

1.0 PURPOSE AND NEED

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1.1 INTRODUCTION

The purpose of the South I-25 Corridor and US 85 Corridor Environmental Impact Statement (EIS) is to develop a transportation solution that addresses transportation capacity inadequacies and safety problems in the I-25 Corridor and US 85 Corridor while avoiding or minimizing adverse environmental impacts. The South I-25 Corridor and US 85 Corridor EIS is a Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) study.

The I-25 Corridor and US 85 Corridor are being evaluated together in this EIS as a north/south transportation system. To an extent, actions to one corridor change the operations of the other corridor (a crash on I-25 may cause vehicles to use US 85). Safety and capacity improvements to one corridor, however, do not solve deficiencies in the other corridor. Improvements, therefore, are needed on both corridors to improve north/south mobility within Douglas County.

The South I-25 Corridor and US 85 Corridor EIS focuses on intra-regional transportation needs along the I-25 Corridor and US 85 Corridor in northern Douglas County. The project area extends along I-25 from C-470 at approximately milepost (MP) 195 to MP 178 near the southern limit of Castle Rock and along US 85 from C-470 at MP 200 to Castle Rock at MP 184. The Burlington Northern Santa Fe Railroad and the Union Pacific Railroad are located within the project area. Both railroads follow along the west side of US 85 to a point south of the I-25/US 85 Interchange (approximately MP 182). At this point, the Burlington Northern Santa Fe Railroad continues along the west side of I-25, and the Union Pacific Railroad crosses over to the east side of I-25 and continues south through Castle Rock. The project area is shown on Figure 1.1.

1.2 PROBLEM STATEMENT/PROJECT OBJECTIVES

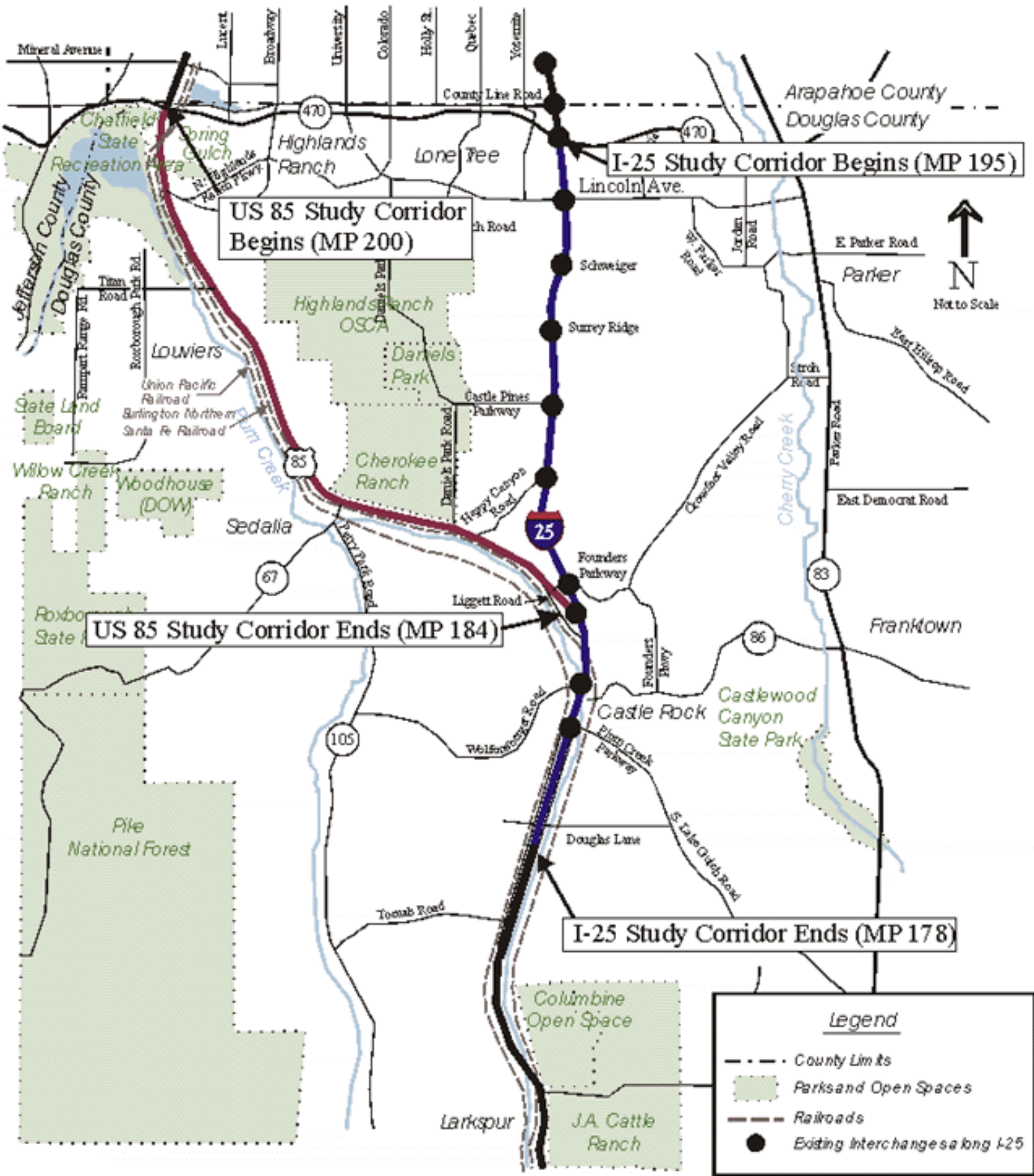
The first step in the South I-25 Corridor and US 85 Corridor EIS was to identify the need of the project. A problem statement was developed from an extensive scoping process, with input from the public and affected agencies. Based on the need, the project objectives were identified. The purpose and need are the foundation of the alternative evaluation process. They determine the guidelines for measuring the effectiveness of proposed improvements.

1.2.1 Problem Statement

The following problem statement was developed as a result of public and agency input from the Issues Team and Technical Committee (see Section 2.2, *Public/Agency Involvement Process*).

The north/south peak travel demand in northern Douglas County has grown at a pace faster than the surrounding metropolitan area. These trips, primarily to jobs in the Denver Central Business District (CBD) and the Southeast Business District, (SEBD) have overtaxed the existing infrastructure. North/south travel options beyond the use of automobiles on I-25 and US 85 are limited.

Figure 1.1
South I-25 Corridor and US 85 Corridor Vicinity Map



1.2.1.1 I-25 Corridor

Traffic volumes on I-25 exceed the design during the a.m. and p.m. peak hours. The result is congestion, delays, and crashes, exacerbated by adverse weather.

- *I-25 is the focus for the inter-regional travel and the majority of the commuter trips originating in Douglas County.*
- *Forecasts of future demand show continued overtaking of the I-25 facility, resulting in more hours of unacceptable congestion, longer delays, and more crashes.*

US 85 Corridor

The US 85 Corridor has one lane in each direction. In many locations left and right turn lanes do not exist. This results in a higher number of crashes and dangerous driving, such as passing slower vehicles on the shoulders.

- *US 85 provides for some short-distance regional trips and many local trips. US 85 is the local street for communities such as Sedalia and Louviers. Turning on to and off of US 85 is difficult because of the speed and volume of the mainline traffic.*
- *Forecasts of future demand show increased driver frustration, resulting in increased crashes and reduced accessibility.*

1.2.2 Project Objectives

Once the problem statement within the project corridor was identified and validated with data, project objectives were developed. These objectives were identified by the public and affected agencies.

The South I-25 Corridor and US 85 Corridor EIS project objective is to improve north/south mobility and travel safety in northern Douglas County in a manner that enhances efficient management and maintenance of transportation facilities and is sensitive to the environment, wildlife resources, and quality of life within Douglas County.

- *I-25 should be maintained as the primary north/south travel corridor in northern Douglas County. I-25 Corridor improvements should reduce congestion during peak periods and improve safety on the interstate.*
- *US 85 Corridor improvements should provide enhanced mobility and safety while managing local access.*

1.3 PROJECT HISTORY/STATUS

The South I-25 Corridor and US 85 Corridor have been previously studied and identified as needing improvements. Some of the improvements recommended in these studies are addressed in this EIS, whereas others are addressed in ongoing studies/projects.

1.3.1 Project History

The following studies have been completed and demonstrated a need for the South I-25 Corridor and US 85 Corridor EIS:

- South Front Range Corridor Assessment Study (CAS)
- US 85 Environmental Assessment (EA)
- I-25 through Castle Rock Feasibility Study

1.3.1.1 South Front Range Corridor Assessment Study

In the summer of 1998, CDOT completed the South Front Range CAS, a multi-modal study of the I-25 Corridor from Denver to Pueblo. The South Front Range CAS analyzed inter-regional travel demands (traffic traveling between Denver, Colorado Springs, and/or Pueblo) on I-25. The multi-modal study recommended the Castle Rock to Denver portion be studied independently to address intra-regional (Castle Rock to Denver) transportation demands. To address this, CDOT, with cooperation from the FHWA, is conducting the EIS between Denver and Castle Rock.

1.3.1.2 US 85 Environmental Assessment

In June 1994 CDOT completed the US 85 EA that evaluated transportation improvements along US 85 from C-470 to I-25 at Castle Rock. The primary element of the proposed improvements was to widen the existing highway. Improvements included the following recommendations:

- Widen the highway to six lanes between C-470 and Titan Road
- Widen the highway to four lanes between Titan Road and I-25
- Correct design deficiencies
- Improve the intersection at Titan Road (Titan Road Early-Action project)
- Add acceleration, deceleration, and turn lanes at appropriate locations
- Implement access control in the corridor
- Re-align the highway in two locations to provide necessary separation from the railroad tracks

Based on significant environmental impacts identified in the EA and due to community out-cry, FHWA and CDOT determined that the proposed project warranted preparation of an EIS. The South I-25 Corridor and US 85 Corridor EIS is being completed as the result of this determination.

1.3.1.3 I-25 through Castle Rock Feasibility Study

The I-25 through Castle Rock Feasibility Study was completed in 1995. This study evaluated transportation needs

and alternatives along I-25 from the Meadows/Founders Parkway Interchange to the proposed Douglas Lane Interchange.

Study results concluded with the following recommendations:

- Expand I-25 from four lanes (two in each direction) to six lanes (three in each direction)
- Reconfigure some existing interchanges
- Relocate the Plum Creek Interchange
- Add an overpass at 5th Street (5th Street Early-Action project)

In addition to these previous studies, several ongoing projects and studies are currently being completed within the South I-25 Corridor and US 85 Corridor EIS study area.

1.3.2 Ongoing Projects/Studies

Due to rapid growth within the study area and surrounding communities, transportation improvements are being evaluated within and adjacent to the study area. The following improvements are underway or have recently been completed in conjunction with the South I-25 Corridor and US 85 Corridor EIS:

- Southeast Corridor project (I-25 from Broadway to Lincoln Avenue and I-225 from I-25 to Parker Road).
- Southwest Corridor Light Rail Transit (LRT) construction (US 85 from Broadway to Mineral Avenue)
- Denver Regional Council of Governments (DRCOG) Congestion Management Systems (CMS)
- Early-Action projects
- I-25 Incident Management Program
- US 85 Access Management Plan
- Town of Castle Rock Railroad Relocation Study
- Wilcox Street Bridge
- I-25 Interchange Studies

1.3.2.1 Southeast Corridor Project

In the Denver metropolitan area, the Southeast Corridor Major Investment Study (MIS) was completed in July 1997. The corresponding EIS was completed with the Record of Decision (ROD) signed on March 16, 2000. The study corridor extends along I-25 from Broadway to Lincoln Avenue and along I-225 from I-25 to Parker Road.

Proposed construction elements include the following:

- Double-tracked LRT along I-25 between the existing Broadway station and Lincoln Avenue. This project is an extension of the existing LRT system currently circulating through downtown Denver. The Regional Transportation District (RTD) will operate the transit system. In addition to the LRT, a bus feeder system will circulate the adjacent areas, transporting riders to the park-and-ride stations.
- Double-tracked LRT along I-225 between I-25 and Parker Road
- Thirteen LRT stations along the corridor
- Highway improvements to I-25 and I-225 consisting of one additional lane in each direction on I-25 from Logan to I-225, two additional lanes in each direction on I-25 from I-225 to C-470, and one additional lane in each direction on I-225 from I-25 to Parker Road (There are three lanes in each direction at the location along I-25 where the South I-25 Corridor and US 85 Corridor project limits begin.)
- Collector/distributor roadway generally between Broadway Avenue and Emerson Street and between Evans Avenue and Colorado Boulevard
- Replacement of existing acceleration/deceleration lanes and provision for new acceleration/deceleration lanes
- Replacement of 13 roadway bridges

The Southeast Corridor Draft EIS (DEIS) was signed in August 1999, and the Final EIS (FEIS) was signed in December 1999. The I-25 improvements end at C-470, and transit improvements end at Lincoln Avenue. The South I-25 Corridor and US 85 Corridor EIS study corridor begins at these respective termini.

1.3.2.2 Southwest Corridor Light Rail Transit Construction

In the Denver metropolitan area, the Southwest Corridor project consists of LRT along Santa Fe Drive (US 85) from the intersection of I-25 and Broadway Avenue to Mineral Avenue. This project also includes transit supporting measures such as park and rides and bus transfer facilities. This project is an extension of the existing LRT system currently circulating through downtown Denver. RTD operates the transit system. In addition to the LRT, a bus feeder system circulates the adjacent areas, transporting riders to the park and ride stations. The project was completed July 2000.

1.3.2.3 DRCOG Congestion Management Systems

The DRCOG CMS was initiated as a federal requirement in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The CMS provides information on transportation system performance and considers strategies to provide the most efficient and effective use of existing and future transportation facilities. It also defines parameters to measure the extent of congestion.

DRCOG implemented the project-level CMS in 1997. At the project level, to respond to federal requirements,

DRCOG identifies two objectives for CMS analysis. The first is to evaluate and compare a congestion alternative to the "build" alternatives to determine whether the need for additional capacity can be met by management strategies. The second objective is to identify the congestion management actions that would provide the most effective use of, and support to, the operation of the Preferred Alternative. This document presents both objectives.

1.3.2.4 Early-Action Projects

Seven Early-Action projects are within the EIS study area. These are primarily safety improvement or minor projects that have either been previously approved or are in the process of being approved. These Early-Action projects are being designed, are under construction, or have been completed. General corridor limits for each project are identified on Figure 1.2. A brief description of each project is provided.

Project 1: Climbing Lanes, Phase I. This project (completed October 2000) added one lane in each direction along I-25 between Lincoln Avenue and Castle Pines Parkway for (but not restricted to) slow-moving vehicles. The 3.6-meter (12-foot) climbing lanes are located on the outside edge of I-25. This project provided a concrete barrier along the middle of the highway dividing travel directions. Noise barriers, primarily in the form of earthen berms, were constructed where feasible and reasonable.

Project 2: Climbing Lanes, Phase II. This project is an extension of Climbing Lanes, Phase I. It provides one lane in each direction along I-25 between Castle Pines Parkway and Meadows/Founders Parkway for (but not restricted to) slow-moving vehicles. The 3.6-meter (12-foot) climbing lanes are located on the outside edge of I-25. This project provides a concrete barrier in the middle of the highway dividing travel directions. Noise barriers (earthen berms) are being constructed where feasible and reasonable. The project is currently under construction and is scheduled to be completed in September 2002.

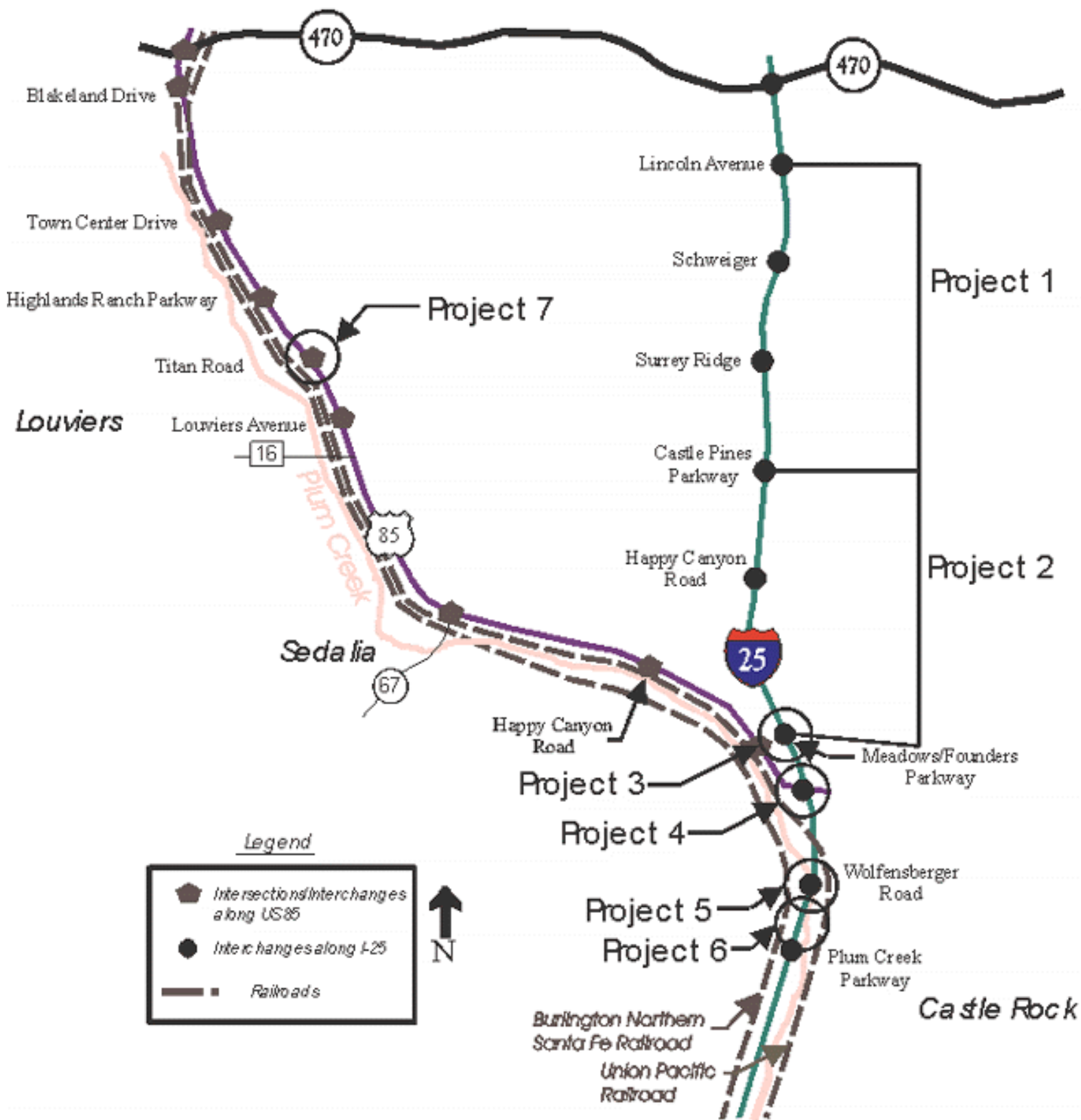
Project 3: Meadows/Founders Interchange. This project (completed in 1999) improved the former diamond interchange deficiencies by constructing a partial cloverleaf interchange. The former interchange was a typical diamond with two entrance ramps and two exit ramps. The new interchange has four diamond ramps with two loop ramps. The two new loop entrance ramps eliminate left turns from Meadows/Founders Parkway to I-25. The new exit ramps consist of double left turns off the I-25 ramps. This project was partially funded privately.

Project 4: US 85/I-25 Interchange. This project removes the existing deficient US 85/I-25 Interchange and re-routes traffic through the improved Meadows/Founders/I-25 Interchange. The existing overpass and entrance and exit ramps are replaced with a grade-separated crossing of US 85 connecting to Crowfoot Valley Road. This project is scheduled to begin construction in Summer 2001 and be completed in Fall 2002.

Project 5: Wolfensberger Interchange. This project improves existing roadway deficiencies by removing and replacing the southern half of the Wolfensberger Road Bridge over I-25 and Plum Creek. Two left-turn lanes are added for traffic on Wolfensberger Road turning to northbound I-25. This project is scheduled to begin construction in Fall 2001 and be completed in Fall 2002.

Project 6: 5th Street Overpass. This project improves the local Castle Rock transportation network and reduces the traffic demand in the Wolfensberger Interchange area by providing an overpass from 5th Street on the east side of I-25 to Park Street on the west side of I-25. The project began construction in October 2000. The town of Castle Rock is contributing funding to this project.

**Figure 1.2
Early-Action Project Vicinity Map**



Project 7: US 85 and Titan Road Interchange. This project improves existing safety deficiencies of the railroad crossings by constructing an interchange at US 85 and Titan Road and by providing grade separations with Titan

Road and the Burlington Northern Santa Fe Railroad and Union Pacific Railroad. With the proposed design, traffic crossing the existing Union Pacific Railroad tracks at the existing at-grade crossing will be limited to local business access. Construction is scheduled for October 2001.

1.3.2.5 I-25 Incident Management Program

CDOT and Douglas County are working together to develop an I-25 Incident Management Plan that evaluates I-25 throughout Douglas County. This plan will help manage incidents (i.e., crashes, breakdowns) by reducing the time it takes between detecting an incident, responding to the incident, managing the incident, and clearing the incident. This plan will help reduce the hours of congestion along the I-25 Corridor. Specifically, the plan will evaluate:

- Providing real-time information to travelers
- Creating diversion routes during lane closures
- Coordinating emergency service providers

Incidents (any non-recurring disruption of traffic flow) impact congestion and delay on the highway, tax resources of responding agencies, and negatively affect the safety of the public and emergency responders. Incidents such as crashes, spilled loads, vehicle breakdowns, and environmental events contribute to as much as 60 percent of congestion in urbanized areas, and often more for smaller urban and rural areas. Not only is capacity reduced, but incidents can result in congestion for a considerable time after it is cleared. For this corridor, it has been estimated that approximately \$2.2 million per year is lost as a result of time spent in incident congestion. Incidents can also lead to secondary accidents, further compounding and affecting safety. Examples of incident management improvements include the following:

- Encouraging motorists to use cell phones to report highway incidents
- Using volunteer spotters to detect incidents
- Expanding current dispatch operations
- Developing closure and alternate route policies

1.3.2.6 US 85 Access Management Plan

The US 85 Access Management Plan is being developed concurrently with the South I-25 Corridor and US 85 Corridor EIS. This plan includes the evaluation of existing and proposed access points along US 85 between C-470 and Meadows Parkway.

The purpose of the access management plan is to:

- Improve traffic flow
- Improve traffic safety

- Reduce traffic conflicts
- Provide appropriate access to adjacent land uses

Examples of access management improvements include:

- Consolidating accesses
- Controlling accesses (adding a traffic signal)
- Reducing the number of full-movement accesses

The proposed US 85 accesses are being developed using the *State of Colorado State Highway Access Code*, August 1998. Guidelines being followed include:

- The category Regional Highway (R-A) is used to classify the majority of US 85; Non-Rural Principal Highway (NR-A) is used to classify the northern section between the railroad bridges and C-470.
- Where two accesses are close together, a continuous auxiliary lane is used between the accesses to improve roadway consistency and safety, and to maintain edge of pavement continuity.
- Where higher left-turning volumes, safety, or traffic operations necessitate, a double left-turn lane is used.

The *US 85 Corridor Access Management Plan* developed by this study, in conjunction with the *State Highway Access Code*, will provide guidance for agency review and decisions regarding access permit applications and may eventually become a control plan. For more information, see the *Final US 85 Access Management Plan*, February 2001. The final plan was revised based on public and agency comment to the *Draft US 85 Access Management Plan* and the alternative designs.

1.3.2.7 Town of Castle Rock Railroad Relocation Study

The Town of Castle Rock is coordinating with CDOT, Douglas County, the Union Pacific Railroad, and the Burlington Northern Santa Fe Railroad to determine the feasibility of relocating the railroad out of Castle Rock. The three alternatives under consideration relocate the railroad from the east side of I-25 to the west side of I-25 from Sedalia to Larkspur. Funding sources are being determined to implement study findings.

1.3.2.8 I-25 Interchange Studies

Two new I-25 Interchanges are being proposed by developers, the Town of Castle Rock, and Douglas County. These interchanges are the Rampart Range Interchange and the Douglas Lane Interchange and both are within the I-25 Corridor study area.

Rampart Range Interchange

Rampart Range is a commercial and residential development being proposed in Douglas County, adjacent to I-25 and south of Lincoln Avenue (see Section 1.8.1, *Land Use*). The Rampart Range Development was annexed into the City of Lone Tree in August 2000. To accommodate the traffic generated by this development, an interchange is being proposed along I-25 approximately 1,460 meters (4,800 feet) south of Lincoln Avenue. The City of Lone Tree is completing the Colorado Procedural Directive 1601 Interchange Approval Process. The requirements of this directive must be met before the interchange can be constructed. For the state to approve a new interchange, it must be concluded that the interchange will not negatively impact the overall transportation system. A diamond interchange at this location is being evaluated as part of the Other Alternative in this FEIS (see Chapter 2.0 *Alternatives*). Exit and entrance ramps are designed to accommodate future loop ramps to eliminate left-turn movements on Rampart Range Boulevard. The design takes into consideration the future widening of I-25 to four 3.6-meter (12-foot) lanes in each direction with 3.6-meter (12-foot) outside shoulders, 3.0-meter (10-foot) inside shoulders, and a 0.6-meter (2-foot) center concrete barrier. The Rampart Range Interchange is being proposed as a privately funded interchange.

Douglas Lane Interchange

Three residential development projects are being planned in southern Douglas County. To accommodate traffic volumes generated by these developments, the Douglas Lane Interchange, along I-25 and approximately 1,450 meters (4,750 feet) south of Plum Creek Parkway, is being proposed. The Douglas Lane Interchange will provide access to commuter routes and a potential incident management route for State Highway (SH) 83 (Parker Road) along South Lake Gulch Road. This interchange will also provide the only grade separation with the railroad tracks south of Castle Rock for those west of I-25. An EA was completed and released in 1986, and the Finding of No Significant Impact (FONSI) was completed and released in 1987 for the Douglas Lane Interchange. A re-evaluation of the environmental documents, the Colorado Procedural Directive 1601 Interchange Approval Process, and an amendment of the 2025 RTP is required for the Douglas Lane Interchange. The design of the interchange is a single-point urban interchange with a frontage road running along the east side of I-25 between Plum Creek Parkway and Douglas Lane. This interchange is assumed to have been constructed prior to the EIS improvements and is considered as part of the No-Action Alternative. Douglas County, the Town of Castle Rock, and private sectors are funding the Douglas Lane Interchange.

1.4 TRAFFIC CHARACTERISTICS

Existing (1998) and future (2020) traffic characteristics were examined within the South I-25 Corridor and US 85 Corridor to identify operational deficiencies.

1.4.1 Existing (1998) Conditions

Existing (1998) traffic volumes, traffic volume variations, vehicle classification, and the quality of traffic operations are discussed in the following sections.

1.4.1.1 Traffic Volumes

Traffic is measured in daily and peak-hour volumes. Daily traffic volumes consist of 24-hour periods, while peak-hour volumes include the highest volume within a one-hour period (typically the morning and evening rush hour).

Average daily traffic (ADT) is the volume of traffic traveling on a roadway during a typical (or average) day.

ADT volumes were collected during May, August, November, and December 1998. Figure 1.3 shows the 1998 ADT for both the I-25 Corridor and US 85 Corridor. Peak hours represent the worst traffic conditions on an average day and are used in the design of a roadway in terms of required laneage (capacity). Figure 1.4 shows 1998 peak-hour volumes for both the I-25 Corridor and US 85 Corridor.

I-25 Corridor Existing Traffic Volumes

As shown on Figure 1.3, traffic volumes were greater on the northern end of the I-25 project area. In 1998 the average number of vehicles per day on I-25 between Plum Creek Parkway and Wolfensberger Road was 60,250 (approximately 72,300 person trips, assuming 1.2 persons per vehicle), while 85,100 vehicles (approximately 102,120 person trips) traveled the segment between Lincoln Avenue and C-470.

Peak-hour volumes occur during hours having the largest volume of traffic on a given roadway segment and were determined for a.m. and p.m. peak hours. The 1998 peak hour typically occurred between 6:00 a.m. and 8:00 a.m. and 3:00 p.m. and 6:00 p.m. on I-25. On average, the p.m. peak hour had the higher traffic volumes along I-25, reaching approximately 5,670 vehicles (6,800 person trips) per hour (2,270 vehicles northbound; 3,400 vehicles southbound) between Lincoln Avenue and Schweiger.

US 85 Corridor Existing Traffic Volumes

As with I-25, traffic volumes were greater on the northern end of the US 85 project area than on the southern end. The average number of vehicles per day driving on US 85 between Meadows Parkway and Happy Canyon Road was 13,200 (approximately 15,840 person trips); whereas 37,600 vehicles (approximately 45,120 person trips) traveled the segment between Town Center Drive and Blakeland Drive.

Peak hours on US 85 occurred between 8:00 a.m. and 10:00 a.m. and between 4:00 p.m. and 6:00 p.m. As shown on Figure 1.4, the US 85 p.m. peak hour had the higher traffic volume than the a.m. peak hour, reaching approximately 2,700 vehicles (approximately 3,240 person trips) per hour (1,483 vehicles northbound, 1,214 vehicles southbound) between Blakeland Drive and C-470.

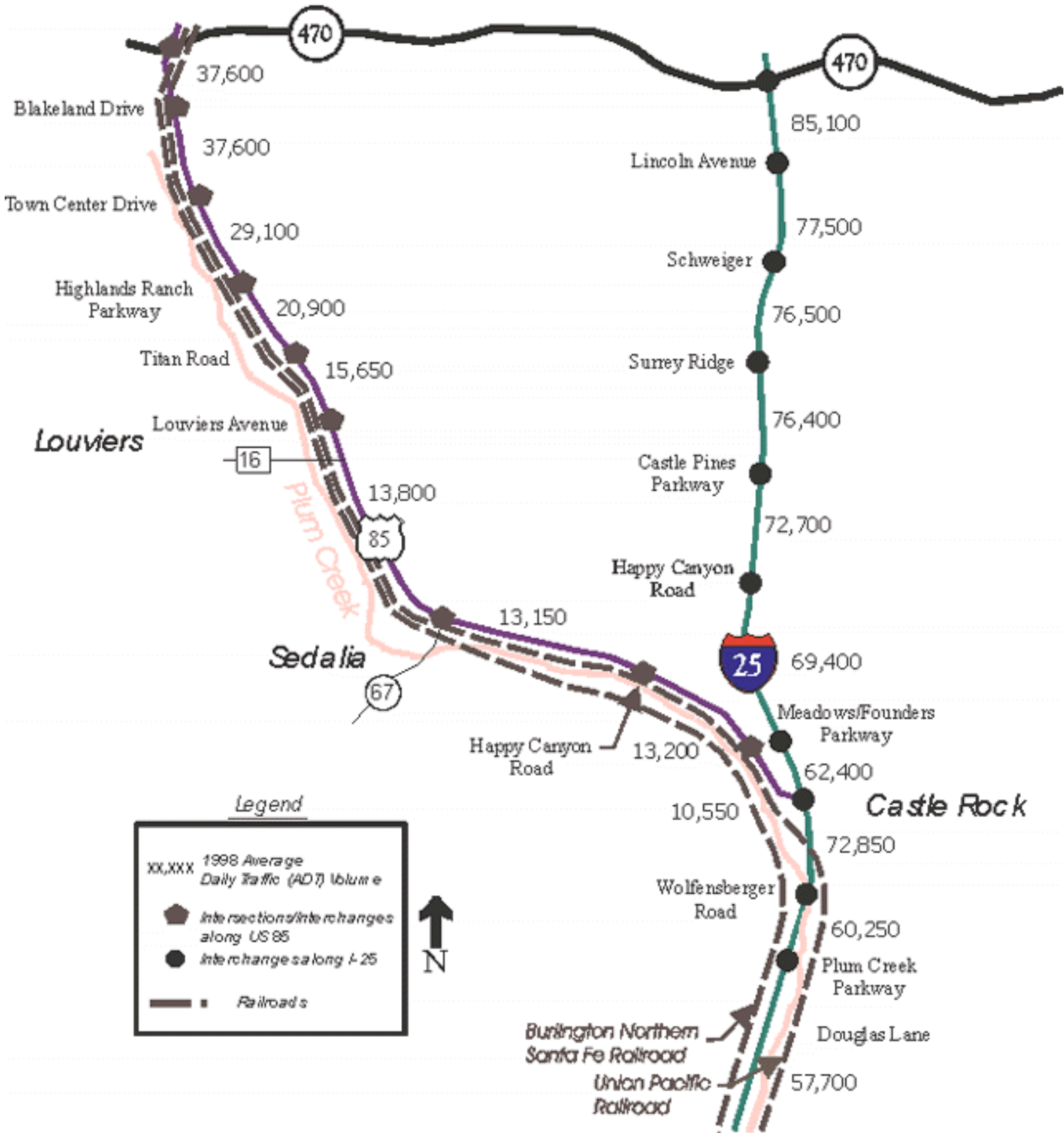
1.4.1.2 Traffic Volume Variations

Daily and peak-hour traffic volumes for 1998 existing conditions varied in magnitude and direction by time of day, as shown on Figure 1.5 and Figure 1.6. Traffic volume variations were calculated south of Meadows/Founders Parkway.

Figure 1.5 shows that during the a.m. peak period, I-25 northbound traffic was heavier, while southbound traffic was heavier during the p.m. peak period. The figure also shows that overall traffic volume was greater during the p.m. peak period. This trend was generally a result of the primary purpose of travel during the a.m. peak period, which was driving to work. During the p.m. peak period, people not only drove home from work, but also ran errands and drove to other activities.

Figure 1.6 shows that the overall 1998 traffic volumes on US 85 gradually increased throughout the day, reaching a peak around 5:00 p.m. The figure also shows that southbound traffic was slightly heavier than northbound traffic during the p.m. peak period.

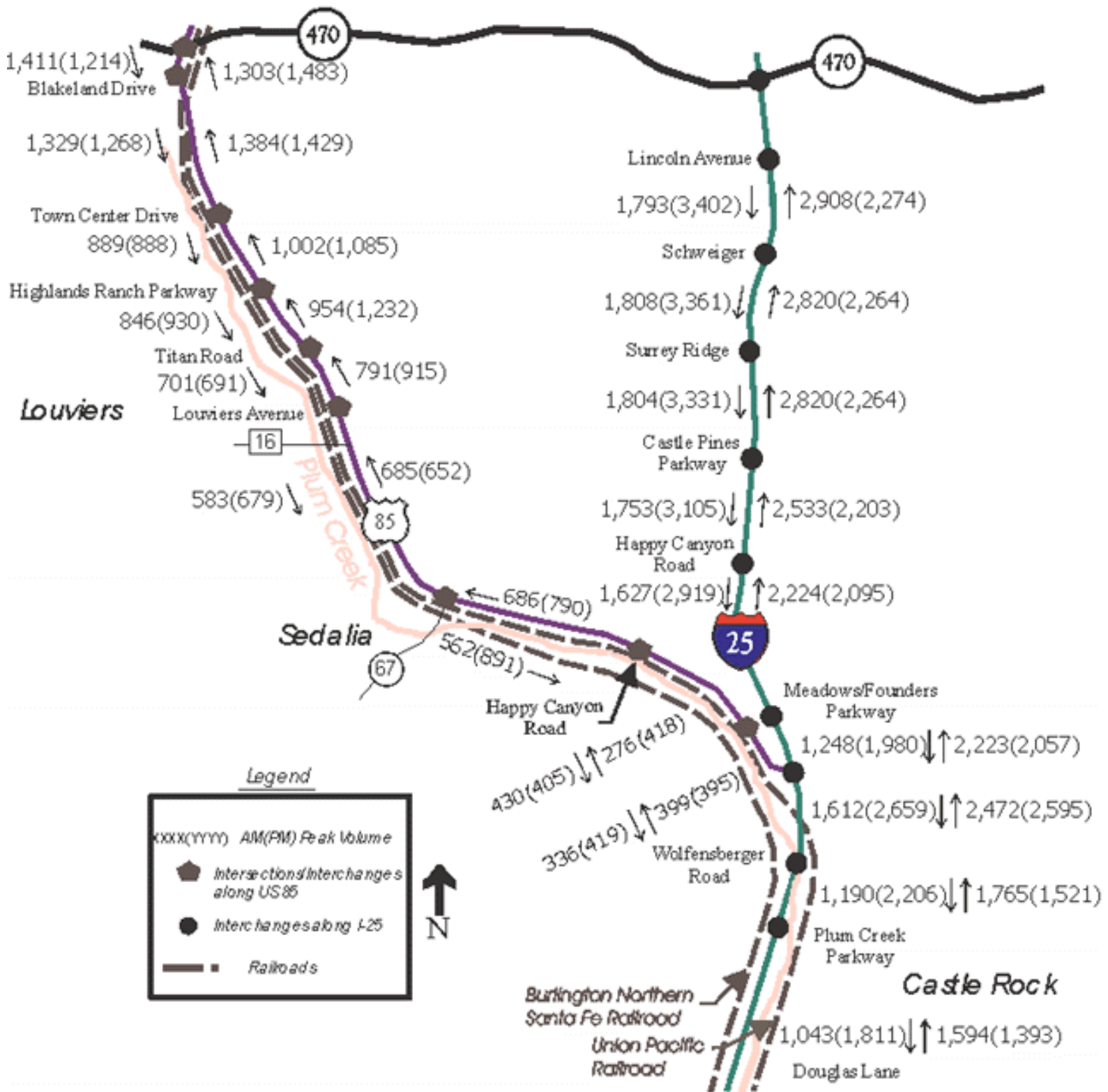
Figure 1.3
1998 Average Daily Traffic Volumes



Source: CDOT

Figure 1.4

1998 Peak-Hour Traffic Volumes



Source: CDOT

Figure 1.5
I-25 Corridor Daily Traffic Variation (1998)

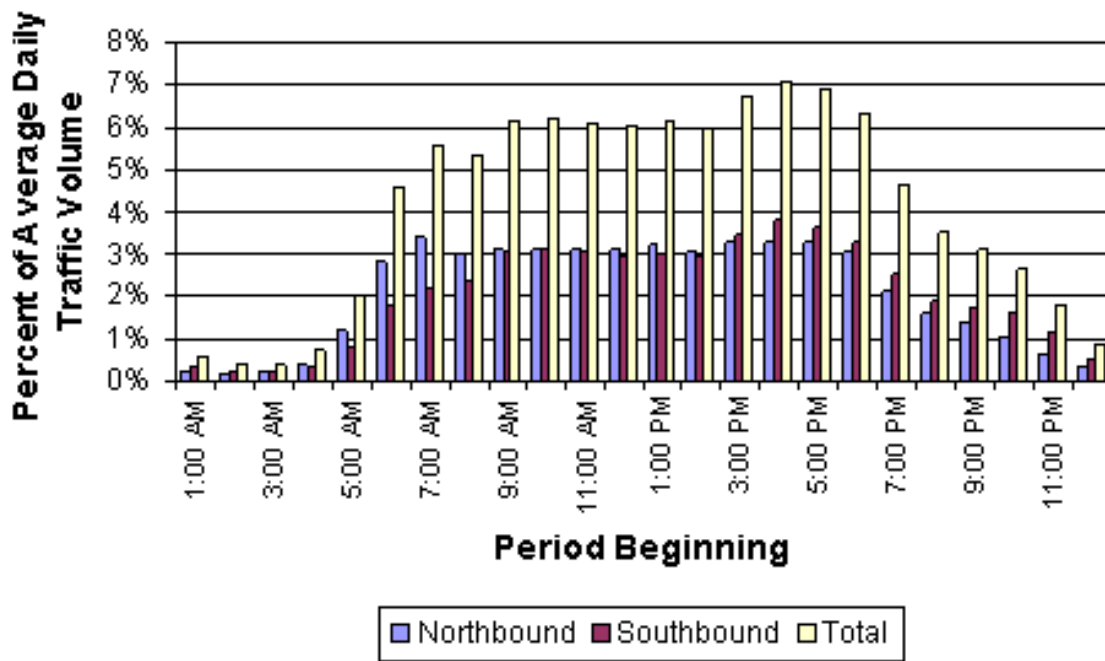
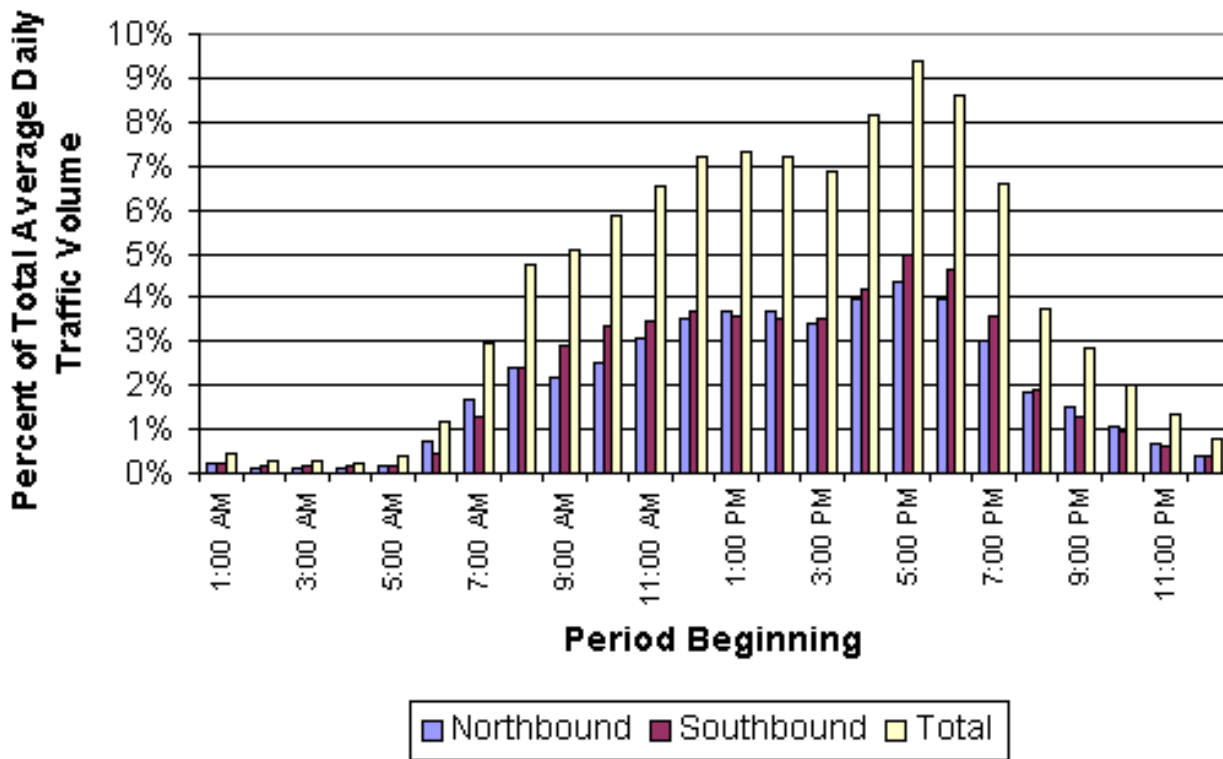


Figure 1.6
US 85 Corridor Daily Traffic Variation (1998)



1.4.1.3 Vehicle Classifications

In 1998 both the I-25 Corridor and US 85 Corridor had a high percentage of heavy and medium truck traffic along their entire lengths. Single-unit and tractor/trailer combinations made up between 8 and 12 percent of total traffic on both I-25 and US 85. Heavy and medium vehicles tended to affect operations along the corridors. The I-25 Corridor has steep grades (up to 4.7 percent), thus making it difficult for heavy vehicles to maintain constant speeds.

1.4.1.4 Quality of Traffic Operations

Traffic operations were analyzed for 1998 volumes for mainline freeway segments along I-25 and mainline roadway segments along US 85, as well as at intersections/interchanges along both corridors. Mainline traffic operations were affected by the classification of roadway (i.e., controlled access, principal arterial), geometry of the roadway (i.e., curves, shoulder width), number of vehicles on the roadway, ability of vehicles to pass other slow-moving vehicles, percentage of trucks on the roadway, vehicle speeds, terrain type, and weather.

Highway traffic congestion is expressed in terms of level of service (LOS) as defined by the *Highway Capacity Manual* (HCM). LOS is a letter code ranging from A for excellent conditions to F for failing conditions. Complete free-flow operations with no restrictions caused by traffic conditions are described as LOS A. LOS F represents forced operations or breakdown of the traffic stream characterized by the familiar traffic jam. LOS B through LOS E describe progressively worse traffic conditions. CDOT defines LOS C as unacceptable operations for rural highways and LOS D as unacceptable for urban highways. Conditions defining the LOS for a highway (from the HCM) are summarized.

- LOS A represents the best operating conditions and is considered free flow. Individual users are unaffected by the presence of others in the traffic stream.
- LOS B represents reasonably free-flowing conditions but with some influence by others.
- LOS C represents a constrained constant flow below speed limits, with additional attention required by drivers to maintain safe operations. Comfort and convenience levels of the driver decline noticeably. LOS C is CDOT's design service level (design capacity) for rural highways (Portions of US 85 and I-25 are rural facilities).
- LOS D represents traffic operations approaching unstable flow with high passing demand and passing capacity near zero, characterized by drivers being severely restricted in maneuverability. LOS D is CDOT's design service level for urban highways (Portions of I-25 and US 85 are urban highways).
- LOS E represents unstable flow near capacity. LOS E often quickly changes to LOS F because of disturbances (road conditions, crashes, etc.) in traffic flow.
- LOS F represents the worst conditions with heavily congested flow and traffic demand exceeding capacity, characterized by stop-and-go waves, poor travel time, low comfort and convenience, and increased crash exposure.

LOS is calculated differently based on the roadway classification. A two-lane highway LOS is dependent on the two-way traffic volume (US 85 between Meadows Parkway and Highlands Ranch Parkway) because operations worsen if a vehicle cannot pass another vehicle. The LOS of an arterial is dependent on the delay at traffic signals, overall travel time, and travel speed. The LOS of an interstate is dependent on the free-flow speed.

I-25 Corridor Existing Traffic Operations

As summarized on Table 1.1, I-25 freeway segments (in 1998) operated at LOS E or better with the addition of

the climbing lanes. Traffic volumes will continue to increase as growth occurs in Douglas County. Without improvements, operations will continue to deteriorate.

US 85 Corridor Existing Traffic Operations

Most US 85 roadway segments operated at a poor LOS in 1998, as summarized on Table 1.2. Poor traffic operations on US 85 warrant improvements under existing volumes. Traffic volumes will continue to increase, and without improvements, operations will continue to deteriorate.

Detailed information regarding existing (1998) traffic conditions within the study area is contained in the *I-25/US 85 Corridor Existing Traffic Operations Technical Report*, September 1999 and *I-25/US 85 Corridor Existing Traffic Operations Addendum*, May 2000.

Table 1.1
I-25 Corridor Existing (1998) Level of Service

| I-25 Roadway Segment | Northbound | | | | Southbound | | | |
|--|---------------------------|-----|---------------------------|-----|---------------------------|-----|---------------------------|-----|
| | a.m. | | p.m. | | a.m. | | p.m. | |
| | Peak Hour Volume (veh/hr) | LOS | Peak Hour Volume (veh/hr) | LOS | Peak Hour Volume (veh/hr) | LOS | Peak Hour Volume (veh/hr) | LOS |
| C-470 to Lincoln Ave | 4,550 | D | 3,100 | B | 2,740 | B | 4,460 | C |
| Lincoln Ave to Schweiger | 2,908 | C | 2,274 | C | 1,793 | C | 3,402 | D/E |
| Schweiger to Surrey Ridge | 2,820 | C | 2,264 | C | 1,808 | B | 3,361 | D |
| Surrey Ridge to Castle Pines Pkwy | 2,820 | C | 2,264 | C | 1,804 | C | 3,331 | D/E |
| Castle Pines Pkwy to Happy Canyon Rd | 2,533 | C | 2,203 | C | 1,753 | B | 3,105 | C |
| Happy Canyon Rd to Meadows/Founders Pkwy | 2,224 | C | 2,095 | C | 1,627 | B | 2,919 | C |
| Meadows/ Founders Pkwy to US 85 | 2,223 | C | 2,057 | C | 1,248 | B | 1,980 | C |
| US 85 to Wolfensberger Rd | 2,472 | C | 2,595 | C | 1,612 | B | 2,659 | C |
| Wolfensberger Rd to Plum Creek Pkwy | 1,765 | B | 1,521 | B | 1,190 | A | 2,206 | C |
| Plum Creek Pkwy to Douglas Ln | 1,594 | B | 1,393 | B | 1,043 | A | 1,811 | B |

veh/hr - vehicles per hour

Table 1.2
US 85 Corridor Existing (1998) Level of Service

| US 85 Roadway Segment | Northbound | | | | Southbound | | | |
|--|---------------------------|-----|---------------------------|-----|---------------------------|-----|---------------------------|-----|
| | a.m. | | p.m. | | a.m. | | p.m. | |
| | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS |
| C-470 to Blakeland Dr | 1,303 | C | 1,483 | D | 1,411 | C | 1,214 | C |
| Blakeland Dr to Highlands Ranch Pkwy | 1,384 | D | 1,429 | D | 1,329 | D | 1,268 | D |
| Northbound and Southbound Combined | | | | | | | | |
| a.m. | | | | | | | | |
| p.m. | | | | | | | | |
| US 85 Roadway Segment * | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS | Peak-Hour Volume (veh/hr) | LOS |
| Highlands Ranch Pkwy to Titan Rd | 1,800 | E | 2,162 | E | 2,162 | E | 1,800 | E |
| Titan Rd to Louviers Ave | 1,492 | E | 1,606 | E | 1,606 | E | 1,492 | E |
| Louviers Ave to SH 67 (Sedalia) | 1,268 | E | 1,331 | E | 1,331 | E | 1,268 | E |
| SH 67 (Sedalia) to Happy Canyon Rd | 1,248 | E | 1,681 | E | 1,681 | E | 1,248 | E |
| Happy Canyon Rd to north of Meadows Pkwy | 706 | E | 823 | E | 823 | E | 706 | E |

veh/hr - vehicles per hour

*- These segments were analyzed as two-lane highways (northbound and southbound were not separated for calculations)

1.4.2 Corridor Growth

Traffic volumes within the I-25 Corridor and US 85 Corridor are projected to continue increasing. Future 2020 traffic volumes are projected using the DRCOG regional travel demand model. The only improvements assumed within the study corridor for this analysis are the Early-Action projects and the Douglas Lane Interchange, as previously discussed. For more information on the DRCOG model see Chapter 3.0, *Travel Demand*.

1.4.2.1 2020 Traffic Volumes

Projected weekday ADT and peak-hour traffic volumes without improvements to the corridors are shown on Figure 1.7 and Figure 1.8. Projected volumes are used to estimate needed corridor capacity. Traffic volumes were projected using the 2020 DRCOG Transportation Model, an updated version of the one used to project volumes in the DEIS. Since different models were used to project volumes, numbers in this FEIS differ from the DEIS numbers.

I-25 Corridor 2020 Traffic Volumes

Traffic volumes along the I-25 Corridor are projected to increase between 90 and 142 percent (depending on location) by 2020. As shown on Figure 1.7, the average number of vehicles driving on I-25 in 2020 between Plum Creek Parkway and Wolfensberger Road is 114,600 (137,500 people, assuming 1.2 persons per vehicle), while 206,200 vehicles (247,400 people) drive on the segment between Lincoln Avenue and C-470. These volumes can be compared to the 1998 volumes of 60,250 (90 percent increase) and 85,100 (142 percent increase), respectively. The projected 2020 p.m. peak-hour volume between Schweiger and Lincoln Avenue is 17,800 vehicles (21,400 people) per hour (8,500 northbound and 9,300 southbound).

Figure 1.7
Projected 2020 Average Daily Traffic Volumes

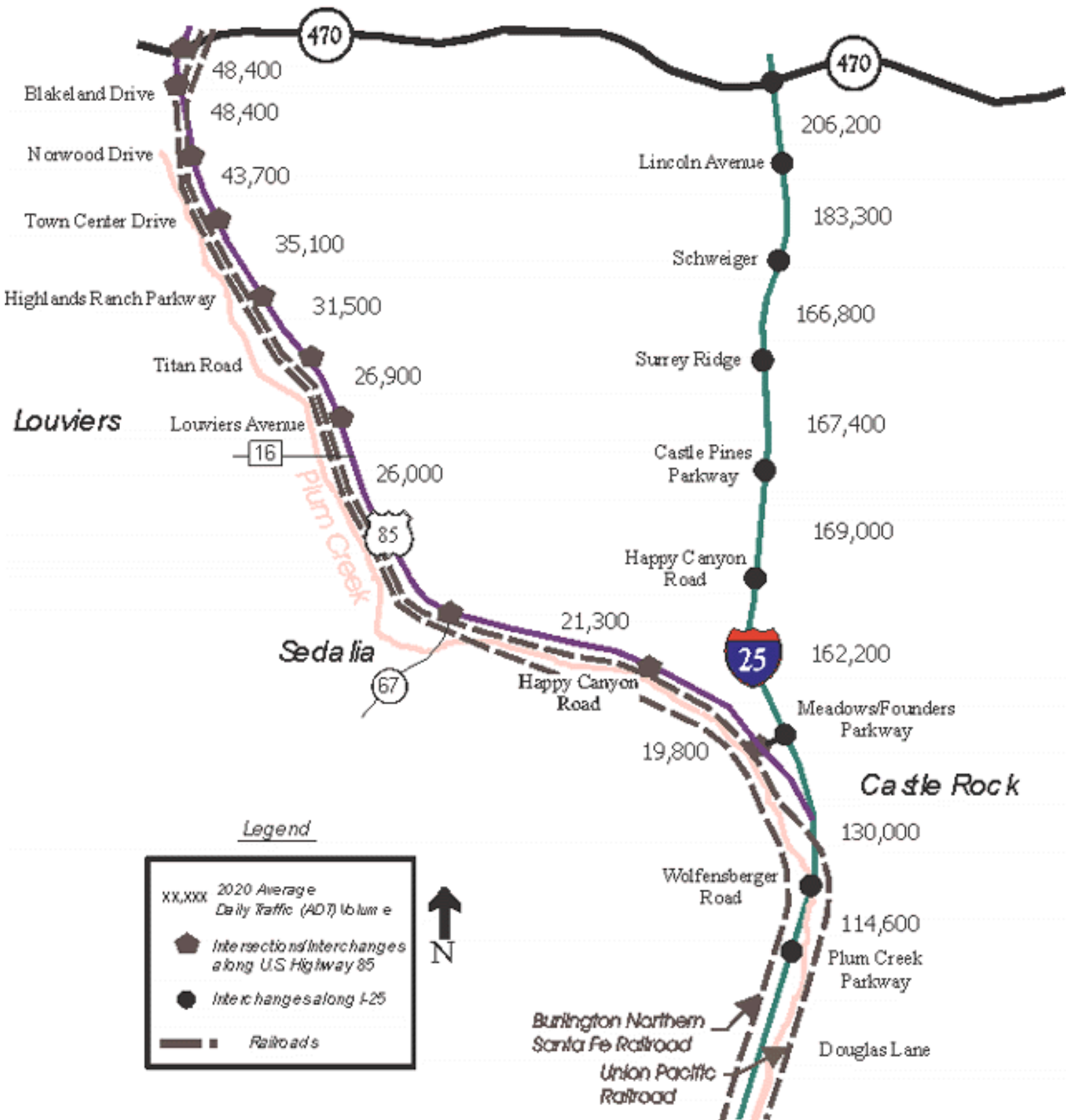
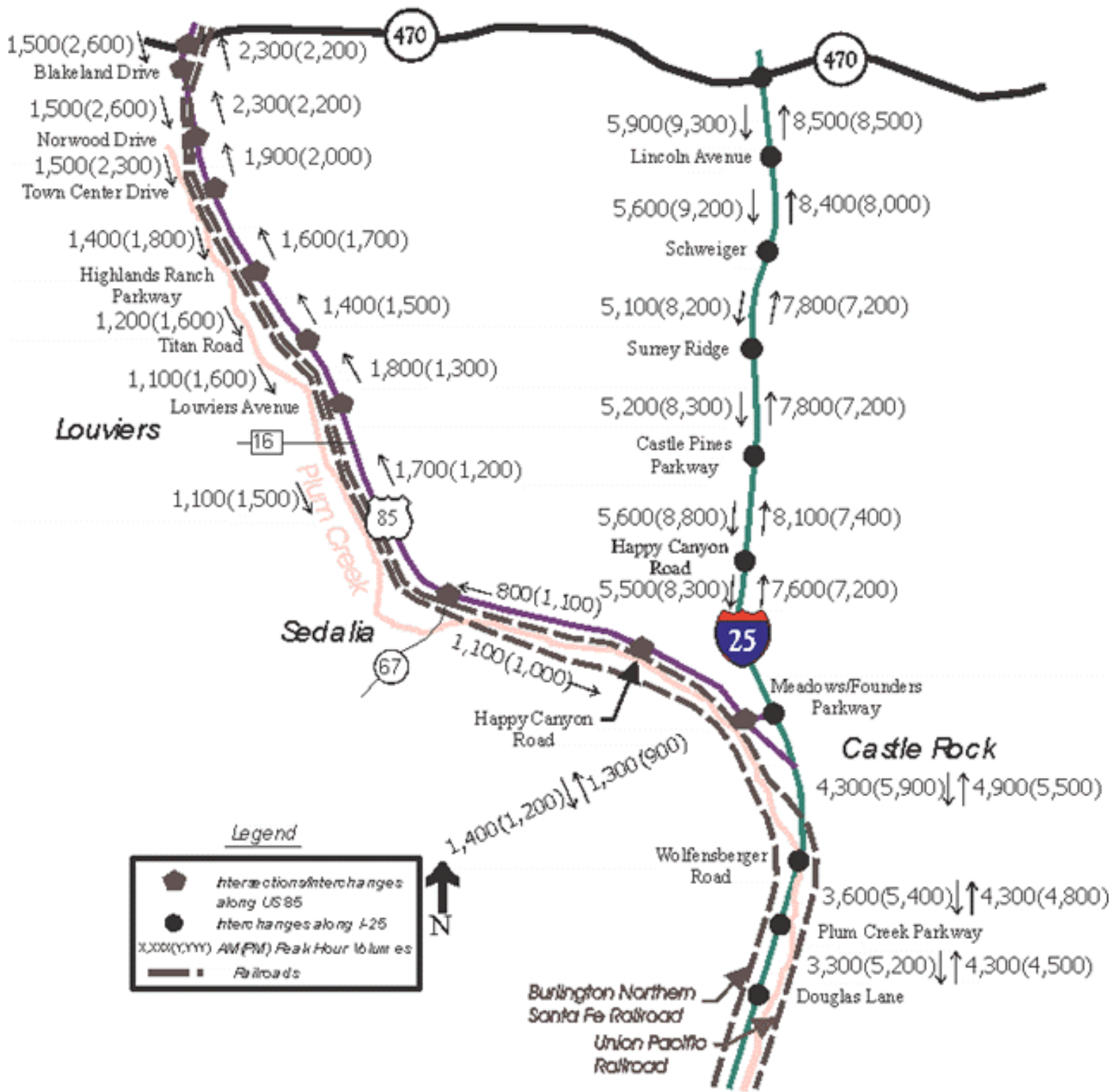


Figure 1.8
Projected 2020 Peak-Hour Traffic Volumes



This traffic can be compared to the existing (1998) peak-hour traffic volume of 5,700 vehicles (6,800 people) per hour (2,300 northbound and 3,400 southbound), an increase of approximately 212 percent.

US 85 Corridor 2020 Traffic Volumes

Traffic volumes along US 85 are projected to increase between 29 and 50 percent by 2020. The weekday ADT volume between Meadows Parkway and Happy Canyon Road is 19,800 vehicles (23,800 people), whereas 48,400 vehicles (58,100 people) are projected on the segment between Blakeland Drive and Norwood Drive. These

volumes can be compared to 13,200 (50 percent increase) and 37,600 (29 percent increase) vehicles that traveled the corridor in 1998. The projected p.m. peak-hour traffic volume between C-470 and Blakeland Drive is 4,800 vehicles (5,800 people) per hour (2,200 northbound and 2,600 southbound). This volume is a 78 percent increase from the 1998 p.m. peak-hour traffic volume of 2,700 vehicles (3,200 people) per hour (1,480 northbound and 1,200 southbound).

Traffic Volume Variations

Similar to the existing traffic variation, future traffic also varies by time of day. The variation may be slightly different. As traffic volumes grow, peak periods expand. Without additional capacity, the current three-hour p.m. peak period will more than double by 2020.

1.4.2.3 Vehicle Classification

It is anticipated that the current level of heavy and medium vehicles using both corridors will either remain the same or increase in 2020, compared to existing levels (between 8 percent and 12 percent of total traffic).

1.4.2.4 Traffic Operations

Peak-hour LOS was analyzed for the existing and committed roadway network (Early-Action projects and Douglas Lane Interchange) with projected 2020 traffic volumes. As summarized on Table 1.3 and Table 1.4, traffic operations on the I-25 Corridor and US 85 Corridor are projected to deteriorate to poor levels for every freeway and roadway segment in the study area.

I-25 Corridor 2020 Traffic Operations

Without improvements, the peak-hour LOS for I-25 deteriorates from a majority of LOS B and LOS C in 1998 to a majority of LOS E and LOS F in 2020. Freeway segments from Surrey Ridge Road north to C-470 are projected to fail during the northbound a.m. peak period and southbound p.m. peak period. In addition to poor LOS in 2020, the failing LOS is projected to last for more hours than the current peak period. The existing peak period along I-25 lasts approximately 3 hours. Without improvements, the peak period is expected to more than double by 2020.

US 85 Corridor 2020 Traffic Operations

The peak-hour LOS for US 85 deteriorates to failing conditions for almost all segments during the peak period in 2020. As previously discussed, not only is the operation worse during the peak period, but it also lasts longer in 2020.

Table 1.3
I-25 Corridor Future (2020) Freeway Segment Conditions

| I-25 Roadway Segment | Northbound | | | | Southbound | | | |
|--|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|
| | a.m. | | p.m. | | a.m. | | p.m. | |
| | Peak-Hour Volume | Peak-Hour LOS | Peak-Hour Volume | Peak-Hour LOS | Peak-Hour Volume | Peak-Hour LOS | Peak-Hour Volume | Peak-Hour LOS |
| C-470 to Lincoln Ave | 8,500 | F | 8,500 | E | 5,900 | E | 9,300 | F |
| Lincoln Ave to Schweiger | 8,400 | F | 8,000 | F | 5,600 | E | 9,200 | F |
| Schweiger to Surrey Ridge | 7,800 | F | 7,200 | F | 5,100 | E | 8,200 | F |
| Surrey Ridge to Castle Pines Pkwy | 7,800 | F | 7,200 | F | 5,200 | F | 8,300 | F |
| Castle Pines Pkwy to Happy Canyon Rd | 8,100 | F | 7,400 | F | 5,600 | E | 8,800 | F |
| Happy Canyon Rd to Meadows/Founders Pkwy | 7,600 | F | 7,200 | F | 5,500 | D | 8,300 | F |
| Meadows/ Founders Pkwy to Wolfensberger Rd | 4,900 | F | 5,500 | F | 4,300 | E | 5,900 | F |
| Wolfensberger Rd to Plum Creek Pkwy | 4,300 | E | 4,800 | F | 3,600 | D | 5,400 | F |
| Plum Creek Pkwy to Douglas Ln | 4,300 | E | 4,500 | F | 3,300 | D | 5,200 | F |

veh/hr - vehicles per hour

**Table 1.4
US 85 Corridor Future (2020) Roadway Segment Conditions**

| US 85 Roadway Segment | Northbound | | | | Southbound | | | |
|--|------------------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|
| | a.m. | | p.m. | | a.m. | | p.m. | |
| | Peak-Hour Volume (veh/hr) | Peak-Hour LOS | Peak-Hour Volume (veh/hr) | Peak-Hour LOS | Peak-Hour Volume (veh/hr) | Peak-Hour LOS | Peak-Hour Volume (veh/hr) | Peak-Hour LOS |
| C-470 to Blakeland Dr | 2,300 | F | 2,200 | F | 1,500 | E | 2,600 | E |
| Blakeland Dr to Highlands Ranch Pkwy | 1,900 | F | 2,000 | F | 1,500 | F | 2,300 | F |
| | Northbound And Southbound Combined | | | | | | | |
| | a.m. | | | | p.m. | | | |
| | Peak-Hour Volume (veh/hr) | | Peak-Hour LOS | | Peak-Hour Volume (veh/hr) | | Peak-Hour LOS | |
| Highlands Ranch Pkwy to Titan Rd | 2,600 | | F | | 3,100 | | F | |
| Titan Rd to Louviers Ave | 2,900 | | F | | 2,900 | | F | |
| Louviers Ave to SH 67 (Sedalia) | 2,800 | | F | | 2,700 | | F | |
| SH 67 (Sedalia) to Happy Canyon Rd | 1,900 | | F | | 2,100 | | F | |
| Happy Canyon Rd to north of Meadows Pkwy | 2,700 | | F | | 2,100 | | F | |

veh/hr vehicles per hour

These segments were analyzed as two-lane highways (northbound and southbound were not separated for calculations).

1.5 SAFETY

Crashes and roadway deficiencies along I-25 and US 85 were identified to determine the need for safety improvements along the corridors.

1.5.1 Crash History

1.5.1.1 Number of Crashes

Safety conditions along the I-25 Corridor and US 85 Corridor were quantified by examining CDOT crash records for the years 1995, 1996, and 1997. Types and number of crashes on I-25 and US 85 are shown on Figure 1.9 and Figure 1.10.

I-25 Corridor Number of Crashes

The largest number of crashes (greater than 150 during the three-year period) occurred between Schweiger (MP 191) and Surrey Ridge (MP 190), and the same frequency also occurred between Happy Canyon Road (MP 187) and Meadows/Founders Parkway (MP 184). The highest percentage of crashes (51 percent) along I-25 resulted from either a rear-end crash or fixed-object crash.

US 85 Corridor Number of Crashes

The largest number of crashes (47 during the three-year period) along US 85 occurred between Titan Road (MP 196) and Louviers Avenue (MP 194). The highest percentage of crashes (36 percent) along US 85 were rear-end crashes.

1.5.1.2 Crash Rates

While number of crashes within a roadway segment is important, the crash rate is used to determine safety deficiencies. More vehicles using a particular road create more opportunity for a crash. Crash rates take the number of vehicles traveling in a particular section into consideration to allow for a comparison between different sections of roadway for a given roadway type. Crash rate is defined as the number of total crashes per million vehicle miles of travel.

I-25 Corridor Crash Rates

The 1996 state average crash rate for urban interstates (I-25 near Castle Rock) was 1.92 and 0.90 for rural interstates (I-25 north of Castle Rock to C-470). Crash rates for each segment of I-25 are compared to the statewide average crash rate, as shown on Table 1.5. Bold and underlined numbers indicate segments where the crash rate is higher than the 1996 statewide average.

Between 1995 and 1997, segments of I-25 between Lincoln Avenue and Meadows/Founders Parkway had a crash rate greater than the statewide average. The addition of climbing lanes in each direction should reduce the number of rear-end collisions caused by slowing vehicles or slow-moving heavy vehicles. CDOT has completed construction of the climbing lanes from Lincoln Avenue to Castle Pines Parkway and is currently constructing the climbing lanes from Castle Pines Parkway to Meadows/Founders Parkway as part of the Early-Action projects.

Figure 1.9
I-25 Corridor Crash Types and Number (1995 - 1997)

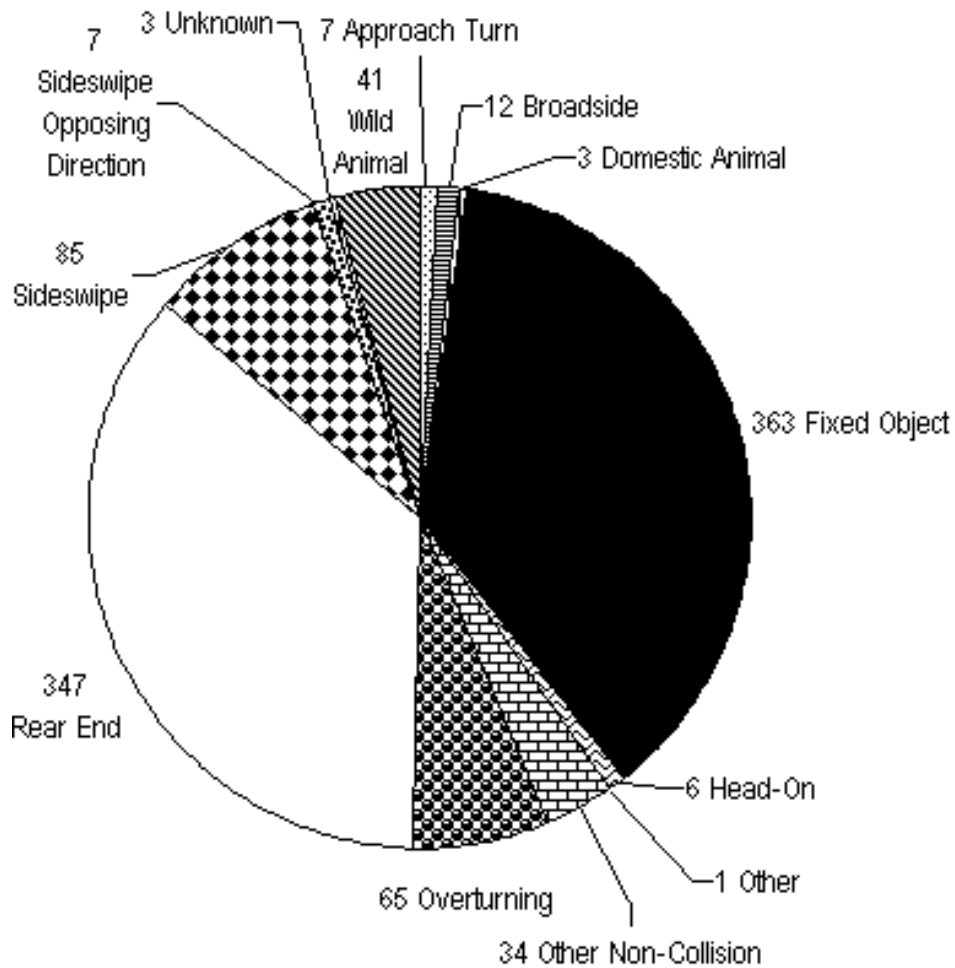
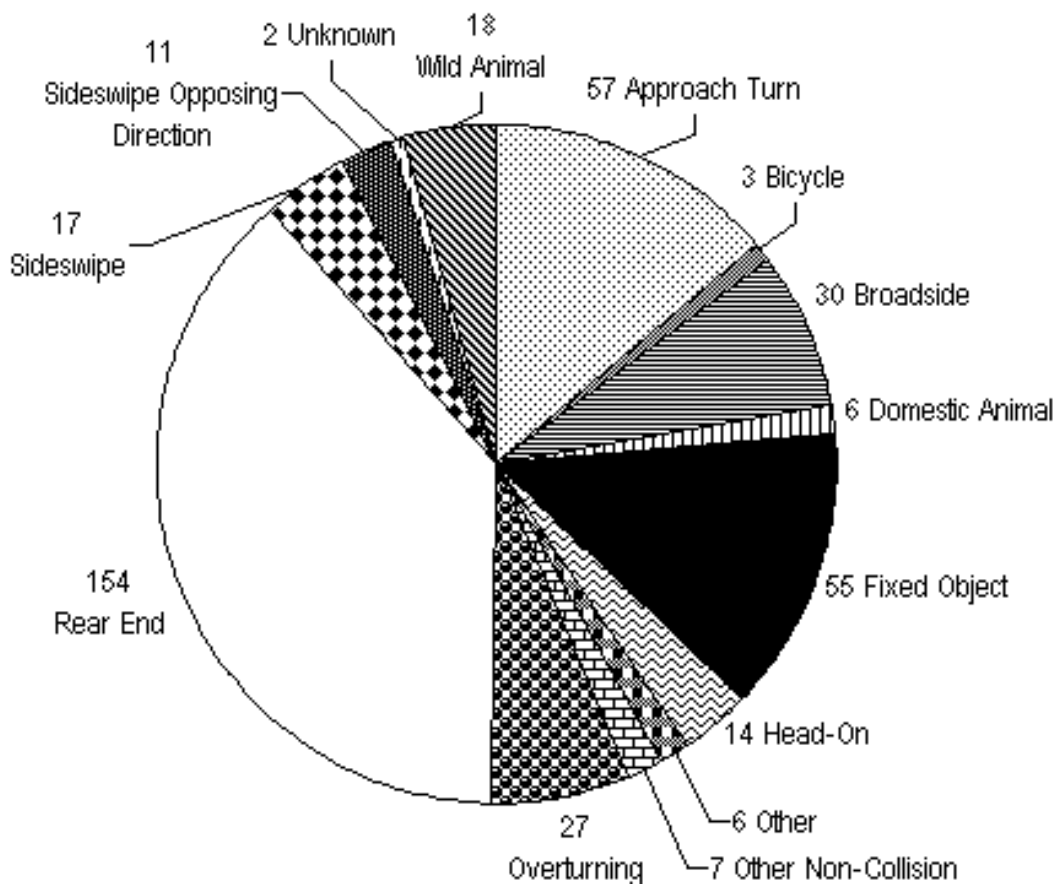


Figure 1.10
US 85 Corridor Crash Types and Number (1995 - 1997)



Source: CDOT

Table 1.5
I-25 Corridor Average Crash Rate (1995 - 1997)

| Interchange | Number of Crashes (Three-Year Total) | ADT Volume | Crash Rate | Facility Classification |
|------------------------|---|------------|-------------|----------------------------|
| C-470 | 58 | 85,100 | 0.68 | Urban |
| MP 194 | 45 | 85,100 | 0.53 | Rural |
| Lincoln Ave | 112 | 57,200 | 1.13 | Rural |
| Schweiger | 156 | 57,200 | 1.51 | Rural |
| Surrey Ridge | 101 | 57,200 | 1.28 | Rural |
| Castle Pines Pkwy | 102 | 54,700 | 1.10 | Rural |
| Happy Canyon Rd | 155 | 51,400 | 1.05 | Rural |
| Meadows/Founders Pkwy | 49 | 51,200 | 0.87 | Urban |
| US 85/I-25 Interchange | 90 | 58,800 | 0.98 | Urban |
| Wolfensberger Rd | 94 | 45,500 | 1.81 | Urban |
| Plum Creek Pkwy | | | | |

1996 State Average Crash Rate: **1.92** crashes per million vehicle miles traveled on urban interstate
0.90 crashes per million vehicles miles traveled on rural interstate

US 85 Corridor Crash Rates

The 1996 statewide average crash rate for urban highways (US 85 near Castle Rock and north of Blakeland Drive) was 3.17 and 1.22 for rural highways (US 85 north of Meadows Parkway to Blakeland Drive).

Crash rates along US 85 are compared to the 1996 statewide average rates shown on Table 1.6. The segments along US 85 with a crash rate above the statewide average are located between Titan Road and Louviers Avenue and between County Line Road and the C-470 Interchange.

Types and patterns of crashes within each roadway segment (between interchanges or intersections) were analyzed to determine possible contributing factors and are detailed in the *I-25/US 85 Corridor Existing Traffic Operations Technical Report*, September 1999 and the *I-25/US 85 Corridor Existing Traffic Operations Technical Report Addendum*, May 2000.

1.5.2 Roadway Deficiencies

Roadway deficiencies affect both capacity and safety of a roadway. Existing deficiencies are described in the following text.

Table 1.6
US 85 Corridor Average Crash Rate (1995 - 1997)

| Intersection | Number of Crashes (Three-Year Total) | ADT Volume | Crash Rate | Facility Classification |
|------------------------------|---|------------|---------------|----------------------------|
| County Line Road | 93 | 27,400 | 3.40 | Urban |
| C-470 Interchange | 45 | 28,700 | 1.02 | Urban |
| Blakeland Drive | 12 | 25,000 | 1.15 | Rural |
| Town Center Drive | 22 | 16,000 | 0.29 | Rural |
| Highlands Ranch Parkway | 37 | 16,000 | 1.20 | Rural |
| Titan Road | 47 | 12,600 | 1.83 | Rural |
| Louviers Avenue | 27 | 10,900 | 0.62 | Rural |
| SH 67 | 39 | 8,700 | 1.18 | Rural |
| Happy Canyon Road | 25 | 8,700 | 0.99 | Rural |
| Meadows Parkway | 25 | 8,700 | 1.69 | Urban |
| US 85/I-25 Interchange Ramps | | | | |

1996 State Average Crash Rate: **3.17** crashes per million vehicle miles traveled on urban highway
1.22 crashes per million vehicle miles traveled on rural highway

1.5.2.1 I-25 Corridor Roadway Deficiencies

The following roadway deficiencies have been identified along I-25:

- Within the project corridor, I-25 has several segments with steep grades, reaching a maximum grade of 4.7 percent. Steep grades cause significant slowing for heavy vehicles. Most crashes that occurred during the three-year period along the I-25 Corridor were rear-end collisions; this type of collision usually occurs as a result of vehicles slowing or stopped prior to the crash. Many of these crashes occurred between passenger cars and heavy vehicles. The addition of climbing lanes in each direction should reduce the number of rear-end collisions caused by slowing vehicles or slow-moving heavy vehicles. CDOT has completed the construction of the climbing lanes from Lincoln Avenue to Castle Pines Parkway and is currently constructing the climbing lanes from Castle Pines Parkway to Meadows/Founders Parkway as part of the Early-Action projects. For more detailed information, see the *I-25/US 85 Corridor Existing Traffic Operations Technical Report*, September 1999 and *I-25/US 85 Corridor Existing Traffic Operations Technical Report Addendum*, May 2000.
- Substandard acceleration/deceleration lanes exist along I-25. These lanes are not long enough to meet CDOT's design standards. They are unsafe, forcing vehicles to merge into traffic before fully accelerated and to decelerate faster than the standards. The Early-Action projects will upgrade the acceleration/deceleration lanes between Lincoln Avenue and Meadows/Founders Parkway. The area from Meadows/Founders Parkway to Douglas Lane will not be improved.
- The railroad bridge overpass north of Wolfensberger exit is geometrically deficient and needs replacing.

- Several inadequate interchanges along I-25 that create congestion and safety problems include the following:
 - The Schweiger Interchange consists of two stop-controlled hook ramps leading into a roadway. Each hook ramp has a deceleration lane leading to the ramp and an acceleration lane leading from the ramp. This awkward interchange decreases vehicle mobility and is not adequate for a major interstate.
 - The Surrey Ridge Road Interchange consists of hook ramps leading into a stop-controlled intersection. Each hook ramp has a deceleration lane leading into the ramp and an acceleration lane leading from the ramp. This awkward interchange decreases vehicle mobility and is not adequate for a major interstate.
 - The Plum Creek Parkway Interchange is comprised of hook ramps for the northbound movements while the southbound movements use a partial diamond interchange. This interchange requires vehicles to access I-25 via downtown Castle Rock, which adds more vehicles to the local Castle Rock traffic and does not provide direct access to I-25.

1.5.2.2 US 85 Corridor Roadway Deficiencies

Multiple roadway deficiencies identified along US 85 include the following:

- Narrow lanes (between 3 meters and 3.6 meters [9 feet and 12 feet]) and inadequate shoulders exist along US 85 from Happy Canyon Road to Titan Road. These deficiencies make it difficult to maintain through traffic when a vehicle is pulled onto the shoulder. Narrow shoulders also reduce the driver's ability to recover safely from slight swerves or driving errors.
- Few passing opportunities exist along US 85, making it difficult to pass slow-moving vehicles. Frustration and inability to pass leads to road rage and inappropriate behavior (e.g., passing on shoulders and in no-passing zones).
- The lack of acceleration and deceleration lanes creates hazards for motorists entering and exiting the highway. Traffic slows, congestion increases, and safety hazards result when slow traffic pulls onto the highway and when vehicles slow for a turn.
- Multiple access points that are closely and inconsistently spaced impair traffic flow and increase the potential for crashes.
- Inadequate sight distance due to vertical and horizontal alignment results in unsafe attempts to pass and impairs traffic flow because of inability to pass.
- Inadequate capacity for crossings and turns at intersections creates congestion when turning vehicles slow or stop through traffic because trains and cross traffic prevent drivers from completing turns.
- Many wildlife species use habitat on both sides of US 85. At-grade crossings of wildlife moving between

habitat types create hazards to wildlife and motorists.

1.6 MOBILITY

Mobility is the degree of ease by which people travel from one point to another. One purpose of the South I-25 Corridor and US 85 Corridor EIS is to increase mobility in the study area. Currently more than 77,500 vehicles (approximately 93,000 person trips, assuming 1.2 people per vehicle) a day travel on I-25 between Happy Canyon Road and Lincoln Avenue. US 85 handles more than 37,600 vehicles (approximately 44,400 person trips) daily north of Titan Road up to C-470. The 2020 projections show 183,000 vehicles (219,960 person trips) on I-25 between Happy Canyon Road and Lincoln Avenue and 31,500 vehicles (37,800 person trips) on US 85 north of Titan Road.

The I-25 Corridor is the major north-south corridor in Colorado, connecting the major front-range metropolitan communities of Fort Collins, Denver, Colorado Springs, and Pueblo. Three major business destination points in Colorado are the Denver CBD, the SEBD, and Colorado Springs. Roadways serving these areas have large volumes due to commuters driving to and from work. The I-25 Corridor provides access to all three areas. US 85 provides access to C-470, which converges with I-25 approximately 1.6 kilometers (1 mile) south of the SEBD, and approximately 24.1 kilometers (15 miles) south of the Denver CBD. The southern end of US 85 permits access to southbound I-25, thus providing access to Colorado Springs.

In addition to serving Colorado, I-25 is only north/south interstate highway linking southern states (Texas, New Mexico, and Oklahoma), through Colorado, to northern states (Wyoming and Montana). Due to the North American Free Trade Agreement (NAFTA), I-25 also acts as a freight corridor, linking Mexico, the United States, and Canada. The ability of I-25 to fulfill its national and statewide function is vital to the state's economy.

1.7 SYSTEM LINKAGES

System linkages are the relationship between the study area and the existing and/or potential transportation system. Proposed improvements must be compatible with the local network, connecting transit systems (LRT and bus), existing railroads, and bicycle facilities.

1.7.1 Local Network

The local network consists of local roads and arterials within the community. Douglas County and Castle Rock local networks connect to I-25. I-25 is sometimes used as part of the local network because no other convenient north/south transportation alternatives exist through Castle Rock and northern Douglas County.

The local street networks of Louviers, Sedalia, Highlands Ranch, and Castle Rock connect to US 85. US 85 is used for commuting and residential and commercial local access. US 85 has multiple access points such as residential driveways, business driveways, and street intersections. These multiple access points make US 85 part of the local community network.

1.7.2 Light Rail Transit Connections

The Southeast Corridor Project provides for the construction of an LRT system to extend the existing LRT along I-25 from the Broadway Park and Ride to north of Lincoln Avenue (the I-25 Corridor northern terminus). The 14-

km (8.7-mile) Southwest I-25 Corridor LRT line has recently been constructed and is in service along Santa Fe (US 85) ending at Mineral Avenue, just north of the US 85 Corridor northern study limit.

1.7.3 Bus Connections

An intra-city shuttle bus operates between Castle Rock's CBD and the Prime Outlets (a group of outlet shopping stores).

Most of the study corridor is located outside the boundaries of the RTD system. The only RTD bus operating in the study area is the Highlands Ranch Town Center Express. Two other RTD bus routes are adjacent to the study corridor: the first route serves Franktown and Parker and accesses I-25 at Lincoln Avenue; the second route serves the SEBD, ending at I-25 and Lincoln Avenue.

1.7.4 Freight Rail

The Burlington Northern Santa Fe Railroad and the Union Pacific Railroad are located on the west side of US 85. After US 85 ends at the merge point with I-25 (north of the Wolfensberger Interchange), the Burlington Northern Santa Fe Railroad continues along the west side of I-25, and the Union Pacific Railroad crosses I-25 to the east side and runs through the Town of Castle Rock. Both railroads converge to the west side of I-25 in the vicinity of Larkspur, south of the project area. The Burlington Northern Santa Fe and Union Pacific Railroad lines are currently serving approximately 40 trains daily to transport freight. Although most of the freight traffic is through traffic, there is one local stop at Big Lift, which is in the Louviers area.

1.7.5 Bicycle Facilities

Biking for transportation as well as recreation is a popular activity in Douglas County. Currently, four maintained trails exist within the project area: Centennial Bike Trail, High Line Canal Trail, East Plum Creek Trail, and Front Street Trail. Several agencies and organizations within the county are in the process of developing a vision for interconnecting existing trails and creating new trails (see Section 4.2.5.1, *Hiking/Bike Trails*).

1.8 ECONOMIC DEVELOPMENT

The study corridor is undergoing abundant growth and development. Rapid economic development and land use changes have accelerated the need for transportation improvements. It is important to examine existing and future land uses to provide a network that addresses demand.

1.8.1 Land Use

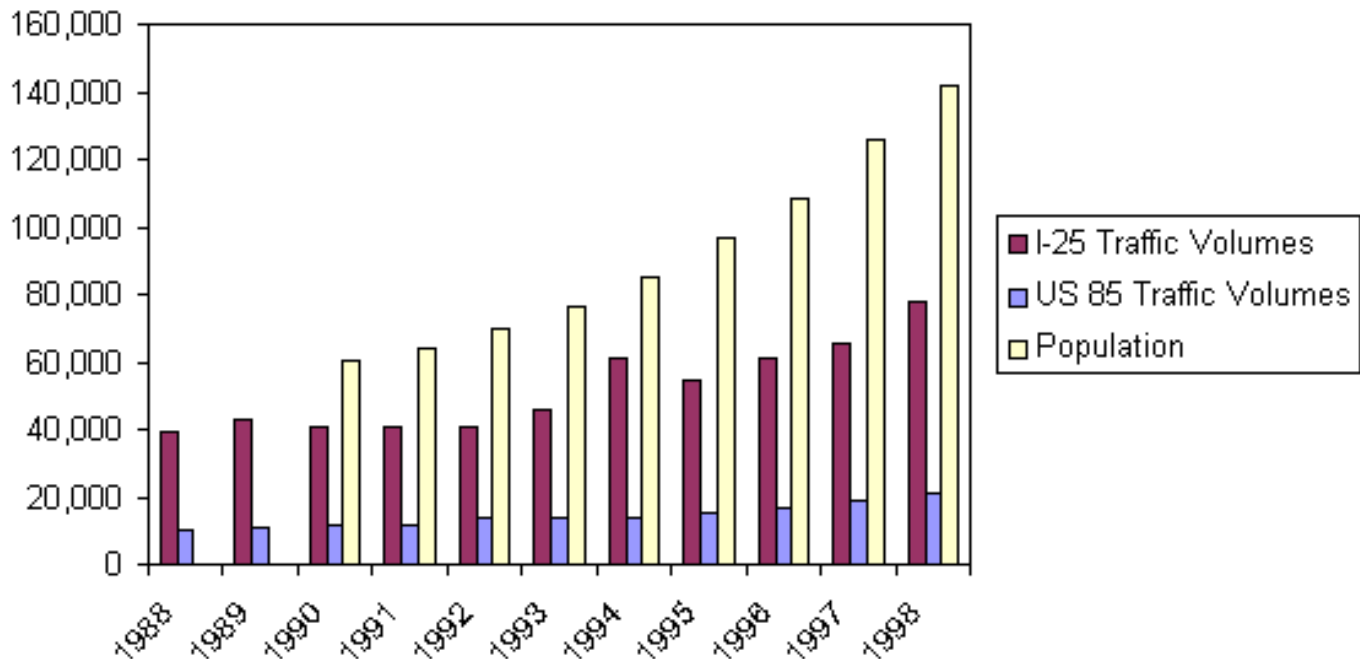
Land use is the main factor in developing travel demand projections. Once the type (residential or commercial) and size of the land use is known, population and employment projections can be determined. Regional growth, household size, income, and employment type influence the projected transportation demand.

From 1980 to 1990 the population in Douglas County nearly doubled from 35,238 to 60,391. Douglas County had an average annual growth rate of 12 percent (between 1991 and 1998), making it one of the fastest growing counties in the country. In 1998 142,000 people lived in Douglas County; the estimated 2020 population is

385,000. This figure reflects the county's analysis of building permits and other data and recent growth trends in the state and metropolitan area.

Population increases have led to increased traffic volumes. From 1988 to 1998, I-25 and US 85 had an average traffic growth of 114 and 97 percent, respectively. This figure equates to an average annual growth rate of 7.1 percent along I-25 and 6.3 percent along US 85. Figure 1.11 shows the historical population and ADT volumes within Douglas County over the past ten years.

Figure 1.11
Historic Douglas County Population and Average Daily Traffic Volumes



Note: 1988 and 1989 population data not available.

Several developments along the study corridor, both residential and commercial, are in the planning stage. Further development of the SEBD will create numerous employment opportunities on the north side of the I-25 Corridor. The area's business growth directly affects residential growth. The tremendous growth of the Highlands Ranch area is indicative of the corridor's expansive growth. The proposed Rampart Range Development south of Lincoln Avenue is indicative of growth yet to come.

The Meridian International Business Center is a commercial and residential development (750 single-family unit) adjacent to the Lincoln Avenue Interchange. The development is considered part of the SEBD, which also includes the Denver Technological Center (DTC). Douglas County (as stated in the Master Plan) is trying to keep "separate, identifiable communities, while most of the Denver metropolitan area is made up of one continuous city." The Meridian fits into this overall vision by concentrating the commercial areas in the northern part of Douglas County as an extension of the DTC.

The Rampart Range Development is being proposed adjacent to I-25, approximately 1,460 meters (4,800 feet) south of Lincoln Avenue. The Rampart Range Development Group has projected 8 to 10 million commercial square feet and 8,000 to 10,000 dwelling units by 2020 based upon market potential. The development is

scheduled to be constructed in eight phases, with the last phase completed by 2040. The development includes a Town Center that provides activities for the community. The Rampart Range Development Group, along with the City of Lone Tree, is evaluating the benefits of an interchange along I-25.

The Douglas Lane Interchange is being proposed along I-25 approximately 1,450 meters (4,750 feet) south of Plum Creek Parkway. Three development projects are being planned in Southern Douglas County near Douglas Lane. The three developments total approximately 4,330 dwelling units in the Douglas Lane Interchange area.

The loop ramp at Castle Pines Parkway is being examined in response to proposed development in the area. The Canyons residential development is proposed east of I-25 on roughly 1,416 hectares (3,500 acres) between Happy Canyon Road and Castle Pines Parkway. There is also a separate piece, referred to as the Southern Piece, of the development located on roughly 809 hectares (2000 acres) away from I-25 and closer to Crowfoot Valley Road. Currently, the northern section of the plan calls for the lots to be situated approximately 762 meters (2,500 feet) east of I-25 and on east-facing slopes. Approximately 600 dwelling units are planned for construction within the next 5 years with most located in the northern section. Complete build-out of the total 2,226 hectares (5,500 acres) will occur over the next 20 years.

1.8.2 Transportation Plans

Transportation plans adopted by governing bodies in the study area include the *1994 Castle Rock Town Wide Transportation Plan*, the *Douglas County 2015 Transportation Plan*, the *DRCOG Metro Vision 2020 Plan*, and the *DRCOG 1999 Regional Transportation Plan (RTP)*. The *1994 Town of Castle Rock Transportation Plan* recommended the following:

- Upgrade the I-25 Meadows/Founders Interchange to a partial cloverleaf design (completed)
- Convert the I-25/US 85 Interchange to a local service crossing of I-25 only (Early-Action project)
- Retain Liggett Road as a crossing of I-25
- Upgrade the I-25 Wolfensberger/Wilcox Interchange and supplement this crossing of I-25 with a new 5th Street Bridge (Early-Action project)
- Upgrade the Plum Creek Parkway Interchange as a long-term goal

The *Douglas County 2015 Transportation Plan* is an element of the *Douglas County Master Plan* completed in 1997. The plan outlines transportation improvements that will be needed in Douglas County in 5-year increments for the next 15 years. Some improvements related to the study area include:

- Construct 5th Street overpass across I-25 (Early-Action project)
- Widen Meadows/Founders Interchange at I-25 from two to four lanes (completed)
- Widen Titan Road between Moore Road and US 85 from two to four lanes

- Construct four-lane facility and bridge overpass at the existing US 85/I-25 Interchange (Early-Action project)
- Install traffic signals on ramp at Plum Creek Parkway and I-25 Interchange
- Improve intersection at Wolfensberger and County Road 105
- Construct a four-lane facility extension of Peoria Street between E-470 and Potomac
- Widen US 85 between Highlands Ranch Parkway and Meadows Parkway from two to four lanes
- Widen I-25 from Meadows Parkway to Wolfensberger from four to six lanes
- Widen US 85 from County Line Road to Highlands Ranch Parkway from four to six lanes
- Widen Meadows Parkway between I-25 and US 85 from four to six lanes

The ***DRCOG Metro Vision 2020 Plan*** is the Denver region's plan for addressing future growth of the metropolitan area. The plan outlines strategies and implementation steps to preserve the region's quality of life while also positioning the region to benefit from growth. The plan is organized around six core elements addressing the development pattern of the region, the necessary transportation system, and the actions needed to preserve air quality and water quality. The six core elements are:

- Extent of urban development
- Open space
- Free-standing communities
- Balanced/multi-modal transportation system
- Urban centers
- Environmental quality

The DRCOG 2020 RTP is the fiscally constrained version of the ***DRCOG Metro Vision 2020 Plan***. It includes those elements of the Metro Vision that can be provided through the year 2020, based on reasonably expected revenues.

Elements included in the DRCOG 2020 RTP along the I-25 Corridor include:

- Eight lanes from C-470 to Meadows/Founders Parkway
- Six lanes from Meadows/Founders Parkway to Douglas Lane

- Half-diamond interchange at Schweiger
- Three-quarter diamond interchange at Surrey Ridge Road
- Car pool lot

Elements included in the DRCOG 2020 RTP along the US 85 Corridor include:

- Six lanes from C-470 to Highlands Ranch Parkway
- Four lanes from Highlands Ranch Parkway to Meadows Parkway

Improvements to the transportation system in the I-25 Corridor and US 85 Corridor are crucial for growth and to maintain acceptable roadway LOS and safety in Douglas County.

1.9 SUMMARY OF DEIS COMMENTS

One of the purposes of the FEIS is to address all comments received during the DEIS formal comment period. Of the 152 letters received during the DEIS formal comment period, 26 letters were agency comments and 126 letters were public comments. Generally, comments were made on the project limits, process, Long-Term Vision, Early-Action projects, I-25 alternatives and design, US 85 alternatives and design, environmental issues, funding, and travel demand. Comments on I-25 included anything from the mainline widening to the frontage road to the Surrey Ridge Road Interchange, Schweiger Interchange, Rampart Range Interchange, and Douglas Lane Interchange. Comments on US 85 included anything from the mainline widening to traffic signals to access issues. These comments have been addressed throughout the FEIS process. The responses to these comments, including comments received at the DEIS public hearings, are included in Volume 2.

Three major issues were raised throughout the EIS process. These issues included the request for a bicycle/pedestrian facility along US 85, a concern for wildlife crossings along US 85, and various proposed alternatives for the Surrey Ridge Road/I-25 Interchange and the Schweiger/I-25 Interchange.

1.9.1 Bicycle/Pedestrian Facility

Concern: Several agencies and individuals requested a detached bicycle/pedestrian facility along US 85.

Solution: Throughout the EIS process, CDOT coordinated with the various agencies in developing a bicycle/pedestrian facility along the US 85 Corridor. There are several elements along the US 85 Corridor that restrict the amount of a detached facility. These elements include residents, businesses, and Section 4(f) properties. The Preferred Alternative includes a bicycle/pedestrian facility where the location (attached, detached, widen shoulder) varies along the corridor. For additional information on the bicycle/pedestrian facility, see Section 2.7: *Bicycle and Pedestrian Facilities along the US 85 Corridor*.

1.9.2 Wildlife Crossings

Concern: The US 85 Corridor bisects open space land used by wildlife. Widening of US 85 increases the barrier

to wildlife attempting to cross over US 85 and further fragments deer and elk habitat.

Solution: Based on the wildlife crossing concerns, CDOT conducted a wildlife tracking study to identify the types of animals crossing under and over US 85. This study assisted in the identification of two wildlife crossing enhancements that are included in the Preferred Alternative. These two wildlife crossings are developed to meet the Colorado Division of Wildlife suggested design to accommodate elk (the largest animal to potentially cross). For additional information on the wildlife crossings, see Section 2.8: *Wildlife Crossings along the US 85 Corridor*.

1.9.3 Surrey Ridge Road Interchange and Schweiger Interchange

Concern: Based on safety issues, CDOT must either improve the Surrey Ridge Road Interchange and Schweiger Interchange or remove the existing ramps to these interchanges. Residents currently accessing I-25 through these interchanges have expressed concern over changes being proposed to their access.

Solution: Throughout the EIS process, CDOT has presented numerous improvement options for both the Surrey Ridge Road/I-25 Interchange and the Schweiger/I-25 Interchange. In addition, based on comments received at the November public open houses, CDOT has added variations of the Preferred Alternative and Other Alternative to the FEIS. CDOT also met with the Douglas County Commissioners to get their input. The final configurations will be determined after the FEIS public hearings, based on public/agency input and additional technical analysis. For additional information on the proposed variations, see Section 2.10: *Alternative Variations*.

For additional information on the public involvement process, see Section 2.2: *Public/Agency Involvement Process* and Volume 2 of this FEIS.