

## Selected Alternative

The Selected Alternative for SIU 6 was based on the overall assessment of potential social and natural environmental impacts, engineering performance and the alternative's ability to satisfy the Purpose and Need, along with the public and resource agency involvement process. The decision making process for determining the Selected Alternative consisted of completion of the Draft EA, a public hearing, review of the Draft EA, determination of the Selected Alternative and finally, determining if there was any significant impact caused by the proposed action.

To simplify the alternatives evaluation process, the SIU 6 study corridor was divided into two distinct study areas:

- **Western Study Area (Kingdom City)** – The western study area extends from the western SIU 6 terminal at mile marker 147, through the U.S. 54 Interchange in Kingdom City, to mile marker 163 just east of the Route D Interchange at Williamsburg.
- **Eastern Study Area (Mineola Hill)** – The eastern study area extends from mile marker 163 just east of the Route D Interchange at Williamsburg to the eastern SIU 6 terminal at mile marker 174. The eastern study area contains the environmentally sensitive Mineola Hill region.

The decision to expand to the north, south or within the existing I-70 footprint as the Selected Alternative for SIU6 is displayed in **Exhibit III-1**.

### A. SIU 6 Selected Alternative

#### 1. Western Study Area (Kingdom City)

The SIU 6 Study Team selected expanding I-70 north through the western study area as a continuation of the SIU 5 Study Team selection to expand north of existing through SIU 5 to avoid impacting Tucker Prairie. Continuation of the northern expansion through the western study area of SIU 6 was also selected to avoid the Missouri Girls Town facility and a potentially historic farmstead located in the southwest quadrant of the Calwood interchange and a gas station located in the southwest quadrant of the Williamsburg interchange.

The western study area included three existing interchanges (Kingdom City, Calwood and Williamsburg) and two overpasses that do not have direct access to I-70. The interchanges at Calwood and Williamsburg were analyzed to determine forecast capacity constraints and it was determined that the standard diamond interchange configurations at the three interchanges will be able to adequately handle the 2030 projected traffic volumes. The study team considered various interchange alternatives and locations for improving the Kingdom City interchange due to the potential impact on the Kingdom City business community and the projected traffic volumes.

##### a. Features of the Selected Alternative

As displayed in **Exhibit III-2**, the study team chose improving the diamond interchange at its existing location at the Kingdom City interchange and other I-70 improvements as the Selected

Alternative for the western (Kingdom City) portion of the SIU 6 study area. The selected improvements in the western study area include the following:

- From the western terminus at mile marker 147 to the start of the Loutre River valley at mile marker 163, the Selected Alternative will provide three continuous lanes in each direction with all construction activities taking place on the north side of the existing I-70 alignment.
- The two existing interchanges at Calwood and Williamsburg will be replaced with standard diamond interchanges based on the design criteria established for standard diamond interchanges being utilized throughout the I-70 Corridor.
- The two overpasses located between Kingdom City and Calwood and between Williamsburg and the Loutre River valley will also be replaced with no provision for direct access.
- The existing interchange at Kingdom City will be replaced with a standard diamond interchange on its present location. The existing south outer road intersection will be relocated south of the existing Best Western Hotel and the existing access road to the Missouri Tourism Center and service stations will be relocated north to the approximate location of the Old Highway 40 intersection. Directional ramps will be constructed south and east of the interchange and Kingdom City if future traffic volumes warrant. MoDOT agreed that it will not construct the directional ramps until such time that traffic volumes degrade the operation of the interchange to an unacceptable level and not until such time as a re-evaluation of the need has been completed.
- Compared to a majority of the existing I-70 corridor in SIU 6, the interstate median between Route JJ and Auxvasse Creek widens substantially through a curve for approximately 4,000 feet. To offset the need for additional right of way to construct this section, the study team selected to utilize a modified maintenance of traffic plan that will require temporary pavement and unique staging of traffic.
- As a result of discussion with the Kingdom City Highway Coalition (KCHC), the study team presented various frontage road alternatives for the Kingdom City area. The details of the frontage road locations will be finalized during later design stages of the project. The environmental document shows the proposed locations of the new outer road intersections, as well as connecting roads necessary to reconnect back to the existing outer road system. This document will not commit MoDOT to building any additional outer roads but instead illustrates where roads are proposed to be included as development occurs in the interchange.

**b. Ability to Address the Issues and Needs of Kingdom City Business Community**

Throughout the SIU 6 decision-making process the study team sought to develop alternatives that balanced the improvement needs of the highway with the concerns of the Kingdom City business community. Working with the KCHC, the study team developed a Selected Alternative that addressed the following highway coalition concerns:

- **Maintain Existing Interchange Location** – The selection of an alternative that maintained the U.S. 54 interchange at its existing location allowed the study team to effectively balance the statewide needs of travel efficiency with the local economic development needs of Kingdom City.

- **Accessibility/Visibility of Existing Businesses** – Although the Selected Alternative will change the interchange configuration somewhat, keeping the interchange at its existing location maintains the accessibility and visibility of existing businesses.
- **Traffic Volumes (Customers)** –The study team estimated that if the proposed directional ramps were constructed, it will shift approximately 25 percent of the total number of trips entering the interchange to the directional ramps. While this did represent a fairly substantial reduction in hourly and daily trips, the overall number of vehicles that will pass through Kingdom City in the year 2020 will be considerably higher than currently exists.
- **Preservation of Fire Fighter’s Memorial/Tourist Center** – The Selected Alternative will not directly impact the memorial, the tourist center or the plans for the proposed museum.
- **Traffic Disruption During Construction** – The study team determined that the construction-related impacts associated with the improved diamond interchange will be substantially less than those associated with a single point interchange.

## 2. Eastern Study Area (Mineola Hill)

As a result of the proximity of numerous environmental constraints, such as the Graham Farmstead, the Graham Cave State Park and Graham Rock, earlier studies did not make a recommendation for expansion through Mineola Hill. The SIU 6 Study Team evaluated numerous options through this section, including several off-alignment alternatives. The SIU 6 Study Team selected a southern expansion of mainline I-70 east of Mineola Hill to avoid the Danville area and the historic Baker Plantation. Coordination with the SIU 7 Study Team indicated that a southern expansion will be acceptable at the eastern terminus as that study is recommending a southern expansion as well. The interchange at Danville was also analyzed to determine forecast capacity constraints and it was determined that the standard diamond interchange configuration at the interchange will be able to adequately handle the 2030 projected traffic volumes.

### a. Features of the Selected Alternative

For the eastern (Mineola Hill) portion of the study area, the study team selected making improvements to the existing highway alignment. The study team based the selection on the evaluation of the potential social and natural environmental impacts, engineering performance, the alternative’s ability to satisfy the Purpose and Need, and the public and resource agency involvement process. The study team determined that the following improvements to I-70 be the Selected Alternative for the eastern (Mineola Hill) portion of the SIU 6 study area.

As displayed in **Exhibit III-3**, from just east of the Williamsburg interchange, near mile marker 163, through the Loutre River valley, to the Danville interchange the Selected Alternative is to provide three continuous lanes in each direction. Unlike other sections of I-70, construction will not take place on either the north or south sides of existing I-70 but instead will be replaced on its existing location. From the Danville interchange to the eastern terminus just west of the Route 19 interchange the additional capacity to mainline I-70 will be constructed south of the existing facility.

The existing interchange at Danville will be replaced with a standard diamond interchange based on the design criteria established for standard diamond interchanges being utilized throughout the I-70 Corridor.

The Selected Alternative through the Mineola Hill area (Loutre River Valley) will be a six-lane section with a seventh lane in the eastbound direction between the Loutre River and the top of the hill to provide a truck passing lane and to aid in the maintenance of traffic. Should an eighth lane be necessary in the distant future, no additional impacts to or use of park land are anticipated, as the study team evaluated potential impacts to Graham Cave State Park as part of the Second Tier Study. Extensive use of retaining walls will be required on both the north and south sides of mainline I-70 to prevent encroachment into the Graham Cave State Park and the historic Graham Farmstead. A maximum vertical grade of four percent from the Loutre River to the Graham Rock will be required instead of the recommended three percent grade being used on other sections of I-70. A maximum side slope grade of 2:1 with the required guard rail will be constructed instead of the standard 6:1 side slope grades. The final recommendation through this section was to utilize the existing highway, State Routes J and N in Montgomery County, south of I-70 through the town of Mineola as the only continuous frontage road through this section.

**b. Ability to Address Eastern Study Area Issues**

The Selected Alternative addressed key issues in the eastern study area as follows:

- **Vertical Grade Issues** – Extensive engineering analysis completed through Mineola Hill determined that the preferred three percent vertical grade will require an extensive amount of rock cut east of the Graham Rock, will require the existing bridge across the Loutre River valley to be raised by almost 20 feet and could not be constructed without impacting the Graham Cave State Park or the historic Graham farmstead. In coordination with FHWA, the study team selected to carry a four percent grade between the Loutre River and Graham Rock and then a three percent grade from the rock to the top of the hill.
- **Side Slope Issues** – By utilizing 2:1 side slopes with guard rails rather than the standard 6:1 side slopes, the Selected Alternative could be constructed through Mineola Hill without impacts to either Graham Cave State Park or the historic Graham Farmstead.
- **Safety Issues** – The Selected Alternative incorporated several improvements through Mineola Hill in an effort to reduce the high crash rates. The improvements included the removal of the rest areas, the additional fifth and sixth through lanes, retaining walls and guard rails, and a seventh lane in the eastbound direction to provide a truck climbing lane.
- **Outer Roads** – The Selected Alternative utilizes a single southern frontage road through the town of Mineola, because the study team determined that adjacent frontage roads could not be constructed without directly impacting the Graham Cave State Park or the historic Graham farmstead.
- **Maintenance of Traffic** – In order to avoid taking portions of Graham Cave State Park and the Graham farmstead, the study team's selected maintenance of traffic plan for Mineola will shift two lanes of traffic to the westbound lanes, with some temporary construction, and will require head-to-head traffic operations separated by a Jersey barrier. The construction of the eastbound lanes will include the fourth truck climbing lane that will be sufficiently wide to handle the head-to-head traffic required while construction of the westbound lanes is completed. Temporary expansion of the westbound Loutre River Bridge will also be required during the first phase of construction.

## B. Alternative's Ability to Meet Purpose and Need

The study team concluded that the Selected Alternative for SIU 6 clearly satisfied the identified purpose and need for the project, while minimizing any adverse social or environmental impacts. The conclusion was based on the overall evaluation conducted during the Second Tier Study process. The Selected Alternative addresses the purpose and need for SIU 6 as follows:

- **Roadway Capacity** – The additional lanes and geometric improvements on I-70 provides for an adequate future year level of service for all mainline segments of interstate. The standard diamond interchanges being proposed at the three interchanges in Calwood, Williamsburg and Danville will maintain an acceptable level of service. The level of service at the two Kingdom City ramp terminals and the relocated north and south outer road intersections could operate at an acceptable level up to and until a point when the proposed directional ramp to the southeast quadrant was necessary.
- **Traffic Safety** – The identified safety deficiencies, primarily in the Kingdom City area, will be improved with the construction of the improved standard diamond interchange and the relocation of the north and south outer road intersections. Mainline geometric improvements, including additional lanes on mainline I-70 and the wider median section, will also improve traveler safety throughout this section of SIU 6, including the Mineola Hill area.
- **Roadway Design Features** – The Selected Alternative will eliminate the existing substandard roadway and interchange bridges. With one exception, the roadway and bridge construction within SIU 6 will meet the design criteria established for I-70. The exception is the Mineola Hill area, which will not meet the recommended I-70 criteria, but will meet existing FHWA standards.
- **System Preservation** – The existing I-70 facility, including the Kingdom City interchange, will be improved in its present location, thereby preserving the existing facility.
- **National Security** – The additional lanes, along with the potential inclusion of continuous frontage roads, will provide for improved ability to respond to regional and national emergencies and will provide needed redundancies.

## C. Environmental Impacts Associated with Selected Alternative

The Selected Alternative will affect the various existing social, economic and natural environmental characteristics present in SIU 6. A full summary of potential environmental impacts is displayed in **Table III-1** at the end of this section. Potential environmental impacts associated with the Selected Alternative included:

- **Displacements** – Within SIU 6, the Selected Alternative will displace a total of 16 residential dwelling units and eight businesses.
- **Mineola Hill Cultural Impacts** – The Selected Alternative will not directly impact the Graham Cave, Graham Cave State Park, Graham Rock, Graham Farmstead, Baker Plantation, Danville Female Academy, potential gravesites near Rumbo Branch

Creek, or any of the other known historic and archaeological resources in the Mineola Hill area.

- **Kingdom City Interchange Impacts** – Kingdom City businesses will experience short-term impacts to visibility and accessibility during construction of the Selected Alternative. However, economic opportunities will improve following interchange reconstruction.
- **Wetlands** – The Selected Alternative will impact approximately 7.27 acres (2.9 hectares) of existing wetlands, exempt wetlands and former NWI mapped wetlands—the majority of which are small, poor quality wetlands that provide limited wildlife and fish habitat, groundwater recharge and aesthetic value. Mitigation for these wetlands will ensure that wetland acreage and functional value will not be decreased.
- **Threatened and Endangered Species** – The Selected Alternative could impact potential habitat for the Blacknose Shiner, Indiana Bat and Running Buffalo Clover. MoDOT will review the Natural Heritage Database periodically for new locations of the Running Buffalo Clover and will conduct a survey for the Running Buffalo Clover at least one year prior to construction and clearing activities at Auxvasse Creek and the Loutre River plus any new areas identified from the Natural Heritage Data Base.

Table III-I: I-70 SIU 6 Evaluation Matrix

Criteria	Selected Alternative	
	Western Sub-area (Kingdom City)	Eastern Sub-area (Mineola Hill)
<b>Engineering Issues</b>		
Does the alternative meet federal and state highway design criteria?	Yes	Yes
Can the alternative be constructed?	Yes	Yes
Can four-lanes of traffic be maintained on I-70 during construction?	Yes	Yes
Can four-lanes of traffic on Route 54 be maintained during construction?	No	---
Are there frontage roads on both sides of the facility?	Yes	No
What is the total increase in State roadway mileage (lane-miles)?	44 miles	22 miles
What are the anticipated construction costs?	\$295.5 million	\$164.2 million
How much could be saved by delaying construction of the directional movement?	\$19.6 million	---
<b>Traffic/Safety Issues</b>		
Does this alternative improve accident rates at the US 54 interchange?	Yes	---
Does this alternative affect incident management and emergency services?	No	No
Does the alternative improve traffic operations, allowing vehicles to move more freely?	Yes	Yes
Does the alternative improve travel efficiency, reducing the hours and miles traveled daily?	Yes	Yes
Does the alternative address long-term capacity needs?	Yes	Yes
<b>Environmental Issues</b>		
How much farmland is impacted?	280 acres	105 acres
How much parkland is impacted?	0 acres	0 acres
How much wooded forests are impacted?	65 acres	50 acres
Does the alternative impact threatened and endangered species?	No	No
Does the alternative impact water resources, stream crossings or floodplains?	20 acres	19 acres
How many wetland areas are impacted?	7.27 acres total in SIU6	
Are any natural areas, habitats or CRP property impacted?	No	Yes
Are there any visually sensitive resources impacted?	No	Yes
Are any historic structures impacted?	No	No
Is Graham Cave State Park, the Graham Farmstead or Graham Rock directly impacted?	---	No
Are any prehistoric archaeological sites impacted by the alternative?	No	No
Are there any secondary or cumulative impacts associated with the alternatives?	Yes	Yes
Are any hazardous waste sites in the path of the alternative?	Yes	No
<b>Social Issues</b>		
How many existing residences will be directly impacted (structures)?	10	6
How many non-business landowners will be partially impacted (land only)?	102	71
Will this alternative increase the level of noise experienced nearby?	Yes	Yes
Is this alternative compatible with the community's land use plans?	Yes	Yes
Will the alternative impact the Firefighter Memorial and Tourist Center?	No	---
Will the alternative impact the new Kingdom City sewage treatment plant?	No	---
Does the alternative disproportionately impact minority or low-income communities?	No	No
<b>Economic Issues</b>		
How many businesses (full taking) will be directly impacted?	6	2
Will the alternative impact business operations during construction?	Yes	---
Will the alternative maintain the existing Kingdom City intersection south of the interchange?	No	---
Will the alternative create out-of-distance travel to businesses after construction?	Yes	---
Will the alternative maintain the visibility of existing Kingdom City businesses?	Yes	---
Does the alternative impact all Kingdom City businesses equitably?	Yes	---

Source: Wilbur Smith Associates