

**Interstate 70 SIU 6 Corridor
Kingdom City to Montgomery City, Missouri
Callaway and Montgomery Counties, Missouri**

**Second Tier
Environmental Assessment**

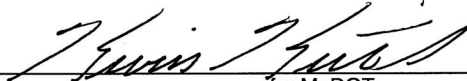
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**U.S. Department of Transportation
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and
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Cooperating Agencies
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The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) propose improving the Interstate 70 (I-70) Corridor in Missouri, between the metropolitan areas of Kansas City and St. Louis, to meet the current and future needs of the traveling public. The First Tier Environmental Impact Statement (First Tier EIS) was completed, with a Record of Decision, in the fall of 2001. The Second Tier environmental decision-making process (Improve I-70) began immediately after the completion of the First Tier EIS Record of Decision. The corridor for the I-70 SIU 6 improvements has been generally defined as an 850 foot (260 m) band centered along existing I-70 from the U.S. 54 interchange with I-70 (mile post 147) near Kingdom City to Route 19 but not including the interchange near Montgomery City (mile post 174).

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INTERSTATE 70 CORRIDOR

KANSAS CITY TO ST. LOUIS, MISSOURI

Second Tier Environmental Assessment

Section of Independent Utility #6
Kingdom City to Montgomery City

MoDOT Job Number: J4I1341J

September 30, 2004



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Documents Available Upon Request

The documents listed below are available for review upon request. To request a document for review, please contact:

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MoDOT Technical Memorandum. July 2003. "Frontage Road Master Plan".
MoDOT Technical Memorandum. January 2003. "Environmental Methodologies".
MoDOT Technical Memorandum. August 2003. "Rest Area Study".
MoDOT Technical Memorandum. January 2003. "Median Area Study".
MoDOT Technical Memorandum. January 2003. "Design Criteria and Cost Estimating Guide".
MoDOT Technical Memorandum. July 2003. "I-70 Corridor Enhancement Plan".
MoDOT Technical Memorandum. January 2003. "Cultural Resources Methodologies".
MoDOT Technical Memorandum. "Geomorphological Report".
Prawl, Toni M.; Gubbels, Thomas; Daniels, Karen L. October 2003. "Interstate 70, SIU 6
Historical and Architectural Survey, Vol. 13"
Shannon and Wilson. "Wetlands Technical Report".
TSi Engineering, Inc. September 2003. "I-70 Second Tier Environmental Studies SIU #6 –
Kingdom City to Montgomery City Preliminary Geotechnical Studies".
TSi Engineering, Inc. November 2003. "I-70 Second Tier Environmental Studies SIU #6 –
Kingdom City to Montgomery City Preliminary Hazardous Waste Studies".
Vibra-Tech. Bayer, Rodger A. December 2003. "Blasting Feasibility Near Graham Cave and
The Homestead".
Wakeman, Ann. September 2003. "A Survey for Running Buffalo Clover (*Trifolium stoloniferum*
Muhlenb. ex Eaton) in the Loutre River Basin Montgomery County, Missouri".
Whittaker, William E. and Newman, Adam. April 2004. "Phase 1 Archaeological Investigations
for Interstate 70 Improvements, SIU 6, T48N-R5-9W, Callaway and Montgomery Counties,
Missouri".
Wilbur Smith Associates. April 2004. "Initial Screening Report".
Wilbur Smith Associates. April 2004. "Traffic Technical Memo".
Wilbur Smith Associates. April 2004. "Visual Assessment Technical Memo".
Wilbur Smith Associates. April 2004. "Final I-70 Noise Technical Memo".

Guide to Acronyms and Abbreviations

AADT – Average Annual Daily Traffic

AASHTO – American Association of State and Highway Transportation Officials

BMP – Best Management Practices

CE – Categorical Exclusion

CPAC – University of Missouri-Columbia Community Policy Analysis Center

CRP – Conservation Reserve Program

CVO – Commercial Vehicle Operations

DEIS – Draft Environmental Impact Statement

DNR – Department of Natural Resources

EA – Environmental Assessment

EIS – Environmental Impact Statement

EPA – Environmental Protection Agency

FHBM – Flood Hazard Boundary Map

FHWA – Federal Highway Administration

FONSI – Finding of no Significant Impact

GEC – General Engineering Consultant

GIS – Geographic Information System

HMVMT –Hundred Million Vehicle Miles Traveled

HOV – High-Occupancy Vehicle

HWP – Hazardous Waste Program

IRI – International Roughness Index

ITS – Intelligent Transportation Systems

KCHC – Kingdom City Highway Coalition

LOS – Level of Service

LWCF – Land and Water Conservation Fund

MDC – Missouri Department of Conservation

MDNR – Missouri Department of Natural Resources

MoDOT – Missouri Department of Transportation

MONAC – Missouri Natural Areas Committee

NEPA – National Environmental Policy Act

NRHP – National Register of Historic Places

PIC – Public Involvement Consultant

PSR – Pavement Serviceability Rating

RCI – Ride Condition Index

ROD – Record of Decision

RWIS – Road Weather Information System

SEC – Section Engineering Consultant

SHPO – State Historic Preservation Office

SIU – Sections of Independent Utility

SMG – Study Management Group

SPUI – Single-Point Urban Interchange

STRANET – Strategic Highway Network

USACE – United States Army Corps of Engineers

USDA – United States Department of Agriculture

USEPA – United States Environmental Protection Agency

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

VMT – Vehicle Miles of Travel

WRP – Wetland Reserve Program

Summary

The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) propose improving the Interstate 70 (I-70) Corridor in Missouri, between the metropolitan areas of Kansas City and St. Louis, to meet the current and future needs of the traveling public. To facilitate this action, MoDOT initiated a tiered environmental decision-making process in the fall of 1999. The First Tier Environmental Impact Statement (First Tier EIS) was completed, with a Record of Decision, in the fall of 2001.

Environmental tiering enables a decision-making process that focuses on corridor-wide issues that must be resolved prior to the detailed environmental review. The First Tier Study decisions framed and narrowed the scope of Second Tier Studies and related documents. The First Tier Study produced the following outcomes:

- Approval of a general concept (i.e. preferred strategy) for improving I-70. The recommended preferred strategy was to widen and reconstruct the existing facility.
- Identification of seven Sections of Independent Utility (SIU) for the Second Tier Studies, including an action plan for the completion of the environmental process.
- Documentation that can be referenced by the Second Tier Studies to eliminate repetitiveness and record the First Tier decision.
- Development of agency and public consensus for the overall improvement plan.

The Second Tier environmental decision-making process (Improve I-70) began immediately after the completion of the First Tier EIS Record of Decision. This draft environmental assessment document details the Second Tier environmental decision-making process specific to SIU 6 from U.S. 54 at Kingdom City to Route 19 but not including the interchange near Montgomery City, based on information developed in the First Tier as well as more specific information collected and analyzed as part of the Second Tier process.

A. Description of Proposed Action

The corridor for the I-70 SIU 6 improvements has been generally defined as an 850-foot (260 m) band centered along existing I-70 from the U.S. 54 interchange with I-70 (mile post 147) near Kingdom City to Route 19 but not including the interchange near Montgomery City (mile post 174). Two alternative corridor concepts (2,000 feet/610 meters in width) were also recommended in the First Tier through the Mineola Hill area (from just east of the Williamsburg interchange to the Danville interchange).

For all of this length, I-70 is a four-lane divided, fully access-controlled interstate facility. The 27-mile corridor includes four diamond interchanges with I-70, two river crossings at Auxvasse Creek and the Loutre River, as well as two crossover structures without direct access to I-70. The communities of Kingdom City, Williamsburg, Mineola and Danville are located in, or adjacent to, the defined I-70 Corridor. The First Tier EIS also identified numerous environmental constraints, including the Graham Cave State Park, the historic Graham Farmstead, the Baker Plantation and Graham Rock.

The proposed action is to seek the most effective improvement alternative for SIU 6 that satisfies the statewide improvement needs for I-70, as well as the identified needs within the

SIU 6 study area, including improvements within the Kingdom City interchange area and through Mineola Hill. The proposed improvement includes an additional lane in each direction, the replacement of all existing interchanges and overpasses, access management where appropriate, and the provision for continuous frontage roads on both sides of I-70 as deemed necessary. The most effective improvement alternative should satisfy the identified purpose and need for the project while minimizing the overall impact to the social and natural environment.

B. Purpose and Need

The First Tier Study established the corridor-wide purpose and need for I-70 improvements between Kansas City and St. Louis. That document identified the goal of I-70 improvements is to provide a safe, efficient, environmentally sound and cost-effective transportation facility that responds to the needs of the study corridor in addition to the expectations of a nationally important interstate. The SIU 6 Second Tier Study began immediately after the completion of the First Tier EIS Record of Decision. The study team developed a more specific purpose and need for SIU 6 improvements. The revised purpose and need was based on information developed in the First Tier Study as well as more specific information collected and analyzed as part of the second tier process. The specific purpose and need for SIU 6 improvements included:

- **Roadway Capacity** – Capacity improvements for the Kingdom City interchange, as well as mainline I-70 were recommended to improve the general operating conditions of I-70.
- **Traffic Safety** – Reduce the number and severity of traffic-related crashes occurring along the SIU 6 portion of I-70 including localized safety improvements in the Kingdom City and Mineola Hill areas.
- **Roadway Design Features** – Upgrade current roadway design features to meet recommended design criteria for I-70 improvements, including interchanges, roadway alignment and cross sections, median and outer roads.
- **System Preservation** – Preserve the existing I-70 facility as needed to carry existing and future loads.
- **National Security** – The enhancements offered by the typical section, including improvements to the Kingdom City interchange, would enhance the ability of the I-70 Corridor to support the system needs for disaster response and national security.

C. Recommended Preferred Alternative

The recommended preferred alternative would not become the selected alternative until after consideration of impacts, agency comments, location hearing comments and following final approval of the environmental assessment. If appropriate, a Finding of No Significant Impact (FONSI) would be approved and it would contain the selected alternative.

1. Western Study Area (Kingdom City)

The SIU 6 Study Team recommended improving the diamond interchange at its existing location and other I-70 improvements as the recommended preferred alternative for the western (Kingdom City) portion of the SIU 6 study area. The decision was based on the evaluation of

the potential social and environmental impacts along with the public and resource agency involvement process. The recommended improvements included the following:

- From the western termini at mile marker 147 to the start of the Loutre River valley, mile marker 163, the recommended improvement strategy would 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 would 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 would also be replaced with no provision for direct access.
- The existing interchange at Kingdom City would be replaced with a standard diamond interchange at its present location (**Exhibit II-6**). Other features would include:
 - Directional ramps would be constructed south and east of Kingdom City as traffic levels warrant. The ramps would serve through traffic traveling from westbound to southbound and northbound to eastbound.
 - The south outer road intersection on U.S. 54 would be relocated approximately 500 feet (156 meters) south of its current location.
 - The existing intersection serving the Missouri Tourism Center, service stations and restaurants located north of the interchange would be relocated to the approximate location of the intersection of Old U.S. 40 and U.S. 54 .
 - Outer roads would be constructed from those new intersections to reconnect to the existing outer road system already in place.

2. Eastern Study Area (Mineola Hill)

For the eastern (Mineola Hill) portion of the study area, the study team recommended making improvements to the existing highway alignment. The study team based the recommendation on the evaluation of the potential social and environmental impacts, along with the public and resource agency involvement process. The study team recommended that the following improvements to I-70 be the recommended preferred alternative for the eastern (Mineola Hill) portion of the SIU 6 study area.

From just east of the Williamsburg interchange, near mile marker 163, through the Loutre River valley, to the Danville interchange the recommended improvement strategy is to provide three continuous lanes in each direction. Unlike other sections of I-70, construction would not take place on either the north or south sides of existing I-70 but instead would be replaced on its existing location. From the Danville interchange to the eastern termini just west of the Route 19 interchange the additional capacity to mainline I-70 would be constructed south of the existing facility.

The existing interchange at Danville would 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 recommended preferred alternative through the Mineola Hill area (Loutre River valley) would 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 plan during construction. Extensive use of retaining walls would be required on both the north and south sides of mainline I-70 to prevent encroachment into either the Graham Cave

State Park or the historic Graham Farmstead. A maximum vertical grade of four percent from the Loutre River to the Graham Rock would 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 would be constructed instead of the standard 6:1 side slope grades. The final recommendation through this section was to utilize the existing highway south of I-70 (Route N and Route J) through the town of Mineola as the only continuous frontage road through this section.

D. Environmental Consequences

A summary of the environmental impact issues include:

a. Displacements

The recommended preferred alternative would displace a total of 16 residential dwelling units and eight businesses. The residential and business displacements are dispersed along the 27-mile study corridor. Due to the dispersed rural population in the corridor and the lack of minority or low-income populations, no undue or disproportionate impacts would occur.

b. Cultural Resources

Southwestern Bell Repeater Station

The SIU 6 Study Team recommended and SHPO concurred that the Southwestern Bell repeater station, located in the northwest quadrant of the U.S. 54 and I-70 interchange, as eligible for listing on the National Register of Historic Places (NRHP) under Criteria A and C, for local significance in communications and architecture. The building represents the efforts of Southwestern Bell to improve communications systems through technology and is part of regional improvements, thus it represents an important development in communications, with a period of significance of 1930, the year the new equipment was installed and put to use. The building is a Classical Revival Style repeater station that also contains elements of the Tudor Revival style present in the door surrounds with the massing and slightly pointed arches above the door. The recommended preferred alternative would not impact this identified resource.

Graham Farmstead

The Graham Farmstead, located just south of I-70 in the Loutre River Valley, is roughly 2.5 acres and comprised of a farm house and numerous support buildings and structures. A separate tract of nearly 278 acres surrounds three sides of the core parcel and contains additional outbuildings that are historically associated with the farm. The farm house was constructed on a sandstone foundation in 1826 and significantly remodeled in 1910, giving it its present gabled-L plan. The State Historic Preservation Officer (SHPO) has previously determined that the Graham Farmstead is eligible for listing in the NRHP under Criteria A, B and D. It is an excellent example of a prosperous and very early Anglo-American farmstead. The period of significance for the property dates from 1819 to 1953 based on the house on this property which continues to be owned by Robert Graham's descendents and a number of later outbuildings that have also survived. The recommended NRHP boundaries encompass all 280 acres contained in the two combined parcels, which include land from the original Spanish Land Grant.

Numerous improve I-70 alternatives were investigated through the Loutre River valley with the known constraints identified for the Graham Farmstead. Several of those alternatives were

rejected from further consideration because they could not be reasonably constructed without directly impacting the Graham Farmstead property. The recommended preferred alternative includes the extensive use of retaining walls on the south side of I-70 to stay within the existing I-70 right of way and out of the Graham Farmstead and therefore does not directly impact the farmstead.

Graham Cave

Graham Cave, a site of early human occupation, is the centerpiece of the Graham Cave State Park and the SIU 6 Study Team took precautions to avoid impacting the property. The cave was recognized as a National Historic Landmark in 1961 and listed on the NRHP in 1966 for its archaeological significance. Remains found at the cave date to 8,000 B.C. and at the time of the 1949 excavations, were among the earliest known for the Archiac Period. The recommended preferred alternative would not impact Graham Cave or Graham Cave State Park.

Baker Plantation

Another property listed on the NRHP, the Baker Plantation, is located just east of Danville and adjacent to the north of I-70. During the initial screening process, the study team determined that I-70 in that section would be improved by expanding it to the south. Once the decision was made to expand to the south, Baker Plantation did not lay within the area of potential effects (APE). Baker Plantation would not be impacted by the recommended preferred alternative.

Danville Female Academy

The SIU 6 Study Team recommended and SHPO concurred that the Danville Female Academy Chapel as eligible for listing on the NRHP under Criteria A and C for local significance in education and architecture. The building is the only surviving element of the Danville Female Academy, which was important in the history of education in the region because it provided an education opportunity to women that they might not have had otherwise. The architectural significance of the building comes from its Greek Revival styling and its period of significance for education is 1859 to 1865 when the chapel was in use by the Academy. The recommended preferred alternative for this portion of SIU 6 would expand the highway to the south of existing I-70 and therefore would not impact either the Danville Female Academy or the property.

Graham Rock

Graham Rock is a large sandstone outcropping located immediately north of the Graham Farmstead in the median of I-70. During the 19th century, the rock became a popular site for picnics and other public gatherings following the Fourth Old Settler's Reunion in 1884. People sometimes inscribed their initials and the dates of their visit on the rock. Historical photographs in the Graham's possession document the site's popularity as a picnic spot and local gathering point.

The belief that slave auctions took place on this rock during the 19th century has become widespread across Missouri in recent decades. This notion has become so popular that the rock is sometimes referred to as "Slave Rock." While Graham's farm was well known throughout the area, it would not have been a convenient location or prime public place for such events. Although it is possible that auctions took place at the site, there is no documentary evidence for this assertion.

The SHPO found that Graham Rock was not eligible for the National Register of Historic Places. The SIU 6 Study Team evaluated a series of alternatives that would improve I-70 without directly impacting the existing rock outcropping, including adding additional fill at the base of the

rock. The recommended preferred alternative through this portion of the SIU 6 Corridor would not directly impact the rock.

c. Archaeological Resources

As will be presented in the Phase 1 Archaeological Report, study team archaeologists encountered a total of 69 archaeological sites: 61 prehistoric, one historic and seven mixed historic/prehistoric sites in the SIU 6 study area. Several parcels within the project area could not be surveyed because landowners could not be contacted or denied access to their properties. Of the 69 sites surveyed, 42 sites lacked the potential for substantial intact subsurface deposits and no further archaeological work would be recommended. Five sites were determined to be outside the proposed study corridor. Of the remaining sites, the Phase 1 Archaeological Report would note that:

- Eight sites near the proposed recommended preferred alternative were recommended for avoidance including:
 - Graham Cave, Graham Rock and Graham Farmstead
 - Daniel Morgan Boone Cabin
 - Loutre Valley Rock Shelter
 - Mineola Hill Rock Shelter
 - Auxvasse Creek Site
 - Rumbo Branch Creek Graves
- Eleven sites were determined to have a potential for intact subsurface deposits.

d. Prime Farmland

The Recommended Preferred Alternative converts approximately 410 total acres (166 hectares) of prime and unique farmland to highway right-of-way. Approximately 96 percent (394 acres, 159 hectares) of the total prime farmland expected to be converted is found in Callaway County, with the remaining four percent (16 acres, seven hectares) in Montgomery County. Impact ratings were developed independently for the Callaway County and Montgomery County sections of the corridor. Conversion Impact Ratings for the corridor in each county were 138 (Callaway) and 142 (Montgomery), well below the 160 points needed to consider additional avoidance and/or mitigation measures.

e. Public Lands

Detailed engineering analysis was completed through the Mineola Hill area to ensure an alternative could be constructed along the existing alignment that did not encroach into Graham Cave State Park. The recommended preferred alternative through this section would utilize a series of retaining walls and would have 2:1 sideslopes with guard rail to ensure additional right-of-way would not be needed from the park. In addition, an analysis of potential constructive use impacts to the park was conducted, in coordination with FHWA, to ensure that the proposed improvements would not substantially impede the recreational usage of the park. The determination was made that the improvements would not substantially increase the existing noise levels and, therefore, would not hinder the use of the facility.

f. Water Quality/Resources

Wetlands and Ponds

The recommended preferred alternative would impact approximately 7.27 acres (2.95 hectares) of existing wetlands, exempt wetlands and former NWI mapped wetlands. The recommended

preferred alternative would impact 1.72 acres of ponds in the study corridor. The impacts are associated with filling emergent wetlands and bridge and culvert expansion impacts to forested and emergent wetlands. The recommended preferred alternative's impacts on wetlands by the Cowarden Classification System would include:

- Ponds
 - Palustrine Unconsolidated – 1.72 acres
- Wetlands
 - Palustrine Emergent – 5.77 acres
 - Palustrine Forested – 1.46 acres
 - Palustrine Scrub-Shrub – 0.04 acres

Lakes, Rivers and Streams

Interstate-70 crosses two perennial streams in the SIU 6 Corridor, Auxvasse Creek and the Loutre River. The crossings of the Auxvasse and Loutre would require expansion of the existing bridge structures, but would not require piers or other structures to be placed in the water course. Several intermittent stream crossings and alignments are also found within the corridor. Impacts to intermittent stream alignments in the SIU 6 Corridor fall into two categories: realignments and culvert extensions. Stream realignment impacts would occur when it is necessary to move a stream bed to allow for fill required for roadway expansion. Culvert expansion impacts would occur when a roadway crosses a stream and an extension of the existing culvert would be required to accommodate the expanded roadbed.

Floodplains

It is anticipated that impacts to floodplains in the SIU 6 Corridor would be limited to fill associated with expansion of the roadway and additional encroachment into the floodplains would be at locations where encroachment already occurs. A total of 38.9 acres (15.8 hectares) of floodplain are anticipated to be impacted with the proposed improvements.

g. Threatened and Endangered Species

The SIU 6 Study Area contains one federally listed endangered plant (Running Buffalo Clover), habitat for one listed endangered species (Indiana Bat) and several state listed species. The Endangered Species Act of 1973 provides special protection to those species listed as either threatened or endangered by the U.S. Fish and Wildlife Service. The Missouri Department of Conservation (MDC) provided generalized locations and descriptions of sensitive species and habitats within the SIU 6 Study Area. The MDC report includes federally listed threatened and endangered species, federally listed candidate species and state listed rare species. Potential habitat for both the Blacknose Shiner and the Indiana Bat could be impacted through the Loutre River Valley. Likewise potential habitat for the Blacknose Shiner could be impacted at the I-70 crossing of Whetstone Creek. According to the Missouri Department of Conservation, the portion of Whetstone Creek crossed by I-70 support seasonal concentrations of spawning, incubating or rearing fishes or mussels of management interest, including Blacknose Shiner.

h. Hazardous Material Sites

Within the SIU 6 study area, the study team identified eight sites that could potentially be impacted by the highway improvements. Potential impact was defined as a site containing hazardous materials that could require a low, medium or high level of effort or expense were MoDOT required to deal with the site. The eight sites with a low potential for impact by construction included the following types of hazards:

- 1 site with underground storage tanks,
- 1 site with resource conservation and recovery information systems,
- 3 sites with above-ground storage tanks,
- 3 sites with piles of asphalt/road materials.

Many of the properties containing these sites are commercial facilities, located within or near the limits of construction. There were no impacted landfills or CERCLA type (Superfund) sites in the study corridor. Additionally, the Village of Kingdom City is constructing a sewage treatment plant on the parcel housing the city hall. The parcel is located east of U.S. 54 and between old U.S. 40 and the interstate. The recommended preferred alternative would avoid direct impacts to the sewage treatment center.

i. **Economic Development (Kingdom City Businesses)**

There are several competing factors that must be evaluated before a true understanding of the likely economic development impacts can be fully understood and evaluated. Those factors include:

- **Visibility** – Several of the preliminary build alternatives called for the realignment of either I-70 or U.S. 54 and would have had a substantial impact on the visibility of the Kingdom City businesses. The recommended preferred alternative replaces the existing interchange in its present location and would maintain the same level of visibility that currently exists. The only exception to that statement is the potential construction of the directional ramps in the southeast quadrant of the interchange that would divert a portion of the trips away from the existing interchange. These ramps have been located as close to the Kingdom City businesses as possible and would still maintain some visibility.
- **Accessibility** – Maintaining the interchange in its present location helps maintain accessibility to the existing Kingdom City businesses. The access management plan being implemented throughout the I-70 Corridor would require the existing at-grade intersections both north and south of the interchange to be relocated farther away from the ramp termini. The result is greater out-of-distance travel for most patrons and some reduction in accessibility.
- **Construction Impacts** – During construction it might be necessary to temporarily modify access points to various businesses or close lanes in certain directions, all of which could result in a short-term reduction in the ability to access certain establishments. The act of construction also brings short-term economic benefits to local businesses as construction workers are hired and materials are purchased resulting in additional disposable income being spent in the area.
- **Travel Efficiencies** – After construction is complete most areas should experience an upturn in economic activity related to improved ability to maneuver through the interchange with fewer delays.

The study team concluded that there would be a limited short-term economic decline during construction if the interchange was reconstructed at its existing location. However, economic opportunities would improve after the interchange has been reconstructed.

j. **Visual Quality**

An expanded I-70 would have minimal impact on most of the Visual Assessment Units (VAUs) in SIU 6. The construction of the project would eliminate some woodlands and farmland along the existing highway. During construction, there would be several temporary visual impacts, such as exposed earth, jobsite equipment and vegetation loss. Removal of the rest area in the

Mineola Hill VAU would reduce the light impacts at night in those areas. Overall, an expanded I-70 along the existing mainline path would not substantially change the viewshed either for viewers from or of I-70. Since the highway would be expanded on its existing location in these areas, the views would remain relatively the same, with a larger roadway in the viewshed.

E. Public and Agency Coordination

1. Public Involvement Process

The public involvement program for the First and Second Tier Studies was designed with two primary objectives in mind. The first objective was to enhance public awareness and understanding of the study. The second objective was to offer citizens frequent and accessible opportunities to participate in a substantive way. The study team utilized newsletters, public meetings, a Web site, a post office box address and a hot line to initiate contact with the public.

The primary goal of the SIU 6 Public Involvement Plan was, *“To create informed consent for the reconstruction and widening of I-70 in SIU 6, including the selected Kingdom City interchange options, through simple, clear and straightforward communications with potentially affected interests and the interested public.”* The primary objective of the plan was to achieve *“Informed consent for reconstruction and widening of I-70, including the selected Kingdom City interchange option, at the conclusion of the study.”*

Included among the guiding strategies utilized by the study team in the Public Involvement Plan were the following:

- Personalized contacts with potentially affected interests;
- A consistent and clear message that communicated project purpose, goals, No-Build Alternative and process;
- Multiple opportunities to convey and receive information;
- Responsive and responsible communication with and input from the public;
- Maximum use of existing organizations and communications channels;
- Use of the media to communicate message; and
- Involvement of all section team members in the process and development of messages and techniques.

The study team chose to utilize a variety of tools and techniques for implementing the plan and achieving its goal and objective:

- **Written Materials and Mailings** – Newsletters, fact sheets and other materials were distributed by mail to media outlets and the public. Copies of newsletters and fact sheets were also available via the project Web site.
- **Intake of Public Inquiries** – The study team utilized a study email address, post office box address and toll free telephone number to receive public inquiries.
- **Project Web site** – The Web site contained Second Tier and SIU 6 specific information.
- **Media Outreach and Coverage** – All media outlets were placed on the project mailing list and received the advisories, releases and follow up support on inquiries.
- **Public Open House Meetings** – Two series of public information meetings were held during the course of the study in the Mineola Hill and Kingdom City areas.
- **Public Information and Community Group Meetings** – The Kingdom City Highway Coalition (KCHC) is a group of Kingdom City business owners, local officials and

citizens interested in the I-70/US 54 interchange. The goal of the KCHC was to maintain the viability of the Kingdom City business community on an improved I-70. Throughout the Second Tier study, the KCHC was a useful source of community input and a sounding board for community issues and concerns regarding alternatives for the U.S. 54 interchange.

- **Public Hearing** – A public hearing would be held following release of the approved draft environmental assessment.

2. Agency Coordination

Agency coordination has been integrated into the I-70 study, including both the First Tier and Second Tier environmental decision-making process. The First Tier EIS initiated the environmental scoping process, including the environmental scoping meeting, to identify issues and concerns that would affect the selection of the preferred strategy and final location. In addition, informal coordination has occurred through both the First and Second Tier with periodic meetings in which resource agency personnel attended and participated. The resource agencies played a key role in the overall decision-making process for this study.

a. Study Management Group (SMG)

The Study Management Group (SMG) assembled during the First Tier Environmental Process was continued through the Second Tier Process. Periodic SMG progress meetings were held during the Second Tier process that resource agency personnel, including representatives from Missouri Department of Natural Resources (MoDNR), Missouri Department of Conservation (MDC), United States Army Corp of Engineers (USACE), United States Fish and Wildlife Service (USFWS) and United States Environmental Protection Agency (USEPA) were invited to attend and participate. In total, five SMG meetings were held during the Second Tier Environmental Decision-Making Process.

b. SMG Mineola Hill Subcommittee

The Mineola Hill Subcommittee of the SMG, initiated during the First Tier Study, was also incorporated into the environmental decision-making process for SIU 6. Periodic meetings were held with the subcommittee during the course of the study to discuss the unique environmental issues that exist in the Mineola Hill area.

F. Commitments and Future Actions

During the course of the Second Tier Studies, MoDOT agreed to the following commitments and future actions during the design and construction phases of future improvements in the SIU 6 Corridor. The agreed upon commitments and future actions include:

1. MoDOT would not construct the directional ramps at the Kingdom City interchange 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.
2. Details of the frontage road locations would be finalized during later design stages of the project. This document would not commit MoDOT to building any additional frontage roads but instead illustrates where roads were proposed.
3. MoDOT would continue to work with the Mineola Hill Subcommittee to investigate enhancement opportunities.

4. MoDOT would apply best management practices to minimize impacts to wetlands and soil erosion.
5. Any impacted well would be appropriately closed and sealed to prevent any contamination of groundwater.
6. Avoidance of instream activities between March 15 and June 15 are recommended for reaches of Whetstone Creek that support seasonal concentrations of spawning, incubating or rearing fishes or mussels of management interest.
7. Avoid all activities that introduce chemical or organic pollutants to streams.
8. No noise mitigation measures were considered for the recommended preferred alternative. If substantial changes in horizontal or vertical alignment occur during the remaining stages of design and construction, noise abatement measures would be reviewed.
9. If a hazardous material site falls within the limits of construction, remediation or clean-up of the waste sites would be required.
10. MoDOT would review the Natural Heritage Database periodically during the project development process to identify any new locations of Indiana Bat activity. As appropriate, MoDOT would coordinate with the USFWS.
11. MoDOT commits to review the Natural Heritage Database periodically for new locations of Running Buffalo Clover and would then conduct a survey for the Running Buffalo Clover at least one year prior to construction and clearing activities at the following locations. MoDOT commits to conducting surveys at the Loutre River crossing, the Auxvasse Creek crossing, the Cedar Creek crossing (SIU 5) and the Lamine River crossing (SIU 2) prior to construction. MoDOT would also continue to consult with the USFWS and MDC on this plant species and would develop or improve habitat for the plant when feasible to do so as part of the construction activities.
12. MoDOT recognizes the importance of riverine corridors for a variety of benefits including habitats suitable for endangered species such as the Indiana Bat and the Running Buffalo Clover. MoDOT has developed a stream mitigation and enhancement plan for the major river crossings, including those noted above.
13. Graham Cave and Graham Cave State Park would not be adversely impacted.
14. Graham Rock would not be adversely impacted.
15. The precise location of the Daniel Morgan Boone Cabin needs to be accurately determined to ensure that the recommended preferred alternative would not impact the sites. If the location information provided by the Graham Farmstead is correct, the recommended preferred alternative would not impact the site.
16. The potential graves located near Rumbo Branch Creek Graves would not be adversely impacted.
17. The Mineola Hill Rock Shelter would not be adversely impacted.
18. The Loutre Valley Rock Shelter would not be adversely impacted.
19. The Graham Farmstead would not be adversely impacted. Retaining walls would be used extensively to stay within existing right of way.
20. The Southwestern Bell Repeater Station would not be adversely impacted.
21. The Slab Rock Commercial Building would not be adversely impacted.
22. The Danville Female Academy and its property would not be adversely impacted.
23. The Baker Plantation would not be adversely impacted.
24. During construction, MoDOT's standard specifications, MDNR Solid Waste Management Program, and MoDOTs' Sediment and Erosion Control Program would all be followed.
25. A long-term study is recommended for Graham Cave where strain gauges and/or crack monitors are installed to measure the expansion and contraction of openings

- through several seasons. This would represent a baseline and these same sensors could provide real-time data measuring the influence of blasting.
26. A test blast program would be implemented prior to full-scale mass rock excavation through the use of explosives.
 27. Prior to construction the study team recommended that, with the owners consent, Graham Farmstead be fully documented both internally and externally with photo, video tape or both prior to the use of explosives in the area. Also, a water sample from the well should be analyzed to establish a baseline.
 28. If blasting is performed, all blasts would be monitored with seismographs at the Graham Farmstead and Graham Cave.
 29. MoDOT would continue discussions with Graham Cave State Park officials to determine how right-of-way areas could best be used to enhance the park.
 30. A mitigation plan to compensate for wetland impacts would be developed.
 31. Applicable parts of the corridor-wide mitigation and enhancement plan would be incorporated and committed to in the second tier environmental decision documents.
 32. Where appropriate, MoDOT would partner with the Grow Native program and implement the establishment of native vegetation along highway rights-of-way.
 33. MoDOT will consult with emergency responder agencies involved in traffic incident management on I-70 in future design and maintenance of traffic plan development as the Improve I-70 program progresses.
 34. MoDOT would continue to coordinate with the SHPO and comply with the Programmatic Agreement.