

CHAPTER I: PURPOSE AND NEED

The term “purpose and need” refers to the transportation-related problems of a system that a project is intended to address. It establishes the need for improvements and justification for environmental impacts and provides an explanation of the priority level for a project. The study area for the East Columbia-Environmental Impact Statement (EC-EIS) is contained in **Exhibit I-1**.

This chapter will:

- 1) Summarize the history and regulatory framework for East Columbia projects.
- 2) Summarize the critical elements of the purpose and need, evaluation criteria, and evaluation standards, as presented in the Draft Environmental Impact Statement (DEIS).
- 3) Provide clarifications to the purpose and need that resulted from the coordination of the Preferred Alternative and the DEIS.

A. History and Regulatory Framework for East Columbia Projects

Improvements to the transportation network in eastern Columbia have been under consideration for many years. For example, the CATSO 2025 Transportation Plan states that the extension of Stadium Boulevard (Route 740), “...has been in the CATSO Major Thoroughfare Plan for several decades.” The most salient elements of the background leading to the EC-EIS project will be discussed below:

In addition to the extension of Stadium Boulevard, numerous other transportation projects affecting eastern Columbia are included in the CATSO 2025 Transportation Plan. Among these projects are the widening of East Broadway (Route WW) and the extension of Ballenger Lane. The CATSO major roadway plan (MRP) identifies Route WW as a major arterial which is currently configured as a two-lane rural roadway. In addition to relieving congestion, the 2025 Transportation Plan identifies concerns regarding pedestrian access and greenway impacts. The extension of Ballenger Lane (over I-70 to Clark Lane/Route PP) was added to the major roadway plan in 1997. The intent was generally defined as to relieve congestion.

In addition to the major projects identified in the CATSO MRP, several minor projects are also under development. These are the products of public and private partnerships. All of the analysis for the EC-EIS project has assumed that these projects, including the “Rolling Hills Road Extension” and the “Gans Road Project,” will be completed by others as currently planned. Other smaller public/private partnerships include the “Lemone Industrial Boulevard Extension” and the “Cinnamon Hill Realignment.” **Exhibit II-4** depicts these projects.

There are also several planning studies that influenced the development of the EC-EIS.

As the most heavily traveled roadway feature in Boone County, MoDOT completed a major investment study (MIS) for the I-70/US-63 interchange in the late 1990s. Very broadly

speaking, the I-70/ US-63 interchange MIS supports the need for improvements within eastern Columbia.

The *Improve I-70* project evaluated the entirety of I-70 with the exception of the St. Louis and Kansas City urban areas. A Tier 1 EIS identified purpose and need elements that applied generally to I-70 and established sections of independent utility (SIUs). Boone County was contained within SIU 4. The selected alternative for SIU 4 proposes the improvement of I-70 along its existing alignment. Improvements include increasing the number of through lanes on I-70 from four to six, west of the US-40 interchange and east of the Route Z interchange, and from four to eight from US-40 interchange to the Route Z interchange. In addition, the Preferred Alternative would include the reconstruction/reconfiguration of the existing interchanges. The ROD for the selected alternative was dated April 27, 2006. Information about the *Improve I-70* project is available at <http://www.improvei70.org>.

In 2008, MoDOT initiated the Supplemental I-70 EIS (SEIS). The intent was to investigate newly developed strategies for accommodating truck traffic. These strategies were not considered during the original EIS and potentially offer cost-effective benefits. Details about the SEIS are also available at <http://www.improvei70.org>.

Regarding the improvement of the transportation system in east Columbia, the FHWA published a notice of intent (NOI) to prepare an EIS, as required by Council of Environmental Quality (CEQ) regulations 40 CFR 1501.7. The NOI was published in the Federal Register on February 27, 2006. The goals listed in the NOI include 1) improve safety, 2) decrease congestion and 3) support community regional development.

Acknowledging the comprehensive/regional nature of the EC-EIS project, the City of Columbia, Boone County, and MoDOT entered into a partnering agreement to cooperatively undertake the EC-EIS. This agreement formalized the decision-making process that would be followed during the NEPA elements of the project. At its heart was a commitment to consensus decision-making. A copy of the partnering agreement is included in **Appendix C**.

B. Summary of Purpose and Need

The critical elements that define the purpose and need associated with the EC-EIS project are as follows:

- Address Traffic Congestion and Safety Concerns
- Complete the Major Highway Linkages between Eastern Boone County and Columbia
- Improve Access to Eastern Columbia

These critical elements have been identified through the evaluation of existing transportation facilities, the social and economic conditions of the project area, consultation with affected communities, input from public meetings and the business community, and input from environmental review agencies. These transportation problems were equally considered during the development and evaluation of alternatives.

In order for the critical elements listed above to be meaningful for decision-making purposes, additional measures are necessary. *Evaluation Criteria* are specific measurable topics that

define the purpose and need elements. *Evaluation Standards* are measurements that define how well an alternative succeeds at accomplishing the evaluation criteria. The remainder of this section and **Table I-1** summarize the important components associated with the EC-EIS purpose and need.

EAST COLUMBIA ENVIRONMENTAL IMPACT STATEMENT
MODOT JOB NO. J5S0636

TABLE I-1
 Purpose and Need Summary

Purpose and Need Element	Evaluation Criteria	Evaluation Standard
Address Traffic Congestion and Safety Concerns	Is congestion on the existing roadway network improved compared to forecasted design year conditions?	To minimally achieve the project's purpose and need, an alternative should be an improvement over the conditions predicted for the no-build alternative.
	Are identified crash hotspots addressed?	To minimally achieve the project's purpose and need, an alternative should address each of the hotspots within its footprint.
	Are the design year levels of service (LOS) at the secondary roadway intersections adequate?	To minimally achieve the project's purpose and need, an alternative should be an improvement over the conditions predicted for the no-build alternative.
	Are emergency service response times hindered by traffic bottlenecks?	To minimally achieve the project's purpose and need, an alternative should have adequate pathways to the existing emergency response services.
Complete the Major Highway Linkages between Eastern Boone County and Columbia	Is the proposed roadway network consistent with the major roadway plan (MRP)?	To minimally achieve the project's purpose and need, an alternative must maintain the number of each of the roadway types.
	Does the proposed roadway system provide adequate connections to I-70, US-63, and Route 740?	To minimally achieve the project's purpose and need, an alternative should provide connections to a majority of the existing interchanges at I-70, US-63, Route 740, and Route WW.
	Is the alternative consistent with the Columbia Area Transportation Study Organization (CATSO)'s MRP roadway type?	To minimally achieve the project's purpose and need, an alternative should have no significant deviations from the roadway type identified in CATSO's MRP.
Improve Access to Eastern Columbia	Does the alternative create a discernable community gateway?	To minimally achieve the project's purpose and need, an alternative should reasonably address each of the attributes of a successful gateway.
	Can the alternative accommodate adequate pedestrian and bicycle facilities?	To minimally achieve the project's purpose and need, an alternative should (1) have no obvious hindrance to constructing bridges that would accommodate all existing and proposed trails, and (2) have no clear right-of-way constraints that would prevent the roadway from being designed in a manner that would allow it to be designated as a "Green Route," as defined by the Columbia Parks and Recreation and <i>Open Space Plan</i> .
	Will the alternative accomplish the area's designated growth and development goals?	To minimally achieve the project's purpose and need, an alternative should not be classified as inconsistent with essential community goals by Columbia, CATSO, or Boone County.



1. Critical Element 1: Address Traffic Congestion and Safety

The current roadway network's congestion and crash environment is expected to worsen over time. One of the goals of this project is to ease congestion and improve safety along the existing roadway network. A summary of the crash and congestion conditions experienced in the study area is contained below.

a. Crashes

Crash data for the years 2002 through 2007 indicate that crash hotspots occur throughout the study area. For example, while crashes occur along the entire length of Route WW, the curve in the vicinity of the bridge over the North Fork of Grindstone Creek is one location where crashes occur with greater frequency. Approximately 25 percent of all accidents that occur on Route WW between Keene Street and Olivet Road are located near this bridge location. Other examples of crash hotspots include the two areas along St. Charles Road near the I-70 interchange and at Keene Street, where crashes are concentrated. A final crash hotspot example is at the intersection of Olivet Road and Route WW where 90 percent of the crashes on Olivet Road occur.

When compared to the Missouri statewide averages, total crash rates, fatal crash rates, and injury crash rates exceed the statewide average crash rates for similar roadways. This suggests that roadway configurations may be insufficient for existing conditions and that improvements to the transportation network are necessary, especially at crash hotspots, intersections, and congested areas.

b. Congestion

The overall volume of traffic on roadways in the study area is projected to increase between 76 percent and 450 percent by the year 2030. Under the no-build scenario, these increases would result in poor operational conditions.

An important tool used in the evaluation of roadway congestion is the metric level of service (LOS), which is also a measurement of a roadway's capacity to handle traffic demand. Factors such as truck percentages, the number of driving lanes, lane widths, vertical grades, presence or absence of traffic signals, and type of access and spacing allowed are used to calculate LOS. The LOS ranges from A to F in order of decreasing operational quality. Generally, the Missouri Department of Transportation (MoDOT) considers an LOS of C (off-peak) and LOS of D (peak) acceptable for rural roadways, and an LOS of D (off-peak) and LOS of E (peak) acceptable for urban roadways in the design year. Given these thresholds, most of the study area roadways will operate at an unacceptable LOS by 2030.

An additional LOS analysis was conducted to evaluate the congestion at the intersections in the study area. This analysis included the use of traffic signal timing data as well as the physical dimensions and lane configuration of the intersections. Planned roadway projects were also considered. Many of the area's intersections currently operate at acceptable levels. However, more than 75 percent of the evaluated intersections are forecasted to decline to LOS E or F for either the morning or evening peak hour, or both, by 2030.

c. Summary of Traffic Congestion and Safety Concerns

Analysis indicates that overall crashes on most roadways within the study area exceed the statewide average rate for similar roadways. Congestion is expected to worsen along study area roadways as well as at intersections. The material contained in this document is a summary of the data contained in the DEIS. For example, **DEIS Tables I-2 through I-5** present crash summaries, comparisons of crash rates and statewide averages, existing and forecasted (No-Build) levels of service.

The evaluation criteria used during the EC-EIS to determine how well alternatives accomplish this element of the project's purpose and need included the following:

- Is congestion on the existing roadway network improved as compared to the forecasted design year conditions?
- Are identified crash hotspots addressed?
- Is the design year LOS at the secondary roadway intersections adequate?
- Are emergency service response times hindered by traffic bottlenecks?

d. Update of Traffic Congestion and Safety Concerns

The Preferred Alternative is expected to address the region's congestion and safety concerns. For example, amongst the local roadways, there will be several improvements from the implementation of the Preferred Alternative.

- The portion of Route WW between Keene and El Chaparral is expected to improve from a LOS E (no-build) to LOS B under the Preferred Alternative.
- The portion of Route WW between El Chaparral and Daniel Boone is expected to improve from a LOS E (no-build) to LOS A under the Preferred Alternative.
- The portion of St. Charles Road between Keene Street and Albany is expected to improve from a LOS E (no-build) to LOS D under the Preferred Alternative.
- The portion of St. Charles Road between Grace and I-70 Drive is expected to improve from a LOS E (no-build) to LOS D under the Preferred Alternative.

While other local roadway segments didn't exhibit the degree of improvement necessary to result in a LOS class improvement, the underlying metrics (e.g. volume to capacity) also showed improvements.

In addition to the improvements to existing local roads, the Preferred Alternative will also provide new roadways that will operate without congestion. The design of the extension Stadium Boulevard Extension and the Ballenger Extension will be adequate to ensure adequate operational quality.

2. Critical Element 2: Complete the Major Highway Linkages between Eastern Boone County and Columbia

The existing roadway system has some notable areas of discontinuity. One of the purposes of the EC-EIS project is to investigate the type of roadway system that is appropriate for the

future of eastern Columbia/Boone County. An essential element of this investigation is to establish adequate continuity.

a. The Consequences of Inadequate Highway Linkages

The study area falls within the planning area of the Columbia metropolitan area. The major roadways in the study area are US-63, I-70, and Route 740. There are no internal linkages between these roadways. The lack of major highway linkages within the study area results in travelers using the local roadway network for trips to and from Columbia and beyond. This additional travel on the local system contributes to the crash and LOS conditions outlined earlier in this section.

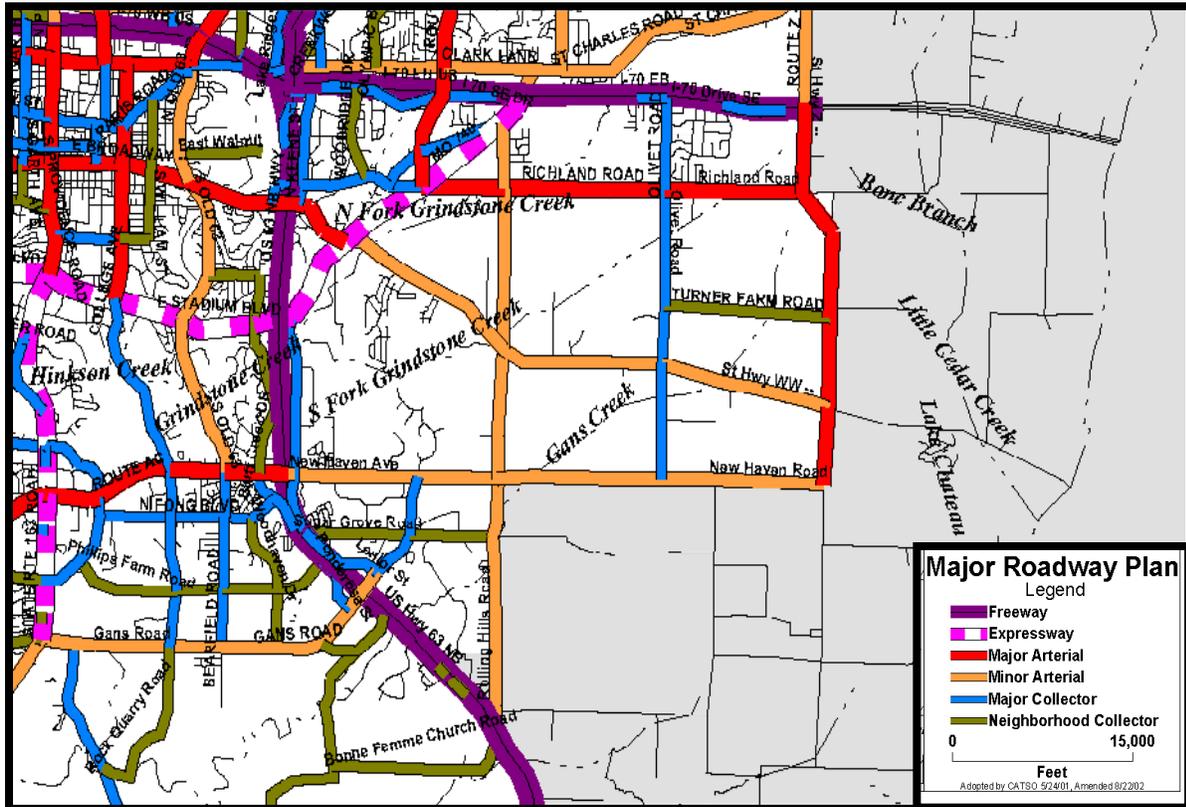
As an example, the lack of major highway linkages in eastern Columbia is a contributing factor to the reliance on US-63 for local connections, especially to and from Route 740. A License Plate Trace Survey conducted as part of the I-70/US-63 Major Investment Study (BWR Corp, 2000) found that 34 percent of vehicles entering US-63 at Route 740 exited at the next interchange (Route WW). In other words, the lack of internal linkages forces drivers to use major highways for local purposes. This sort of diversion not only increases trip lengths, but also unnecessarily degrades important state-wide transportation corridors.

Another example from the License Plate Trace Survey that illustrates the problems of internal linkages was the 22 percent of vehicles observed on Route 740 that were also observed near the I-70/St. Charles Road interchange. To maneuver from Route 740 to I-70, traffic is required to use inefficient pathways that require either longer trips on major roadways or more direct trips on slower local roads. The continued development and increasing congestion in the study area will place additional strain on the existing roadways.

Transportation planning for the Columbia metropolitan area is the focus of the Major Roadway Plan (MRP). The MRP is a component of the region's long-range transportation plan (Columbia Area Transportation Study Organization [CATSO] *2025 Transportation Plan*). The MRP completes the linkages between arterials on the east side of Columbia, which would allow local traffic to avoid the freeways and improve connections to existing freeway interchanges from the study area for regional travel.

Consistent with 23 CFR 450.324(d), the improvements proposed in this EIS are included in Columbia's MRP. **Figure I-1** is a snapshot of the MRP for the EC-EIS study area. Improvements depicted include upgrading Richland Road, Rangeline Road, Route WW, and New Haven Road to major or minor arterials. More significantly, the MRP includes an expressway extension of Route 740 between the interchange at US-63 to the existing St. Charles Road interchange at I-70. This expressway would serve as the linchpin connector between Route 740 west of US-63 and most of the primary roadways east of US-63. The MRP also proposes a new major arterial across I-70 to connect Richland Road to Ballenger Lane (a major arterial north of I-70). This new arterial is intended to reduce through traffic on St. Charles Road through the I-70 interchange area.

FIGURE I-1
 CATSO 2025 Transportation Plan (Major Roadway Plan)



b. Summary of Highway Linkage Deficiencies

In east Columbia, the major roadways are US-63, I-70, and Route 740. The existing roadway system has some notable areas of discontinuity. There are no internal linkages between these roadways. One of the purposes of the EC-EIS project is to investigate the type of roadway system that is appropriate for the future of eastern Columbia/Boone County.

The evaluation criteria used in the EC-EIS to determine how well alternatives accomplish this critical element of the project’s purpose and need included the following:

- Is the proposed roadway network consistent with the MRP?
- Does the proposed roadway system provide adequate connections to I-70, US-63, and Route 740?
- Is the alternative consistent with CATSO’s MRP roadway type?

3. Critical Element 3: Improve Access to Eastern Columbia

In addition to the connectivity purposes discussed above, one of the purposes of this project is to provide the transportation infrastructure consistent with the creation of an eastern access point for Columbia. This is a concept broader than strictly providing major roadway linkages,

as described above. This element addresses attributes that would help to incorporate this developing eastern area into the metropolitan community at large. This element of the purpose and need includes providing the following essential non-roadway linkages.

a. Eastern Access Point

Eastern access to the center of Columbia, including the City’s major civic functions as well as the University of Missouri, is from US-63 to local roads such as Broadway, New Haven Road, and Route 740. As the City has expanded and traffic congestion has increased, this approach has become outmoded. This approach tends to isolate the eastern area from the rest of the metropolitan area, and does not offer an identifiable eastern access point from I-70.

A single, identifiable gateway would provide more centralized access to all parts of the city center and improved access in the study area. This central access would also provide an opportunity for incorporating design features and aesthetic enhancements that broadcast the community’s unique image.

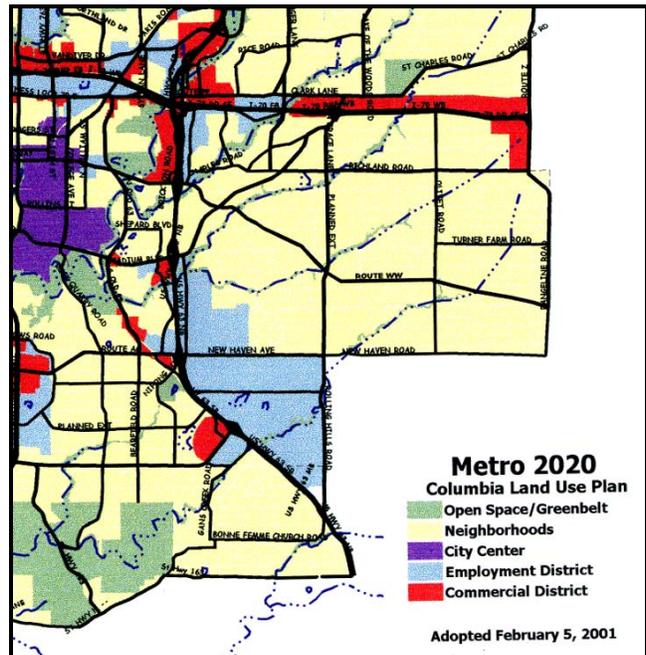
b. Growth/Development Goals

Centralized and improved access is an important part of the continued development of the study area as a primarily residential area, as shown in the *Metro 2020 Land Use Plan* (see **Figure I-2**). Easy access to the city center, major commercial areas, and major employment areas will support the development of additional housing to meet the forecasted needs for the area and encourage consolidated neighborhood development rather than discontinuous, sprawling development to which it is difficult to provide services.

c. Multimodal Considerations

The City of Columbia and CATSO have a strong interest in the development of multimodal transportation systems. This is evidenced by the constructed and planned bike/pedways at numerous locations in Columbia, most notably in the City center and in the northern part of the City of Columbia. Recent projects, such as the East Broadway widening and improvements, between Old US-63 and US-63, have been designed and constructed with bike/pedways. Transportation objectives in the *Metro 2020 Plan* include the development of a comprehensive pedestrian and bicycle trail network, and encouragement of bicycle travel for commuting as well as recreational purposes.

FIGURE I-2
Metro 2020 Land Use Plan



d. Summary of Access to Eastern Columbia Issues

An identifiable eastern gateway to the city from I-70 is important to the project's local planning partners—the City of Columbia and Boone County. This centralized access point will improve access to the city center as well as the study area, and encourage the planned development of the eastern metropolitan area. The project should also allow for the accommodation of multimodal transportation, particularly bicycle and pedestrian travel for both recreation and commuting.

The evaluation criteria used in the EC-EIS to determine how well alternatives accomplish this element of the project's purpose and need included the following:

- Does the alternative create a discernable community gateway?
- Can the alternative accommodate adequate pedestrian/bicycle facilities?
- Will the alternative accomplish the area's growth/development goals?

C. Clarifications to the Draft Environmental Impact Statement

1. Phased Construction

As proposed, the Preferred Alternative is a multi-component project composed of several elements. Nothing about the purpose and need or the consolidated nature of the Preferred Alternative is intended to constrain the flexibility of the design and construction process for this project.

The scheduling of the individual project elements will be developed based on available resources in accordance with the processes outlined in the MoDOT Engineering Policy Guide. There is currently no schedule for the design or construction process.

A commonly used technique that is related to design/construction flexibility is the potential for phased construction. For example, the ultimate development of a new alignment expressway can be done in phases—perhaps a traditional two-lane facility will be initially constructed with later modifications adding capacity and access improvements as they become necessary. Given the many elements of the EC-EIS, the use of phased construction is likely. Other similar techniques may also be implemented.

The public involvement process for the project will continue and will be the best source for accurate and timely updates regarding the project's schedule.

2. Coordination with the *Improve I-70* Project

Continued coordination between the EC-EIS and the *Improve I-70* project is vital. Connectivity with I-70 is an important element of the EC-EIS project. The two projects are not only related, but also overlap one another in the preliminary development process.

In 2006, the widening of I-70 to six lanes was recommended in the *Improve I-70* project and all necessary approvals were obtained. The interchanges on I-70 were also evaluated and modifications were proposed, as necessary. The EC-EIS utilized the recommended I-70

interchange configurations in its evaluations. In 2008, MoDOT began an evaluation to determine whether and how truck-only lanes in the 200-mile I-70 corridor would help to better achieve the goal for the project. This effort is known as the I-70 Supplemental Environmental Impact Statement (I-70 SEIS). The I-70 SEIS selected the Truck-only Lanes Strategy as the Preferred Alternative for the I-70 SEIS. This approach involves a configuration that provides four general purpose lanes, four truck-only lanes, and slip ramps to allow trucks to use existing interchanges and as many as seven truck-car separated interchanges. The nearest truck-car separated interchange to the EC-EIS is the US-63 interchange. The Final SEIS was circulated for comment in May 2009. The Record of Decision was signed on August 14, 2009.

Overall, the coordination between the I-70 SEIS and EC-EIS study teams was very good. In fact, many of the key partners were involved in both projects, which include technicians, administrative staff, governmental representatives, and agency oversight personnel. Consequently, the Preferred Alternatives for the I-70 SEIS and EC-EIS are expected to work together to satisfactorily satisfy the goals of both projects.

Nevertheless, it is important that any changes to either project be coordinated to ensure that potential conflicts are avoided.

3. Coordination with Ongoing Local Projects

Throughout the planning of the EC-EIS, several non-traditional projects were included in the project's evaluations. These were projects like the Gans Road project, Lemone Industrial Boulevard, Cinnamon Hill realignment, and the Rolling Hills Road Improvements. These projects are public-private partnerships and are depicted, to the extent possible, on the project EIS graphics. Based on the coordination with appropriate representatives, they should be developed in the same general timeframe as the EC-EIS. As with the I-70 project, any substantial changes should be coordinated to ensure that any potential conflicts are avoided.

4. Bike and Pedestrian Facilities

Among the evaluation criteria for the purpose and need for the project is one that involved an evaluation of the capability for each alternative to accommodate bicycle and pedestrian facilities. Environmental Commitment #14 delimits the extent to which the project is required to implement such facilities. **Summary Section J** provides a summary of the environmental commitments for the project.