3.1 TRANSPORTATION

Transportation planning in Pueblo has been designed as a continuous and ongoing process. As part of the process, the Pueblo Area Council of Governments (PACOG) developed a comprehensive plan in 2002, the *Pueblo Regional Development Plan*. This plan addressed regional planning needs, including those related to Pueblo's transportation systems (PACOG, 2002). In 2008, PACOG developed the *Pueblo Area 2035 Long Range Transportation Plan* to further refine the vision for the future transportation system in Pueblo. As a part of this ongoing planning process, the citizens of Pueblo were given the opportunity to identify community issues to be addressed. Among the issues cited by the citizens were cross-town local mobility concerns, the lack of pedestrian-friendly streets, safety at railroad crossings, and the impact of I-25 on the surrounding neighborhoods.

When PACOG asked for their vision of the Pueblo region's future, residents cited strong, interconnected neighborhoods with local services and activities, an efficient multi-modal transportation system serving all citizens, pedestrian and bicycle facilities, and greenways that provide added connectivity to neighborhoods. This section addresses roadway configuration, traffic, transit, and related multi-modal issues in the Pueblo I-25 corridor.

Transportation is discussed first in this chapter because the local and regional mobility and safety improvements included as part of the Build Alternatives were an important distinguishing feature to use for comparison between alternatives. Additionally, throughout the extensive public involvement process (see **Chapter 6 – Comments and Coordination**), citizens told the CDOT Project Team that I-25 and the local street network are the primary challenges in their ability to travel around Pueblo. Citizens were interested in which of the alternatives best address their local street issues, which in turn affects their neighborhoods. Lastly, presenting the proposed transportation improvements associated with each Build Alternative first will help the reader better understand the features of the alternatives as they read about the impacts of each alternative in this chapter.

3.1.1 Affected Environment

3.1.1.1 Existing Roadway Conditions

The segment of I-25 through Pueblo consists of four travel lanes; two continuous asphalt-covered lanes in each direction serve as the primary thoroughfare for north-south traffic. This section was constructed between 1949 and 1959, predating the Interstate Highway System and its associated design guidelines, making it among the oldest segment of the interstate system in Colorado. Lane and shoulder widths vary throughout the corridor. Posted speeds of the segment range from 50 miles per hour (mph) to 75 mph.

As a result of its age and the design practices at the time it was built, structural and operational deficiencies are becoming apparent and are manifested in two major roadway condition categories: safety and local/regional mobility. The following provides detailed descriptions of the safety and local/regional mobility issues present in the study area.

Roadway Conditions that Affect Safety

The design of a roadway considers the traffic volume and speed expected over the service life of the roadway. The design accommodates the traffic volume with adequate lanes and accommodates speed with appropriate curves and other geometric features.

A technical evaluation of the geometric and operational deficiencies was conducted by CDOT Project Team engineers to evaluate the nominal safety of this segment of I-25 (CH2M HILL, 2002; 2011a). The evaluation consisted of a combination of field measurements, field observations, and review of original construction plans. The geometric features that were reviewed included the horizontal and vertical alignment of the roadway, stopping sight distance, cross-sectional elements, entrance and exit lane design, and ramp design and spacing. Each feature was evaluated against current state and national standards, including CDOT's *Roadway Design Guide* (2005a), the American Association of State Highway and Transportation Officials' *A Policy on Geometric Design of Highways and Streets* (2004), and the Transportation Research Board's *Highway Capacity Manual* (2010), and rated as good, fair, or poor. **Exhibit 3.1-1** lists the ratings for geometric and operational features on I-25.

EXHIBIT 3.1-1
Accident Ratings and Major Geometric and Operational Deficiencies on I-25 through Pueblo for 2003 through 2005

Segment	Travel Direction	Accident Rate[1]	Evaluation Rating	Major Geometric Deficiency[2]
Statewide Average	–	1.57	Fair	–
29th Street to US 50B	Northbound	2.31	Poor	Distance between ramps leaves insufficient deceleration and acceleration distance. Steep vertical curves on 29th Street. Deficient ramp design and lane balance at US 50B evident by sideswipe accidents. Several multi-vehicle crashes on the ramps, which could be related to the ramp layout.
	Southbound	2.76	Poor	
US 50B to 13th Street	Northbound	1.64	Fair	Rear-end accidents on the mainline could result from congestion. Several rear-end accidents at the ramp intersections. Obstructions within the clear zone. Tight curves resulting in fixed object crashes. Steep grades and side slopes. Obstructions within the clear zone. Inadequate stopping sight distance leading to rear-end type accidents. Poor lane balance and ramp sequencing.
	Southbound	2.13	Fair	
13th Street to 6th Street	Northbound	1.96	Fair	Tight curves resulting in fixed object crashes. A fatal crash occurred in this section of I-25 when a driver was changing lanes on a curve. Steep grades and side slopes. Obstructions within the clear zone. Inadequate stopping sight distance leading to rear-end type accidents. Insufficient distance to decelerate for 13th Street exit ramp in the northbound direction. Poor ramp design and insufficient distance to decelerate for 6th Street exit ramp in the southbound direction. Evidence of parked car accidents due to insufficient shoulder width. Poor ramp design. Poor lane balance and ramp sequencing.
	Southbound	1.54	Fair	
6th Street to 1st Street	Northbound	2.54	Poor	Tight curves resulting in fixed object crashes. Steep grades and side slopes. Obstructions within the clear zone. Inadequate stopping sight distance leading to rear-end type accidents. Inadequate shoulder width. Poor ramp design. Poor lane balance and ramp sequencing leading to sideswipe type accidents. Steep grades on exit ramp at 1st Street southbound. Insufficient distance to accelerate northbound at 1st Street entrance ramp leading to sideswipe type accidents. Several multi-vehicle crashes on the ramps that could be related to the ramp layout.
	Southbound	4.42	Poor	
1st Street to Ilex Street	Northbound	2.62	Poor	Tight curves resulting in fixed object crashes. Steep grades. Inadequate stopping sight distance leading to rear-end accidents. Poor ramp layout and design leading to multi-vehicle accidents on the ramps. Sharp curve on exit ramp at Ilex Street northbound. Inadequate deceleration length for 1st Street exit ramp northbound. Inadequate acceleration length southbound from the 1st Street entrance ramp. Evidence of parked car accidents due to Insufficient shoulder width. Several multi-vehicle crashes on the ramps that could be related to the ramp layout.
	Southbound	2.79	Poor	
Ilex Street to Abriendo Avenue	Northbound	3.64	Poor	Tight curves resulting in fixed object crashes and overturning accidents. Poor driver comfort. Obstructions within the clear zone. Inadequate stopping and decision sight distance leading to rear-end accidents in this segment. Poor ramp spacing possibly leading to multi-vehicle crashes on the ramp. Insufficient shoulder width.
	Southbound	3.02	Poor	
Abriendo Avenue to Central Avenue	Northbound	4.72	Poor	Tight curves resulting in fixed object crashes and overturning accidents. Steep side slopes. Poor signing. Inadequate sight distance leading to rear-end accidents. Unexpected ramp location at Central Avenue contributing to multi-vehicle crashes. Insufficient shoulder width causing accidents with parked vehicles.
	Southbound	1.87	Poor	

EXHIBIT 3.1-1
Accident Ratings and Major Geometric and Operational Deficiencies on I-25 through Pueblo for 2003 through 2005

Segment	Travel Direction	Accident Rate[1]	Evaluation Rating	Major Geometric Deficiency[2]
Central Avenue to Indiana Avenue	Northbound	1.34	Fair	Constrained cross section leading to running off the road and hitting fixed objects. Inadequate sight distance. Poor ramp layout and design. Rear-end accidents on ramps are typical accident types in this location due to the poor ramp design and inadequate sight distance.
	Southbound	1.73	Fair	

Source: CH2M HILL, 2011b.

[1] Rating scale: Good = < 1.18 total accidents per million vehicle miles traveled (VMT); Fair = 1.18-1.96 total accidents per million VMT; Poor = > 1.96 total accidents per million VMT.

[2] Unless otherwise noted, the Geometric Deficiency applies to both the northbound and southbound directions.

Horizontal and Vertical Alignment

The horizontal alignment of a roadway is defined by its configuration as seen in plan view, such as on a map or from an airplane. Vertical alignment refers to the vertical elevation of a roadway on the landscape; for example, the grade of a road as it climbs or descends a hill. If the horizontal or vertical alignments of a roadway are substandard, it is usually due to tight curves, inadequate banking of the road at curves, and/or long, steep grades.

The horizontal and vertical alignments on I-25 were evaluated against state and national standards. Horizontal alignments on I-25 were rated as good from 29th Street to United States Highway (US) 50B, poor from US 50B to Central Avenue, and good from Central Avenue to Pueblo Boulevard. Vertical alignments on I-25 were rated as fair at 29th Street, good from 29th Street to US 50B, poor from US 50B to Abriendo Avenue, and fair from Abriendo Avenue to Pueblo Boulevard.

Stopping Sight Distance

Stopping sight distance is the distance required by a driver to stop a vehicle traveling at or near the design speed of a highway before reaching a stationary object such as a stopped vehicle. Stopping sight distance on I-25 was evaluated against state and national standards and was rated as poor at 29th Street, good from 29th Street to US 50B, poor from US 50B to Abriendo Avenue, fair from Abriendo Avenue to Indiana Avenue, and good from Indiana Avenue to Pueblo Boulevard. Inadequate stopping sight distance could result in rear-end accidents when a driver's ability to react is compromised.

Cross-Sectional Elements

Cross-sectional elements encompass a wide variety of roadway components, including lane widths, shoulder and median widths, clear zone obstructions, side slopes, and guard rails. Compared to state and national standards, the cross-sectional elements on I-25 were rated as poor in more than 95 percent of the corridor, from US 50B to Pueblo Boulevard and in segments north of US 50B (CH2M HILL, 2002; 2011a). The poor rating can be attributed to the following conditions:

- Narrow shoulders and clear zone obstructions such as light or utility poles throughout the corridor.
- The lack of a barrier between northbound and southbound traffic between 29th Street and US 50B.
- Steep side slopes near downtown Pueblo and the Arkansas River.
- Unprotected bridge piers at Northern Avenue.
- A concrete-lined drainage ditch close to the edge of the highway from Ilex Street to Central Avenue.
- An alley that backs up to a residential area within the clear zone between Central Avenue and Indiana Avenue.
- An electrical substation close to the edge of the highway near Pueblo Boulevard.

Entrance/Exit Ramp Design

Existing entrance and exit ramp length and curvature were evaluated in conjunction with the interchange design. Entrance and exit ramps were considered good at 29th Street, Abriendo Avenue, and Pueblo Boulevard; fair at 13th Street, 6th Street, and Central Avenue; and poor throughout the rest of the corridor.

Interchange and Ramp Spacing

The spacing of interchanges was evaluated against national criteria for sufficiency. The national design recommendation is to provide a minimum spacing between interchanges of 1 mile in urban areas and 2 miles in rural areas. Appropriate spacing of interchanges is determined based on the ability of traffic to exit or enter the highway without conflicting with other motorists.

Along the 7-mile project corridor, there are 11 interchanges. The average spacing between these interchanges is 0.53 mile. Interchange spacing was rated as poor throughout the downtown Pueblo area and near the Ilex Street and Abriendo Avenue interchanges. Interchange spacing was rated as good on the north and south ends of the corridor and fair everywhere else.

Adequate spacing between the ends of each ramp allows for vehicle maneuvering and the required signing to inform, warn, and control drivers. In the project corridor, the areas south of Pueblo Boulevard are considered to have good ramp spacing; areas north are generally rated poor.

Accident Analysis

Accidents on a roadway are typically associated with a combination of several elements, including the driver, the vehicle, and the roadway's geometric and operational features. The severity and frequency of accidents along a given roadway can be used to develop an accident rate, which is measured in total accidents per million vehicle miles traveled (VMT).Likewise, the accidents and Average Daily Traffic (ADT) along a section of roadway can be compared to facilities with the same number of lanes, area type (rural or urban), and access control with the use of a Safety Performance Function (SPF) graph. These comparisons can provide insight into the safety of the roadway compared to similar types of roads within the state.

An accident analysis was conducted for the I-25 corridor from the 29th Street interchange to the Pueblo Boulevard interchange for the 6-year period from 2003 to 2008 (CH2M HILL, 2011b). During this timeframe, CDOT safety analyses evolved from accident rate comparisons to SPF comparisons. Both methodologies assess the level of safety for a roadway based on accidents and traffic volumes. However, the SPF methodology provides a more accurate comparison of a roadway's safety performance to similar facilities because it considers factors such as number of lanes and presence of a median, whereas the average accident rate is calculated from statistics for facilities across the state with varying cross-sectional elements including number of lanes. The SPF methodology is now the industry standard.

Because the methodology for evaluating accidents changed during the preparation of the DEIS (around 2006), both methodologies are presented in this section. The accident analysis for the 2003 through 2005 time period was conducted by comparing the I-25 accident statistics for the study area to the 2005 statewide average urban interstate rates. The accident analysis for the 2006 through 2008 time period was conducted by comparing the I-25 accident statistics to CDOT's "Urban 4-Lane Freeways" SPF graph. The results are described below.

- **Accident Rates (2003 - 2005)**. Comparative data from 2003 to 2005 indicate that I-25 through Pueblo has a 43 percent higher overall rate of accidents than other urban interstates statewide. I-25 through Pueblo has a 68 percent higher property-damage-only accident rate for the same period. Accident rates that are considerably higher than the statewide average are key indicators of the safety issues on I-25 through Pueblo.

  For the accident rate analysis (2003 – 2005), the 7-mile length of I-25 through Pueblo was divided into nine different study segments. **Exhibit 3.1-1** shows accident rates for the eight segments of I-25 through Pueblo that were rated as fair or poor. The rating is based on CDOT criteria for urban interstates, with a good rating being 1.18 or fewer total accidents per million VMT, a fair rating being between 1.18 and 1.96, and a poor rating being 1.96 or greater. The 2005 average urban interstate accident rate in Colorado, measured in total accidents per million VMT, was 1.57.

  Major geometric deficiencies for the eight segments with fair and poor accident rates and typical accident types associated with these deficiencies are also included in **Exhibit 3.1-1**. The accident history for the Indiana Avenue to Pueblo Boulevard segment results in a good rating and is, therefore, not included in the exhibit. The geometric deficiencies and typical accident types are similar to those shown for the Central Avenue to Indiana Avenue segment.

- **Safety Performance Function (2006 - 2008).** The SPF analysis was conducted by comparing the total number of accidents per mile per year and the ADT volume along the 7-mile length of I-25 in the study area to

CDOT's "Urban 4-Lane Freeways" SPF graph (CH2M HILL, 2011b). This analysis indicated that I-25 through Pueblo experienced more accidents and exhibited a lower safety performance than expected during the 2006 to 2008 time period. This is consistent with the fair and poor ratings attributed to the accident rates shown in **Exhibit 3.1-1**. Roadway segments with a low safety performance such as I-25 through Pueblo have a high potential for accident reduction once improvements that target the safety issues are implemented. Additional information on the SPF analysis may be found in the Accident Analysis Update, Addendum to Traffic Report Technical Memorandum (CH2M HILL, 2011b).

Both accident analysis methodologies indicate that traffic safety problems exist on I-25 through Pueblo. The accident rate and SPF comparisons yield similar conclusions over the 6-year analysis period because the accidents have remained fairly consistent from year to year, due in part to the geometric deficiencies and recurring congestion along this segment of I-25.

Roadway Conditions that Affect Mobility

Mobility is a measure of how well the roads, sidewalks, trails, and public transit move people and goods within and through the community. The citizens of Pueblo have come to depend heavily on I-25 for local north-south local mobility, and I-25 also serves regional travelers and freight movement. Mobility on I-25 can be measured by how effectively it moves vehicles from place to place. Part of this measurement relates to how interchanges connect to side streets, how local and regional traffic interacts, and the level of traffic congestion.

Interchange Connectivity

Typically, interchanges are placed to connect interstates with major cross streets, such as highways and major arterials. Rarely do interstate interchanges directly connect with a neighborhood street, a minor roadway, or a roadway that does not extend a reasonable distance from the highway. The existing interchanges in Pueblo connect a variety of roadways, state highways, and local neighborhood streets to I-25.

Many of the interchanges connect to streets that do not provide adequate east-west local mobility. The interchanges at US 50B and Pueblo Boulevard connect I-25 to other major regional routes; however, the interchange at US 50B does not provide access to the west, and the interchanges at 13th Street, Ilex Street, Abriendo Avenue, Central Avenue, and Pueblo Boulevard do not provide access to the east of I-25. Many of the interchanges connect directly to neighborhood streets or to streets that are local and discontinuous. Examples include the exit ramps at Minnequa Avenue and Illinois Avenue, which move traffic from the highway directly into local neighborhood streets, and the interchange at Central Avenue, which connects I-25 to a discontinuous local street.

Traffic Conflicts

I-25 serves as the primary north-south route in Pueblo, with no convenient alternative routes on local roadways. Barriers to east-west local mobility include Fountain Creek, the Union Pacific Railroad (UPRR) line, the Arkansas River, the Evraz Rocky Mountain Steel Mills, and other physical features. Traffic is further hindered by poor interchange connectivity, thereby increasing local and regional demand on I-25.

Traffic Congestion

Data on existing traffic conditions in the I-25 corridor are collected by CDOT and local governments. According to CDOT, bi-directional traffic volumes along the I-25 corridor ranged from a low of approximately 25,900 daily vehicles north of Pueblo Boulevard to a high of 67,500 daily vehicles between the US 50B and 13th Street interchanges. Traffic in the corridor is expected to approximately double by the year 2035, with ADT ranging from 54,300 to 108,360 in various segments of the corridor (CH2M HILL, 2005a; 2010h; 2011b).

Roadway capacity is defined as a road's ability to efficiently handle traffic. Theoretical capacity is based on the number of lanes on a road. Capacity is the measure of the number of vehicles that can travel through a location in 1 hour. According to the *Highway Capacity Manual*, the theoretical capacity is approximately 2,000 vehicles per lane per hour, or 8,000 vehicles per hour for a four-lane interstate highway (Transportation Research Board, 2010). Operating constraints such as high truck volumes, narrow shoulders, sharp curves, and inadequate sight distance further reduce the theoretical capacity of a road. These operating constraints reduce the speed of traffic which, in turn, reduces the actual roadway capacity.

Level of Service (LOS) measures the efficiency of the road's operation using a rating system of A through F. LOS A is the best operating level and allows a motorist to travel at the speed limit, encountering a minimum number of vehicles and minimal roadway restrictions LOS F is a failure condition ranging from stop-and-go to stopped traffic. At LOS F, the road's actual capacity has been exceeded. **Exhibit 3.1-2** shows an example of LOS and the associated conditions. The LOS by direction for segments on the I-25 corridor within the project limits is summarized in **Exhibit 3.1-3.**

As shown in **Exhibit 3.1-3**, many segments in the corridor exceed 8,000 vehicles per hour (4,000 in each direction) for the future No Action scenario, suggesting that six lanes would theoretically be required to handle this amount of traffic. While safety improvements alone would slightly improve the theoretical capacity, these improvements still would not provide sufficient capacity to meet these future traffic demands on the system.

VMT is a measure of the total distance traveled by the total number of vehicles within the Pueblo region, as defined by PACOG. Changing the vehicle path (for example, closing a ramp) is likely to increase VMT as the route to get to the same location may be longer. Another contributing factor to increasing VMT is roadway congestion. As an existing roadway network becomes more congested, the VMT increases as drivers opt for more indirect routes in an effort to save overall travel time. (The current and No Action Alternative VMT in the project area are shown in **Exhibit 3.1-6**.)

Truck traffic ranges from 5 to 10 percent of daily traffic along I-25 through Pueblo, with the highest percentages north of 29th Street. The corridor average is nearly 7 percent. These values are higher than the truck percentages on other state highways in the Pueblo area, where the average is just over 4 percent, indicating that I-25 is a major truck traffic route through Pueblo and the state. The mixture of higher-than-average heavy truck traffic and a high number of local trips on I-25 poses a concern for motorists because the travel needs of each type of user differ.

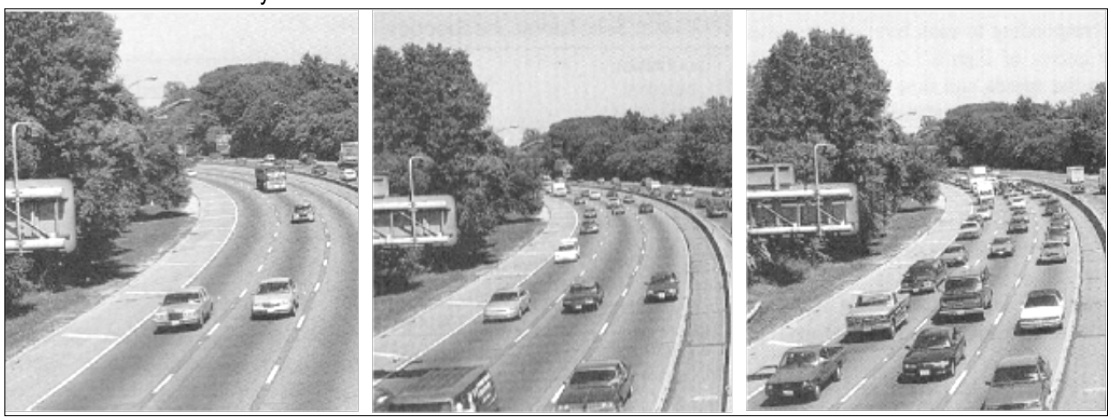
Further detail on traffic in the project area may be found in the *Traffic Report Technical Memorandum, New Pueblo Freeway* (CH2M HILL, 2005a; 2010h, 2011b).

Bridge Deficiencies

CDOT assigns bridge sufficiency ratings to structures on all state highways. This rating is a number between 100 (best) and 1 (worst) based on the condition and design of each bridge. A bridge rated below 50 qualifies for replacement, and those rated between 50 and 80 qualify for rehabilitation or replacement if justified.

Bridge sufficiency ratings may reflect structural deficiencies and/or functional obsolescence. A structurally deficient rating is assigned to bridges that are in advanced stages of deterioration. Bridges in the study area, listed in **Chapter 1 – Purpose and Need**, **Exhibit 1-3**, continue to deteriorate, and four bridges are currently rated as structurally deficient (southbound I-25 at Ilex Street, northbound I-25 at Indiana Avenue, and the Mesa Avenue and Northern Avenue Bridges that span I-25).

EXHIBIT 3.1-2
Level of Service and Associated Roadway Conditions



LOS B **LOS D** **LOS F**

EXHIBIT 3.1-3
Existing (2002) and Future (2035) No Action Bi-directional PM Peak-Hour Highway Level of Service and Peak-Hour Volumes (Vehicles per Hour)*

Segment	Existing I-25		Future No Action I-25	
	Northbound	Southbound	Northbound	Southbound
North of 29th Street	C (2,341)	C(2,430)	F(3,310)	D(4,000)
29th Street to US 50B	C (3,147	C(3,619)	F(3,920)	D(4,050)
US 50B to 13th Street	C (3,222)	C (3,406)	F(4,170)	E(4,350)
13th Street to 6th Street	C (2,574)	C (3,049)	F(4,100)	E(4,600)
6th Street to 1st Street	C (1,946)	C (2,515)	F(3,550)	F(4,400)
1st Street to Ilex Street	C (1,866)	C (2,613)	F(3,595)	F(4,500)
Ilex Street to Abriendo Avenue	B (1,585)	B (2,152)	F(3,300)	D(4,200)
Abriendo Avenue to Central Avenue	B (1,302)	B (1,757)	E(2,650)	D(3,600)
Central Avenue to Indiana Avenue	A (1,019)	A (1,501)	C(2,300)	D(3,350)
Illinois Avenue to Pueblo Boulevard	A (891)	A (1,230)	A(1,800)	C(2,700)

Source: CH2M HILL, 2005a; 2010h; 2011b.
*Data is shown as LOS (PM Peak-Hour Volume)
LOS = level of service US 50B = United States Highway 50B

Functionally obsolete bridges are those with acceptable load-carrying capacity but physical limitations, such as narrow deck width, severe erosion around piers or abutments, or deterioration in concrete or girders. Other bridge conditions considered in determining functional obsolescence (and possibly contributing to corridor safety and capacity issues) relate to existing conditions that do not meet current design guidelines or that cannot adequately accommodate the planned improvements, such as narrow medians, bridge pier locations that result in tight horizontal curvature, and low vertical bridge clearances. Based on evaluation for this study, 11 of the 28 structures in the I-25 corridor were considered functionally obsolete.

Existing Pedestrian and Bicycle Facilities

Non-motorized mobility within the City is provided by a series of on-street bicycle routes, multi-use trails, and sidewalks. The city-wide bicycle route network consists of nearly 200 miles of designated on-street routes suitable for riders of all experience levels (PACOG, 2008). Pueblo's multi-use trails are designed to accommodate pedestrians and bicyclists along open space areas, major rivers, and stream corridors. The Fountain Creek and Arkansas River trails provide almost 15 miles of multi-use trails within the City (illustrated in **Section 3.3 Parks and Recreation**, **Exhibit 3.3-1**); however they do not provide connections for users south of the Arkansas River. More information on trails in the project area is available in **Section 3.3 Parks and Recreation**. Sidewalks encourage alternative transportation by connecting neighborhoods, existing trails, and other city centers and public facilities. Approximately 80 percent of roadways in the City of Pueblo have sidewalk facilities (PACOG, 2008).

Existing Public Transit Facilities

Bus service first became available in Pueblo in 1947 to meet the City's mass transportation needs. The bus service was privately owned and operated by the Pueblo Transit Company until 1968 when the City acquired the company and its assets. The City's Department of Transportation currently manages this publicly owned transportation system.

In 2010, the Pueblo Transit System consisted of 11 bus routes that have a central transfer point at the Pueblo Transit Center, located in downtown Pueblo at 1st Street and Court Street. The location of the Pueblo Transit Center is shown in **Exhibit 3.1-4**. This system is called a "radial pulse" system, which is designed to have all routes

converge and diverge from a central transfer point with all routes timed to arrive and depart at the same time. This type of system is helpful for facilitating transfers between routes but can lead to a significant overlap of service. The bus routes provide service to St. Mary Corwin and Parkview Hospitals, the Pueblo Mall, Colorado State University at Pueblo, and various other schools, neighborhoods, retail centers, and medical facilities. These routes are shown in **Exhibit 3.1-4**. Future planned improvements to the transit center, to be completed by others, will be made to accommodate a private inter-state bus operator of Greyhound.

I-25 is not heavily used as a public transit corridor; bus travel on I-25 is limited to Route 6, "Pueblo Mall," which uses I-25 between 29th Street and 13th Street. The routes that cross I-25 are Route 1 along 4th Street and 8th Street, Routes 9 and 10 along 8th Street, and Route 11 along Northern Avenue and Santa Fe Avenue.

The Pueblo Transit System also offers a service called Citi-Lift. Citi-Lift is an Americans with Disabilities Act (ADA) paratransit service for individuals who cannot use the fixed-route bus service because of a disability. The service area for Citi-Lift includes the Pueblo city limits and corridors that are within 0.75 mile of the fixed routes. Services are offered Monday through Saturday, 6:00 a.m. to 6:30 p.m. According to PACOG's *Pueblo Area 2035 Long Range Transportation Plan*, demand for Citi-Lift doubled between 2003 and 2005 (PACOG, 2008).

Existing Railroad Operations

Railroads have a long history in Pueblo. The founder of the Denver & Rio Grande Railroad, General William J. Palmer, aspired to build a railroad from Denver to Mexico, passing directly through Pueblo. The Denver & Rio Grande Railroad arrived in Pueblo in 1872 after the citizens of Pueblo passed a $100,000 bond to finance the construction of the rail line into Pueblo. Shortly after the arrival of the first rail line, a total of five rail lines connected in Pueblo at the Pueblo Union Depot. The Pueblo Union Depot was built in 1890 and sits adjacent to Pueblo's rail yard north of the Arkansas River. The Colorado Fuel and Iron (CF&I) steel mill (now known as the Evraz Rocky Mountain Steel Mills), located 2 miles south of the Pueblo Union Depot on the Denver & Rio Grande Railroad line, relied heavily on the line. The construction of rail lines made it possible for Pueblo's first industry, steel works, to succeed (PACOG, 2002).

Today, Pueblo County is served by the Burlington Northern Santa Fe (BNSF) Railway Company and UPRR rail lines. All rail activities in Pueblo County consist exclusively of freight service. As shown in **Exhibit 3.1-5**, the UPRR freight line parallels I-25 to the east along Fountain Creek until it splits to the north of Ilex Street. One branch continues south on the west side of the Evraz Rocky Mountain Steel Mills. The other heads west, crossing I-25 approximately 0.25 mile north of the Ilex Street interchange, toward the rail yard. From the rail yard, this branch heads due south, crossing I-25 at the Abriendo Avenue interchange, then follows I-25 until it rejoins the first branch south of the steel mill facility (within the steel mill property). A third branch heads east across I-25 from the line split north of Ilex Street near the trail that leads to the Historic Arkansas Riverwalk of Pueblo (HARP).

The BNSF Railway Company shares the UPRR freight rail lines in Pueblo with the exception of the line east of I-25 along Fountain Creek. For service to the north of Pueblo, the BNSF Railway Company line extends northwest from the downtown rail yard along the west side of Pueblo until it connects with the UPRR line to the north of Pueblo near Purcell Boulevard and I-25.

In addition to the BNSF Railway Company and UPRR rail lines, lines exist on and around the Evraz Rocky Mountain Steel Mills site. Internal steel mill lines are operated by the Colorado and Wyoming Railroad Company.

EXHIBIT 3.1-4

Existing Public Transit Facilities in the Project Area

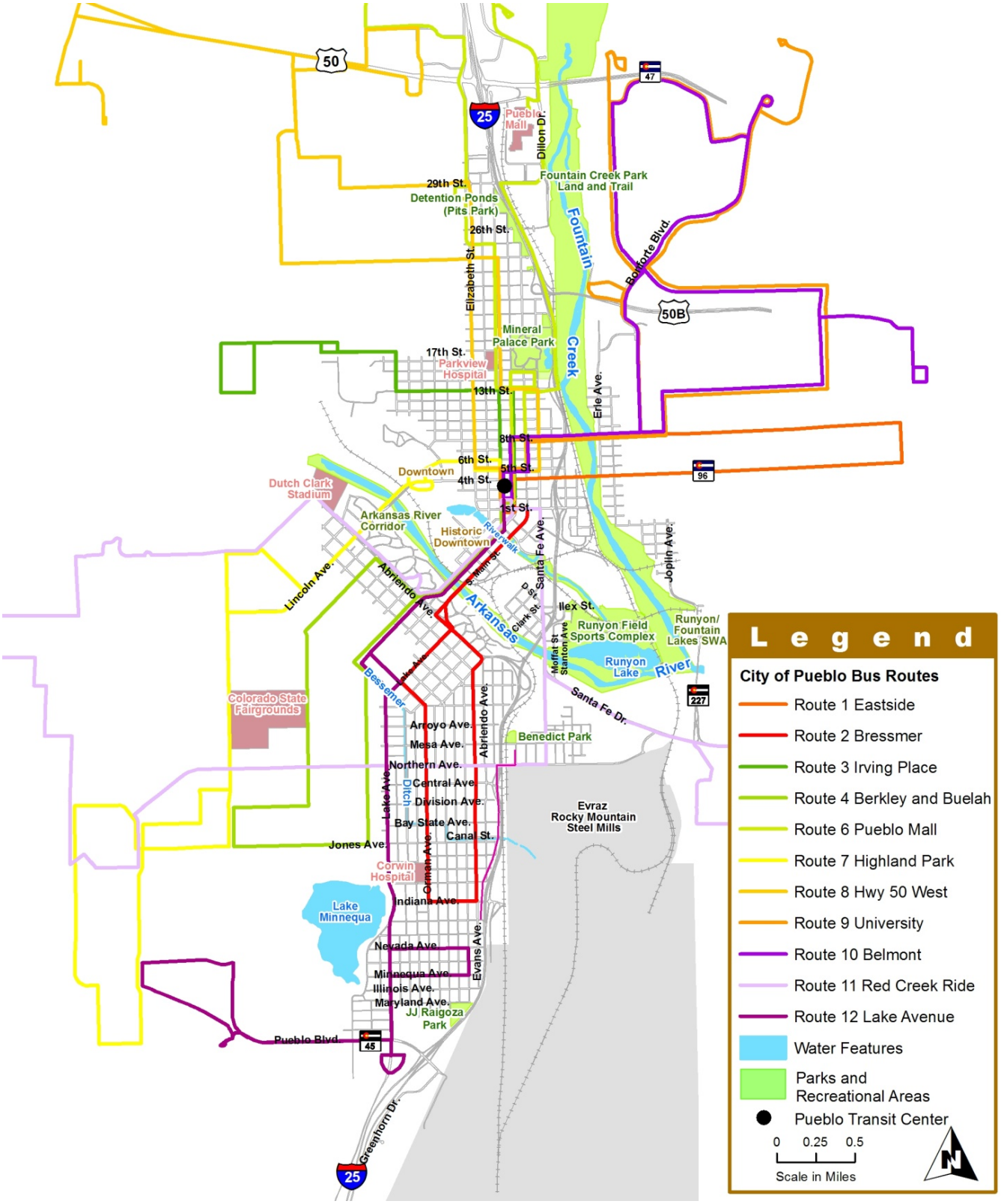


EXHIBIT 3.1-5
Existing Rail Lines in the Project Area

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, there would be no construction impacts as a result of highway reconstruction. Normal highway maintenance operations may temporarily disrupt traffic; however, there would be no improvements to the accident rates that currently affect I-25. The existing problems on I-25 are expected to persist under the No Action Alternative because the basic configuration of the highway throughout the study area will remain the same. The deficient geometric and operational features would continue to exist without the reconstruction needed for improving the safety of the highway.

Local and regional mobility in Pueblo would not be improved as a result of the No Action Alternative because of the following situations:

- Interchanges would continue to connect to discontinuous local and neighborhood streets, providing limited east-west local mobility across I-25.
- Conflicts between local and regional users of the highway would persist.
- Traffic congestion would continue to increase, resulting in LOS F conditions which would cause stop-and-go to stopped conditions, further reducing regional mobility on I-25.
- Aging and functionally obsolete bridges would continue to deteriorate.

3.1.2.2 Build Alternatives

The Build Alternatives would positively impact transportation safety and local/regional mobility in Pueblo. The geometric and operational deficiencies that are a result of the age of I-25 would be corrected, thereby improving safety. Local and regional mobility would be improved through the connection of interchanges to appropriate city streets, the creation of off-highway connections, increased capacity, provisions of multi-modal elements such as trails and sidewalks, and the replacement of functionally obsolete bridges along the corridor.

To measure the capacity and efficiency of the current I-25 through Pueblo and to analyze solutions, existing and future traffic volumes were developed in coordination with PACOG. The 2035 forecasted traffic volumes were used in

the analysis of future operating conditions (CH2M HILL, 2005a; 2010h).

Exhibit 3.1-6 shows the projected daily miles traveled in the project area for each alternative. **Exhibit 3.1-7** lists the corresponding LOS of specific segments of I-25 through Pueblo during PM peak traffic.

Construction of either Build Alternative may result in temporary impacts to businesses and residents, such as changes in access, delay caused by lane closures, out-of-direction travel due to detours, and other similar unavoidable impacts caused by construction-related activities.

EXHIBIT 3.1-6
Daily Vehicle Miles Traveled in the Project Area (2035)

Alternative	Total VMT
No Action Alternative	68,650
Existing I-25 Alternative	74,630
Modified I-25 Alternative	80,490

Source: CH2M HILL, 2005a; 2010h; 2011b.

North Area

Both Build Alternatives would improve the transportation network in the North Area of the project corridor. Improvements to the mainline of I-25 would correct geometric and operational deficiencies that are a result of the age of the highway. A total of 13 bridges in the North area would be replaced, including the three bridges with sufficiency ratings below 50. These bridges are the two Ilex Street bridges and northbound I-25 over US 50B. In addition, four bridges with sufficiency ratings under 80 would also be replaced.

Both Build Alternatives would construct a split-diamond interchange from 13th Street to 1st Street through downtown Pueblo (see **Chapter 2 – Alternatives**, **Exhibit 2-27**) that would improve the safety of the interchanges and improve local mobility by disconnecting highway ramps from local streets, providing continuous, organized, and improved access to the downtown street network, and improving signage. The construction of the northbound frontage road would require that Bradford Avenue be made into a cul-de-sac on both ends. Kelly Road would be extended from Santa Fe Avenue into Goat Hill, improving local mobility by providing a second access point to the neighborhood.

Reconstruction of the US 50B interchange would increase safety by improving ramps with insufficient lengths and improve local mobility by providing access to 29th Street via a frontage road system (see **Chapter 2 – Alternatives**, **Exhibit 2-26**). CDOT would extend Dillon Drive south approximately 2 miles to US 50B, which would allow for improved local access to the Pueblo Mall and regional retail destinations in the North Area. This extension would provide additional off-highway local mobility for local users by

EXHIBIT 3.1-7
Bi-directional PM Peak-Hour Highway Level of Service

Segment	Existing (2002) I-25 LOS NB/SB	No Action Alternative (2035) I-25 LOS NB/SB	Existing I-25 Alternative (2035) I-25 LOS NB/SB	Modified I-25 Alternative (2035) I-25 LOS NB/SB
North of 29th Street	C/C	F/D	B/B	B/C
29th Street to US 50B	C/C	F/D	B/C	B/C
US 50B to 1st Street	C/C	F/F	C/C	C/C
1st Street to Abriendo Avenue	C/C	F/F	B/C	B/C
Abriendo Avenue to Northern Avenue	B/B	E/D	B/C	B/C
Northern Avenue to Pueblo Boulevard	A/A	C/C	A/A	A/A

Source: CH2M HILL, 2005a; 2010h; 2011b.

I-25 = Interstate 25
US 50B = United States Highway 50B
LOS = level of service
NB/SB = Northbound/Southbound

shifting onto local roads those drivers who are using I-25 for local trips, thus reducing demand on I-25 parallel to Dillon Drive. Construction of pedestrian trails along I-25 to the north and south and across I-25 near Mineral Palace Park would improve pedestrian and bicycle mobility.

Bus Transit Route 6, which currently uses I-25, would have to be modified to accommodate the new interchange system from 13th Street to 1st Street through downtown Pueblo. It is expected that the new interchanges would provide for more efficient operation of the transit system in the City.

South Area

Both Build Alternatives would improve the transportation network in the South Area of the project corridor. Improvements to the mainline of I-25 would correct geometric and operational deficiencies. The exit ramp at Illinois Avenue would be removed, thus improving safety by removing a ramp that does not connect to an appropriate City street. The trails connecting Runyon Field Sports Complex and JJ Raigoza Park would improve pedestrian and bicycle mobility. The bridge at Pueblo Boulevard would be replaced, although this bridge does not have a low sufficiency rating.

Central Area

Existing I-25 Alternative

The Existing I-25 Alternative would improve the transportation network in the Central Area of the project corridor. Improvements to the mainline of I-25 would correct geometric and operational deficiencies and restore east-west connectivity that was severed when I-25 was built. Eleven existing bridges would be replaced in the Central Area. Three of these bridges have sufficiency ratings below 50. These are the two bridges over Indiana Avenue and the Northern Avenue bridge. In addition, four bridges with sufficiency ratings under 80 would also be replaced.

Reconstruction of the interchange at Abriendo Avenue and removal of the interchange at Ilex Street would improve safety by increasing the spacing between interchanges. The reconstructed Abriendo Avenue interchange would increase local mobility by providing access to the east and west of I-25 through an indirect connection of Abriendo Avenue and Santa Fe Drive.

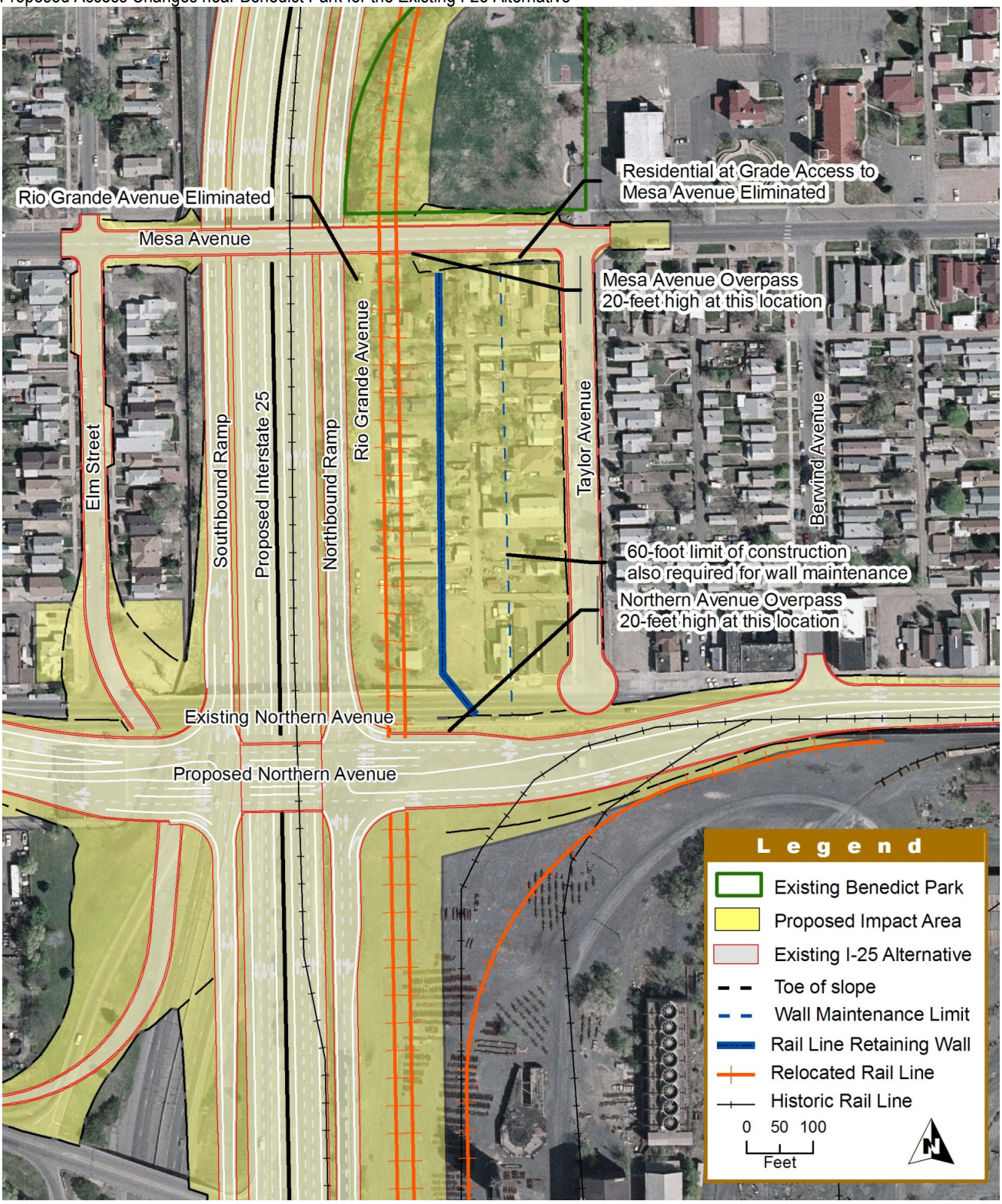
The connections between I-25 and local neighborhood streets at Central Avenue, Minnequa Avenue, and Illinois Avenue would be removed and replaced with connections to major roadways – including Abriendo Avenue, Northern Avenue, and Indiana Avenue – providing better east-west connectivity for highway users and reserving neighborhood streets for local traffic. Under the Existing I-25 Alternative, the interchange at Central Avenue would be removed and relocated to Northern Avenue (see **Chapter 2 – Alternatives**, **Exhibit 2-28**). The Northern Avenue interchange would become a split-diamond interchange with Abriendo Avenue, connected by a frontage road system. Improvements to the interchanges, the addition of frontage roads, and improvements to Mesa Avenue would improve off-highway local mobility for local users, thus reducing the demand on I-25. The new interchange system would improve east-west local mobility by providing access across I-25 in a location north of the Evraz Rocky Mountain Steel Mills, which currently acts as an eastern barrier at the Central Avenue interchange.

Access to some homes in the Bessemer Neighborhood can no longer be provided under the Existing I-25 Alternative due to the construction of the Northern Avenue Interchange, as shown in **Exhibit 3.1-8**. Rio Grande Avenue would be closed to allow for construction of the northbound ramp and rail lines in its place. Homes on the west side of Taylor Avenue would be acquired to allow for the construction and maintenance of a retaining wall adjacent to the rail lines. The elevation of Northern Avenue and Mesa Avenue would have to be raised to cross over the reconstructed I-25, which would remove access to some properties that front along these streets. The loss of access to the properties between Mesa Avenue and Northern Avenue would require the acquisition of these homes and businesses. More detail on property acquisitions can be found in **Section 3.4 Right-of-Way and Relocations.**

The interchange at Indiana Avenue would be reconstructed to remove ramps at Minnequa Avenue and Aqua Avenue. The removal of these ramps would improve safety by removing highway traffic from neighborhood streets and upgrading the interchange at Indiana Avenue to current design standards.

Under the Existing I-25 Alternative, the rail line located east of the current I-25 alignment would have to be moved to accommodate mainline reconstruction, causing impacts to the freight industry during construction. The rail line would

EXHIBIT 3.1-8
Proposed Access Changes near Benedict Park for the Existing I-25 Alternative



be moved east from roughly Abriendo Avenue to Minnequa Avenue and would tie back in to the existing line to the north and south of the relocation.

Regional pedestrian and bicycle mobility through the Central Area would be improved with the construction of a trail "backbone" system that would connect JJ Raigoza Park in the south to destinations to the north such as HARP, Runyon Field Sports Complex, and Mineral Palace Park. The trails would cross I-25 at Mesa Avenue on sidewalks, providing additional east-west connectivity for pedestrians and bicyclists.

Modified I-25 Alternative

The realignment of I-25 under the Modified I-25 Alternative would make it possible to improve the transportation network by substantially increasing both north-south and east-west local mobility throughout the Central Area. Improvements to the mainline of I-25 would correct geometric and operational deficiencies and improve local mobility by restoring off-highway connections that were removed when I-25 was originally constructed. A total of 11 existing bridges would be replaced in the Central Area. Three of these bridges have sufficiency ratings below 50. These are the two bridges over Indiana Avenue and the Northern Avenue bridge. In addition, four bridges with sufficiency ratings under 80 would also be replaced.

Additional north-south local mobility is provided by the extension of Stanton Avenue north and west to Santa Fe Avenue and south to Santa Fe Drive. The realignment of the mainline of I-25 to the east under the Modified I-25 Alternative (see **Chapter 2 – Alternatives**, **Exhibit 2-34**) allows for the extension of Santa Fe Avenue south to Minnequa Avenue using the current I-25 right-of-way. This extension would allow residents to use a local roadway to travel from neighborhoods in the south to downtown Pueblo, rather than having to rely on I-25. The extension would also provide a much needed additional local street crossing of the Arkansas River (reconnecting Santa Fe Avenue to Abriendo Avenue) and would restore the local street network that was severed when I-25 was built. The extension of Santa Fe Avenue is only available under the Modified I-25 Alternative.

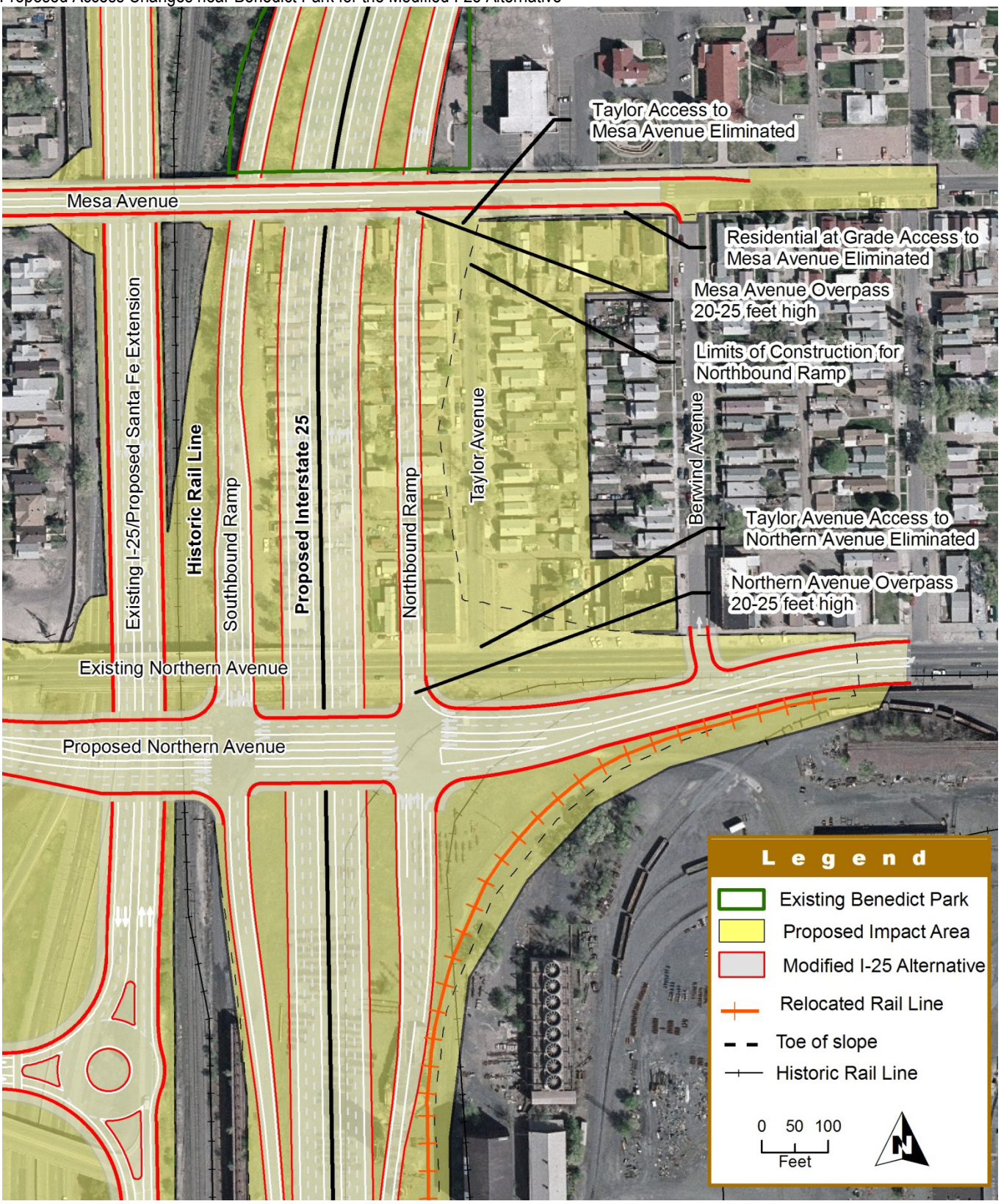
The extension of Stanton Avenue from Santa Fe Avenue near the existing Ilex Street interchange to Santa Fe Avenue just south of Santa Fe Drive reestablishes part of a local grid system. The Stanton Avenue connection was developed directly from community input and reflects the public's desire to use local roads for local trips. It also adheres to the City's long-range plans, which show Stanton Avenue connecting to D Street. Property acquisition required for the shift in I-25 alignment under the Modified I-25 Alternative makes this extension possible. These improvements provide approximately 23 lane miles of new local roads that would improve local mobility, increase safety, and reduce demand on I-25 from local users between 1st Street and Indiana Avenue.

Under the Modified I-25 Alternative, the interchange at Central Avenue would be removed and moved to Northern Avenue (see **Chapter 2 – Alternatives**, **Exhibit 2-34**). The Northern Avenue interchange would become a split-diamond interchange with Abriendo Avenue, connected by a frontage road system. Improvements to the interchanges, the addition of frontage roads, and improvements to Mesa Avenue would improve local mobility for local users, reducing the demand on I-25. The new interchange system would improve east-west local mobility by connecting Abriendo Avenue across I-25 and providing access east of I-25 in a location south of downtown and north of the Evraz Rocky Mountain Steel Mills, which currently acts as an eastern barrier at the Central Avenue interchange.

Access to some homes in the Bessemer Neighborhood can no longer be provided under the Modified I-25 Alternative due to the construction of the Northern Avenue Interchange as shown in **Exhibit 3.1-9**. Rio Grande Avenue would be closed to allow for construction of the shifted I-25 alignment. Taylor Avenue would be closed to allow for construction of the northbound ramp (including side-slopes) and due to the elevation changes of Northern Avenue and Mesa Avenue. The elevation of Northern Avenue and Mesa Avenue would have to be raised to cross over the reconstructed I-25, which would remove access to some properties that front along these streets. The loss of access to the properties between Mesa Avenue and Northern Avenue requires the acquisition of these homes and businesses. More detail on property acquisitions can be found in **Section 3.4 Right-of-Way and Relocations.**

The interchange at Indiana Avenue would be reconstructed to remove ramps at Minnequa Avenue and Aqua Avenue.

EXHIBIT 3.1-9
Proposed Access Changes near Benedict Park for the Modified I-25 Alternative



The removal of these ramps would improve safety by removing highway traffic from neighborhood streets and upgrading the interchange at Indiana Avenue to current design standards. Regional pedestrian mobility would be improved through a trail "backbone" system, as described for the Existing I-25 Alternative.

Bus Transit Route 11, which currently uses Santa Fe Avenue, would have to be modified to accommodate the Santa Fe Avenue and Stanton Street extensions. It is expected that the modifications to the local roadway network would provide for more efficient operation of the transit system in the City.

3.1.2.3 Indirect Effects

Indirect effects to transportation typically include changes in regional travel patterns or forced out-of-direction travel. On I-25 through Pueblo, modeling predicts that vehicle and person trips for the two Build Alternatives and the No Action Alternative would be similar. This is particularly true for north-south trips where vehicles would use either Build Alternative to bypass local traffic encountered at geometrically deficient interchanges. As safety deficiencies are reduced on the mainline, travel speed on I-25 would increase and VMT would be reduced. VMT would also be reduced on virtually every east-west road segment connecting to I-25. Both Build Alternatives would provide congestion relief on local roadways and improve travel times, whereas congestion and VMT would continue to worsen under the No Action Alternative.

In addition, corrections to traffic queuing at geometrically deficient interchanges would indirectly improve safety and access to and on the local road system. Once new traffic patterns are established, the improved geometry of the corridor would encourage and support the use of transit in the study area. Some out-of-direction travel would be indirectly created by removing access at Illinois Avenue, Illex Street, Aqua Avenue, and Minnequa Avenue; relocating traffic from Central Avenue to Northern Avenue; and reconstructing the Indiana Avenue interchange. This out-of-direction travel can be anticipated due to the proposed changes in access. Overall, the Build Alternatives would result in fewer VMT even with the creation of some out-of-direction travel. No other quantifiable indirect effects were identified for the transportation analysis.

3.1.3 Mitigation

Unless otherwise specified, the following mitigations apply to both the Existing I-25 Alternative and the Modified I-25 Alternative:

- During construction, CDOT will conduct public information efforts (including the development of a Public Information Plan) to inform the public and affected businesses in advance of lane closures, detours, and interchange reconstruction activities. The Public Information Plan will include regular media releases to describe the upcoming construction activities and aid in communication with City staff. In particular, CDOT will maintain safe business access during construction and provide an extensive communications program with affected businesses to keep them informed of construction schedules. At all times during construction, access to downtown Pueblo will remain open through at least one access point. Signage will be provided to alert motorists of access changes and identify detour routes. To minimize the impact of construction on bus routing and service, CDOT will coordinate with the Pueblo Transit System prior to and throughout construction.
- CDOT will develop a traffic control plan during final design that details strategies to minimize traffic disruption from construction activities. These strategies include the following:
  - Whenever possible, the existing number of lanes will be maintained during construction. Typically, new capacity lanes will be constructed adjacent to the existing facility, and once these are ready, traffic will be diverted to them so that reconstruction can occur on the original lanes. The full benefits of the new lanes will not be realized until final project completion. This approach will be time-consuming and expensive, but avoids the dramatic impacts of temporarily reducing the number of lanes and diverting traffic to other nearby local streets.
  - Construction activities will be phased to minimize the number of times that traffic must switch between lanes (per the strategy described above). Where lane closures on I-25 are unavoidable for safety reasons (e.g., during placement or demolition of a bridge structure), such closures will typically occur at night.

  - Where temporary closure of a lane on a cross-street is unavoidable, the closure will be limited to one lane per direction and will take place only during off-peak hours. Wherever possible, impacted sidewalks and trails will be provided with a safe detour.
  - Lane closures will be avoided at times when there are planned special events within the region.
- CDOT will follow appropriate permitting, including coordination with the railroads for impacts to the rail lines during bridge construction under the Build Alternatives and track realignment under the Existing I-25 Alternative.
- CDOT will reduce speed limits in work zones.
- Impacts and mitigation associated with traffic and construction noise are provided in **Section 3.5 Noise**.
- Based on final design, commitments will be modified or adapted as needed to mitigate for both construction and operational effects of a Preferred Alternative. A mitigation monitoring and implementation plan will be developed during final design; any commitments to mitigation will be based on a higher level of design and can be considered preliminary at this stage of design.