*), and Russian olive (*Elaeagnus angustifolia*). Sandbar willow was the most dominant shrub in these wetlands, which provided the *scrub-shrub* classification. The locations containing these wetlands were found adjacent to waterways, in irrigation ditches, or in roadside ditches, which receive periods of temporary flooding or stormwater flows that contribute to a higher water table. Common hydrologic indicators found in the study area include drift lines, sediment deposits, and drainage patterns in wetlands.

Palustrine Emergent Wetlands

Palustrine emergent wetlands found in the study area were located along irrigation and roadway ditches, along edges of detention ponds, and adjacent to perennial and intermittent waterways. The typical vegetation includes a predominance of reed canarygrass (*Phalaris arundinacea*) and broad-leaf cattail (*Typha latifolia*), as well as smaller populations of rush (*Juncus* ssp.), and Canada thistle (*Cirsium arvense*). The primary hydrology for these wetlands is surface runoff, groundwater flows, and adjacency to intermittent and perennial waterways. Hydrologic indicators observed include sediment deposits, areas of inundation, and drainage patterns in wetlands. **Table 4.9** lists all wetlands identified in this field review, as shown in **Figure 4.3**.

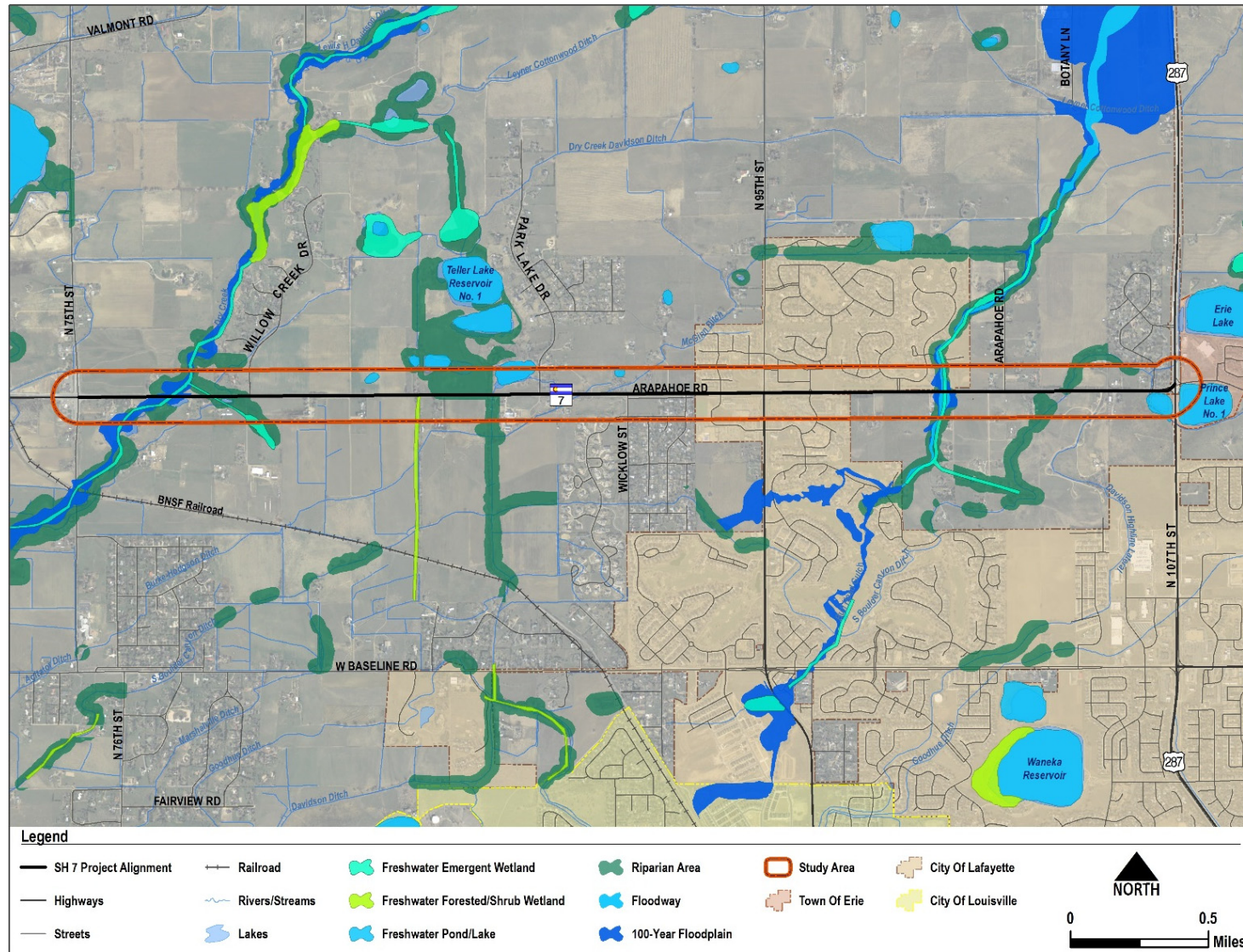
Wetland hydrology for the identified wetlands in the corridor study area was based on field observations and was found to be a combination of irrigation ditches, groundwater, stormwater runoff, and adjacency to water flows in Dry Creek and Bullhead Gulch.

Table 4.9 Summary of Study Area Wetlands

Wetland Label	Wetland Identification
Prince Lake No. 1	PUBGx: Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated
Unnamed Pond (west of Prince Lake No. 1)	PUBGx: Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated
Unnamed Pond	PUBFx: Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated
Davidson Highline Lateral Ditch (also known as South Boulder Canyon Ditch)	R5UBFx: Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently Flooded, Excavated
Bullhead Gulch Wetland	PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded
Bullhead Gulch Ditch	R4SBC: Riverine, Intermittent, Streambed, Seasonally Flooded
Unnamed Wetland (North of Bullhead Gulch)	Rp1FO: Riparian, Forested
McGinn Ditch	R5UBFx: Riverine, Unknown Perennial, Unconsolidated Bottom, Semipermanently
Unnamed Pond	PUBF: Palustrine, Unconsolidated Bottom, Semipermanently Flooded
Burke Lake	PUBF: Palustrine, Unconsolidated Bottom, Semipermanently Flooded
	PEMC: Palustrine, Emergent/Herbaceous, Seasonally Flooded
Unnamed Ditch	R4SBC: Riverine, Intermittent, Streambed, Seasonally Flooded Rp1FO: Riparian, Forested
Unnamed Wetland System	PEMA: Palustrine, Emergent
Unnamed Pond	PUBF: Palustrine, Unconsolidated Bottom, Semipermanently Flooded
Unnamed Pond	PUBF: Palustrine, Unconsolidated Bottom, Semipermanently Flooded
Unnamed Pond	PUBF: Palustrine, Unconsolidated Bottom, Semipermanently Flooded
Unnamed Wetland System	PEMC: Palustrine, Emergent/Herbaceous, Seasonally Flooded
Unnamed Wetland System	PSSA: Palustrine, Shrub/Scrub, Temporarily Flooded
Unnamed Ditch	R5UBFx: Riverine, Unknown Perennial, Unconsolidated Bottom, Semi-permanently Flooded, Excavated
Dry Creek	PEM1C: Palustrine, Emergent, Persistent, Seasonally Flooded

Source: Wetland Classification as identified from the USFWS National Wetland Inventory

Figure 4.3 Floodplains, Floodways, Wetlands, and Waters of the US



Source: Boulder County GIS

4.6 Wildlife/Threatened and Endangered Species

Wildlife is an important public resource that warrants consideration during federally funded projects and is documented during the NEPA process. Various federal laws have been established to protect wildlife, including the ESA, the MBTA, and the BGEPA.

Details and characteristics of wildlife resources in the study area were identified using existing GIS data and field verified (June 2016) (see **Table 4.10** and **Figure 4.4**). Additional inventory details about the resources, such as protection status and presence of species, were obtained from accessing the Colorado Parks and Wildlife (CPW) species profiles website, the CNHP website, and the USFWS website in May 2016. Research used the most current version of information available online. Data from the North I-25 EIS was used because the two study areas generally overlap with the SH 7 study area (FHWA and CDOT, 2011a).

Table 4.10 Existing Wildlife Resources

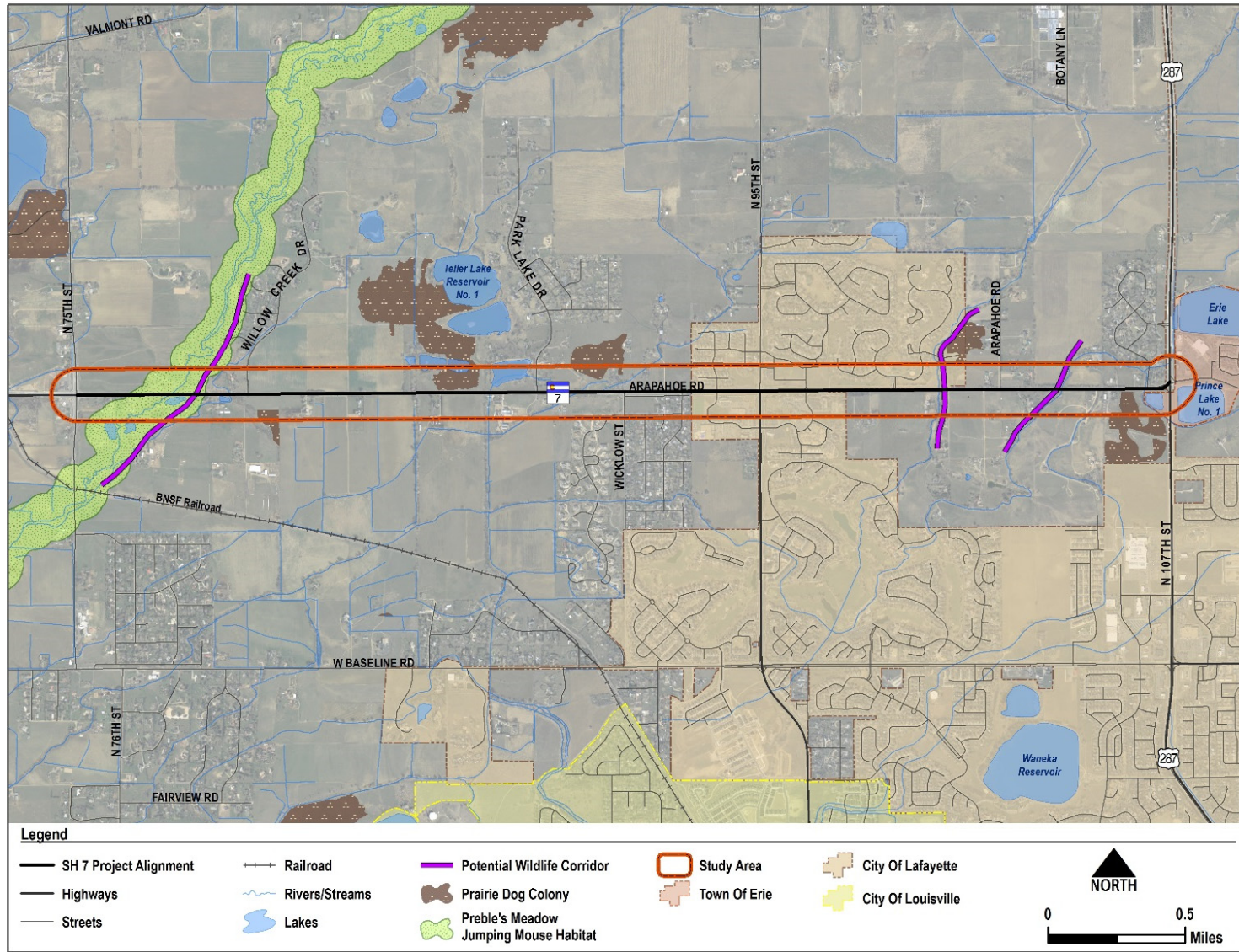
Resource Name	Protection Type	Habitat	Habitat Present?	Observed in Field?
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA, MBTA	Reservoirs and rivers. In winter may also occur locally in semideserts and grasslands, especially near prairie dog towns.	Yes, multiple areas with cottonwoods and creeks/rivers in study area.	None was seen during windshield survey.
Western Burrowing Owl (<i>Athene cunicularia</i>)	State Threatened Species, MBTA	Lives in dry, open areas with short grasses and no trees. Nests and lives in underground burrows created by prairie dogs, ground squirrels, and badgers. Can be found where suitable burrows exist.	Yes, prairie dog colonies exist in several places along the corridor.	None was seen during windshield survey.
Cliff Swallows (<i>Petrochelidon pyrrhonota</i>)	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.	None was seen during windshield survey.
Colorado butterfly plant (<i>Oenothera coloradensis</i>)	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. It does not occur in Boulder County.	Yes, Dry Creek and agricultural ditches.	No survey was conducted.

Table 4.10 Existing Wildlife Resources (Continued)

Resource Name	Protection Type	Habitat	Habitat Present?	Observed in Field?
Common shiner (<i>Notropis cornutus</i>)	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, Dry Creek.	No survey was conducted.
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	Federally Threatened Species – ESA	Resides in old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, and high tree density).	No habitat in this study area meets the species requirements.	No survey was conducted.
Black-Tailed prairie dog (<i>Cynomys ludovicianus</i>)	CPW Species of Concern	Typically resides in areas below 6,000 feet, east of Colorado's foothills. The largest areas of active prairie dog colonies are located along the Front Range and in the south-central/southeastern portions of Colorado.	Yes, multiple prairie dog colonies occur in the study area.	Yes
Preble's meadow jumping mouse (<i>Zapus hudsonius preblei</i>)	Federally Threatened Species – ESA	Inhabits riparian areas near standing or running water in lowland areas dominated by forested wetlands, shrub dominated wetlands, and grass/forb dominated wetlands between 4,000 and 8,000 feet in elevation.	Yes, Dry Creek *Note: A block clearance zone for this species exists just outside the study area, south of SH 7 and east of US 287.	No survey was conducted.
Ute ladies'-tresses orchid (<i>Spiranthes diluvialis</i>)	Federally Threatened Species – ESA	Occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams.	Yes, Dry Creek *Note: A block clearance zone for this species exists outside of the study area along the South Platte River south of SH 7.	No survey was conducted.
Western prairie fringed orchid (<i>Platanthera praeclara</i>)	Federally Threatened Species – ESA	Occurs most often in mesic to wet unplowed tallgrass prairies and meadows but has been found in old fields and roadside ditches.	No habitat is present.	No survey was conducted.

Sources: CPW, 2016; USFWS, 2016

Figure 4.4 Wildlife Corridors, Threatened and Endangered Species



Source: Boulder County GIS

The wildlife analysis identified state and federally listed endangered species, protected species, common species, and potential wildlife corridors. State and federally listed threatened and endangered species are listed or are candidates for listing on the ESA. Habitat and range maps were collected from the above resources. Protected species were identified by sight or habitat that was readily visible in the field at the time of the survey. They included species protected by the MBTA and BGEPA. Other species present in the study area could be mule deer (*Odocoileus hemionus*), whitetail deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*). Wildlife corridors are beneficial for wildlife to move through the landscape freely.

Threatened and Endangered Species

Field surveys identified locations where possible protected threatened and endangered species habitat would be present as listed in **Table 4.10**. This includes habitat for plants such as the Colorado butterfly plant and the Ute ladies'-tresses orchid. Other species identified as having habitat present in the study area include the common shiner and Preble's meadow jumping mouse. While prairie dog habitat is present, which can indicate Western Burrowing Owl habitat, Western Burrowing Owls usually prefer an area with longer sightlines to spot predators approaching. A detailed survey of these drainages is recommended for the listed species to identify their presence or absence in the study area.

Migratory Birds

During the field survey, no nests were identified within or readily visible from the study area. This includes migratory birds, raptors, and eagle nests. However, suitable habitat exists within the study area for Cliff Swallow (*Petrochelidon pyrrhonota*), Bald Eagle, Great Horned Owl (*Bubo virginianus*), and Red-tailed Hawk (*Buteo jamaicensis*). This habitat should be further studied to determine the presence of any nests, as the CPW has recommended buffers for raptor nests to limit disturbance due to human encroachment and vary based on the nesting species of raptor (CPW, 2008).

Thus, impacts to migratory birds (e.g., song birds, herons, other raptors, and eagles) may occur from design alternatives if construction occurs during the normal nesting season of these species. The normal nesting season can differ by species.

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 focuses only on large wildlife species. Existing land use in the study 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 that included identified movement corridors for wildlife between protected tracts of land within or adjacent to the study area. The field survey noted no major wildlife corridors that facilitate wildlife movement. However, three corridors, including Dry Creek, Bullhead Gulch, and South Boulder Canyon Ditch, serve as potential wildlife corridors. The construction of wildlife-friendly structures over or along these drainages will provide avenues for wildlife to move through the study area while keeping the general public safe.

4.7 *Hazardous Materials*

The methodology used to identify the presence of sites with known RECs (recognized environmental contaminant) and PECs (potential environmental contaminant) within the study area included the following steps:

1. Obtained an Environmental Data Resources (EDR) regulatory database search report of sites listed in federal, state, and local environmental databases as defined by ASTM Standard E1527-13. The EDR report identifies regulated facilities with aboveground storage tanks (ASTs), underground storage tanks (USTs); landfill (LF) sites; hazardous waste generation or treatment, storage, and disposal facilities; leaking underground storage tank (LUST) sites; and other sites associated with potential soil and groundwater contamination in the search area up to one mile from the study area.
2. Performed a limited site reconnaissance of properties within the study area for obvious evidence of potential contamination sources visible from the public right-of-way.

For this hazardous materials assessment summary, sites within the study 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. ASTM Standard E1527-13 defines RECs as: "...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." When potential regulated materials concerns, as identified during the limited site reconnaissance, or review of agency databases or other relevant resources could not be confirmed without additional inspection or investigation, the sites were distinguished as sites with potential RECs.

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 study area has a variety of land uses, including agricultural, oil/gas development, residential, commercial, and light industrial. A total of 16 sites with recognized and potential environmental conditions were identified within 500 feet of the SH 7 study area (**Table 4.11** and **Figure 4.5**).

Table 4.11 Sites with Recognized and Potential Environmental Conditions within 500 feet of SH 7 and 168th Avenue within the Study Area

Site Address/Name	Distance from Study Area	Site Description
SH 7		
3332 Arapahoe Rd Erie, CO 80516	Adjacent	Database: AST, Historical Auto. PEC. This site previously operated as a Great American Tire and Auto Service and is now closed. Unknown material handling, storage, and disposal practices. Given the potential presence of materials including fuel, motor oils, hydraulic fluids, degreasers, paints, and solvents, this site is a PEC.
3333 Arapahoe Rd, Erie Historical Auto Stations	Adjacent	Database: Historical Auto and Historical Cleaner. PEC. Two auto stations were previously present at this site: Great American Fast Lube closed in 2001, and Great American Tire & Auto Service closed in 2002. Unknown material handling, storage, and disposal practices. Potential materials include fuel, motor oils, hydraulic fluids, degreasers, paints, and solvents. Heritage Cleaners was also identified at this address between 2004 and 2008. Currently this site is a strip mall with a Safeway store. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
3334 Arapahoe Rd Erie, CO 80516	Adjacent	Database: UST. PEC. This site is an operating gasoline station with three tanks currently in use with a 20,000 gallon gasoline tank, a 12,000 gallon gasoline tanks, and a 10,000 gallon diesel tank. No incidents reports; however, given the presence and use of petroleum products, this site is a PEC.
3335 Arapahoe Rd Erie, CO 80516	Adjacent	Database: Historical Cleaner. This site is a historical cleaner. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
US 287 and Arapahoe Rd Boulder County, Shirk Borrow Pit	Adjacent	Database: MINES. PEC. An 8.5 acre surface mine. Listed as terminated use. A permit was issued 03/24/1983. Current site is developed residential. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
10473 Arapahoe Rd, Boulder	Adjacent	Database: CO ERNS. PEC. In 1996, heavy rains caused a 500-gallon diesel tank to overturn and spill into South Boulder Canyon Ditch. Residual contamination could be present making this site a PEC.
101000 Arapahoe Rd, Lafayette	Adjacent	Database: CO ERNS. PEC. In 1996 an unknown amount of diesel spilled onto the driveway and drainage ditch along SH 7. Residual contamination could be present making this site a PEC.
9899 Arapahoe Rd, Boulder Blum Jim Oldsmobile GMC	Adjacent	Database: AIRS. PEC. Potential for emissions. Unknown material handling, storage, and disposal practices. Potential materials include fuel, motor oils, hydraulic fluids, degreasers, paints, and solvents.

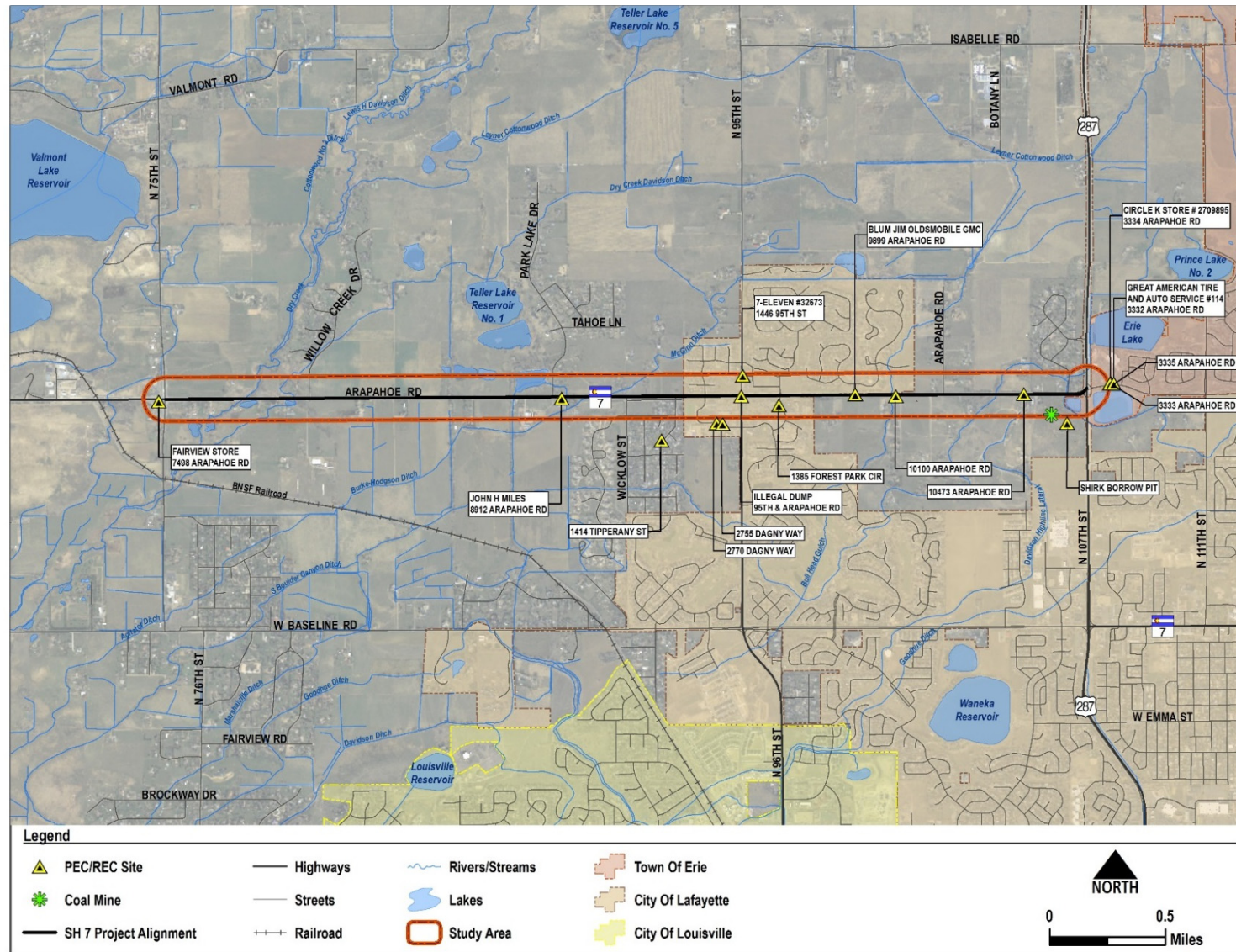
Table 4.11 Sites with Recognized and Potential Environmental Conditions within 500 feet of SH 7 and 168th Avenue within the Study Area (Continued)

Site Address/Name	Distance from Study Area	Site Description
SH 7 (Continued)		
1385 Forest Park Cir, Lafayette Historical Cleaners	Adjacent	Database: Historical Cleaners. PEC. Boulder Cleaners and Laundry Inc. operated at this location until 2007. Unknown material handling, storage, and disposal practices. Currently, this site is a Guitar Hut. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
1414 Tipperary St, Boulder Historical Auto Station	550 Feet N	Database: Historical Auto. PEC. Global Off Road Engineering LLC operated at this location until 2007. Unknown material handling, storage, and disposal practices. Potential materials include fuel, motor oils, hydraulic fluids, degreasers, paints, and solvents. Currently, this site is a residence. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
N 95 th St & Arapahoe Rd Boulder Illegal Dump	Adjacent	Database: SWF/LF. REC: Unknown details concerning dump; residual contamination could be present. Site is currently undeveloped. Given the unknown details on this site, it is a REC.
1446 95 th St, Lafayette 7-Eleven	Adjacent	Database: LUST, UST. PEC: This site contained a RGA LUST from 2010 to 2012. This facility is an operating gas station with three open underground storage tanks (one 15,000-gallon and two 10,000-gallon) with unleaded regular gasoline, mid-grade gasoline, and premium gasoline. Two LUST events have occurred at the site due to overfilling with closure letters submitted (OPS, 2016).

Table 4.11 Sites with Recognized and Potential Environmental Conditions within 500 feet of SH 7 and 168th Avenue within the Study Area (East to West) (Continued)

Site Address/Name	Distance from Study area	Site Description
SH 7 – West of I-25		
2755 Dagny Way, Lafayette Historical Auto Stations	Adjacent	Database: Historical Auto. PEC. Meineke Car Care Center operated at this location from 2006 to 2010. Currently, this location is a Smashburger restaurant, a CrossFit Julia gym, and an insurance office. Given the historic uses of the property, this site is considered a PEC, requiring additional analysis.
2770 Dagny Way, Lafayette Historical Cleaners	Adjacent	Database: Historical Cleaners. PEC. Scientific Cleaner Inc. operated at this location from 2003 to 2005. Currently, this location is an Espresso Vino coffee shop/bar, a Mew Mew's yarn shop, a 95 th St Salon, and a Brewing Market coffee shop.
8912 Arapahoe Rd, Boulder	Adjacent	Database UST. PEC. This location contains a permanently closed UST in 1951 that held gasoline (size unknown). Currently, this site is a residence. Given the unknown presence of contamination, this site is considered a PEC, requiring additional analysis.
7498 Arapahoe Rd, Boulder Fairview Store	Adjacent	Database: LUST. REC. This facility was in the LUST database with a RGA LUST from 2001 to 2009. This location contains three 10,000-gallon open underground storage tanks that hold mid-grade gasoline, premium gasoline, diesel, and waste oil. The facility also has two permanently closed 2,000-gallon USTs, but the removal of these tanks is unknown according to OPS (2016). This site is currently an operating Conoco gas station. Given the unknown removal of the tanks, this site is a REC and requires additional analysis.

Figure 4.5 Hazardous Materials – Sites with Recognized Potential Environmental Conditions



Source: EDR, 2016.

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 is one LUST site adjacent to the study area from an overfill. A closure letter has been sent.

Oil and Gas Facilities

No oil and gas facilities were observed within or adjacent to the study area.

Farm Properties

Several farm properties are located adjacent to the SH 7 corridor. 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, ASTs, 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.

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