

CHAPTER II

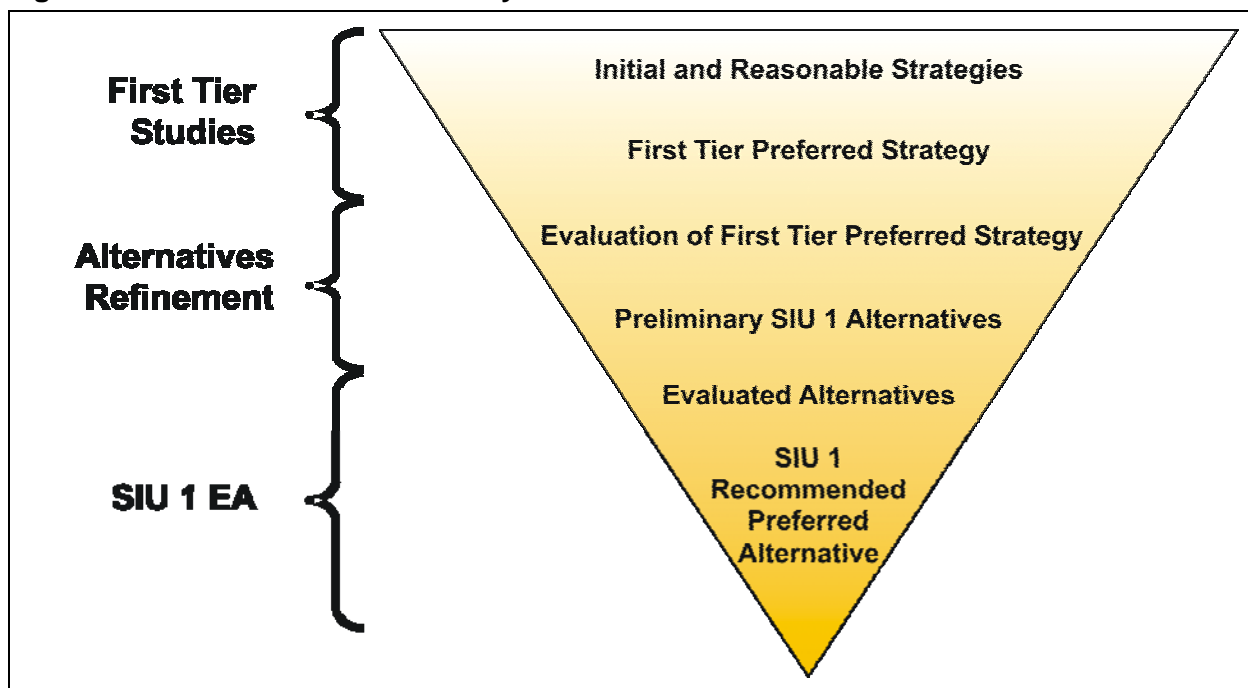
Alternatives Considered

A. Initial Alternatives

1. Introduction and Overview of Tiered Alternatives Analysis

The alternatives evaluated in this Section of Independent Utility (SIU) 1 Environmental Assessment (EA) were developed during a reasoned decision-making process that involved the project team, federal and state regulatory agencies, local authorities and the public. As illustrated in Figure II-1, the alternative analysis process was tiered in that the initial alternatives resulting from the First Tier Study were broad in scope and generally defined. During the Second Tier Study in SIU 1, the alternatives were refined to a greater level of detail through alternative refinement workshops and as increasingly more detailed evaluation criteria were applied. Throughout the tiered analysis, the alternatives were analyzed and screened based on their ability to meet the project purpose and need as defined in the First Tier Environmental Impact Statement (EIS) and in Chapter I of this EA. The alternatives selection process resulted in the identification of the Recommended Preferred Alternative (RPA) for SIU 1.

Figure II-1: Tiered Alternatives Analysis



2. Alternatives Selection Process

a. Introduction and Overview of Alternatives Selection Process

Since 1999, the Missouri Department of Transportation (MoDOT) has been studying I-70 between the cities of Kansas City and St. Louis. The tiered alternative selection process included a feasibility study and a First Tier EIS. Following the First Tier EIS, MoDOT and the Federal Highway Administration (FHWA) concluded that widening and reconstructing I-70 would be the most effective improvement strategy. Studies are being conducted in seven different SIUs to ensure that the location and general configuration of the I-70 improvements consider local issues as well as statewide concerns. As part of this EA, MoDOT is considering how to apply widening and reconstruction on a local level. This chapter presents a summary of the interchange configurations considered for SIU 1, the widening strategy for urban areas, where the urban to rural transition should occur and addresses decisions on whether I-70 should be widened to the north or south in rural areas, all of which resulted in the alternatives selected for detailed evaluation in this EA.

b. Summary of First Tier Alternatives and Recommendations

The First Tier EIS identified the following seven Initial Improvement Strategies for the I-70 Corridor:

- **Strategy No. 1 (No-Build)**
Preserve the existing I-70 freeway by completing rehabilitation and performing ongoing maintenance without adding new lanes or capacity.
- **Strategy No. 2 (Transportation System and Demand Management)**
Manage the demand and volume of traffic on I-70 through such programs as park-and-ride lots, variable message signs and other traveler information tools and intelligent transportation systems.
- **Strategy No. 3 (Widen Existing I-70)**
Improve existing I-70 by adding lanes and reconstructing the existing roadway to enhance safety and performance, including improved access management.
- **Strategy No. 4 (New Parallel Facility)**
Build a new parallel four-lane freeway or truckway close to and parallel with I-70 and improve access management at existing I-70 interchanges.
- **Strategy No. 5 (New Parallel Toll Road)**
Build a new four-lane parallel toll road close to and parallel with I-70 and improve access management at existing I-70 interchanges.
- **Strategy No. 6 (High-Occupancy Vehicle Lanes)**
Improve performance of I-70 through special new lanes reserved for high-occupancy or multi-person vehicles.
- **Strategy No. 7 (High-Speed Passenger Rail)**
Use high-speed passenger rail between Kansas City and St. Louis to alleviate some of the traffic pressure on I-70.

The First Tier EIS utilized public and agency input to perform an initial screening to evaluate the ability of each strategy to meet the Purpose and Need of the I-70 Corridor. Those strategies that were determined to not meet the Purpose and Need of the I-70 Corridor were eliminated from further consideration as a standalone strategy. These included:

- **Strategy No. 2 (Transportation System and Demand Management)**
TSM/TDM would adequately enhance I-70 operations only if combined with other improvements.
- **Strategy No. 6 (High-Occupancy Vehicle Lanes)**
The high occupancy vehicle lanes would not improve operations due to the highly dispersed nature of the origination and destination points for daily I-70 travel.
- **Strategy No. 7 (High-Speed Passenger Rail)**
High-speed passenger rail would provide benefits due to a conversion of highway traffic to an alternative mode. However, like TSM/TDM, high-speed rail alone would not improve daily, recurring congestion experienced in the I-70 Study Corridor.

The remaining four strategies, including Strategy No. 1 (No-Build) as a basis of comparison, were carried forward as Reasonable Strategies for more detailed evaluation. The First Tier EIS then evaluated the Reasonable Strategies: Strategy No. 3 (Widen Existing I-70), Strategy No. 4 (New Parallel Facility) and Strategy No. 5 (New Parallel Toll Road) in terms of their ability to accomplish the Purpose and Need of the I-70 Study Corridor. As indicated in the First Tier EIS Summary (Appendix A) these three strategies would have varying degrees of adverse impacts and benefits and there were distinguishing factors and issues which supported the identification of the preferred strategy.

As indicated in the First Tier EIS, public hearings were held during the week of August 27, 2001. During these public hearings and throughout the public involvement process, the following two general messages were identified by the public:

- **Concern for Safety** – The clearest message was that the experience of driving on I-70 elicits strong concerns from Missourians. Missourians are uniformly concerned for their safety when traveling on I-70.
- **Improvement Strategy Preference** – The preponderance of public input suggested a preference for widening the existing I-70. In general, the public expressed a higher degree of opposition to building a new parallel facility.

On this basis, MoDOT and the FHWA selected Strategy No. 3 (Widen Existing I-70) as the preferred alternative, along with the No-Build Alternative and transportation system management (TSM)/travel demand management (TDM) Alternative for further evaluation in the Second Tier Environmental Studies.

c. Evaluation of First Tier Recommendations

One of the first tasks associated with the Second Tier Studies was the evaluation of the widening recommendations made in the First Tier EIS. This section presents the analysis and results of this evaluation for SIU 1.

In summary, the First Tier EIS evaluation recommended that widening alternatives for I-70 in SIU 1 include an urban roadway from the I-470 Interchange east to exit 24 at Grain Valley centered on the existing roadway. The First Tier EIS evaluation further recommended that widening within the rural portion of SIU 1 from Grain Valley east to Odessa include widening to the north based on a number of issues including displacements, engineering issues, potential impacts to wetlands, natural communities and hazardous waste sites.

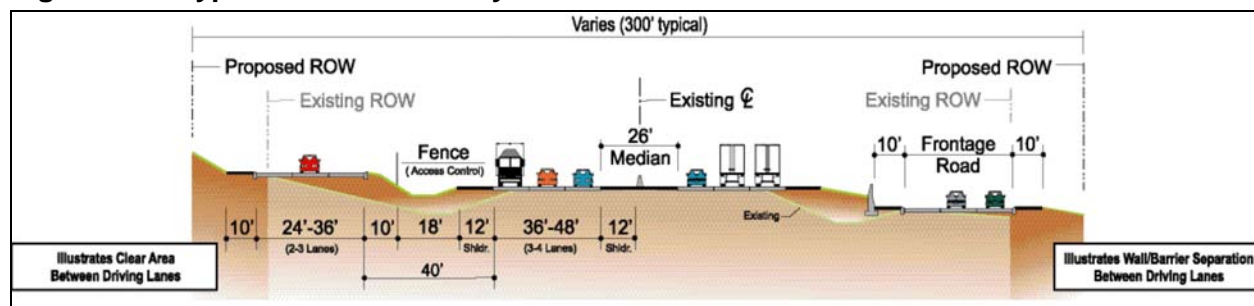
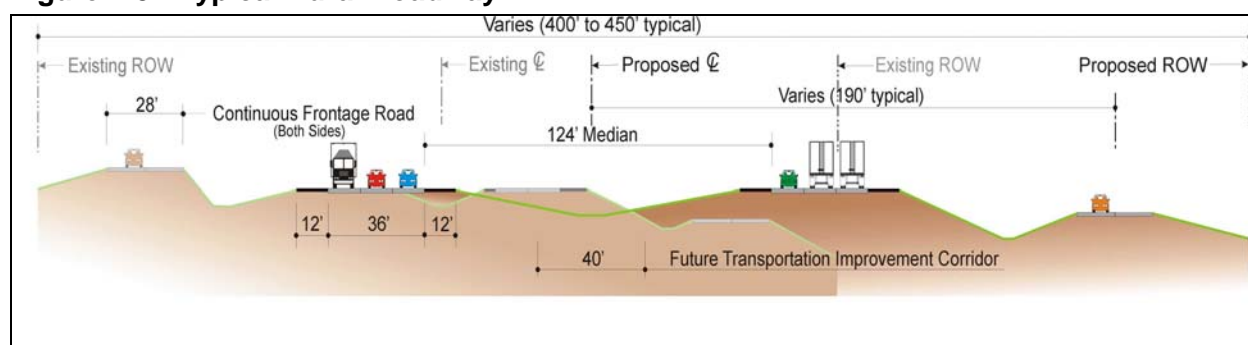
This Second Tier Study for SIU 1 confirms that the future 2030 travel demands dictate that six lanes be provided in the rural areas and a minimum of eight lanes through the metropolitan area of Kansas City. The I-70 Major Investment Study (MIS), conducted by MoDOT for I-70 in Jackson County, recommended that the eight-lane urban areas would be constructed on existing alignment by adding lanes to the north and south, generally within existing MoDOT right of way. This Second Tier Study for SIU 1 confirms that the minimum eight-lane roadway cross section in metropolitan Kansas City should extend from the I-470 interchange to Adams Dairy Parkway and further recommends a six-lane urban roadway from Adams Dairy Parkway to mile marker 29 in Oak Grove. The eight-lane urban roadway was originally recommended in the First Tier EIS to transition to a six-lane rural roadway at Grain Valley. A Technical Memorandum "Urban to Rural Transition Study" dated November 11, 2003 presents the details and analysis of the evaluation used in recommending the extension of the six-lane urban section to Oak Grove (available upon request).

This Second Tier Study for SIU 1 also includes a more detailed review to determine whether widening in the rural area of I-70 should be located to the north or to the south of the existing I-70 alignment. This review was conducted using a combination of the Geographic Information System (GIS) data gathered in association with the First Tier EIS and supplemented with agency data, 2002 aerial photography, existing engineering plans, potential hazardous waste sites data, property owner and parcel information and fieldwork. The Technical Memorandum "I-70 Alternative Screening Evaluation" prepared in July 2003 (available upon request) summarizes the Second Tier evaluation of the First Tier EIS widening recommendations for SIU 1.

d. Refinement of Mainline Alternatives

Widening

Section of Independent Utility 1 is approximately 24 miles (39 kilometers) long and is divided into a 14-mile long urban area and a 10-mile long rural area. The typical urban roadway uses a 26-foot median with a concrete median barrier to separate the westbound and eastbound traffic (Figure II-2). The typical rural roadway uses a 124-foot wide grass median to separate the westbound and eastbound traffic (Figure II-3).

Figure II-2: Typical Urban Roadway**Figure II-3: Typical Rural Roadway**

In the areas with a typical urban roadway, the options for widening were evaluated in order to minimize impacts and costs and to maximize the use of existing right of ways, roadways and structures. The preferred widening strategy to accomplish these goals would be to widen along the existing I-70 centerline. Four miles (I-470 to Route 7) out of the ten miles of urban area in SIU 1 is currently undergoing a pavement replacement improvement (MoDOT Job Numbers J4I1352 and J4I306). The project includes the reconstruction of six through-lanes of pavement and shoulders from the I-470 interchange to Route 7 while also bringing this section of I-70 up to current interstate design standards. Therefore, widening in this area would only require converting the existing roadway shoulder into a travel lane (the shoulder was designed with considerations for this purpose) and constructing a new shoulder to the outside of the roadway. The remainder of the urban area would be reconstructed and also widened on the existing I-70 centerline.

In the areas with a typical rural roadway, the options for widening to the north or to the south were evaluated. The Technical Memorandum "I-70 Alternative Screening Evaluation" (available upon request) was prepared to address this issue. The Technical Memorandum concluded that the north and the south alternative alignments would have similar environmental impacts, but the north alignment would be preferred due to the lower number of business displacements, the conflicts with the existing rail lines of the south alternative, construction costs would be less, interchange compatibility ratings would be better and the majority of the development associated with the cities of Oak Grove, Bates City and Odessa is located to the south of existing I-70. The Technical Memorandum "SIU 1 Median Width Study" (available upon request) was prepared to compare an alignment which parallels the existing eastbound lanes, utilizing a constant width median, to an alignment that parallels the existing westbound lanes, allowing for greater compliance with the First Tier EIS guidelines. The conclusion reached was

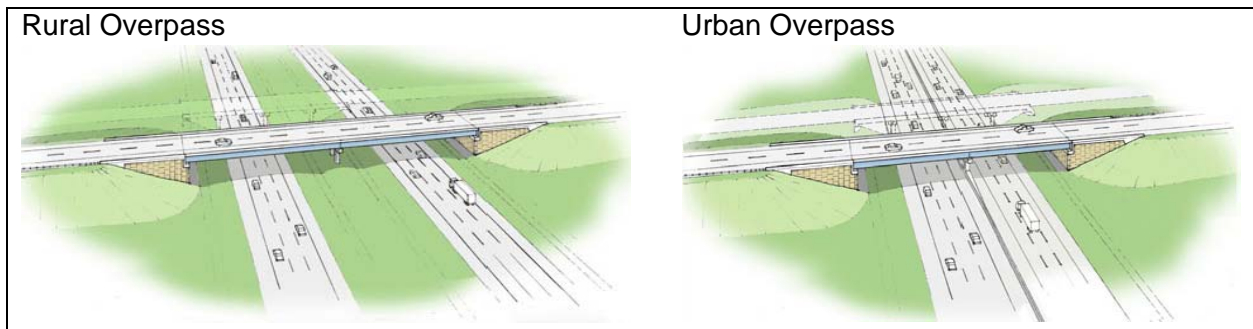
that the widening in the rural area of SIU 1 should be aligned with the existing westbound lanes, allowing for increased compliance with the construction staging guidance provided by the First Tier EIS.

Urban to Rural Transition

The First Tier EIS designated the area from I-470 to mile marker 25, approximately halfway between Grain Valley and Oak Grove, as urban. The area from mile marker 25 to the eastern project limit of SIU 1 was designated as rural.

The urban roadway design, which requires less right of way because of the compressed typical section, is proposed where the existing area is highly developed and land costs are higher. The rural roadway design, which requires more right of way because of its 120- to 130-foot (36.6- to 39.6-meter) wide median, is proposed where the existing area is more agricultural and right of way costs are lower. Figure II-4 illustrates a typical urban and rural roadway at an overpass.

Figure II-4: Typical Rural and Urban Overpasses



A Technical Memorandum “Urban to Rural Transition Study” (available upon request) was prepared in November 2003 to examine the extension of the typical urban roadway from mile marker 25 as designated in the First Tier EIS to mile marker 29, which is approximately 0.75 miles (1.21 kilometers) east of the Route H/F interchange in Oak Grove. Extending the typical urban roadway to include the Route H/F interchange in Oak Grove would provide the following benefits:

- An urban mainline between Grain Valley and Oak Grove is more consistent with the increasing traffic volumes in the area.
- Right of way and displacements for a typical urban roadway in this area would be approximately one-half of those required if a typical rural roadway were used in this area due to the increased development in this area.
- An urban roadway is more compatible with the rapid growth in this area.
- Floodplain and wetland impacts for an urban roadway in this area would be less than half of those if a typical rural roadway were used in this area.
- If the Single Point Urban Interchange (SPUI) alternative at Route H/F in Oak Grove were preferred, a typical urban roadway would be more compatible with the interchange than a typical rural roadway.

Based on the benefits compared to a typical rural roadway and the positive public feedback received at the November 2003 public information meeting in Oak Grove, an urban mainline alternative between mile marker 25 and mile marker 29 was retained for further evaluation in this EA.

e. Preliminary Interchange Alternatives

Following the evaluation of the First Tier EIS widening recommendations and the selection of the north alternative for the rural area, the preliminary alternative evaluation process continued with a review of the potential interchange alternatives. The preliminary review of the interchange alternatives was conducted using a combination of the GIS data gathered in association with the Final First Tier EIS and supplemented with 2002 aerial photography, more refined SIU 1 engineering plans, additional GIS data and property owner and parcel information. Following the preliminary review, a workshop was held on February 24, 2004 with the study team to discuss the results of the review and to select the alternatives that would be carried forward for evaluation in the SIU 1 EA. Drawings of the preliminary interchange alternatives are included in Appendix D. The following is a list of the preliminary alternatives and results of the evaluation:

- **Interstate 470**
An analysis of the I-470 interchange was not included as part of this study. However, it was evaluated to assure its compatibility with the proposed mainline improvements. The only modifications to this interchange would include minimal construction to tie in the existing access ramps to the improved mainline. The I-470 interchange will be addressed in a First Tier EIS that is currently be initiated for I-70 from the Missouri State line east to the I-470 interchange.
- **Little Blue Parkway**
The Little Blue Parkway interchange meets current design standards, access management guidelines and was designed with considerations for the future widening of I-70. Therefore, the only modifications to this interchange would include minimal construction to tie in the four existing access ramps to the improved mainline. No alternatives were developed for this interchange.
- **Woods Chapel Road**
The Woods Chapel Road interchange is constrained in the northwest quadrant by a commuter lot that would most likely need to be relocated. The northeast quadrant is constrained by two hotels and a small stripmall. The southwest quadrant is constrained by a restaurant and a gas station with the remaining open lot being planned for development. The southeast quadrant is fully developed commercially, including a bank and a large automotive sales lot. Three interchange and frontage road access alternatives were considered at this location. The commercial development and the current road network prevent a full application of MoDOT's access management guidelines.
 - **Alternative 1** – This alternative included a SPUI configuration with roundabouts or traffic signals at Duncan Road and relocated South and Northwest Outer Roads. This alternative would include widening Woods Chapel Road to four lanes with left turn storage to Kingsridge Road. This configuration would yield a LOS D for 2030 traffic conditions. This alternative was favored by the public at the November 2003 public meeting and by Blue Springs and Independence city

officials because it would minimize right of way impacts. This alternative was retained for evaluation in this EA.

- **Alternative 2** – This alternative included a standard diamond configuration that would utilize existing Duncan Road and relocated South and Northwest Outer Roads. This alternative would include widening Woods Chapel Road to four lanes with left turn storage to Kingsridge Road. This configuration would yield a LOS D for 2030 traffic conditions and would minimize right of way impacts as compared to Alternative 3. This alternative was retained for evaluation in this EA.
- **Alternative 3** – This alternative included a folded diamond configuration with loop ramps in the southwest and northwest quadrants. This alternative would also include widening Woods Chapel Road to four lanes with left turn storage to Kingsridge Road. This configuration would yield an undesirable LOS F for 2030 traffic conditions, would require more right of way, would cause substantially more displacements than the other two alternatives and was not favored at the November 2003 public meetings. This alternative was eliminated from further consideration.
- **Route 7**
The Route 7 interchange is heavily developed and constrained in all quadrants by multiple commercial developments. St. Mary's Hospital is also located on Mock Avenue to the east of Route 7 and retaining access via Mock Avenue is very important even though the configuration falls short of MoDOT's access management guidelines. Operational analysis shows that three through lanes in each direction would be needed on Route 7 to handle all the traffic at an acceptable LOS.
 - **Alternative 1** – This alternative included a SPUI configuration at Route 7 that would utilize the existing NW Jefferson Street as a north frontage road and the existing South Outer Road and Mock Avenue as the south frontage roads. This alternative would operate at LOS F for 2030 traffic conditions. This alternative was eliminated from further consideration.
 - **Alternative 2** – This alternative included a standard diamond configuration at Route 7 that would utilize the existing NW Jefferson Street as a north frontage road and the existing South Outer Road and Mock Avenue as the south frontage roads. This alternative would have a LOS F for 2030 traffic conditions. In addition, this alternative would have severe right of way impacts to achieve an acceptable LOS. This alternative was eliminated from further consideration.
 - **Alternative 3** – This alternative included a tight diamond configuration at Route 7 that would utilize the existing NW Jefferson Street as a north frontage road. The existing South Outer Road and Mock Avenue would have "right-in right-out" access to Route 7. This alternative would operate at LOS D for 2030 traffic conditions. This alternative was a refinement that was developed after the alternative screening workshop. This alternative was retained for evaluation in this EA.
 - **Alternative 4** – This alternative included a tight diamond configuration on the south side of I-70 at Route 7 and a standard diamond configuration on the north

side with a loop in the northeast quadrant. A dedicated lane would be provided on Route 7 for northbound Route 7 traffic to westbound I-70. This configuration would utilize the existing NW Jefferson Street as a north frontage road and the existing South Outer Road and Mock Avenue would have “right-in right-out” access to Route 7. This alternative would have a LOS C for 2030 traffic conditions. This alternative was a refinement that was developed after the alternative screening workshop. This alternative was retained for evaluation in this EA.

- **Adams Dairy Parkway**

The Adams Dairy Parkway interchange meets current design standards and access management guidelines. The existing I-70 bridges over Adams Dairy Parkway would require widening to accommodate the I-70 mainline improvements. The four access ramps would require minimal construction to tie into the I-70 mainline improvements. No alternatives were developed for this interchange.

- **Grain Valley**

The Grain Valley interchange is heavily constrained in the southwest quadrant by a large commercial building owned by the Owner-Operator Independent Drivers Association (OOIDA). There is a commuter lot in the northwest quadrant, which could be relocated to a lot farther north. The northeast quadrant is constrained by a gas station and a church, and the southeast quadrant is constrained by a gas station, a small hotel, and a bank that could be impacted by Alternative 2. The existing frontage roads are very close to I-70 creating access conflicts. New frontage roads would be designed to replace the existing “tight” frontage road connections and comply with MoDOT’s access management guidelines.

- **Alternative 1** – This alternative included a SPUI configuration at Route AA/BB. This alternative would include a north frontage road 1,100 feet (335 meters) north of I-70 and a south frontage road along Yenni and Rollo Streets. This alternative would operate at LOS A for 2030 traffic conditions. Grain Valley has embraced Alternative 1 and is already constructing a road to the southwest frontage road. This alternative was acceptable to the public and city officials, as it would minimize right of way impacts. This alternative was retained for evaluation in this EA.
- **Alternative 2** – This alternative included a folded diamond configuration at Route AA/BB with a north frontage road 750 feet (229 meters) north of the ramp terminus and a south frontage road at Yenni and Rollo Streets. This alternative would operate at an acceptable LOS C for 2030 traffic conditions. This alternative was acceptable to the public and city officials because it would fit well with the existing roadway network and the relocation of Route 40. This alternative was retained for evaluation in this EA.
- **Alternative 3** – This alternative included a standard diamond configuration at Route AA/BB with a north frontage road 750 feet (229 meters) north of the ramp terminus and a south frontage road at Yenni and Rollo Streets. This alternative would operate at an acceptable LOS C for 2030 traffic conditions. This alternative would require several displacements, including the OOIDA property. Originally the total cost of this alternative was thought to be less than Alternative 1 and Alternative 2. However, it was noted at the February 24, 2004

study team workshop that the total cost of the alternative included a standard business displacement cost estimated on a per-square-foot basis and the actual business relocation cost would likely be much higher (approximately \$5M). The consensus among the study team was that Alternative 3 could be eliminated from further analysis due to its potential impact upon the OOIDA property.

- **Oak Grove**

The Route H/F interchange at Oak Grove has truck stops in the northwest and southwest quadrants, commercial development in the southeast quadrant and residential development in the northeast quadrant which constrain the interchange. New frontage roads would be designed to replace the existing “tight” frontage road connections and comply with MoDOT’s access management guidelines. The location of the south frontage road either along Fifth Street or along the extension of Fourth Street is controversial because of potential impacts to the residential neighborhood along Fifth Street. The frontage road location alternatives are being addressed by the MoDOT District 4 office in a separate study of Route F. A public meeting was held on October 26, 2004 to present six alternatives for the area and to receive public input. A public hearing to present the proposed final alternative is expected to be held in early summer 2005 with construction scheduled to begin in summer 2008. The conclusions of the Route F study would be incorporated into the final design of I-70 in Oak Grove. The frontage road location is not critical to the decision of the SIU 1 RPA, and could be changed from what is shown based on the outcome of the Route F study.

- **Alternative 1** – This alternative included a diamond configuration at Route H/F with a frontage road at 5th Street. This alternative would operate at an acceptable LOS C for 2030 traffic conditions. This alternative was retained for evaluation in this EA.
- **Alternative 2** – This alternative included a diamond configuration at Route H/F with a frontage road at 4th Street. This alternative would operate at an acceptable LOS C for 2030 traffic conditions. A compelling argument against this alternative is that MoDOT currently holds the title to land along the west side of the I-70 Truck Stop and is required to rebuild the road to 5th Street. This alternative was eliminated from further consideration.
- **Alternative 3** – This alternative included a SPUI configuration at Route H/F with a frontage road at 5th Street. This alternative would operate at an acceptable LOS B for 2030 traffic conditions. This alternative was retained for evaluation in this EA with one modification. The south frontage road was changed to 4th Street for evaluation in the EA.

- **Bates City**

Route D north of I-70 and Route Z south of I-70 are offset by about 800 feet (243 meters). The existing interchange is constrained by commercial development south of I-70 and east of Route Z and by a mobile home park north of I-70 and west of Route D.

- **Alternative 1** – This alternative included a diamond configuration at Route D/Z with frontage roads spaced 1,320 feet (402 meters) north and 900 feet (274 meters) south of the ramp termini. The south frontage road was spaced

900 feet (274 meters) from the ramp terminus to avoid the GM&O Railroad and the residences on Mitchell Street. This alternative would operate at an acceptable LOS A for 2030 traffic conditions and would require six permanent structure displacements, plus approximately 46 mobile homes. The total cost would be substantially more than Alternatives 2 and 3. No comments were received on any of the Bates City alternatives during the November 2003 public meetings. This alternative was eliminated from further consideration due to the potential impact on the mobile home community and the higher cost.

- **Alternative 2** – This alternative included a diamond configuration one-quarter mile (0.4 kilometers) east of Route D/Z with frontage roads spaced 1,100 feet (335 meters) north and south of the ramp termini. The north frontage road was spaced at 1,100 feet (335 meters) to avoid impacts to an existing private lake. The south frontage road was spaced 1,100 feet (335 meters) from the ramp terminus to avoid the GM&O Railroad. This alternative would operate at an acceptable LOS A for 2030 traffic conditions. This alternative was retained for evaluation in this EA.
- **Alternative 3** – This alternative included a diamond configuration at McDaniel/ Foster College Road with frontage roads spaced 1,320 feet (402 meters) north and 1,000 feet (305 meters) south of the ramp termini. The south frontage road was spaced 1,000 feet (305 meters) from the ramp terminus to avoid the GM&O Railroad. Preliminary engineering indicated that the alternative would require an at-grade rail crossing and potentially impact a cemetery near that location. If the rail crossing were to be grade separated, it would require at least a six percent grade to cross the railroad tracks and tie in to Route D/Z. This alternative would operate at a LOS A for 2030 traffic conditions. Due to potential environmental and engineering constraints, this alternative was eliminated from further consideration.
- **West Odessa**

A range of alternatives was developed for an interchange west of Odessa to replace the existing Route 131 partial diamond interchange. A Route WW interchange alternative was developed because the Comprehensive Plan for the City of Odessa identified the location as strategic to a future west bypass road. Public input also prompted development of the Burton Road interchange alternative because of availability of the former weigh station property. The Hughes Road interchange was a First Tier EIS option and was desirable because of its proximity to the existing Route 131 partial diamond interchange. Grade separations at Route WW and Route 131 were also considered in conjunction with the Burton Road and Hughes Road interchanges. If an interchange at Burton Road were to be selected, a grade separation at Route 131 would be included as part of the alternative, but not one at Route WW. If an interchange at Hughes Road were to be selected, a grade separation at Route WW would be included as part of the alternative, but not one at Route 131.
- **Alternative 1** – This alternative included a diamond configuration at Route WW with frontage roads spaced 1,320 feet (402 meters) north and 1,000 feet (305 meters) south of the ramp termini. The south frontage road was spaced 1,000 feet (305 meters) from the ramp terminus to avoid the GM&O Railroad. This alternative would operate at a LOS A for 2030 traffic conditions. During the

November 2003 public information meeting, concern was expressed regarding Alternative 1 because of the distance from Odessa and its development. Due to the number of potential displacements, relatively high impact to prime farmlands, access to commercial properties and distance from Odessa, this alternative was eliminated from further consideration.

- **Alternative 2** – This alternative included a diamond configuration at Burton Road with frontage roads spaced 1,320 feet (402 meters) north and 1,000 feet (305 meters) south of the ramp termini. The south frontage road was spaced 1,000 feet (305 meters) from the ramp terminus to avoid the GM&O Railroad. During the November 2003 public information meeting, concern was also expressed regarding Alternative 2 because of the distance from Odessa and its development. However, this interchange configuration would operate at a LOS A for 2030 traffic conditions. This alternative was retained for evaluation in this EA.
- **Alternative 3** – This alternative included a diamond configuration at Hughes Road with frontage roads spaced 1,320 feet (402 meters) north and south of the ramp termini. During the November 2003 public information meeting, support for this alternative was received due to its closer proximity to Odessa and its development. This interchange configuration would operate at a LOS A for 2030 traffic conditions. This alternative was retained for evaluation in this EA.
- **Alternative 4** – This alternative included a diamond configuration at Route 131 with frontage roads spaced 1,320 feet (402 meters) north and south of the ramp termini. This alternative would operate at an acceptable LOS A for 2030 traffic conditions. Route 131 is constrained by commercial development in the southwest quadrant, residential development north of I-70 and a church in the northeast quadrant. Preliminary engineering also indicated that an underground high-pressure petroleum line would require relocation at substantial cost. This alternative was eliminated from further consideration.
- **East Odessa**

County Road 96/Johnson Road south of I-70 is constrained by commercial and residential development in the southwest quadrant. North of I-70, the interchange is further constrained by the GM&O Railroad and an old city dump site. Any new interchange construction at this location is further complicated by the vertical alignment of I-70 and the bridges over the GM&O Railroad west of County Road 96/Johnson Road. Both preliminary interchange alternatives for this location were offset slightly east of County Road 96/Johnson Road to minimize impacts to the existing residential development south of I-70. Locating the interchange to the east also eliminates multiple conflicts with the GM&O Railroad.
- **Alternative 1** – This alternative included a diamond configuration located approximately 0.2 miles (0.32 kilometers) east of County Road 96/Johnson Road with frontage roads spaced 1,000 feet (305 meters) north and 1,250 feet (381 meters) south of the ramp termini. The north frontage road was spaced closer to the ramp terminus to avoid the existing GM&O Railroad. The south frontage road was spaced to line up with the existing residential street on Johnson Road. This alternative would operate at an acceptable LOS A for 2030 traffic conditions. This alternative was retained for evaluation in this EA.

- **Alternative 2** – This alternative included a diamond configuration located approximately 0.3 miles (0.48 kilometers) east of County Road 96/Johnson Road with frontage roads spaced 1,320 feet (402 meters) from the north ramp terminus and 1,250 feet (381 meters) from the south ramp terminus (same reason as Alternative 1). This alternative would operate at a LOS A for 2030 traffic conditions. This alternative was retained for evaluation in this EA.

f. Summary of Preliminary Alternatives Carried Forward for Analysis in the EA

After the preliminary analysis, the Reasonable Alternatives were carried forward for a more detailed evaluation in this EA. The mainline and interchange alternatives were combined and SIU 1 was divided into five subsections (Figure II-5) in order to facilitate comparisons. Each alternative evaluated in the EA has a mainline component and an interchange component (in some cases, multiple interchanges). In instances where only one interchange alternative was carried forward from the preliminary stage to the EA, that interchange was included with other alternatives. Table II-1 identifies the preliminary interchange alternative designations and Table II-2 identifies the alternative designations and their mainline plus interchange components used for evaluation in the EA. Exhibits II-1 through II-5.4 illustrate the Build Alternatives that were carried forward for a more detailed evaluation in this EA.

Figure II-5: SIU 1 Subsections

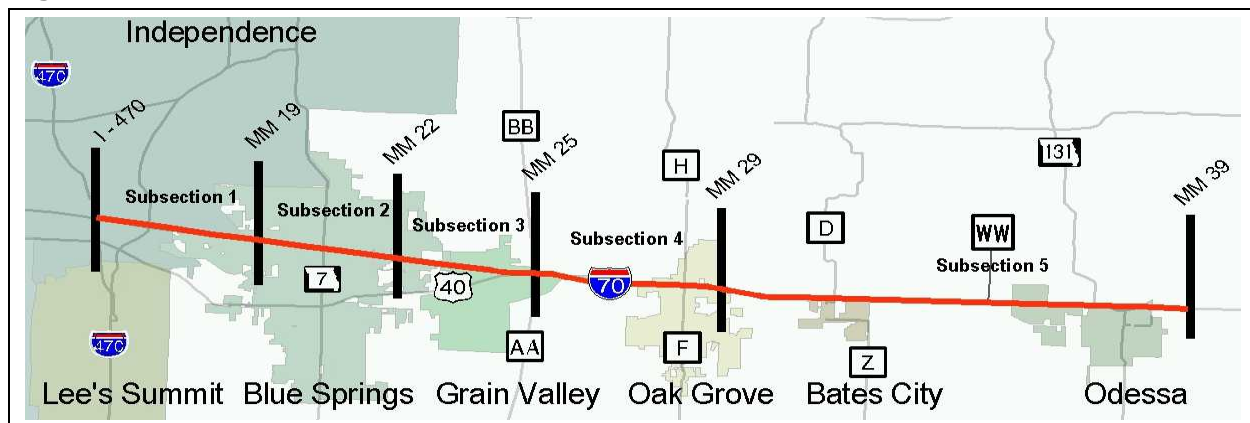


Table II-1: Preliminary Alternative Designations

Preliminary Interchange Alternative Name		Interchange		Result of Preliminary Analysis
		Type	Location	
Woods Chapel Road	1	SPUI	Woods Chapel Road	Reasonable Alternative
	2	Diamond	Woods Chapel Road	Reasonable Alternative
	3	Folded Diamond	Woods Chapel Road	Eliminated
Route 7	1	SPUI	Route 7	Eliminated
	2	Diamond	Route 7	Eliminated
	3	Tight Diamond	Route 7	Reasonable Alternative
	4	Tight Diamond w/ Loop	Route 7	Reasonable Alternative
Grain Valley	1	SPUI	Route AA/BB	Reasonable Alternative
	2	Folded Diamond	Route AA/BB	Reasonable Alternative
	3	Diamond	Route AA/BB	Eliminated

Preliminary Interchange Alternative Name		Interchange		Result of Preliminary Analysis
		Type	Location	
Oak Grove	1	Diamond	Route H/F	Reasonable Alternative
	2	Diamond	Route H/F	Eliminated
	3	SPUI	Route H/F	Reasonable Alternative
Bates City	1	Diamond	Route D/Z	Eliminated
	2	Diamond	0.25 miles East of Route D/Z	Reasonable Alternative
	3	Diamond	McDaniel/Foster College Road	Eliminated
West Odessa	1	Diamond	Route WW	Eliminated
	2	Diamond	Burton Road	Reasonable Alternative
	3	Diamond	Hughes Road	Reasonable Alternative
	4	Diamond	Route 131	Eliminated
East Odessa	1	Diamond	0.2 miles East of County Rd. 96	Reasonable Alternative
	2	Diamond	0.3 miles East of County Rd. 96	Reasonable Alternative

Table II-2: Environmental Assessment Alternative Designations

EA Alternative Name	Mainline Type	Interchange(s)	
		Type	Location
Subsection 1 – I-470 to Mile Marker 19			
1-1	8-lane Urban ¹	SPUI	Woods Chapel Road
1-2	8-lane Urban ¹	Diamond	Woods Chapel Road
Subsection 2 – Mile Marker 19 to Mile Marker 22			
2-1	8-lane Urban	Tight Diamond	Route 7
2-2	8-lane Urban	Tight Diamond w/ Loop	Route 7
Subsection 3 – Mile Marker 22 to Mile Marker 25			
3-1	6-lane Urban	SPUI	Route AA/BB
3-2	6-lane Urban	Folded Diamond	Route AA/BB
Subsection 4 – Mile Marker 25 to Mile Marker 29			
4-1	6-lane Rural	Diamond	Route H/F
4-2	6-lane Urban	Diamond	Route H/F
4-3	6-lane Urban	SPUI	Route H/F
Subsection 5 – Mile Marker 29 to Mile Marker 39			
5-1	6-lane Rural	Diamond	0.25 miles East of Route D/Z
		Diamond	Burton Road
		Grade Separation	Route 131
		Diamond	0.2 miles East of County Rd 96/Johnson Rd
5-2	6-lane Rural	Diamond	0.25 miles East of Route D/Z
		Diamond	Burton Road
		Grade Separation	Route 131
		Diamond	0.3 miles East of County Rd 96/Johnson Rd
5-3	6-lane Rural	Diamond	0.25 miles East of Route D/Z
		Grade Separation	Route WW
		Diamond	Hughes Road
		Diamond	0.2 miles East of County Rd 96/Johnson Rd
5-4	6-lane Rural	Diamond	0.25 miles East of Route D/Z
		Grade Separation	Route WW
		Diamond	Hughes Road
		Diamond	0.3 miles East of County Rd 96/Johnson Rd

- Indicates the Recommended Preferred Alternative.

1 - Also includes two auxiliary lanes between I-470, Little Blue Parkway and Woods Chapel Road

B. SIU 1 Reasonable Alternatives Evaluated

1. No-Build Alternative

The No-Build Alternative would leave I-70 in its current condition and configuration. No interchange, mainline or other improvements would be implemented. Any reconstruction or rehabilitation projects to the existing I-70 facility would be in-kind, with no new capacity added and no substantial safety improvements implemented. Routine and programmed maintenance activities such as minor repairs and repaving would be expected. Through 2030, the costs associated with the No-Build Alternative would be \$91,500,000. These maintenance costs would be more than the costs of the maintenance requirements of the Build Alternatives for equivalent time periods.

A separate Intelligent Transportation System (ITS) may be implemented under the No-Build Alternative.

The No-Build Alternative would be incompatible with the Purpose and Need defined for I-70 in the First Tier EIS and the Purpose and Need for SIU 1, as stated in Chapter I of this EA. The No-Build Alternative would result in undesirable LOS ratings for the roadway areas in SIU 1 (Table II-3), would not reduce the number and severity of traffic related crashes, would not upgrade the facility to current design standards, would not increase the efficiency of goods movement, and would not increase the ability of the corridor to handle diversion from other highway links, should some type of disaster occur.

The No-Build Alternative is analyzed to illustrate future conditions if no improvements are made to the SIU 1 portion of I-70. This analysis serves as a baseline condition, which is then compared to conditions that would be anticipated following implementation of the Build Alternatives.

Table II-3: Summary of No-Build Level of Service for Mainline I-70

Description	Level of Service		
	2000 No-Build Alternative	2020 No-Build Alternative	2030 No-Build Alternative
I-470 to Woods Chapel Road	F	F	F
Woods Chapel Road to Route 7	F	F	F
Route 7 to Adams Dairy Parkway	F	F	F
Adams Dairy Parkway to Route AA/BB	D	F	F
Route AA/BB to Route H/F	C	F	F
Route H/F to Route D/Z	C	F	F
Route D/Z to Route 131	B	F	F
Route 131 to County Rd 96/Johnson Road	B	E	F



= Undesirable operations based on target LOS C in rural areas and LOS D in urban areas.

2. Build Alternatives

The following is a physical description and summary analysis of the SIU 1 Build Alternatives by subsection. A complete summary of all impacts by alternative is presented in Table II-8 at the end of Chapter II. The Build Alternatives included as part of the RPA are depicted in italics. Exhibits II-1 through II-5.4 show an overview of each alternative layout. Exhibits IV-1 through IV-17, located in Chapter IV, show a more detailed view of the RPA.

a. Subsection 1 - I-470 to Mile Marker 19 (Exhibit II-1)

Both alternatives in this subsection would also include the minor improvements needed to connect the I-470 and Little Blue Parkway access ramps to the I-70 mainline improvements.

Alternative 1-1 (RPA) – *This alternative would include an urban mainline with eight through lanes and two auxiliary lanes located between I-470, Little Blue Parkway and Woods Chapel Road. It would also include a Single Point Urban Interchange (SPUI) at Woods Chapel Road with traffic signals or roundabouts at Duncan Road and relocated South and Northwest Outer Roads for frontage roads. This alternative would also include widening Woods Chapel Road to five lanes from I-70 to Kingsridge Road. While the environmental impacts for both Alternatives 1-1 and 1-2 would essentially be the same, this alternative would only require three business displacements, versus five for Alternative 1-2 and the total cost would be \$8.2 million less than Alternative 1-2. Alternative 1-1 is estimated to cost \$59.8 million.*

Alternative 1-2 – This alternative would include an urban mainline with eight through lanes and two auxiliary lanes located between I-470, Little Blue Parkway and Woods Chapel Road. It would also include a standard diamond interchange at Woods Chapel Road utilizing the existing Duncan Road and relocated South and Northwest Outer Roads for frontage roads. This alternative would also include widening Woods Chapel Road to five lanes from I-70 to Kingsridge Road. This alternative would require five business displacements and is estimated to cost \$68.0 million.

b. Subsection 2 – Mile Marker 19 to Mile Marker 22 (Exhibit II-2)

Both alternatives in this subsection would include the construction of a new grade separation near 15th Street and the elimination of the traffic signal located at Route 7 and Mock Avenue in Blue Springs. The construction of the grade separation would be made by the City of Blue Springs as the need arose or as funds became available. Both alternatives would also include the widening of the existing I-70 bridges over Adams Dairy Parkway and minor improvements needed to connect the access ramps to the I-70 mainline improvements.

Alternative 2-1 – This alternative would include an eight-lane urban mainline from mile marker 19 to Adams Dairy Parkway. A tight diamond interchange would be used at Route 7 utilizing the existing NW Jefferson Street as a north frontage road. The existing South Outer Road and Mock Avenue would have “right-in, right-out” access to Route 7. This alternative would require the displacement of eight businesses. The total cost would be \$9.2 million less than Alternative 2-2. Alternative 2-1 is estimated to cost \$75.6 million.

Alternative 2-2 (RPA) – This alternative would include an eight-lane urban mainline from mile marker 19 to Adams Dairy Parkway. A tight diamond interchange configuration would be used on the south side of I-70 at Route 7 and a modified standard diamond interchange configuration would be used on the north side with a loop in the northeast quadrant. A dedicated lane would be provided on Route 7 for northbound Route 7 traffic to westbound I-70. This configuration would utilize the existing NW Jefferson Street as a north frontage road and the existing South Outer Road and Mock Avenue would have “right-in right-out” access to Route 7. This alternative would require the displacement of 10 businesses. The environmental impacts associated with both Alternatives 2-1 and 2-2 would essentially be the same. While Alternative 2-2 would cost more to construct and have more business displacements, it would provide a better future LOS at the heavily congested Route 7 interchange. Alternative 2-2 is estimated to cost \$84.8 million.

c. Subsection 3 – Mile Marker 22 to Mile Marker 25 (Exhibit II-3)

Alternative 3-1 (RPA) – This alternative would include a six-lane urban mainline and a SPUI at Route AA/BB with a new frontage road spaced 1,100 feet (335 meters) north of I-70 and a south frontage road to be improved by the city of Grain Valley along existing Yenni and Rollo Streets. The existing Old Route 40 would be relocated and tied in to Route AA to the south of the current location as part of a separate project in Grain Valley. While the environmental and residential displacement impacts (one residential) for both Alternatives 3-1 and 3-2 would essentially be the same, Alternative 3-1 would have one less business displacement and the total cost would be \$5.7 million less than Alternative 3-2. Alternative 3-1 is estimated to cost \$73.6 million.

Alternative 3-2 – This alternative would include a six-lane urban mainline and a folded diamond interchange at Route AA/BB with a new north frontage road spaced 750 feet (229 meters) north of the ramp terminus and a south frontage road along existing Yenni and Rollo Streets. The existing Old Route 40 would be relocated and tied in to Route AA to the south of the current location as part of a separate project in Grain Valley. Alternative 3-2 is estimated to cost \$79.3 million.

d. Subsection 4 – Mile Marker 25 to Mile Marker 29 (Exhibit II-4.1 and Exhibit II-4.2)

Alternative 4-1 – This alternative would include a six-lane rural mainline and a standard diamond interchange at Route H/F with a new north frontage road spaced 1,320 feet (402 meters) from the ramp terminus and a south frontage road at existing 5th Street. This alternative would widen Route H/F to six lanes and provide a channelized dual right-turn lane from the eastbound I-70 off-ramp. This alternative would require 49 residential and 3 business displacements. The estimated total cost would be \$8.8 million more than Alternative 4-2 and \$11.4 million more than Alternative 4-3. Alternative 4-1 is estimated to cost \$97.7 million.

Alternative 4-2 – This alternative would include a six-lane urban mainline and a standard diamond interchange at Route H/F with a new north frontage road spaced 1,320 feet (402 meters) from the ramp terminus and a south frontage road at existing 5th Street. This alternative would include widening Route H/F to six lanes and providing a channelized dual right-turn lane from the eastbound I-70 off ramp. This alternative would require 28 residential and two business displacements. The estimated total cost would be \$ 8.8 million less than Alternative 4-1 and \$2.6 million more than Alternative 4-3. Alternative 4-2 is estimated to cost \$88.9 million.

Alternative 4-3 (RPA) – This alternative would include a six-lane urban mainline and a SPUI at Route H/F with a new north frontage road spaced 1,750 feet (533 meters) from I-70 and a south frontage road at existing 4th Street. This alternate would include widening Route H/F to six lanes and providing a channelized dual right-turn lane from the eastbound I-70 off ramp. While the environmental impacts for Alternatives 4-1, 4-2 and 4-3 would essentially be the same, alternative 4-3 would require less residential and business displacements and would cost less than either alternative 4-1 or 4-2. This alternative would require 20 residential and 2 business displacements. The estimated total cost would be \$11.4 million less than Alternative 4-1 and \$2.6 million less than Alternative 4-2. Alternative 4-3 is estimated to cost \$86.3 million.

e. Subsection 5 – Mile Marker 29 to Mile Marker 39 (Exhibit II-5.1 through Exhibit II-5.4)

Alternative 5-1 – This alternative would include a six-lane rural mainline with a standard diamond interchange 0.25 miles (0.40 kilometers) east of Route D/Z with frontage roads spaced 1,100 feet (335 meters) north and south of the ramp termini, a standard diamond interchange at Burton Road with frontage roads spaced 1,320 feet (402 meters) north and 1,000 feet (305 meters) south of the ramp termini, a grade separation at Route 131, and a standard diamond interchange approximately 0.2 miles (0.3 kilometers) east of County Road 96/Johnson Road with frontage roads spaced 1,000 feet (305 meters) north and 1,250 feet (381 meters) south of the ramp termini. The Burton Road interchange associated with this alternative would be constrained to the south by the GM&O Railroad and would not meet MoDOT's access management guidelines for this project. The interchange 0.2 miles (0.3 kilometers) east of County Road 96/Johnson Road associated with this alternative would also be constrained to the north by the GM&O Railroad and would not meet MoDOT's access management guidelines for this project.

This alternative would require seven single-family displacements, nine mobile home displacements, and three business displacements. The estimated total cost would be \$0.6 million less than Alternative 5-2, \$1.6 million less than Alternative 5-3 and \$2.2 million less than Alternative 5-4. Alternative 5-1 is estimated to cost \$227.0 million.

Alternative 5-2 – Alternative 5-2 is the same as Alternative 5-1 with the exception of a slight difference in the location of the interchange near County Road 96/Johnson Road. For Alternative 5-1 the interchange is located 0.2 miles (0.3 kilometers) east of County Road 96/Johnson Road. For Alternative 5-2 the interchange is located 0.3 miles (0.5 kilometers) east of County Road 96/Johnson Road and would fully comply with MoDOT access management guidelines.

This alternative would require seven single-family displacements, nine mobile home displacements, and three business displacements. The estimated total cost would be \$0.6 million more than Alternative 5-1, \$1.0 million less than Alternative 5-3 and \$1.6 million less than Alternative 5-4. Alternative 5-2 is estimated to cost \$227.6 million.

Alternative 5-3 – This alternative would include a six-lane rural mainline with a standard diamond interchange 0.25 miles (0.40 kilometers) east of Route D/Z with frontage roads spaced 1,100 feet (335 meters) north and south of the ramp termini, a standard diamond interchange at Hughes Road with frontage roads spaced 1,320 feet (402 meters) north and south of the ramp termini and a standard diamond interchange approximately 0.2 miles (0.3 kilometers) east of

County Road 96/Johnson Road with frontage roads spaced 1,000 feet (305 meters) north and 1,250 feet (381 meters) south of the ramp termini. Alternative 5-3 would allow for construction of an interchange at Hughes Road that would fully comply with MoDOT access management guidelines. The replacement interchange 0.2 miles (0.3 kilometers) east of County Road 96/Johnson Road associated with this alternative would be constrained to the north by the GM&O Railroad and would not meet MoDOT's access management guidelines for this project. This alternative would require six single-family displacements, nine mobile home displacements, and four business displacements. The estimated total cost would be \$1.6 million more than Alternative 5-1, \$1.0 million more than Alternative 5-2 and \$0.6 million less than Alternative 5-4. Alternative 5-3 is estimated to cost \$228.6 million.

Alternative 5-4 (RPA) – *Alternative 5-4 is the same as Alternative 5-3 with the exception of a slight difference in the location of the interchange near County Road 96/Johnson Road. For Alternative 5-3 the interchange is located 0.2 miles (0.3 kilometers) east of County Road 96/Johnson Road. For Alternative 5-4 the interchange is located 0.3 miles (0.5 kilometers) east of County Road 96/Johnson Road and would fully comply with MoDOT access management guidelines.*

This alternative would require six single-family displacements, nine mobile home displacements, and four business displacements. The estimated total cost would be \$2.2 million more than Alternative 5-1, \$1.6 million more than Alternative 5-2 and \$0.6 million more than Alternative 5-3. Alternative 5-4 is estimated to cost \$229.2 million.

While the cost, displacement and environmental impacts associated with Alternatives 5-1, 5-2, 5-3 and 5-4 would essentially be the same, Alternative 5-4 would avoid conflicts with the GM&O Railroad and allow for the full implementation of MoDOT's access management guidelines at all of the interchange locations within Subsection 5.

3. Traffic Analysis

The proposed action involves improvements to the mainline and interchanges within the SIU 1 Project Area. These improvements would provide a safer and more efficient transportation system, improve transportation network connectivity, save travel time and reduce traffic congestion. After the reasonable Alternatives were identified, additional analysis resulted in slightly different LOSs for several of the interchange alternatives. Table II-4 shows the interchange LOS for the year 2030 for the all of the Build Alternatives. Table II-5 shows the Mainline LOS for the year 2030 for the Recommended Preferred Alternative. The targeted LOS for SIU 1 is a LOS D in the urban areas and a LOS C in the rural areas.

Table II-4: 2030 Interchange Level of Service for the Build Alternatives

Location	Alternative	Interchange Type	Interchange LOS
Subsection 1 – I-470 to Mile Marker 19			
Woods Chapel Road	1-1	SPUI	D
	1-2	Diamond	D
Subsection 2 – Mile Marker 19 to Mile Marker 22			
Route 7	2-1	Tight Diamond	D
	2-2	Tight Diamond With Loop	C

Location	Alternative	Interchange Type	Interchange LOS
Subsection 3 – Mile Marker 22 to Mile Marker 25			
AA/BB	3-1	SPUI	B
	3-2	Folded Diamond	C
Subsection 4 – Mile Marker 25 to Mile Marker 29			
H/F	4-1	Diamond w rural mainline	D
	4-2	Diamond w urban mainline	D
	4-3	SPUI	B
Subsection 5 – Mile Marker 29 to Mile Marker 39			
D/Z	5-1,5-2, 5-3,5-4	Diamond	B
West Odessa	5-1,5-2	Diamond at Burton Rd	C
	5-3,5-4	Diamond at Hughes Rd	C
East Odessa	5-1,5-3	Diamond 0.2 miles east of CR 96	B
	5-2,5-4	Diamond 0.3 miles east of CR 96	B

- Indicates the Recommended Preferred Alternative.

5-4 - Indicates the Recommended Preferred Alternative.

Table II-5: 2030 Mainline Level of Service for the Recommended Preferred Alternative

Location	Number of Lanes	2030 ADT		Ramp	Target LOS	2030 Build LOS
Subsection 1						
I-470 at interchange	8	121,600	AM Peak	EB	D	C
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C
I-470 to Little Blue Parkway ramp to ramp with auxiliary lanes	8 + 2 Auxiliary ¹	121,600	AM Peak	EB	D	B
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C
Little Blue Parkway at interchange	8	125,590	AM Peak	EB	D	C
				WB	D	E
			PM Peak	EB	D	D
				WB	D	C
Little Blue Parkway to Woods Chapel ² ramp to ramp with auxiliary lanes	8 + 2 Auxiliary ¹	125,590	AM Peak	EB	D	C
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C
Subsection 2						
Woods Chapel Road to Route 7	8	112,650	AM Peak	EB	D	C
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C
Route 7 to Adams Dairy Parkway ³	8	108,700	AM Peak	EB	D	C
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C

Location	Number of Lanes	2030 ADT		Ramp	Target LOS	2030 Build LOS
Adams Dairy Parkway at Interchange	8	108,700	AM Peak	EB	D	B
				WB	D	D
			PM Peak	EB	D	E ⁴
				WB	D	B
Subsection 3						
Adams Dairy Parkway to Route AA/BB ⁵	6	94,060	AM Peak	EB	D	C
				WB	D	E ⁶
			PM Peak	EB	D	E ⁶
				WB	D	C
Subsection 4						
Route AA/BB to Route H/F	6	89,190	AM Peak	EB	D	C
				WB	D	D
			PM Peak	EB	D	D
				WB	D	C
Subsection 5						
Route H/F to Route D/Z ⁷	6	83,310	AM Peak	EB	D	D ⁸
				WB	D	D ⁸
			PM Peak	EB	D	D ⁸
				WB	D	D ⁸
Route D/Z to Route 131	6	80,400	AM Peak	EB	C	C
				WB	C	C
			PM Peak	EB	C	C
				WB	C	C
Route 131 to County Road 96/Johnson Road ⁹	6	73,470	AM Peak	EB	C	C
				WB	C	D ¹⁰
			PM Peak	EB	C	D ¹⁰
				WB	C	C
Source: GEC						

 = Undesirable operations based on target LOS C in rural areas and LOS D in urban areas.

- 1 - In order to achieve a LOS D in the urban area, it may be necessary to add auxiliary lanes. Between the I-470 and Little Blue Parkway interchanges auxiliary lanes are needed along with the basic four-lanes in each direction. Auxiliary lanes are also needed between the Little Blue Parkway and Woods Chapel Road interchanges. Depending on more detailed ramp volume forecasts, the auxiliary lanes may need to be extended further east.
- 2 - Between the Little Blue Parkway and Woods Chapel Road interchanges in the westbound direction is a grade of 3.5 percent for approximately one-half mile (0.8 kilometers). A grade of this type impacts the LOS because heavy vehicles have some difficulty maintaining speed. The resulting LOS remains a D, taking into account this specific grade in the eastbound direction.
- 3 - The Route 7 to Adams Dairy Parkway PM eastbound has a lower ADT than Woods Chapel Road to Route 7, but a higher percentage of heavy trucks (24 percent versus 22 percent) resulting in a lower LOS (E versus D). Differing percentages of the peak hour volume (K factor) and directional distribution also influence the LOS.
- 4 - The basic four lanes in each direction cross section should be continued to the Adams Dairy Parkway interchange. The fourth lane eastbound would be dropped into the eastbound off-ramp to Adams Dairy Parkway and the fourth lane westbound would begin at the Adams Dairy on-ramp. The capacity analysis results in a LOS of D with the exception of the eastbound lane drop at Adams Dairy Parkway, which slightly drops below the desired LOS D/E threshold. Since the volume only slightly exceeds the LOS D, continuing the lane through the Adams Dairy Parkway interchange is not warranted.
- 5 - The Adams Dairy Parkway to Route AA/BB AM westbound and PM eastbound has a lower ADT than Route 7 to Adams Dairy Parkway, but a higher percentage of heavy trucks (AM westbound: 24 percent versus 22 percent, PM eastbound: 25 percent versus 24 percent). This results in a lower LOS (E versus D) for Adams Dairy

Parkway to Route AA/BB AM westbound and PM eastbound. Differing percentages of the peak hour volume (K factor) and directional distribution also influence the LOS.

- 6 - The I-70 link between Adams Dairy Parkway and the Route AA/BB interchange is forecast to carry a traffic volume in year 2030 that slightly exceeds the desired LOS D/E threshold. If the forecast volume is 4.6 percent lower (89,718 vpd), the LOS would be D. Since the volume only slightly exceeds the level of service D, adding an additional lane is not warranted.
- 7 - The Route H/F to Route D/Z AM eastbound and PM westbound has a lower ADT than Route AA/BB to Route H/F, but the percentage of heavy trucks is higher (26 versus 25) for both AM eastbound and PM westbound. The terrain used for the calculation was rolling verses level, which also lowered the LOS for Route H/F to Route D/Z. Differing percentages of the peak hour volume (K factor) and directional distribution also influence the LOS.
- 8 - Although the transition point from a typical Urban roadway to a typical Rural roadway has been designated at mile marker 29, by 2030 it could be argued that the area from mile marker 29 to Route D/Z would be considered urbanized in terms of the LOS, therefore a LOS D would be acceptable for this area.
- 9 - Even though the volumes are lower for Route 131 to County Road 96/Johnson Road compared to Route D/Z to Route 131, the terrain for Route 131 to County Road 96/Johnson was assumed to be rolling, rather than the level terrain used for Route D/Z to Route 131. This resulted in a lower LOS for Route 131 to County Road 96/Johnson Road. The percentage of heavy trucks was also higher from Route 131 to County Road 96/Johnson (29 percent verses 27 percent), which also impacted the LOS. Differing percentages of the peak hour volume (K factor) and directional distribution also influence the LOS.
- 10 - Between Route 131 and County Road 96/Johnson Road the AM westbound and PM eastbound LOS only slightly exceed the C/D threshold. Because the LOS only slightly exceeded the desired LOS C, adding an additional lane is not warranted.

4. Recommended Preferred Alternative

A thorough investigation of the engineering and environmental constraints of SIU 1 and an evaluation of the social, economic and environmental impacts of the mainline and interchange alternatives has been completed. This evaluation is presented in detail in Chapter IV and summarized in Table II-8.

The resulting RPA includes the following alternatives: 1-1, 2-2, 3-1, 4-3, and 5-4. This RPA includes widening I-70 to an eight-lane urban roadway with two additional auxiliary lanes from I-470 to Woods Chapel Road, an eight-lane urban roadway from Woods Chapel Road to Adams Dairy Parkway, a six-lane urban roadway from Adams Dairy Parkway to mile marker 29 and a six-lane rural roadway from mile marker 29 to mile marker 39. The Recommended Preferred Alternative also includes reconstruction of interchanges at Woods Chapel Road, Route 7, Route AA/BB and Route H/F. The Recommended Preferred Alternative would also include the construction of replacement interchanges located at 0.25 miles (0.4 kilometers) east of Route D/Z, Hughes Road, 0.3 miles (0.5 kilometers) east of County Road 96/Johnson Road and a grade separation near 15th Street in Blue Springs. The reconstruction of bridges at Old Highway 40 and Route WW as well as minor improvements to the interchanges at I-470, Little Blue Parkway and Adams Dairy Parkway would also be included as part of the RPA.

The Recommended Preferred Alternative generally provides the desired LOS for the I-70 mainline, its related interchanges and crossroad intersections. The proposed improvements would also improve traffic safety by reducing the number and severity of traffic related crashes along the SIU 1 portion of I-70.

Although this EA addresses all of SIU 1, the construction of the RPA may not be constructed at one time. Rather, it would be phased over time based on need and funding.

The Recommended Preferred Alternative discussed in this Draft EA is subject to review during the public hearing process and will not become final until all agency and public input has been evaluated and the Final EA and the decision document are approved.

5. Other Improvements

a. Intelligent Transportation System Improvements

The implementation of an ITS along the SIU 1 Project Area would improve the operating efficiency of the corridor under both the No-Build and Build Alternatives. The movement of people and goods along the corridor would be safer, faster and more reliable. Intelligent Transportation System deployment in the corridor would improve safety by identifying hazards and providing information on those hazards to drivers and system operators. Efficiently identifying and managing incidents in the I-70 corridor would reduce the occurrences of congestion, which reduces average travel time and improves travel time reliability. Implementing ITS improvements along I-70 would maximize the return on the investment being made on the critical I-70 corridor.

Intelligent Transportation Systems recommended for deployment along the I-70 corridor include:

- commercial vehicle operations,
- parking management,
- road weather information system,
- incident detection and management,
- traffic and travel information, and
- work zone management.

The capital cost for implementing an ITS in SIU 1 is \$8,200,000 with an estimated annual operation and maintenance cost of \$820,000. These costs reflect the extension of the Kansas City Scout system to the Odessa area, but do not include the cost for developing and operating an I-70 traffic operations center.

b. Corridor Enhancement Projects

The First Tier EIS documented the commitments of MoDOT and the FHWA to provide corridor-wide impact coordination, impact mitigation and considerations of corridor enhancements. The document provided agencies and communities the assurance that an enhancement master plan would be developed, and that corridor-based considerations would be fulfilled and appropriate special considerations would be provided for each of the second tier studies.

As part of the Second Tier Studies, MoDOT formed an Enhancement Subcommittee composed of the project team and local, state and federal agency technical staff and developed the I-70

Corridor Enhancement Plan. The scope of the plan includes all seven SIUs from Kansas City to St. Louis. The goals of the plan are to create an enhancement concept for the corridor that:

- complements the existing natural environment,
- maintains a sensitivity to the existing context of the corridor,
- provides a sense of consistency along the entire corridor,
- showcases Missouri through enhancements that highlight Missouri history, cultural resources and economy,
- establishes baseline enhancements for the entire corridor, and
- identifies opportunities for additional enhancements by local communities and other partnering agencies.

Included in the conceptual plan are: a program for aesthetic enhancements for the existing natural features in the corridor; visual design treatments to build elements that reduce their sense of scale; an overall design theme for enhancements to complement the visual context of the corridor (context sensitive solutions); corridor landscape enhancements for both the mainline and interchanges; and riparian habitat enhancement and wildlife corridors treatment.

Appropriate baseline enhancement features would be incorporated into the major reconstruction efforts along the I-70 Corridor, dependent upon the availability of adequate funding. This baseline enhancement concept includes bridge enhancement, landscaping using native grasses and flowers, and habitat enhancement at major stream and river crossings. Additional “beyond-baseline” enhancements are dependent upon the participation and funding by local communities and resource agencies.

c. Interstate 70 Rest Area

Guidance for rest area size, configuration and potential locations was provided in the I-70 Rest Area Study (Kansas City to St. Louis) (Available upon request). That study recommended that a rest area be located somewhere between Exit 24 and Exit 41. The study further recommended three candidate sites in SIU 1 at Oak Grove (Exit 28), Bates City (Exit 31) and Odessa (Exit 37). The selection of the candidate sites was based on multiple criteria, including access to utilities.

A new rest area was considered at Oak Grove (Exit 28), which is also the site of two private truck stops. Locating a Single Sidesaddle rest area at Exit 28 would not be desirable because of the amount of traffic congestion created in part by the existing truck stops.

An Odessa (Exit 37) rest area was considered and included a grade separation with no ramp connections to I-70. Locating a rest area at Exit 37 would not be desirable because of potential impacts to existing commercial properties and the potential cost of relocating an existing fuel line.

The Bates City (Exit 31) location was selected as the general location for a rest area in SIU 1. The specific site chosen is near mile marker 33, which is about one and one-half miles (2.4 kilometers) east of the proposed Route D/Z Interchange for Bates City (see Exhibits IV-12

and IV-13). The location near mile marker 33 provides a site about half way between the Route D/Z Interchange and the Route WW overpass. It provides a site suitable for an eastbound and westbound sidesaddle rest area design and requires no additional displacements. The location was also situated to minimize impacts to the Sni-A-Bar creek floodplain and bridge, which are located just east of the proposed location. The site would require the extension of utility service from Bates City but the lower cost of the design (\$10-12 million) compared to other designs (\$12-14 million) would likely offset any utility extension costs.

The proposed rest area site, which occupies approximately 40 acres located near mile marker 33, was included as part of all of the Build Alternatives, including the RPA, and studied for environmental impacts in this document.

d. Frontage Road Improvements

The First Tier EIS stated the long-term goal of providing continuous frontage roads for the purposes of providing an alternate travel route for I-70 traffic during incident management and for providing a travel route, other than I-70, for recurring local, short distance trips. Though continuous frontage roads are a long-term goal and are included as part of the proposed action for environmental planning purposes, continuous frontage roads are not a high priority. Including continuous frontage roads as part of the proposed action provides a long-term master plan for the corridor, but MoDOT is not committed to building continuous frontage roads in the near term. However, MoDOT is committed to constructing frontage roads for the purposes of maintaining existing local service connections and maintaining existing access to adjacent properties. Each frontage road would be assessed on an individual basis to determine whether or not any existing discontinuities would be addressed as part of construction. Improvement of existing discontinuities would depend on the availability of construction funding and relative priorities.

Within SIU 1, the existing frontage roads are completely continuous on the south side of I-70 and mostly continuous on the north side of I-70. From the I-470 interchange at the western terminus of SIU 1 to the interchange at Route AA/BB, continuous frontage roads currently exist on both the north and south sides of I-70, with the exception of a one mile area east of Little Blue Parkway on the north side of I-70. Highway 40, located to the south of I-70, also provides an additional alternate travel route for I-70 traffic from I-470 to Route AA/BB. On the south side of I-70 from Route AA/BB to the eastern terminus of SIU 1 in Odessa, existing Old U.S. Highway 40 serves as a continuous frontage road. On the north side of I-70 from Route AA/BB to the eastern terminus of SIU 1 in Odessa, many non-continuous frontage roads exist. Overall, approximately 23 miles of continuous frontage roads currently exist on the south side of I-70 and approximately 19 miles out of the 24 miles needed for continuous frontage roads on the north side of I-70 currently exist.

As part of the Build Alternatives in SIU 1, frontage roads would be constructed to maintain existing local service connections and existing access to adjacent properties. In addition, frontage roads within the SIU 1 Project Area would be constructed to close the approximate 6 miles (9.7 kilometers) of gaps in the existing frontage road system, out of the 48 miles (77.2 kilometers) needed for a complete system on both sides of I-70. All frontage roads shown on the exhibits for SIU 1 would be included as part of the Build Alternatives.

As stated in the “Frontage Road Master Plan” Technical Memorandum (MoDOT, 2003) (available upon request), new frontage roads, for purposes of this environmental document, would consist of two-lane, two-way roads conforming to the standards for a low volume local road. The frontage roads would utilize two 12-foot (3.7-meter) travel lanes and two 8-foot (2.4-meter) paved shoulders. Generally, a 50-mph (80.5-kph) design speed would be used, however at crossroad connections and in developed areas, a reduced design speed would be necessary to minimize right of way requirements. The frontage roads would use a uniform 26-foot (8-meter) clear zone on each side of the proposed right of way. Fill areas would have a maximum allowable slope of 4:1. Cost estimates and displacements shown on the exhibits reflect these design elements; however, each road will be looked at individually based on needs and funding at the time of final design. The Missouri Department of Transportation is not committed to these precise design elements.

C. Capital Costs

1. Capital Cost Methodology

a. Construction Costs

Construction cost estimates for mainline subsections and interchange alternatives also include design costs that were developed in the “Median Area Study, Design Criteria and Cost Estimating Guide, I-70 Second Tier Environmental Studies, January 2003” (available upon request) and email of classification and revision dated December 18, 2003. The unit costs provided are based on 2005 dollars. However, as the construction timeline is extended, costs are subject to change due to inflation.

b. Right of Way Costs

Right of way procurement includes the costs for securing and providing real property rights required for implementation of the proposed improvements to SIU 1. The right of way requirements were measured by the area within the construction limits, as available at this phase of the project design. The right of way procurement costs were then computed based on the best available local data.

c. Billboard Costs

The widening of I-70 would typically result in the need to acquire and remove existing billboards located where new right of way is required. Under current state and federal law, some of the billboards that are removed may be able to be replaced on other land adjacent to the new right of way limits. Minimum spacing and other requirements are likely to prevent other billboards from being replaced. The cost estimates assume that impacts to billboards would be paid for based on the actual cost to replace the billboards in kind. In some cases, existing billboards don't conform to MoDOT policy, and there may be additional cost implications in order to bring them into compliance. These potential costs are subjective based on each individual occurrence and therefore have not been included in the estimate.

Within SIU 1, it is estimated that construction of a Build Alternative would require the removal of approximately 39 to 40 existing billboards, depending on the alignment of the Build Alternative selected. Under current law, a substantial number of these large billboards would be able to be set back and rebuilt at their same approximate milepost location.

Under the No-Build Alternative, the existing billboard structures would not be affected.

2. Capital Cost Estimates

Each of the reasonable alternatives considered in this EA was also evaluated on the basis of cost. Table II-6 provides a cost breakdown of each mainline subsection and interchange alternative. The total capital cost estimate for the RPA is \$533.7 million.

The No-Build Alternative assumes no new major transportation improvement investments would be implemented within the SIU 1 Project Area other than those already programmed and funded. Costs for the No-Build Alternative include rehabilitation, operations and maintenance and are included in Chapter II.D.

Table II-6: Capital Cost Estimates

Alternative	Construction ¹	Right of Way ¹	Total ¹
Subsection 1 – I-470 to Mile Marker 19			
1-1	\$46.2	\$13.6	\$59.8
1-2	\$42.2	\$25.8	\$68.0
Subsection 2 – Mile Marker 19 to Mile Marker 22			
2-1	\$49.7	\$25.9	\$75.6
2-2	\$50.6	\$34.2	\$84.8
Subsection 3 – Mile Marker 22 to Mile Marker 25			
3-1	\$57.4	\$16.2	\$73.6
3-2	\$56.8	\$22.5	\$79.3
Subsection 4 – Mile Marker 25 to Mile Marker 29			
4-1	\$70.5	\$27.2	\$97.7
4-2	\$68.6	\$20.3	\$88.9
4-3	\$66.1	\$20.2	\$86.3
Subsection 5 – Mile Marker 29 to Mile Marker 39			
5-1	\$214.0	\$13.0	\$227.0
5-2	\$214.6	\$13.0	\$227.6
5-3	\$216.0	\$12.6	\$228.6
5-4	\$216.5	\$12.7	\$229.2

 - Indicates the Recommended Preferred Alternative.

1 - Cost are in millions (year 2005 dollars)

D. Operations and Maintenance Estimates

Table II-7 presents the major rehabilitation and operations and maintenance (O&M) costs for the SIU 1 No-Build and RPA. These estimates include the costs of maintaining and rehabilitating the existing I-70 pavement and bridges. Portions of the existing I-70 facility would need to be

rehabilitated through milling and overlaying prior to the full implementation of the Improve I-70 project. In order to develop the Equivalent Uniform Annual Cost (EUAC), it is assumed that prior to completing the construction of the I-70 project, these rehabilitation efforts would be necessary and would occur early in the 26-year study period to address the very poor pavement needing immediate attention. The costs include a two percent increase each year in the rehabilitation and construction cost. Milling and overlay was assumed to be done on a ten-year cycle for both the No-Build and RPA (after 20-year initial life). The No-Build Alternative includes one bridge re-decked or repaired annually. The Build Alternative assumes no bridge work in the first two years.

Table II-7: Rehabilitation and O&M Costs for SIU 1

Rehabilitation and O&M Costs	Total 26-year Cost	Present Value of Annual Costs (6% Discount Rate)	Equivalent Uniform Annual Cost (EUAC)
<i>No-Build Alternative</i>			
Major Rehabilitation	\$69,393,000	\$48,870,000	\$3,758,000
O&M	\$22,160,000	\$8,239,000	\$634,000
Total			\$4,392,000
<i>Recommended Preferred Alternative</i>			
Major Rehabilitation	\$1,378,000	\$1,000,000	\$73,000
O&M	\$24,559,000	\$8,909,000	\$647,000
Total			\$720,000

The additional O&M cost for the RPA, 154 lane-miles (248 lane-kilometers), is only marginally more than that for the No-Build Alternative, 106 lane-miles (171 lane-kilometers), because the full implementation of the Improve I-70 project would not occur until funding and construction are completed. Major rehabilitation costs for the No-Build Alternative will be almost \$3.8 million annually (EUAC) compared to \$73,000 annually (EUAC) for the RPA.

Table II-8: Summary of Impacts by Alternative

Evaluation Factor	Unit	No-Build	Build Alternatives												
			Subsection 1		Subsection 2		Subsection 3		Subsection 4			Subsection 5			
			1-1	1-2	2-1	2-2	3-1	3-2	4-1	4-2	4-3	5-1	5-2	5-3	5-4
ENGINEERING															
Capital Cost (Order of Magnitude):															
• New Construction	\$ million	\$0	\$46.2	\$42.2	\$49.7	\$50.6	\$57.4	\$56.8	\$70.5	\$68.6	\$66.1	\$214.0	\$214.6	\$216.0	\$216.5
• Right of Way	\$ million	\$0	\$13.6	\$25.8	\$25.9	\$34.2	\$16.2	\$22.5	\$27.2	\$20.3	\$20.2	\$13.0	\$13.0	\$12.6	\$12.7
Total	\$ million	\$0	\$59.8	\$68.0	\$75.6	\$84.8	\$73.6	\$79.3	\$97.7	\$88.9	\$86.3	\$227.0	\$227.6	\$228.6	\$229.2
TRAFFIC															
Mainline Level of Service (2030)	LOS	F	C	C	C	C	D	D	C	C	C	C	C	C	C
Interchange Level of Service (2030)	LOS	Varies A-F	D	D	D	C	B	C	D	D	B	C	C	C	C
SOCIAL AND ECONOMIC															
Land Use Compatibility with Current Trends	Rating	NA	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Displacements:															
• Total Area	Acres	0	26.3	31.4	10.5	14.7	43.1	41.8	154.3	124.2	87.6	272.8	279.1	279.1	285.4
• Residential Units ¹ /Residents ²	Number	0/0	0/0	0/0	4/10	4/10	1/3	1/3	49/123	28/70	20/50	16/40	16/40	15/38	15/38
• Businesses ³ /Employees ⁴	Number	0/0	3/38	5/63	8/100	10/125	1/13	2/25	3/38	2/25	2/25	3/38	3/38	4/50	4/50
• No. of Parcel Acquisitions (Total/Partial)	Number	0/0	4/47	7/47	9/61	10/63	7/58	7/57	45/93	45/90	45/88	0/23	0/24	4/49	4/50
Environmental Justice Issues	Yes/No	NA	No	No	No	No	No	No	No	No	No	No	No	No	No
ENVIRONMENTAL															
Air Quality	Rating	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Noise ⁵	Number ⁶	205	44	44	9	9	13	0	2	2	2	51	51	51	51
Parklands:															
• Refuges/Parks	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Other Public Lands	Number	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Farmland Conversion Impact Rating	Rating #	NA	117	117	0	0	134	134	149	153	153	139	140	136	136
Prime Farmland	Acres	0	11.4	11.9	12.2	10.5	9.1	12.0	51.1	42.6	42.2	125.1	135.0	103.6	113.5
Farmland of Statewide Importance	Acres	0	17.2	19.5	1.3	3.8	23.1	22.5	53.1	36.1	34.6	171.9	165.0	191.5	184.6
CRP Land	Acres	0	0	0	0	0	0	0	4.0	3.6	3.6	0	0	0	0
Floodplains	Acres	0	8.0	8.0	0.3	0.3	11.8	11.8	17.7	17.6	17.6	65.1	64.4	65.1	64.4
Stream Crossings	No./Lin.Ft.	0/0	4/431	4/431	0/0	0/0	7/5,629	7/5,629	11/3,825	11/3,155	11/3,155	18/6,694	18/6,694	18/8,435	18/8,435
Vegetated Wetlands	Acres	0	1.1	1.1	0.0	0.0	2.1	2.1	8.1	8.1	8.1	3.5	3.5	3.5	3.5
Jurisdictional Ponds	Acres	0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.6	0.6
WRP Lands	Acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Threatened & Endangered Species	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Riparian Corridors	Acres	0	0	0	0	0	0	0	0	0	0	12.8	12.8	31.3	31.3
Known Cultural Resources:															
• Cemeteries	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Architectural Recourses	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Historic Bridges	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
• Archaeological Sites	Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous Waste Sites	Number	0	1	1	2	2	1	1	0	0	0	1	1	1	1
Visual Quality	Rating	NA	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
Secondary Impacts	Rating	NA	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

- Preferred Alternative for this Category
- Recommended Preferred Alternative for Subsection
- ☉

Benefits > Adverse Impacts
- ☉

Benefits = Adverse Impacts
- ☉

Benefits < Adverse Impacts
- NA

Not Applicable

1 -

Includes single-family, multi-family and mobile homes

2 -

Assumes 2.5 residents per unit

3 -

Includes businesses that would require relocation

4 -

Assumes 12.5 employees per business

5 -

Impacts for Build Alternatives include potential mitigation measures

6 -

Number meeting or exceeding the FHWA NAC of 66 dBA or causing a 15 dBA increase over existing noise levels.