CHAPTER II
Alternatives

A. Summary of Alternatives

1. Overview of the Decision-Making Process

This text summarizes the evaluation of alternatives that were developed during the DEIS. The development and evaluation of alternatives were based on engineering evaluations; agency coordination; consideration of social, economic and environmental impacts and public input. Among the alternatives analyzed were the desirability of bypassing the SIU 4 portion of I-70, the possibility of implementing alternatives that would not require the complete reconstruction of the existing corridor (such as the No-Build Alternative or transportation demand/management) as well as various reconstruction alternatives.

The process to identify the preferred alternative was based on a screening process that began by identifying a wide range of initial alternatives to address the transportation needs of I-70. The alternatives were then screened based on engineering evaluations; agency coordination; consideration of social, economic and environmental impacts and public input. **Figure II-1** visually depicts the overall process of alternative development and evaluation. The basic steps were as follows:

- Re-evaluate the **corridors** that emerged from the First Tier EIS. The corridor alternatives include improving the existing I-70 corridor, developing a Near North Corridor and developing a Far North Corridor. The Near North and Far North Corridors are one-mile-wide (1.3-km-wide) bands without a specific freeway alignment.

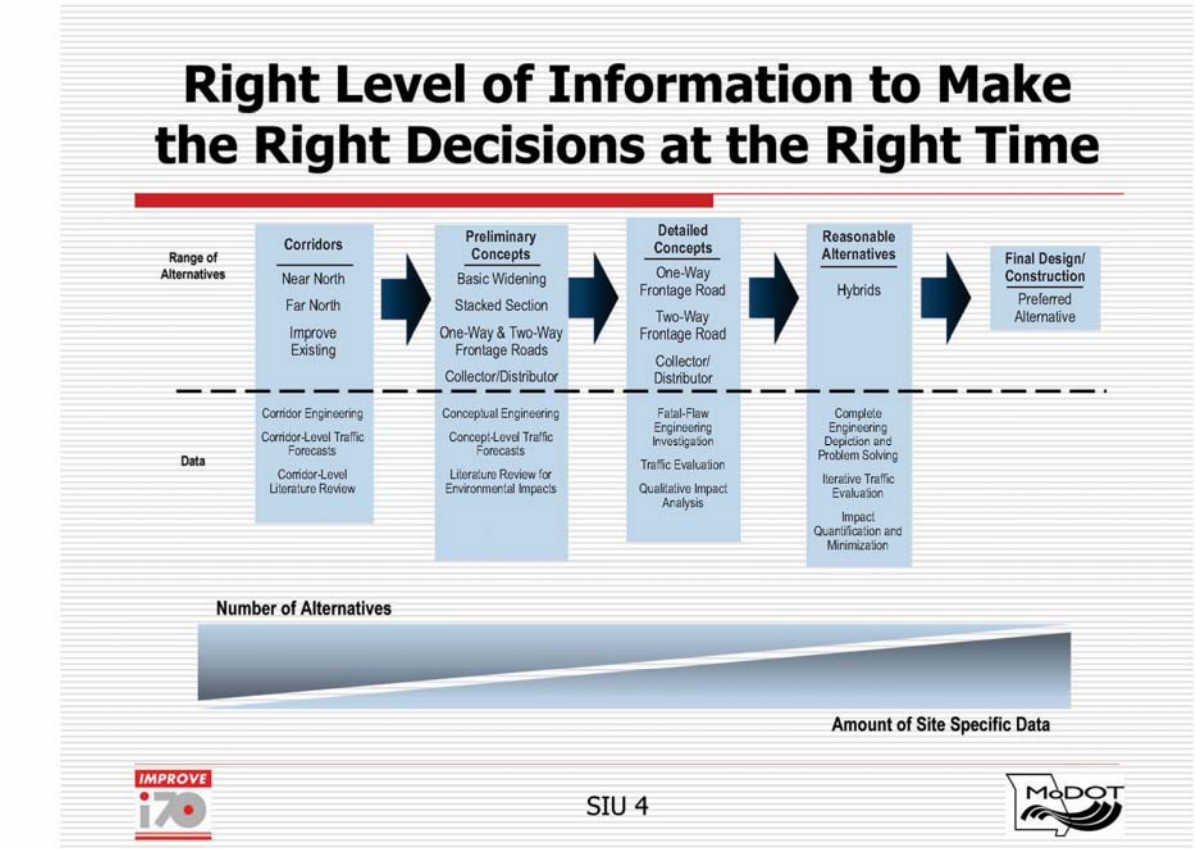
- Screen the corridors to determine whether improvements to only the existing I-70 corridor would address future transportation needs or whether improvements in multiple corridors would be required to safely accommodate future traffic volumes.

- Develop a range of preliminary alternatives or **concepts** within the corridor(s) that have been screened.

- Determine whether each concept is reasonable and responsive to the project purpose and need and retain alternatives that address the existing deficiencies of I-70 (**reasonable alternatives**).

- Identify a **preferred alternative**, including adequate support for the identified alternative.

Figure II-1: Process of Alternative Development and Evaluation

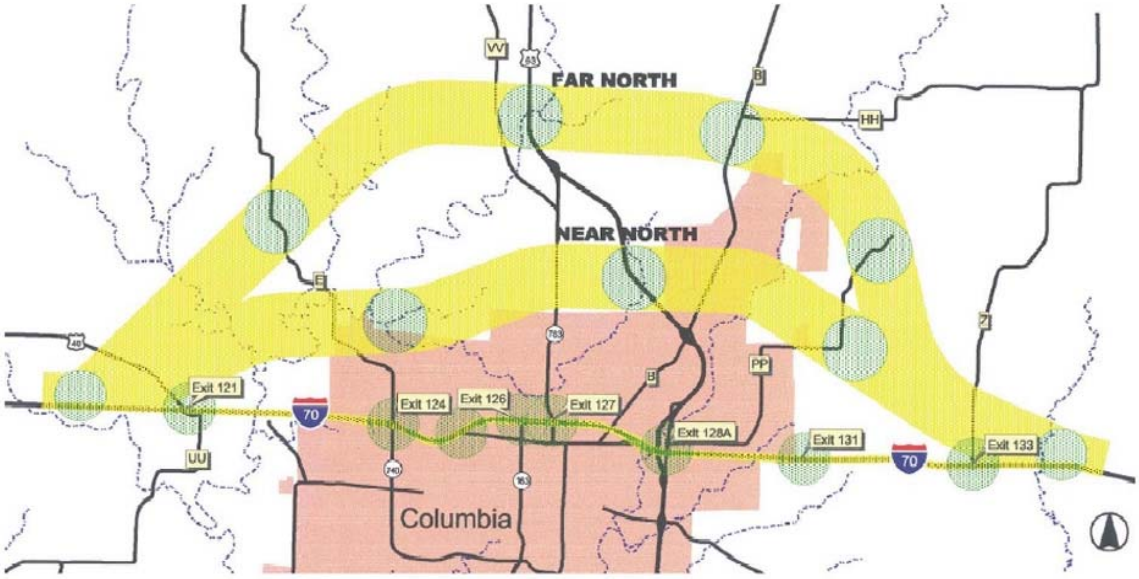


2. Corridors

With the approval of the First Tier EIS for SIU 4 in December 2001, FHWA approved the continued investigation of the *Widen Existing I-70 Strategy* for improving I-70. The *Widen Existing I-70 Strategy* proposed reconstructing I-70 within its existing corridor (see **Figure II-2**). Within SIU 4, it also proposed to investigate a new four-lane freeway, within a new corridor north of existing I-70[1], while also reconstructing existing I-70 to the extent necessary. The First Tier EIS identified two unique relocation corridors – the Far North Corridor and the Near North Corridor. These are shown in **Figure II-2**. The corridors were assumed to be one mile (1.6 km) wide, with four 12-foot (3.7-m) travel lanes. The corridors were assumed to have inside and outside shoulders and a 124-foot (37.8-m) median.

[1] The First Tier EIS concluded that relocating I-70 to the south of Columbia should not be considered because of unacceptable impacts to the environment and excessive travel distances.

Figure II-2: Corridor Location Map



Approximate Scale: One Inch = Three Miles

During the First Tier EIS, MoDOT used a statewide traffic model to predict traffic volumes in the Columbia area. The model was macroscopic, concentrating on the operation of I-70 on a statewide level. The analysis in the First Tier EIS concluded that while a northern I-70 corridor might reduce traffic on I-70, these traffic reductions would not be large enough to preclude the need to improve existing I-70. It is expected that under a No-Build scenario, all of I-70 within Columbia would operate poorly (worse than LOS D by 2030). Using the need to improve existing I-70 as a starting point, there were two steps in the Second Tier EIS corridor screening analysis, 1) to confirm whether the First Tier EIS finding was still true with the updated I-70 Columbia traffic volumes and 2) to determine whether transportation deficiencies on I-70 would be best addressed by improving only the existing highway or by improving the existing highway and developing a new highway north of I-70. The first step in comparing the corridors was to determine I-70 traffic volumes in 2030 without a northern corridor and traffic volumes with a Near North Corridor and a Far North Corridor (including traffic volumes on I-70).

The I-70 Columbia Travel Demand Model was used to forecast 2030 volumes for the existing, Far North and Near North Corridors (see **Table II-1)**.

Table II-1: Corridor Screening Traffic Volume Forecasts (2030)

Corridor	Volumes on New Corridors (ADT)*	Volumes on Existing I-70 (ADT)**	Predicted Traffic Reductions on I-70
Improve Existing I-70 Only	N/A	72,200–118,000	N/A
Far North	5,000–16,000	60,800–116,000	2%
Near North	30,000–60,000	20,000–91,700	22%

** ADT means Average Daily Traffic.*

*** Volumes on I-70 reflect three through lanes in each direction on the existing I-70 corridor.*

Among the important findings used in the decision-making process were the following:

- The Far North and Near North Corridor options were underused throughout their design life. This means that the volume of traffic using those corridors would be substantially lower than the volume those corridors would be capable of accommodating. Given the cost of developing roadways and the competition for funding, developing underused facilities is generally avoided. On average, only 10,700 vehicles per day would utilize a Far North Corridor while 95,300 would use existing I-70. On average, 39,800 vehicles would utilize a Near North Corridor while 73,900 would use existing I-70.
- To meet current design standards, this analysis suggested that three lanes in each direction would be required along the existing I-70 corridor from the western project terminus to U.S. 40 and four lanes in each direction would be required from U.S. 40 to the eastern project terminus.
- A large number of I-70 travelers are on local trips. This work quantified these levels and examined how a Near North Corridor and a Far North Corridor might affect them. Based on these data, local trips would continue to be high on existing I-70.
- A sensitivity analysis confirmed earlier indications that even though a new northern corridor may attract a fair amount of traffic, it would not be from travelers diverted from existing I-70. Consequently, the new corridor options would not appreciably improve conditions on existing I-70 or lessen the need for improvements.

Based on the Corridor Traffic Evaluation, the Far North Corridor was eliminated from further consideration because it was inconsistent with the purpose and need of the project. There is very little diversion of existing I-70 traffic onto the Far North Corridor. Overall, only about two percent of the traffic on I-70 would be rerouted to the Far North Corridor. Because the Far North Corridor would divert so few vehicles, it would have virtually no benefit on existing I-70 traffic operations. Consequently, the improvements required within the I-70 corridor would be virtually identical even after incurring the impacts and costs associated with developing the Far North Corridor.

The Near North Corridor would divert about 22 percent of the I-70 traffic. This represents roughly 26,000 vehicles per day, enough to warrant additional consideration. Because the Near North Corridor would offer some traffic relief to I-70, MoDOT decided to investigate the level of environmental and socio-economic impacts associated with constructing a freeway in that corridor and compare those impacts to the impacts of improving the existing I-70 corridor.

Overall, the analysis showed that the cost to build the Near North Corridor and minimal I-70 improvements would be $275 million more than improving I-70 alone. The difference is largely the result of the need for new roadways and structures. Other impacts associated with the Near North Corridor include approximately 1,500 acres of property acquisition, 180 acres of floodplain encroachments, 550 residential displacements and 990 acres of farmland impacts. Any alignment within the Near North Corridor would have higher costs and environmental and socio-economic impacts compared to building all the required improvements along the I-70 corridor only.

Following the completion of the corridor traffic evaluation and the corridor impact assessment, the Near North Corridor was eliminated from further consideration. Data used to make this determination included the following:

- The traffic analysis indicated that the Near North Corridor would draw significantly less traffic than its capacity could support. Conversely, alternatives consisting solely of improvements to I-70 would maintain a higher volume of traffic while operating at levels that meet the project's operational thresholds. Thus, the increase in expected impacts of building a highway along a new alignment in the Near North Corridor, in addition to the impacts of improving I-70, is not offset by a comparable increase in system economy.

- Even with the Near North Corridor, additional lanes would be needed on I-70 to allow it to operate at a minimally acceptable level. Even one additional lane would require replacement of every bridge along I-70 and the reconstruction of each interchange along the entire SIU 4 section of I-70 because of the way the existing structures are constructed, at a cost on the order of hundreds of millions of dollars.

- The analysis determined that any alignment within the Near North Corridor would have considerable environmental and socio-economic impacts as compared to building all the required improvements along the I-70 corridor only. Regardless of the optimum alignment, taking approximately 1,500 acres of land not currently used for highway purposes would result in numerous additional impacts.

3. Preliminary Concepts

The transportation problems within the I-70 corridor can be solved in several ways. The different solutions are referred to as *concepts.* This section discusses the work done at the preliminary concept-stage of the project. The preliminary concepts included concepts that do not involve the complete reconstruction, such as the No-Build concept and concepts based on Transportation Demand Management (TDM) and Transportation System Management (TSM)[2]. The preliminary concepts also included concepts that require the complete reconstruction of the existing I-70 corridor. Among the reconstruction concepts are a basic widening, a stacked section, two-way and one-way frontage road systems and a collector/distributor road system.

The concepts were evaluated in two stages. First, the concepts were developed and underwent a preliminary evaluation. Based on this evaluation, concepts determined to be feasible were advanced for a more detailed evaluation. This additional evaluation included detailed engineering, detailed traffic evaluations and quantification of project-related impacts. In general, the concepts represented the application of a single transportation technique across the entire urban or rural corridor. All five concepts were considered for the central city section (Stadium to U.S. 63). Only the basic widening and two-way frontage road concepts were considered for the remaining sections of the corridor. See **Figures II-3** through **II-7**.

[2] These are standard traffic management techniques that attempt to either improve the overall system or to modify demand.

Figure II-3: Stacked Section Concept

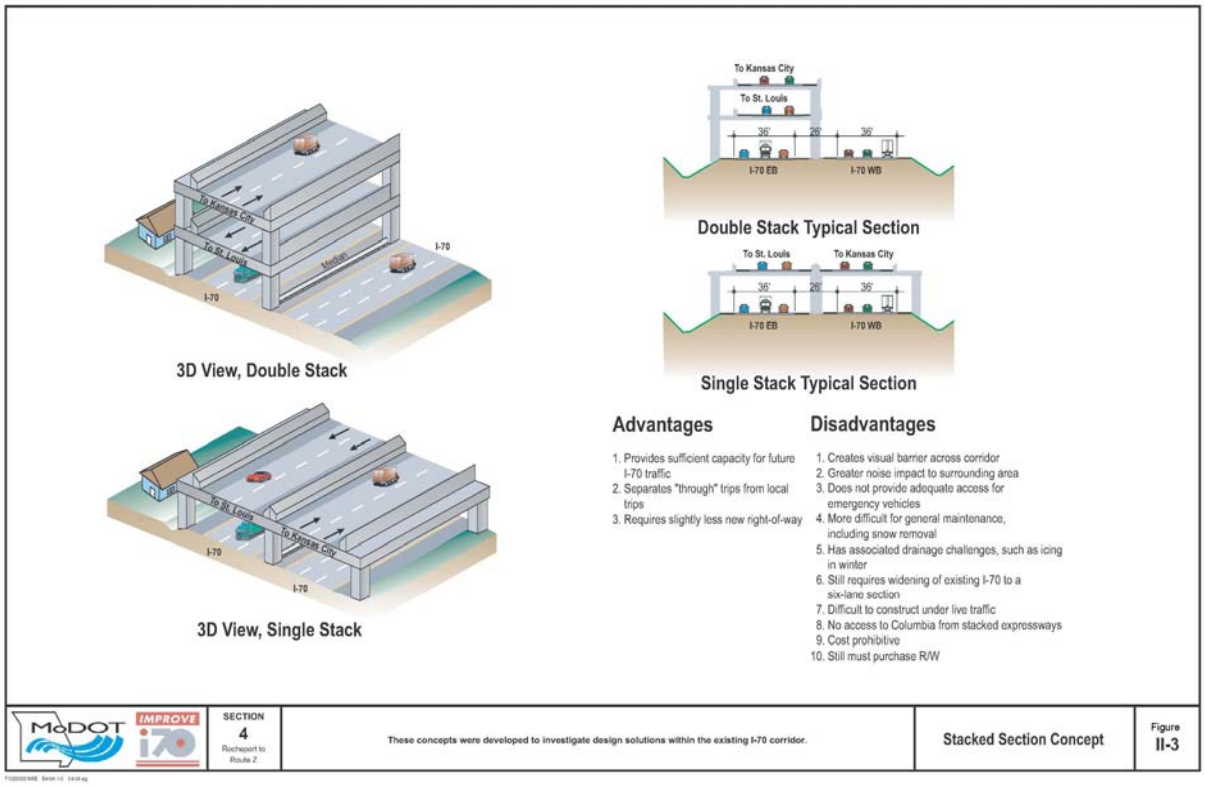


Figure II-4: Basic Widening Concept

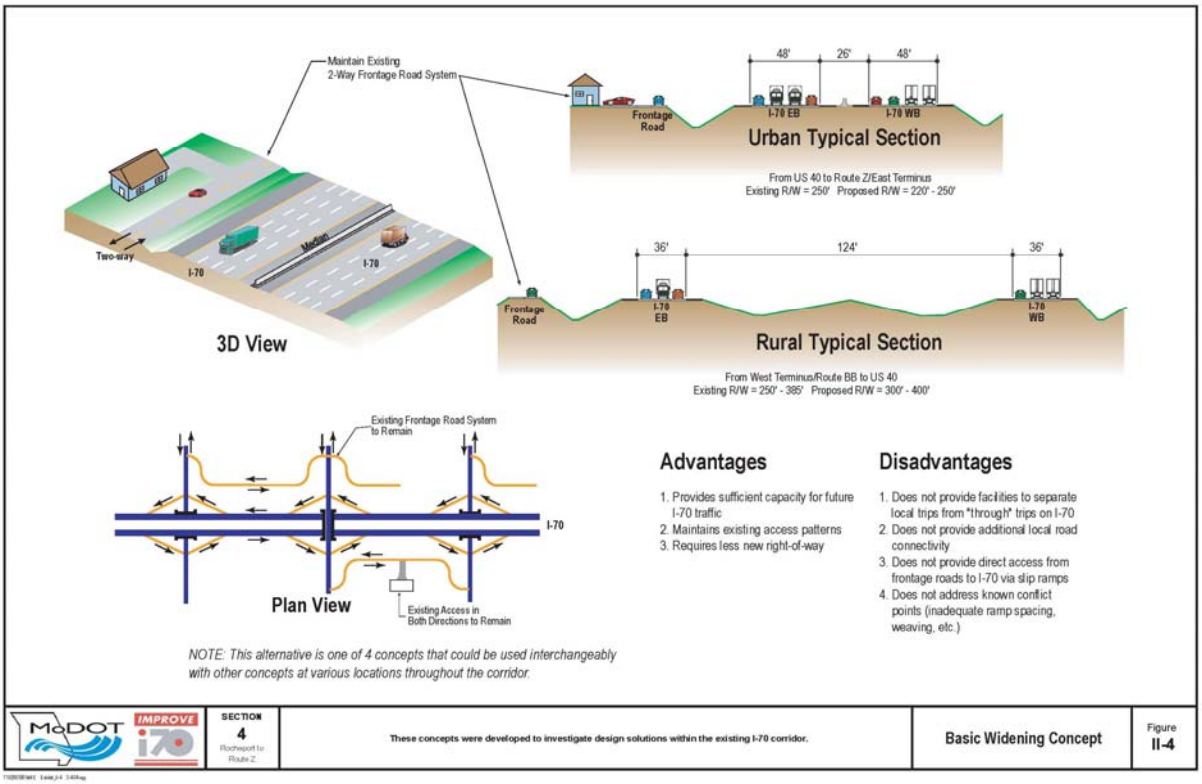


Figure II-5: One Way Frontage Road Concept

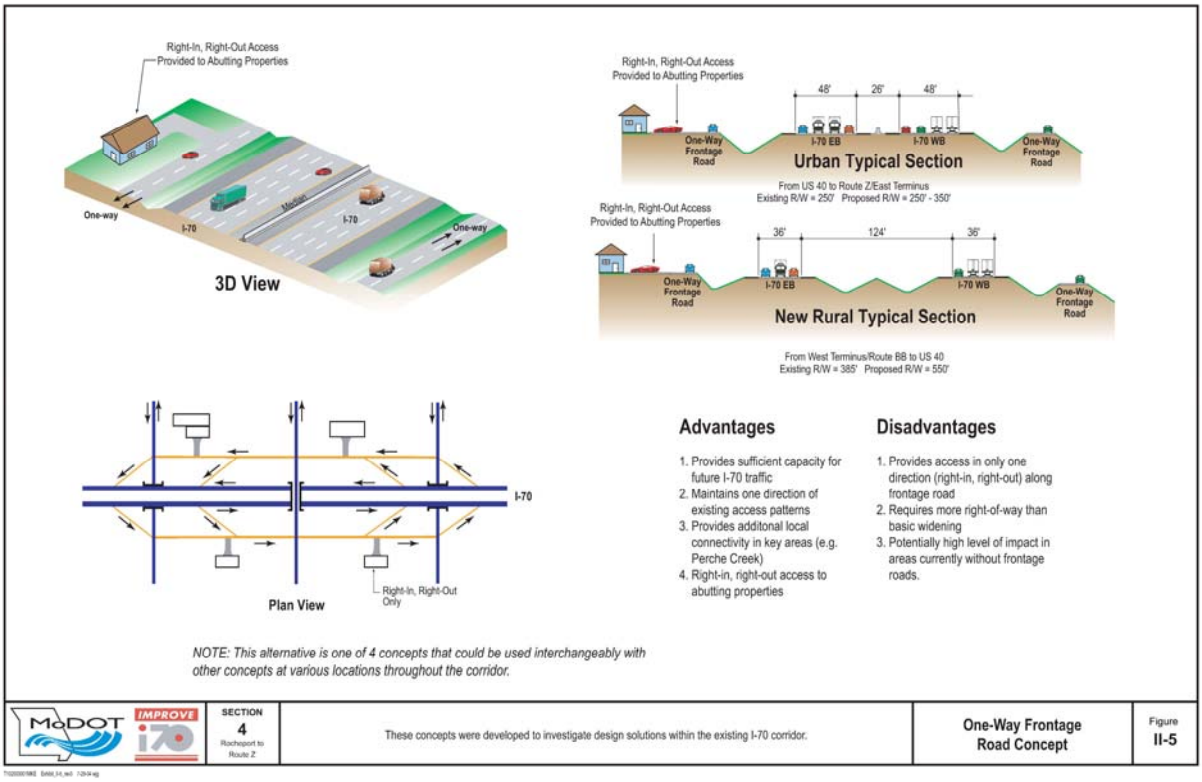


Figure II-6: Two Way Frontage Road Concept

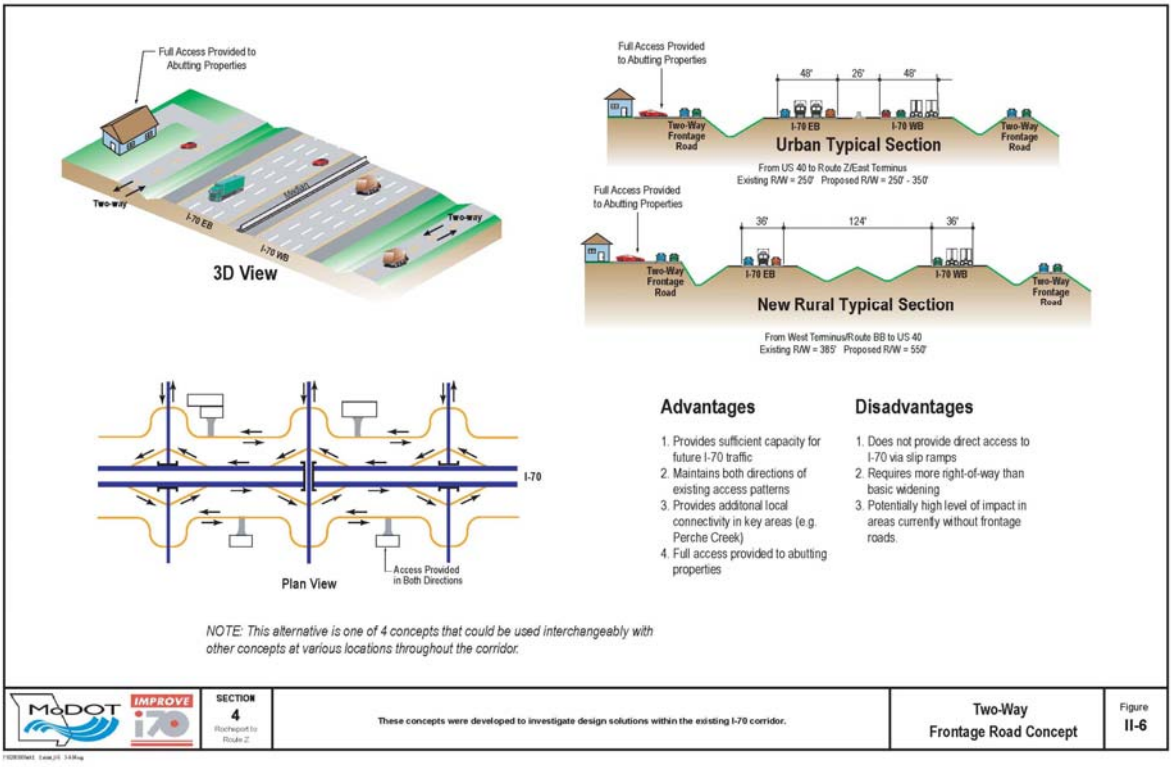
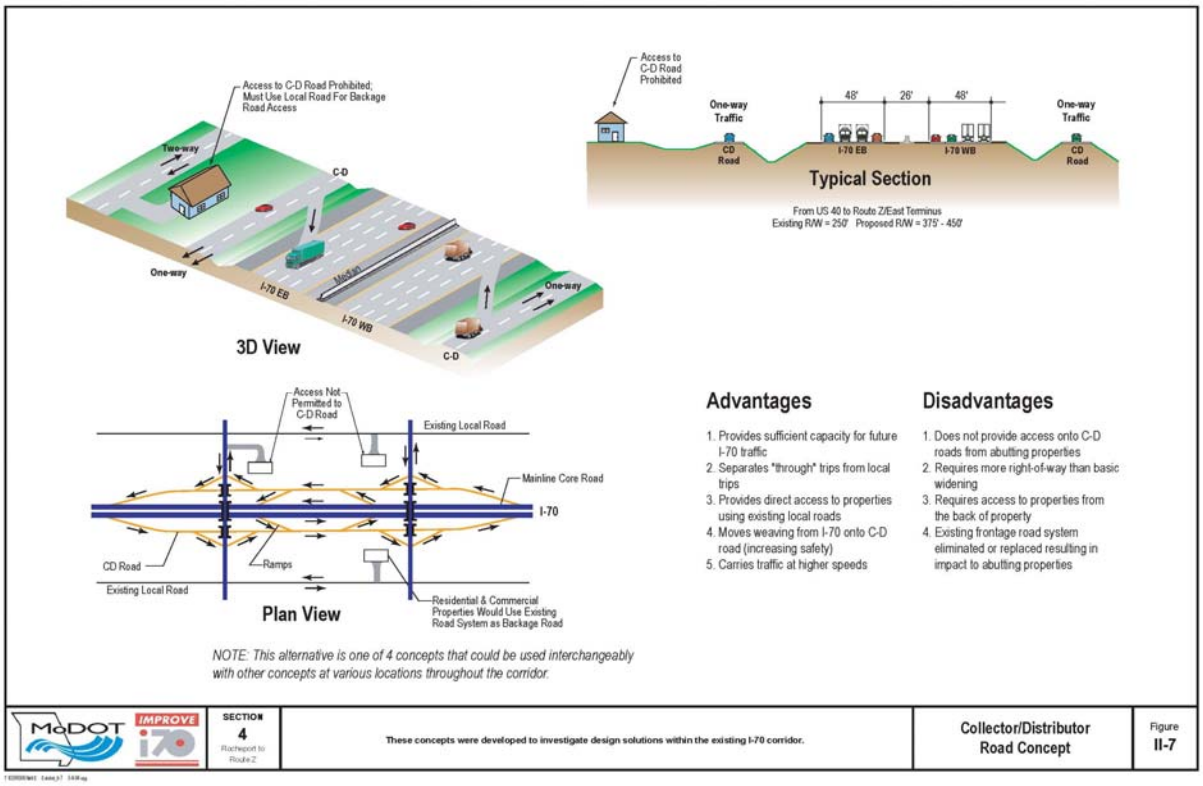


Figure II-7: Collector/Distributor Road Concept



Based on the preliminary concept evaluation, the basic widening and stacked section concepts were eliminated from further consideration. The basic widening concept would not even minimally satisfy the project's purpose and need. While it was unclear whether the stacked section concept could minimally satisfy the project's purpose and need, its other deficiencies led to its elimination from further consideration. For example, the stacked section provides very little ability to minimize project impacts, it has significant negative engineering impacts and it makes I-70 a larger and more insurmountable barrier.

4. Detailed Concept Evaluation

In September 2003, the two-way frontage road, one-way frontage road and collector/distributor road concepts were chosen to undergo a more detailed evaluation. The detailed concept evaluation included developing functional engineering depictions of the concepts, an iterative traffic engineering process to develop a configuration that would meet established traffic threshold levels and a quantitative impact assessment. Based on this work, it was determined that, on their own, no individual concept was optimal. As a result, a design process was undertaken to address the issues associated with the concepts in order to develop a range of reasonable alternatives that satisfy the project's purpose and need and minimize overall project-related impacts. The alternatives that emerged from this process would be hybrids—combinations and modifications of the concepts.

The important conclusions of the detailed concept evaluation that guided the development of the reasonable alternatives included the following:

- The need to consider phased implementation and overall cost minimization;
- The need to merge acceptable Stadium Boulevard configurations with appropriate frontage roads;
- The need to find better solutions to the merging problems at exits 126, 127 and 128;
- The need to address the access issues that arose during preliminary development;
- The need to minimize project-related impacts;
- The need to implement the most appropriate access control system;
- The need to address implications of a new interchange west of Stadium Boulevard; and
- The need to balance the impacts and the needs of U.S. 63 interchange.

5. Reasonable Alternatives

The reasonable alternatives represent those techniques that satisfy the project's purpose and need, meet the established traffic-related threshold levels, meet engineering requirements and minimize impacts to the human and natural environment. The reasonable alternatives emerged from the information that was developed during the concept phase of the project and validated by supplemental investigations conducted for the reasonable alternatives. The reasonable alternatives are summarized in **Table II-2**.

Table II-2: Key to Reasonable Alternatives

Western Portion of Project Area: Western Terminus to Stadium Boulevard Interchange
Mile Marker 116.2 to Mile Marker 120.0, including MO-J/O Interchange
Reasonable Alternative #1: Diamond Interchange
Mile Marker 120.0 to Mile Marker 124.6, including U.S. 40 Interchange
Reasonable Alternative #1: Enhanced Diamond Interchange
Reasonable Alternative #2: Diamond Interchange with Southwestern Loop Ramp
Central Portion of Study Area: Columbia between Stadium Boulevard and U.S. 63
Mile Marker 124.6 to Mile Marker 125.2, Stadium Boulevard Interchange
Reasonable Alternative #1: Interchange with Northwestern Loop Ramp
Reasonable Alternative #2: Tight Diamond Interchange
Reasonable Alternative #3: Single Point Urban Interchange
Reasonable Alternative #4: Split Diamond Interchange
Mile Marker 125.2 to Mile Marker 126.0, Business Loop West Interchange
Reasonable Alternative #1: Two-Point Interchange
Mile Marker 126.0 to Mile Marker 128.0, MO-163, MO-763 and Business Loop East Interchanges
Reasonable Alternative #1: One-Way Frontage Road System
Reasonable Alternative #2: Collector/Distributor System
Mile Marker 128.0 to Mile Marker 130.0, U.S. 63 Interchange
Reasonable Alternative #1: Tight Right of Way Interchange Design
Eastern Portion of Project Area: U.S. 63 to MO-Z
Mile Marker 130.0 to Mile Marker 132.0, including St. Charles Interchange
Reasonable Alternative #1: Tight Diamond Interchange
Reasonable Alternative #2: Offset Diamond Interchange
Mile Marker 132.0 to Mile Marker 134.0, including MO-Z Interchange
Reasonable Alternative #1: Diamond Interchange
Reasonable Alternative #2: Diamond Interchange with Northwestern Loop Ramp

6. Identification of the Recommended Preferred Alternative

Based on all of the work conducted within the Improve I-70 project, a recommended preferred alternative was identified and presented in the DEIS[3]. The project team believed that the recommended preferred alternative satisfied the project's purpose and need, minimized negative environmental impacts and best balanced the costs and benefits of project development. This section will describe the recommended preferred alternative presented in the DEIS and examine the key data associated with its identification. The recommended preferred alternative consisted of the following reasonable alternative elements:

Western Part of Project Area: Western Terminus to Stadium Interchange

Mile Marker 116 to 120, MO-J/O Interchange	Diamond Interchange
Mile Marker 120 to 124, U.S. 40 Interchange	Enhanced Diamond

This portion of I-70 extends between mile 116 and 124. The mainline widening would occur to the south and grass medians would be maintained. The widening to the south minimizes impacts and allows for a seamless transition to the Missouri River crossing that occurs in SIU 3 (approximately 1.3 miles [2.1 km] west of the SIU 4 terminus). This would also minimize delays by using existing lanes during the construction process and reducing costs by minimizing the use of additional right of way.

Central Part of Study Area: Columbia between Stadium and U.S. 63

Mile Marker 124 to 125, Stadium Interchange	Tight Diamond
Mile Marker 125 to 126, Business Loop West	Two-Point Interchange
Mile Marker 126 to 128, 163/763/Business Loop East	One-Way Frontage Road
Mile Marker 128 to 130, U.S. 63 Interchange	Tight Right of Way Interchange

This portion of I-70 extends from mile 125 to 130. Overall, the mainline widening occurs symmetrically on each side for the existing highway[4]. Room for a maximum of eight lanes would be available. The existing frontage roads would be maintained and, in some cases, improved.

Eastern Part of Project Area: U.S. 63 to MO-Z

Mile Marker 130 to 132, St. Charles Interchange	Tight Diamond Interchange
Mile Marker 132 to 134, MO-Z Interchange	Diamond Interchange

This portion of I-70 extends from mile 130 to the eastern terminus. The mainline widening would occur symmetrically on each side for the existing highway. The existing frontage roads would be maintained and, in some cases, improved. Room for a maximum of eight lanes would be available.

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[3] In the DEIS, the term "recommended preferred alternative" was used. In the FEIS, the term is modified to "preferred alternative". Chapter II.B. of the FEIS will discuss the changes between the recommended preferred alternative presented in the DEIS and the preferred alternative presented in this FEIS. Since the differences between the recommended preferred alternative and the preferred alternative are very slight, the summary of the elements that comprise the recommended preferred alternative, presented here, are equally applicable to the preferred alternative.

[4] One important exception occurs in the vicinity of the Business Loop West interchange. An existing substandard curve would be improved in this area, resulting in widening to the north for the portion of I-70 west of Business Loop and to the south for the portion of I-70 east of Business Loop.

The process that led to the identification of the recommended preferred alternative included evaluations of impacts. The impact analysis included right of way impacts, environmental impacts, community impacts, displacement impacts, and engineering impacts along with an examination of the compatibility with CATSO priorities. Among the important engineering evaluations were investigations of construction staging and maintenance of traffic.

The recommended preferred alternative would operate well in the design year 2030. It would perform at or better than the established thresholds for acceptable operations. **Table II-3** shows the 2030 Peak Hour LOS for the mainline and interchanges.

Table II-3: Level of Service – Recommended Preferred Alternative

SIU 4 Subsections		2030 Peak Hour Level of Service		
		Desired LOS	Eastbound	Westbound
1	MO-BB to MO-J/O	C	C	C
	MO-J/O Interchange Area	C	C	C
2	MO-J/O to U.S. 40	C	C	C
	U.S. 40 Interchange Area	D	C	C
3	U.S. 40 to MO-740	D	C	C
	MO-740 Interchange Area	D	C	C
4	MO-740 to Bus Loop West	D	D	D
	Bus Loop West Interchange Area	D	C	C
5	Bus Loop West to MO-163	D	D	D
	MO-163 Interchange Area	D	D	D
6	MO-163 to MO-763	D	C	C
	MO-763 Interchange Area	D	C	C
7	MO-763 to Bus Loop East	D	C	C
	Bus Loop East Interchange Area	D	D	D
8	Bus Loop East to U.S. 63	D	C	C
	U.S. 63 Interchange Area	D	C	D
9	U.S. 63 to St. Charles Road	D	C	C
	St. Charles Interchange Area	D	D	C
10	St. Charles Road to MO-Z	D	B	C
	MO-Z Interchange Area	D	C	B

The interchange Area LOSs are composite LOSs, meaning that they represent the worst LOS of the respective ramps and mainline traffic within each interchange area.

The recommended preferred alternative is estimated to cost $653,808,000. **Table II-4** summarizes the main components that constitute this opinion of cost. This estimate is based on the preliminary engineering conducted to date. Because of the developed nature of the project corridor, the right of way costs are a large component of the total estimated cost; one that is notoriously difficult to estimate. For comparison, the projected costs associated with the No-Build Alternative are also included in **Table II-4**.

Table II-4: Opinion of Cost Comparison (2005 Dollars)

	Preferred Alternative	No-Build Alternative
Construction	$469,630,000	N/A
Right of Way	$134,886,000	N/A
Design Engineering	$23,481,000	N/A
Rehabilitation, O & M	$12,135,000	$23,171,000
ITS:		
Implementation Cost	$5,300,000	$5,300,000
Annual O & M Cost	$8,376,000	$8,376,000
Total	$653,808,000	$36,847,000

B. Clarifications of DEIS

The preferred alternative was altered in only one respect, from the recommended preferred alternative presented in the DEIS. The intersection of Fairview Road and Bernadette Drive was reconfigured pursuant to coordination with local transportation planning agencies. This alteration will be discussed below. Two other topics will also be addressed in this section – access points on the one-way frontage road system and the interchange ramps at Fairview. While these do not represent changes to the preferred alternative, they are topics that received substantial attention during the review of the DEIS. A complete depiction of the preferred alternative is contained in **Exhibits II-1A through II-1F**. The Chapter II exhibits are intended to depict all of the roadways (ramps, weaves, connectors and interchanges) that constitute the preferred alternative. Because of their detail, they obscure the affected environment. Consequently, the exhibits depicting project impacts, such as **Exhibit III-1A through III-1J**, show only the overall project footprint so that the resources impacted by the preferred alternative will be more clearly visible. **Summary Table S-1** contains a summary of the impacts associated with the preferred alternative.

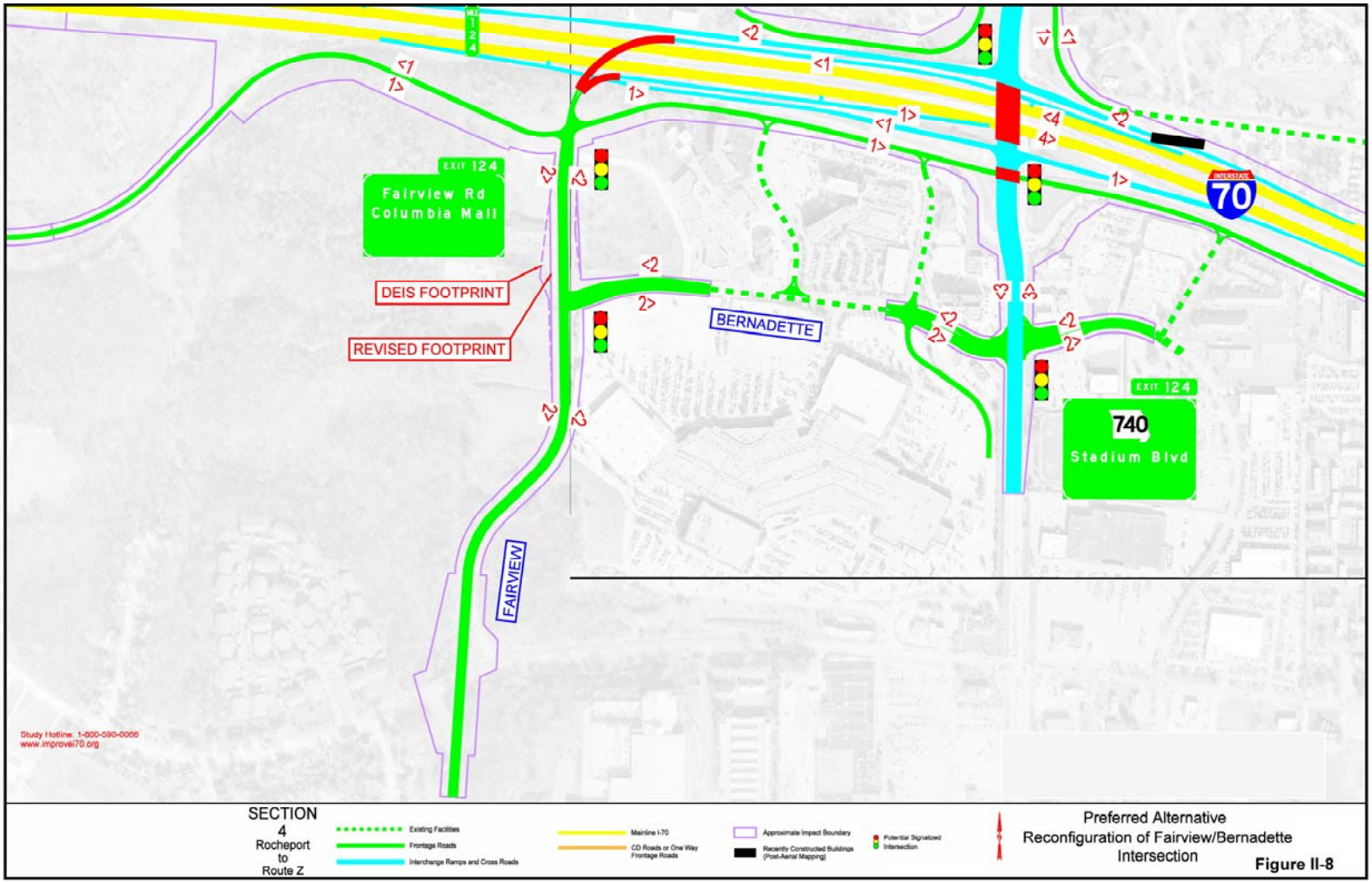
1. Configuration of Fairview/Bernadette Intersection

At the Stadium interchange, the recommended preferred alternative/preferred alternative includes fly-over ramps onto Fairview Road from westbound I-70 and from Fairview Road onto eastbound I-70. The inclusion of these ramps is a result of considerable detailed analysis of the operations of the Stadium interchange. In order to accommodate the traffic that the ramps would attract, the I-70 project area included Fairview Road, from its termini adjacent to I-70 to the Worley Street intersection – a distance of approximately one-half mile. The I-70 project area also includes the Fairview Road and Bernadette Drive intersection. The Preferred Alternative in

this Final EIS slightly modifies the Fairview/Bernadette intersection. This reconfiguration would minimize impacts and is the result of input from the local transportation planning agencies.

Figure II-8 depicts the new configuration. The change eliminates impacts to a City-owned utility. Overall, this change very slightly reduces the amount of right of way required for the project.

Figure II-8
Reconfiguration of Fairview/Bernadette Intersection



2. Access Points on One-way Frontage Road System

Throughout the project, an issue of frequent concern was the nature of the access that local businesses and landowners would have after I-70 was improved in Columbia. Several traffic control/access techniques were considered for the area encompassed by MO-163, MO-763 and the Business Loop East interchange. Ultimately, a one-way frontage system was chosen for this area. Because of continued interest in this topic, the data presented in the DEIS, regarding access in the triplets, will be summarized here.

The preferred alternative utilizes one-way frontage roads and Texas Turnarounds to access all directions to and from I-70. It also uses signals at each cross road. The widths of the frontage roads vary from two to four lanes to accommodate turning movements and ramp merging/diverging. The 163/763/Business Loop one-way system also provides the potential for a limited number of carefully located access points for adjoining landowners.

The one-way frontage road was preferred over the collector/distributor road (the other reasonable alternative) because of traffic operational differences and higher levels of support by the public, MoDOT, CATSO, the city of Columbia and other stakeholders. The one-way frontage road could potentially allow greater direct local access to abutting properties than other alternatives, but that access would be limited by the available capacity on the one-way system. Sensitivity analyses of the one-way system indicated that it could absorb an additional 15 percent (approximate) increase in design year volume without exceeding the established threshold limits. Development along the frontage roads and the associated traffic using the access points along the one-way system would need to be regulated to keep the additional volumes from impacting the level of service at the interchanges. Limited right-in/right-out movements would be possible in a few select locations.

The preferred alternative for the triplets (MO-163/MO-763/Business Loop East) is for a one-way frontage road system. This would create a new one-way frontage road, parallel to I-70, between mile markers 126.5 and 128. The on- and off-ramps at each of the three interchanges would be controlled by signalized intersections. Texas Turnarounds would allow traffic destined for the opposite frontage road to avoid the signalized intersections. The one-way frontage road system could also permit limited right-in/right-out movements between the frontage road and the adjoining businesses in a few select locations. Access is limited for operation and safety reasons and because of physical limitations due to the topography between the frontage road and the adjacent parcels. A maximum of seven access points could be implemented. The influence of traffic volumes entering the frontage road system has not been evaluated because development levels are unknown. It is possible that the influence of traffic volumes could reduce the number of possible access points. On the north side of I-70, three potential access points have been identified, all between the MO-763 and Business Loop East interchanges. On the south, four possible access points have been identified: three between the MO-763 and Business Loop East interchanges and one between the MO-163 and MO-763 interchanges.

3. Interchange Ramps at Fairview

The tight diamond design was identified as the recommended preferred alternative for the Stadium Boulevard (MO-740) interchange. The important constraints, such as COSMO Park and the highly developed Stadium Boulevard corridor, forced all of the reasonable alternatives into very similar and very constrained areas. The tight diamond is expected to have marginally

lower displacement impacts and construction costs. The fly-over ramps are a concern for many stakeholders. Fairview Road is not typically viewed as a road closely associated with the interstate. Its use, as proposed, would require its re-designation on the CATSO Major Roadway Plan. However, the tight diamond is still favored in regard to satisfying CATSO priorities. The issues associated with Fairview Road and the local transportation planning are discussed in several places in Chapter III of the DEIS (III.B.1.c, III.B.2.k, and III.B.3.c and d). Because of continued concern regarding the interchange ramps at Fairview, some of the data presented in the DEIS will be summarized here.

Traffic deficiencies, environmental constraints and a densely built urban environment make the Stadium Boulevard interchange among the most constrained locations within the project area. The reasonable alternatives include four interchange configurations. The reasonable alternative configurations differed from those developed and evaluated at the concept stage. The reasonable alternatives represented the incorporation of public involvement and agency coordination. Further, the reasonable alternatives incorporated the efforts undertaken to avoid and minimize impacts to social, economic and environmental resources (they also meet the objectives of the project's purpose and need and satisfy the project-related traffic threshold service levels).

The first Stadium Boulevard reasonable alternative is a modified diamond interchange with a loop ramp in the interchange's northwestern quadrant (Stadium Boulevard northwest loop ramp). The loop ramp is provided to eliminate the left turns associated with westbound I-70 traffic exiting at Stadium Boulevard. This greatly increases the footprint of the project in the northwestern quadrant but yields operational benefits. Two fly-over ramps are also essential parts of this configuration. One allows westbound I-70 traffic to bypass the Stadium Boulevard interchange and exit to the south side of I-70 via Fairview Road. The other ramp allows travelers to enter I-70 (eastbound) from Fairview Road. These ramps reduce traffic at the Stadium Boulevard interchange and the Bernadette/Stadium intersection by directing it to Fairview Road. Further discussion on the ramps to and from Fairview is located below. The Stadium Boulevard northwest loop ramp is depicted on DEIS Exhibit II-15.

The second Stadium Boulevard reasonable alternative is a tight diamond interchange (Stadium Boulevard tight diamond). The Stadium Boulevard tight diamond attempts to minimize the footprint while retaining the functionality of a standard diamond. Footprint savings are accomplished through the use of retaining walls and context-sensitive design tolerances. These techniques are usually restricted to highly developed areas because of the high construction and maintenance costs. The tight diamond can generally be described as being symmetrically centered on the existing interchange. Two fly-over ramps are also essential parts of this configuration. One allows westbound I-70 traffic to bypass the Stadium Boulevard interchange and exit to the south side of I-70 via Fairview Road. The other ramp allows travelers to enter I-70 (eastbound) from Fairview Road. These ramps reduce traffic at the Stadium Boulevard interchange and the Bernadette/Stadium intersection by directing it to Fairview Road. The Stadium Boulevard tight diamond is depicted on DEIS Exhibit II-16.

The third Stadium Boulevard reasonable alternative is a Single Point Urban Interchange (SPUI). It is similar to the diamond in general appearance, but functions quite differently. It achieves operational benefits by combining the two signalized ramp intersections of a typical diamond into a single signalized intersection. Two fly-over ramps are also essential parts of this configuration. One allows westbound I-70 traffic to bypass the Stadium Boulevard interchange and exit to the south side of I-70 via Fairview Road. The other ramp allows travelers to enter

I-70 (eastbound) from Fairview Road. These ramps reduce traffic at the Stadium Boulevard interchange and the Bernadette/Stadium intersection by directing it to Fairview Road. The Stadium Boulevard SPUI is depicted on DEIS Exhibit II-17.

The fourth Stadium Boulevard reasonable alternative is a modified split diamond interchange (Stadium Boulevard split diamond). To segregate movements (and thus improve efficiency and mobility), Fairview Road is used to provide access to traffic to and from the west on I-70, thereby reducing the volume of traffic required to use the Stadium Boulevard interchange and the Bernadette/Stadium intersection. This uses an overpass at Fairview, one-way connections between Fairview and Stadium and multiple exits to accomplish this goal. The Stadium Boulevard split diamond is depicted on DEIS Exhibit II-18.

All but the split diamond alternative include fly-over ramps onto Fairview Road from westbound I-70 and from Fairview Road onto eastbound I-70. The inclusion of these ramps is a result of considerable detailed analysis, in coordination with CATSO, of the operations of the Stadium interchange.

A detailed traffic analysis of the Stadium interchange revealed that in the design year 2030, heavy volumes at the intersection of Bernadette and Stadium would cause the Stadium interchange to operate at an unacceptable LOS. Traffic queues at this intersection extended to the Stadium interchange and caused significant traffic problems at the south ramp terminal. The north ramp terminal also suffered heavy congestion in 2030 due to the heavy turning volume from westbound I-70 to southbound Stadium.

Early in the development of the interchange alternatives, consideration was given to providing ramps at Fairview Road to and from the east on I-70. Both ramp terminals and the intersection with Bernadette would see improved levels of service with the reduced traffic. Traffic destined for the commercial area in the southwest quadrant of the interchange would also have a less congested alternative access route.

During this period, CATSO adopted a placeholder on its Major Roadway Plan for a new interchange between Stadium Boulevard and Perche Creek. The CATSO adopted interchange, referred to as the Scott interchange by many because of its general location, was intended to address traffic flows on a regional basis for the western part of Columbia. In order to make the best possible decision, CATSO agreed that the appropriate course of action was to allow the SIU 4 team to complete its I-70 analysis. The analysis would include the investigation of the Stadium Boulevard interchange and the issues associated with the new interchange supported by CATSO.

The SIU 4 project team analyzed various locations west of the existing Stadium interchange to determine the effectiveness of a new interchange in mitigating the traffic problems at Bernadette and Stadium. The traffic analysis was performed after reviewing and updating land use assumptions in this part of Columbia with CATSO. This land use update involved significant coordination with and concurrence from CATSO staff to determine what types of land use would be expected with the addition of a new access point onto I-70 in this general area.

The traffic analysis performed showed that the CATSO placeholder location provided benefit to traffic flows on the regional roadway network, primarily Broadway and Stadium near Broadway. However, the Scott interchange did not draw enough traffic away from the Stadium interchange and the intersection with Bernadette to improve operations. Through this analysis it was determined that ramps to and from the east at Fairview Road provided the most effective traffic

relief to allow the Stadium interchange and the Bernadette/Stadium intersection to operate at acceptable LOS.

It is important to note that while the traffic analysis dictates that these ramps would be required for proper operations in the design year 2030, it also shows that it is not necessary to build these ramps during initial construction of the Stadium Boulevard interchange improvements. The need for, and the timing of, the construction of the ramps to and from Fairview Road would be dependent on growth patterns in western Columbia. Missouri Department of Transportation would continue to work with the city of Columbia on the further development of these ramps and the inclusion of the ramps in the City's Major Roadway Plan.