Chapter 1 – Purpose and Need

The route of United States Highway 24 (US 24) west of Colorado Springs has long provided a vital link for travel between the mountains and the plains in southern Colorado as shown in **Exhibit 1-1**. Regional population growth and changes in travel patterns have resulted in traffic congestion in some areas between Manitou Springs and Interstate 25 (I-25) in Colorado Springs, and the Pikes Peak Area Council of Governments (PPACG) forecasts more congestion by 2035.

The Colorado Department of Transportation (CDOT), in cooperation with the Federal Highway Administration (FHWA) and other stakeholders, has prepared this Environmental Assessment (EA) to comply with the National Environmental Policy Act of 1969 (NEPA) to identify and assess potential environmental effects of improvements to US 24 in El Paso County, Colorado.

EXHIBIT 1-1
The Study Area is on US 24 in Colorado Springs

Not to scale
Study Area - Milepost 300 (Manitou Springs) to Milepost 304 (I-25)

CDOT and FHWA propose to make changes to US 24 between I-25 and Manitou Springs to reduce traffic congestion in the study area, which is illustrated in **Exhibit 1-2**. Few substantial changes have been made to US 24 in this area since it was built in 1964. Today, US 24 serves several purposes in the Pikes Peak region:

- US 24 is the only route for regional commuters who travel between western El Paso County, Teller County, and the Colorado Springs metropolitan area. Commuters travel on US 24 predominantly during the busiest daily travel times, from 7 a.m. until 9 a.m. (morning peak) and 4 p.m. until 6 p.m. (evening peak), adding to congested conditions during these peak periods.

- US 24 is heavily used by local travelers because it connects to I-25 and allows faster travel into downtown than Colorado Avenue, which is also known as Business 24. This results in local traffic using side streets that intersect US 24 to get in and out of neighborhoods and commercial areas, adding to high volumes of turning vehicles and slow travel conditions on US 24.

- US 24 is the only major route into the mountains for nearly 50 miles north and south of Colorado Springs. The lack of gateway routes into the mountains results in the funneling of trucks destined for mountain communities and regional recreational traffic headed to national forests, ski resorts, and gaming communities west of Colorado Springs. Because this traffic includes trucks, cars, campers, and recreational vehicles driven by visitors to the region, slow travel conditions occur year-round, most noticeably in summer.

As shown in **Appendix A**, US 24 is a four-lane urban principal arterial with two through-lanes in each direction and auxiliary lanes for most turns. There are six at-grade intersections between I-25 on the east and Manitou Avenue on the west; four of the intersections are signalized, one is uncontrolled, and one is a right-in/right-out access only. This 4-mile stretch of road has congested peak periods and an increasing number of crashes within the congested areas. US 24 has a posted speed limit of 35 miles per hour (mph) from I-25 to 8th Street, increasing to 45 mph from 8th Street to Ridge Road, and increasing again to 50 mph west toward Manitou Avenue.

US 24 is not an existing transit route for local service and no bus stops currently exist on US 24. However, several transit routes circulate through the study area, using Colorado Avenue, 31st Street, 21st Street, and 8th Street.

US 24 is used for an express bus service for commuters between downtown Colorado Springs and Manitou Springs, with service further west to mountain communities.

Providing transit stops and possible transfer stations within the study area are a part of the Mountain Metro Transit's future plans.

Scenic view to the west from US 24 and 21st Street

EXHIBIT 1-2
US 24 Study Area

Many local recreational destinations (particularly the Red Rock Canyon Open Space) draw pedestrians and bicyclists to the study area. Connectivity of trails, adequate parking areas, and grade-separated crossings for pedestrians and bicyclists are the City of Colorado Springs' goals within the study area.

US 24 in the study area is a challenging environment in which to implement major transportation improvements. Surrounding land uses reflect a mature, suburban community with intermixed commercial businesses and residential neighborhoods that attract local drivers. US 24 also serves as a travel corridor for freight, regional commuters, and regional recreational travelers. This mix results in travelers having different purposes for driving in the study area. Traffic is nearly equally balanced between local travelers who begin and end their trips within the study area and regional travelers who begin or end their trips outside the study area.

These issues and challenges were discussed with the stakeholders and their input helped develop the purpose and need. Stakeholder input is discussed further in **Section 2.1.1, Step One: Identify Transportation Problems and Ideas.**

1.1 Purpose of the Proposed Action

The purpose of the project is to: 1) reduce congestion problems for travelers today and through the year 2035; 2) improve mobility for local trips within the US 24 corridor and regional trips through the US 24 corridor; and 3) improve connectivity to the multiple destinations accessible from the US 24 corridor.

1.2 Need for the Proposed Action

El Paso County has been among the fastest growing counties in the nation for the last three decades. El Paso and Teller Counties added more than 480,000 new residents to Colorado's booming Front Range between 1960 and 2009. Congested travel is expected to increase further in the study area by 2035 (the planning horizon for this EA) based on several conditions, including:

- When US 24 was built in 1964, the populations of El Paso County and Teller County totaled 146,000. In 2009, the populations of these two counties totaled approximately 626,000, a figure forecasted to grow by 330,000 to 956,000 by 2035 (State of Colorado, 2010). This growth means more drivers will be on the roads.

- The typical Coloradoan drives more miles today than drivers in the past, resulting in more heavily used roads. The average annual number of miles traveled by motorized vehicles more than doubled between 1982 and 2007 (Casper, 2008).

These two factors—substantially more people traveling substantially more miles—overload US 24 in the study area to the point it no longer has adequate capacity for current and future travelers.

Roadway "capacity" is the number of vehicles that should be able to travel through a specific segment or intersection in a given period of time, under normal roadway and traffic conditions.

Capacity is based on the number of lanes on a roadway and related features such as traffic control, merge lanes, cross-street traffic, and vehicle mix – such as commuters, tourists, trucks, and buses.

Too many vehicles trying to use a roadway and its intersections during the same time period results in congestion problems.

The needs of the project are to accommodate existing and future traffic volumes, improve traffic operations at intersections with US 24, and provide for transportation circulation for local travelers and predictable travel times for regional travelers while providing access to the multiple local and regional destinations accessed from the US 24 corridor.

Congested roadways along US 24

Congestion in the study area is caused by the high volume of traffic and the interruption of traffic flow on mainline US 24 at signalized intersections, as described in the *Traffic Impact Analysis Technical Memorandum* (CH2M HILL, 2008a) in **Appendix C**. Daily and peak hour traffic volumes have been increasing steadily over time, a trend that PPACG transportation planners predict will continue. The peak hour traffic exhibits a directional split in traffic, with peak hour volumes 40 to 60 percent greater eastbound in the morning and westbound in the afternoon. These problems will persist if the capacity of US 24 and its intersections are not improved to handle more vehicles.

Congestion results in increased travel time, as heavy traffic volume slows movement through the US 24 corridor and causes delays. Safety can be affected because the likelihood of crashes increases from more vehicles traveling on crowded roadways. Drivers seek alternate routes on surrounding street networks, resulting in cut-through traffic in residential neighborhoods. These factors combine to heighten driver stress, a social cost arising from interference between vehicles on congested roadways.

Additional information on traffic conditions in the study area is provided in the *Traffic Impact Analysis Technical Memorandum*, (CH2M HILL, 2008a) in **Appendix C**.

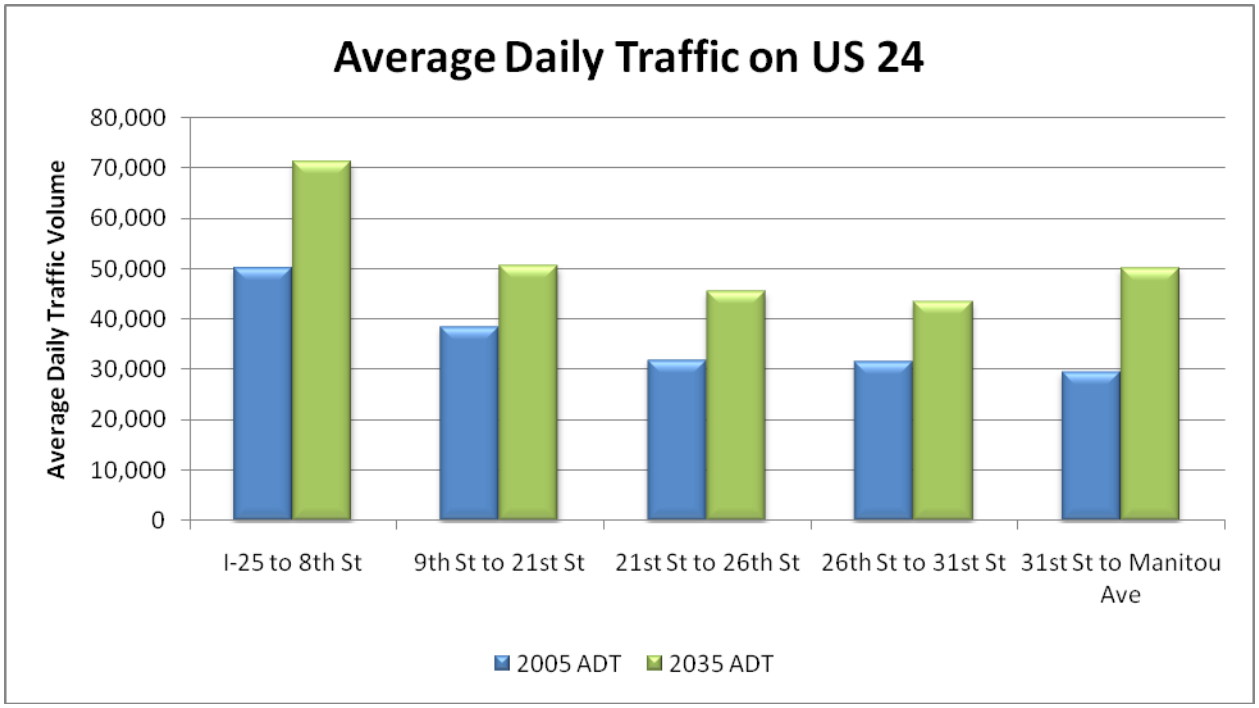
1.2.1 Traffic Volumes

US 24 carried up to 50,000 vehicles daily in 2005 (measured in traffic counts), as shown in **Exhibit 1-3**. Existing average daily traffic (ADT) on US 24 is highest between I-25 and 8th Street, with approximately 50,300 vehicles. As shown in **Exhibit 1-3**, the existing ADT continues to decrease moving west toward the Manitou Avenue interchange, where the ADT is approximately 30,000 vehicles. By 2035, ADT is forecasted to rise to more than 71,000 ADT between I-25 and 8th Street, and to more than 50,000 ADT at the Manitou Avenue interchange. Within the study area, ADT is forecasted to increase an average of 45 percent between 2005 and 2035. Travel during peak periods of the day are expected to increase accordingly by 2035. In 2005, in the evening peak hour (measured between 4 p.m. and 6 p.m.), the traffic volume between I-25 and 8th Street was 3,720 vehicles. The forecast for 2035 is 5,420 vehicles in this segment, an increase of 45 percent. Across the study area, the average increase in evening peak period volume from 2005 to 2035 is 55 percent. Additional information on traffic volumes in the study area is provided in the *Traffic Impact Analysis Technical Memorandum*, (CH2M HILL, 2008a) in **Appendix C**.

EXHIBIT 1-3
Average Daily Traffic on US 24 in the Study Area

Segment (East to West)	Segment Capacity	2005	Forecasted 2035
I-25 to 8th Street	40,000 to 45,000	50,300	71,300
8th Street to 21st Street	40,000 to 45,000	38,500	50,600
21st Street to 26th Street	40,000 to 45,000	31,900	45,600
26th Street to 31st Street	40,000 to 45,000	31,500	43,500
31st Street to Manitou Avenue	40,000 to 45,000	29,600	50,300

Source: CH2M HILL, 2008a



1.2.2 Traffic Operations and Congestion

Roadways are designed to accommodate a given number of vehicles based on the number of lanes and their width, access, traffic signals, and other features. Level of Service (LOS) is a measure used to indicate how efficiently a roadway or intersection operates, based on a rating system of A through F. On this scale, LOS A is least congested and LOS F is most congested.

According to the *Highway Capacity Manual* (Transportation Research Board, 2000) LOS for signalized intersections is defined in terms of delay, which measures "driver discomfort, frustration, fuel consumption and increased travel time." LOS A allows extremely favorable traffic movement: most vehicles arrive during a traffic signal's green phase, and many vehicles do not stop at all. LOS D reflects more congestion: many vehicles stop at the intersection, and failure to clear the intersection in a single signal phase is noticeable. LOS F is considered a failure in operations: drivers may wait through several signal cycles because the number of vehicles arriving exceeds the capacity of the intersection.

CDOT and the City of Colorado Springs have established LOS D as the minimum acceptable LOS for urban areas during weekday peak periods.

Signalized Intersection Level of Service

*At **LOS A**, there is a very good progression through the intersection. Most vehicles arrive during the green phase; most do not have to stop. Vehicle delay is 10 seconds per vehicle or less.*

*At **LOS B**, more vehicles stop than in LOS A, but generally there is still good progression. Delay ranges from 10 to 20 seconds per vehicle.*

*At **LOS C,** the number of vehicles stopping is significant, although many still pass through the intersection. Delay ranges from 20 to 35 seconds per vehicle.*

*At **LOS D**, the influence of congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles that do not stop declines. Some vehicles do not make it through the intersection in one cycle length. The range for delay is 35 to 55 seconds per vehicle, which is considered to be the limit of acceptable delay.*

*At **LOS E**, there are longer delays of 55 to 80 seconds per vehicle, poor vehicle movement between signalized intersections, and individual cycle failures.*

*At **LOS F**, vehicle arrival rates exceed the capacity of the intersection. This condition is considered unacceptable to most drivers. Delay is greater than 80 seconds per vehicle.*

Source: Transportation Research Board, 2000.

To measure the operating efficiency of the existing intersections along US 24 in the study area and to evaluate potential solutions, the project team collected existing traffic counts and obtained PPACG traffic volume forecasts for 2035. The existing LOS and the estimated future LOS for intersections in the study area during the evening peak hour are shown in **Exhibit 1-4**. By 2035, if changes are not made to US 24 and its intersections, all but two intersections in the study area would operate at unacceptable levels and LOS would continue to deteriorate at several locations in the study area.

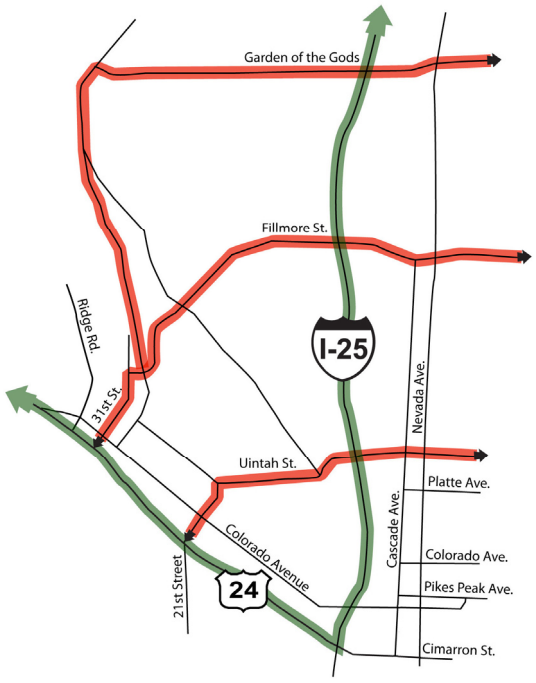
EXHIBIT 1-4
Levels of Service on US 24 during the Evening Peak Hour in the Study Area

Location	2005	Forecasted 2035
I-25 Interchange – South-/Northbound	C/D	C/E
8th Street	E	E
21st Street	D	E
26th Street	B	C
31st Street	C	F
Ridge Road[1]	F	F
Manitou Avenue Interchange – East-/Westbound	A/A	A/B

Source: CH2M HILL, 2008a
[1] Because this is an unsignalized intersection, LOS reflects traffic on Ridge Road approaching US 24.

When traffic volume exceeds capacity, drivers wait at intersections through more than one traffic signal cycle, which currently occurs frequently at 8th Street and 21st Street during morning and evening peak travel periods, and throughout the day during the summer tourist season. While most of the ADT is due to through-trips, the LOS at these intersections is dictated mostly by the turning movements. At congested intersections, vehicles at turn lanes sometimes form lines that back up into the mainline of traffic, which is experienced today on US 24 at 8th Street, 21st Street, and 31st Street. Congestion at the exit ramps from I-25 onto US 24 presently causes northbound and southbound traffic to back up onto the mainline of I-25. These backups are a safety concern; the differences in speed on I-25 can potentially lead to high severity rear-end accidents. To avoid congested routes, some drivers cut through neighborhoods, which happens currently when 31st Street and 21st Street are used as a "back door" to Garden of the Gods Road, I-25, and other destinations on the City of Colorado Springs' northwest side, as shown in **Exhibit 1-5**.

EXHIBIT 1-5
Cut-Through Routes (red) from US 24 in Study Area



1.2.3 Improving Travel in the Corridor

Local governments have recognized the need to improve travel conditions in the study area and on US 24 for 30 years. Several previous studies were conducted between 1979 and 1996 that identified congestion as a problem on US 24 west of I-25 as part of other community and transportation planning needs. In 1980, the Colorado Springs City Council adopted *The Westside Plan* (City of Colorado Springs, 1980) to prioritize revitalization of the neighborhood. Among the transportation goals were to "eliminate bottleneck congestion problems" and construct "grade separated interchanges on Midland Expressway [as US 24 was called] beginning with 8th Street."

The most recent of these studies, *U.S. 24 Corridor Study, Colorado Springs to Woodland Park* (PPACG, 1996), prioritized proposed projects on US 24 west of I-25. The study's recommendations included widening US 24 to six lanes between 8th Street and 21st Street, and constructing an interchange at 8th Street. In addition to the projects west of I-25, an improved interchange at US 24 and I-25 was identified in the *I-25 Improvements through the Colorado Springs Urbanized Area EA* (CDOT, 2004). However, no funding was appropriated to build any of these major projects. As a result, capital improvements to US 24 in the study area have been limited to minor projects such as shoulder work, intersection changes, and acceleration and deceleration lanes.

PPACG's *2035 Fiscally Constrained Regional Transportation Plan* (PPACG, 2008a) includes adding interchanges to various locations from I-25 to Manitou Springs and widening US 24 to six lanes from I-25 to Manitou Avenue.

The following chapter describes alternatives the project team considered to meet the needs of these different travelers.