Chapter 2: Purpose and Need

This chapter describes the project purpose and why it is needed. It also details why the project was started, the horizon years of analysis, the project limits, and the project area. The project purpose has not changed since the 2008 Draft EIS, although some of the data used to describe why the project is needed have been updated.

2.1 Why was the I-70 East project initiated?

As discussed in the DRCOG 2035 MVRTP (2007), the transportation system is integral to the growth and development of the region. One of the policies within this plan is system preservation, to assure existing and future transportation facilities are maintained and preserved.

The transportation vision for the I-70 East corridor is to serve as a multi-modal interstate freeway and rapid transit corridor serving regional and statewide trips. Future improvements are needed on I-70 East to increase mobility as well as maintain system quality and improve safety.

Thousands of tourists traveling between DIA and the mountains use this section of I-70. The corridor serves the Stapleton Redevelopment Area and leads to Peña Boulevard, which connects to DIA. Bus service with associated Park-n-Ride lots is provided in the corridor. A parallel rapid transit line, the East Corridor line, is planned to connect to DIA, and the Union Pacific Railroad (UPRR) line also is parallel to I-70. A large number of industrial activities are situated all along this corridor (DRCOG, 2011, Appendix 1).

In addition, the viaduct between Brighton Boulevard and Colorado Boulevard, which was constructed in 1964, is one of the largest and most notable bridges in deteriorating condition across the state. The viaduct requires replacement within the next 10 to 15 years.

What is a viaduct?

A viaduct is a long, elevated roadway consisting of a series of shorter bridge spans supported on arches, piers, or columns.

2.2 What is the horizon year of analysis for this project?

Transportation modeling is used to create information to help in making decisions about the future development of transportation systems. It is used as part of an overall transportation planning process that incorporates forecasting travel patterns 15 to 25 years into the future. These forecasts are used to develop a transportation network that will work effectively in the future. The 2008 Draft EIS used a horizon year of 2030. The horizon year has been updated to 2035 for this document to reflect the time that has passed since the 2008 Draft EIS was released. This is consistent with what is currently used for the Denver region's transportation planning process guided by DRCOG. This year also is used by CDOT as the horizon year in its current transportation plans for the state. Data for the year 2035 are based on available projections from DRCOG and provide the foundation for developing and evaluating alternatives.

2.3 What are the project limits and why were they selected?

The project area is a blend of older, established neighborhoods and communities to the west of Quebec Street and newer, expanding communities to the east. These communities are diverse in their character and history, providing a wide variety of residential, commercial, public facility, and institutional land uses. Adding to the complexity of the project area is the presence of major travel destinations such as the National Western Complex events center, and the redevelopment of areas such as the former Stapleton International Airport into a major mixed-use residential and commercial center. I-70 serves as a key east-west transportation and freight corridor through the American Midwest, Denver, and Colorado's Rocky Mountains, and it is the primary access to DIA.

As shown in Exhibit 2-1, the project limits extend along I-70 between I-25 and Tower Road. The project area covers locations within Denver, Commerce City, and Aurora. This document mostly focuses on the neighborhoods of Globeville, Elyria and Swansea, Northeast Park Hill, Stapleton, Montbello, Gateway, and a portion of Aurora.

Existing and forecasted traffic volumes were the main factor in determining the project limits on I-70. Forecasted volumes range from 117,000 to 285,000 vehicles per day between I-25 and Peña Boulevard and decline as you travel farther east. Tower Road is the eastern limit because the traffic volumes drop substantially

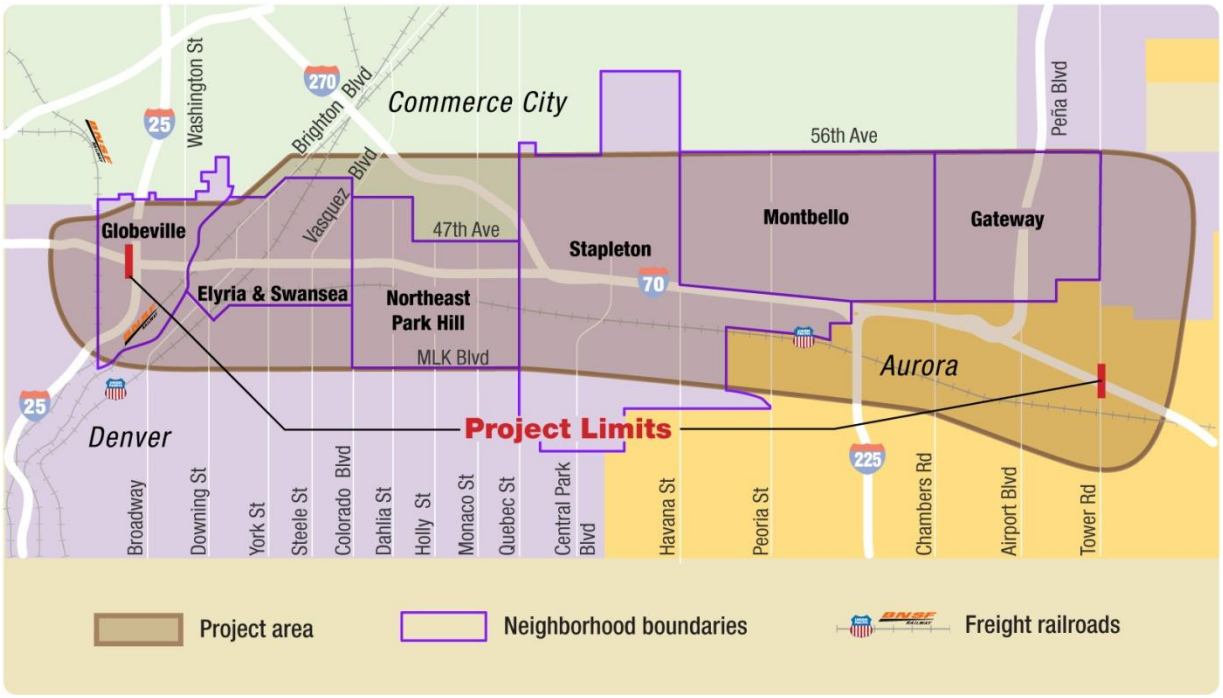
Logical termini

Using NEPA terminology, project limits are the same as logical termini. Logical termini for project development are defined as rational end points for both a transportation improvement and a review of the environmental impacts.

after Peña Boulevard. I-25 was selected as the western limit because of the high diversion of traffic to both north and southbound I-25. Between 50 percent and 60 percent of traffic traveling westbound on I-70 continues on past I-25. These limits do not preclude other NEPA transportation improvement studies outside the corridor.

An approximate one-mile buffer was created around the project limits to establish the project area. The project area was used to frame the range of transportation solutions and examine existing resource conditions.

Exhibit 2-1. Project area



2.4 What is the purpose of the project?

Currently, I-70 between I-25 and Tower Road is one of the most heavily traveled and congested highway corridors in the region and state. The corridor provides a number of important transportation functions, including interstate and intrastate travel along I-70; regional access from downtown Denver and the metropolitan area to DIA; linkage as an inner beltway between I-225 and I-270; and access to adjacent employment areas, neighborhoods, and new development centers. Using input from scoping, data gathering, and technical analysis, the project purpose and need was developed.

The purpose of the project is to implement a transportation solution that improves safety, access, and mobility and addresses congestion on I-70 in the project area.

2.5 Why is this project needed now?

The need for this project results from the following issues:

- Transportation infrastructure deficiencies
- Increased transportation demand
- Limited transportation capacity
- Safety concerns

2.5.1 Transportation infrastructure deficiencies

I-70 was constructed in the early 1960s with bridge and drainage structures designed to last for 30 years. Nine structures on the corridor are now past their anticipated lifespan and are classified as either structurally deficient or functionally obsolete and in need of replacement, rehabilitation, or repair.

The viaduct between Brighton Boulevard and Colorado Boulevard was constructed in 1964. The sufficiency rating of the viaduct was 44 out of a possible 100, which is considered structurally deficient, functionally obsolete, and requiring replacement. Following two rehabilitation projects completed recently on the viaduct, this rating has increased to 62. The rehabilitation projects completed in 2011 have extended the useable lifespan of the structure an additional 10 to 15 years.

What qualifies a bridge as "structurally deficient"?

Federal guidelines classify bridges as "structurally deficient" if the components are rated at poor or worse on inspection. This means that engineers have identified a major defect in the bridge's support structure or deck. If a bridge is rated "structurally deficient," the bridge needs substantial maintenance or rehabilitation, or it needs to be replaced.

When is a bridge "functionally obsolete"?

A bridge is functionally obsolete when it cannot properly accommodate traffic due to poor roadway alignment or out-of-date design standards.

Falling pieces of concrete show a structurally deficient viaduct. This photo was taken on 46th Avenue under the viaduct

2.5.2 Increased transportation demand

The project area is experiencing rapid growth and development. This includes both areas of new development and redevelopment, with substantial residential populations and business activity. In addition to the established neighborhoods on the western end of the corridor, the following substantial new residential and business growth is occurring:

- **Downtown Denver.** According to *Blueprint Denver* (Denver, 2002a) (the land use/transportation plan for the city), downtown Denver will add more than 21,000 new housing units and 47,000 new jobs by 2020.

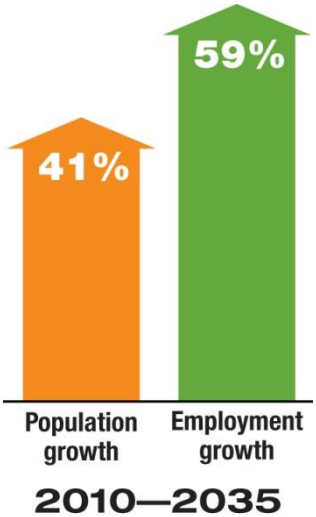
- **Stapleton.** Redevelopment of the old Stapleton International Airport began in 2001. At build-out, it is projected to have more than 30,000 residents and 35,000 new jobs.

- **Gateway Park**. Gateway Park in Aurora, north of I-70 and west of Chambers Road, is projected to have from 34,000 to 65,000 new residents and more than 54 million square feet of commercial space at build-out.

- **Denver International Airport.** DIA is expected to add an additional 13,500 jobs by 2030 as it continues to grow and expand.

The land use and development trends within the corridor will result in additional demands on the transportation system. Providing access and maximizing travel ability to, through, and within the corridor are critical to maintaining the economy. This includes maintaining and enhancing connections between major activity centers near the corridor.

The 2010 and 2035 DRCOG travel demand models have shown recent population and employment growth within the Denver region, which has resulted in increased travel demand in the corridor. Population and employment growth in the project area has been heavily influenced by the development of DIA and other areas. Development in the project area is projected to continue in the future as population is expected to increase 41 percent and employment is expected to increase 59 percent from 2010 to 2035, with annual growth rates of 1.4 percent and 1.9 percent, respectively. Most of the developable land in the central and eastern parts of the project area will be built out by 2035.



Source: 2010 and 2035 DRCOG travel demand models

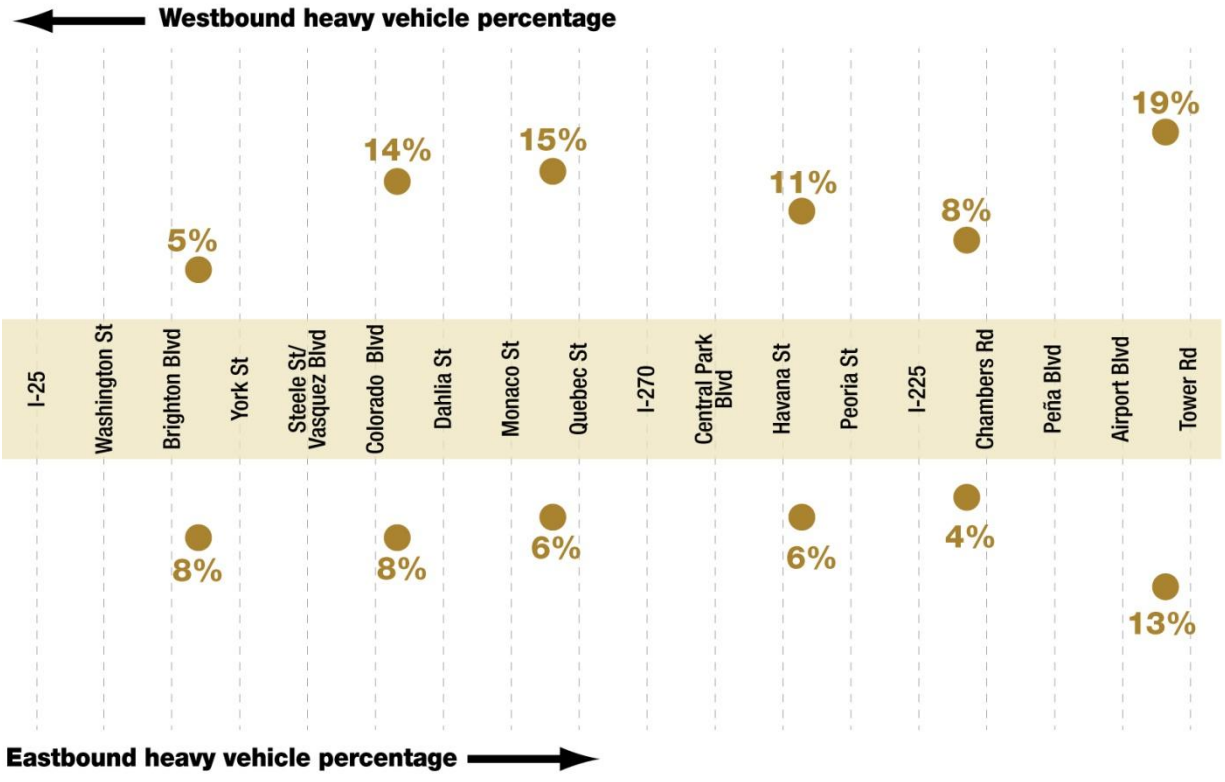
Based on the population and employment projections for 2035, access to activity centers, residential areas, and employment will become more difficult. Access to and from I-70 is provided through the existing interchanges. The interchanges at Vasquez Boulevard, Peoria Street, and Chambers Road currently experience traffic and congestion issues, which will continue to grow and worsen with time. A substantial number of the people traveling on I-70 (50 percent to 70 percent) begin or end their trip within the project area. I-70 also serves as a gateway to Aurora and Commerce City, provides regional access to the

Stapleton redevelopment area and the developing northeast portion of the project area, and is a critical link for travel to DIA.

In addition to accommodating airport and inter-city travel, the I-70 corridor is home to many industrial and warehousing businesses. These businesses account for much of the trucking and freight operations in the corridor. Currently, there are 684 businesses within the quarter-mile buffer on each side of I-70 between I-25 and I-270 with approximately 11,408 employees.

The percentage of heavy vehicles that travel along a roadway affects traffic operations. As the percentage of heavy vehicles in the traffic stream increases, passenger vehicle movement becomes restricted and traffic operations deteriorate. Between 5 percent and 19 percent of the traffic on I-70 is truck traffic, as shown in Exhibit 2-2. Truck access to the established businesses in the neighborhoods and future activity centers is important for future economic development.

Exhibit 2-2. Heavy vehicle percentage of traffic



Source: The heavy vehicle percentage was calculated based on the available 2012 peak traffic counts.

2.5.3 Limited transportation capacity

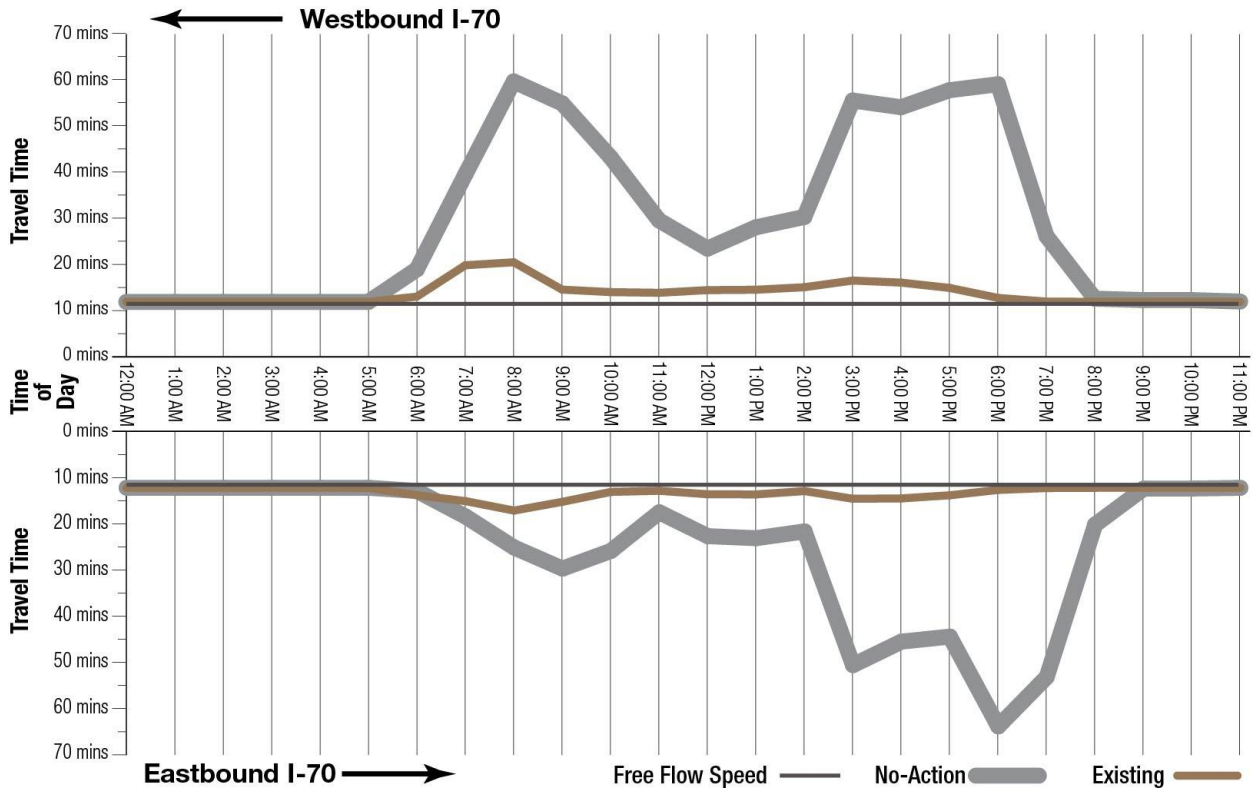
I-70 serves a growing number of users, ranging from travelers and tourists from outlying areas and DIA to regional trucking to commuters or local traffic. The demand from these users is exceeding the existing design capacity of I-70 and associated interchanges.

Within the project area, I-70 is currently near or over capacity. Between 47,000 and 205,000 vehicles per day (average daily traffic) travel over the project area, depending on the location in the corridor. Forecasted traffic for the year 2035 shows that traffic on I-70 will increase substantially, carrying from 117,000 to 285,000 vehicles per day. This increase in traffic will result in more hours of congestion, longer delays, and increased potential for crashes. Existing and future traffic times are shown in Exhibit 2-3. Comparative free-flow travel time also is shown for those same sections. The increase in traffic volumes, as well as substandard geometric features (i.e., inadequate shoulders in some highway segments), will result in longer travel times for the corridor. In addition to longer travel times, the peak periods also will extend into several more hours of the day.

Free flow travel time

Free flow travel time is the amount of time it takes a driver to pass through the study area while traveling at the posted speed limit of 55 mile per hour.

Exhibit 2-3. Travel time



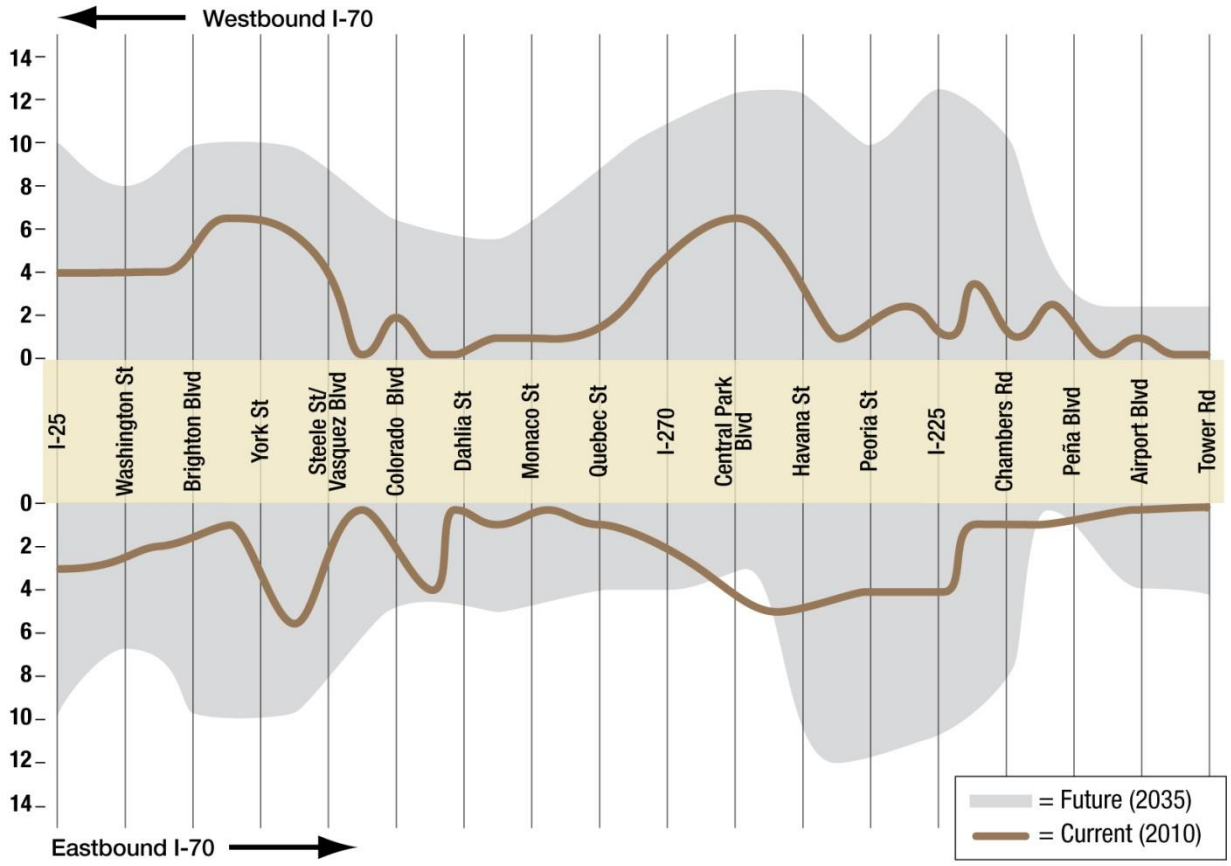
Source: Existing daily traffic volumes were calculated based on the available 2012 peak traffic counts.

The increasing traffic is expected to lead to similar increases in the percentage of the day that I-70 will be congested as demand exceeds the available roadway capacity on an hour-by-hour basis. Without improvements, hours of congestion experienced by travelers on I-70 in the corridor will continue to increase. Currently, some portions of the highway—including the section from I-270 to I-225—are congested for six hours of the day. Without improvements, by 2035, I-70 will be congested for up to 12 hours—or half of the day—as shown in Exhibit 2-4. More detailed discussions of existing and future traffic conditions are in Chapter 4, Transportation Impacts and Mitigation Measures.

Congestion

A roadway is considered congested when the demand, or number of cars wanting to use the roadway, exceeds the capacity or the number of cars for which the road is designed.

Exhibit 2-4. Daily hours of traffic congestion



Source: 2010 and 2035 DRCOG travel demand models
Note: Future (2035) hours of congestion are based on the No-Action Alternative

2.5.4 Safety concerns

In the project area, I-70 generally experiences more traffic crashes than the state average for urban freeways. These crashes cause unpredictable and unavoidable traffic congestion, which adds to or worsens the already existing congestion from

travel demand that exceeds the normal roadway capacity. The unpredictable nature of traffic congestion on I-70 increases safety concerns for freight carriers, employers, manufacturers, and business interests in the region, as well as commuters and residents who depend on reliability for their daily travel.

According to the *I-70 East Corridor EIS Safety Evaluation Addendum* (CDOT, 2013a), from 2009 to 2012, there were 2,872 crashes on I-70 within the project area. Of these crashes, 1,068 occurred on the I-70 interchange ramps and crossroads and 1,804 occurred on mainline I-70. Over the three-year period, there were seven fatalities on this portion of I-70.

Higher-than-average crash rates often can be attributed to roadway conditions that do not meet current design standards, such as those found on sections of I-70. The following deficiencies contribute to higher crash rates on I-70:

- Inadequate acceleration and/or deceleration lane lengths
- Insufficient sight distances at entrance and exit ramps
- Ramp design speeds that are too low
- Insufficient shoulder widths of only two feet
- Interchange spacing of less than one mile that creates weaving issues for traffic entering and exiting the highway
- Inadequate roadway drainage
- Other geometric deficiencies

Impacted crash barrels at I-70 and York Street off-ramp resulting from inadequate deceleration lane length

Many of these deficiencies occur in the western half of the corridor, contributing to the highest crash rates. The defects are associated with the aging viaduct between Brighton Boulevard and Colorado Boulevard. These issues are described further in Chapter 3, Summary of Project Alternatives.

2.6 How is the project purpose and need used to evaluate potential alternatives?

The project purpose and need is the basis for the development and evaluation of alternatives to address the projected transportation problems. Addressing the needs of the project is an important outcome of the alternatives evaluation process.

Specific factors to illustrate the extent of the transportation problems that must be addressed are used to measure how well alternatives meet these needs in the future. Chapter 3, Summary of Project Alternatives, discusses the alternatives analysis and the methods used to measure their performance.

Addressing transportation needs on I-70 requires careful consideration of the physical, environmental, and community constraints and requirements. Chapter 3 provides a more detailed description of how the purpose and need have been used in developing, evaluating, and comparing alternatives and for preliminarily identifying the Preferred Alternative.