Project Alternatives

The First Tier Environmental Impact Statement (EIS) concluded that I-70 should be reconstructed along its existing alignment within Section of Independent Utility (SIU) 5. The recommendations of the First Tier EIS as to which side of I-70 to widen, and rationale for those recommendations, were evaluated based on additional data collection and analysis conducted in May 2003.

A. Summary of the First Tier Recommendations for SIU 5

Appendix B of the First Tier EIS presented the north versus south widening recommendations for the SIUs. Exhibit II-1 illustrates the limits of the roadway subsections and the First Tier recommendations. Section of Independent Utility 5 begins at milepost 134 and extends to milepost 147. As shown in Exhibit II-1, SIU 5 was broken into three subsections for the north versus south widening analysis.

The First Tier EIS indicated that Subsection 1 should be widened to the south and Subsections 2 and 3 should be widened to the north. The selection criteria utilized for these determinations included the presence of a cemetery and development within the northeast quadrant of the interchange at milepost 133 within Subsection 1 and the presence of Tucker Prairie and associated threatened and endangered species within Subsection 3.

B. Second Tier Rationale for Recommendations by Subsection

The Second Tier alternative evaluation process entailed a more detailed review of the environmental impacts identified during the First Tier review. The evaluation matrix shown in Appendix B was used to reach this conclusion by identifying impacts from the preliminary impact analysis in May 2003. Evaluation of this preliminary data supports the First Tier recommendations for roadway Subsections 1 and 3. The analysis for roadway Subsection 2 supports widening to the south rather than to the north as recommended in the First Tier EIS.

Roadway Subsection 1 - The project limits of SIU 5 exclude certain constraints that influenced the analysis contained in the First Tier EIS. The criteria utilized in the First Tier EIS for Subsection 1 includes a cemetery and development in the northeast quadrant of mile 133. These constraints are located outside of the limits of SIU 5, which begins at milepost 134. Widening Subsection 1 to the north would result in greater displacements than widening to the south. Information provided during the process of obtaining right of access identified a private cemetery on the north side of I-70 within this subsection. Review of preliminary data also identified the possibility of suitable habitat for two state identified rare species north of I-70; the giant floater (*Pyganodon grandis*) and crawfish frog (*Rana areolata circulosa*). The Second Tier

evaluation confirmed the First Tier recommendation to widen to the south in Subsection 1. The location of the SIU 4 terminus 4 has been coordinated and is consistent with the beginning of SIU 5 in roadway Subsection 1.

Roadway Subsection 2 - A review of preliminary data indicated that widening to the south in this subsection would result in fewer residential displacements than would widening to the north. While this subsection would require a crossover to ensure that the widening would occur to the north side of I-70 in the vicinity of Tucker Prairie, locating the crossover in the eastern portion allows the majority of the widening to be located on the south side. Additionally, widening to the north would require the relocation, or significant modification, of support anchors associated with a communication tower. Widening to the south would require the acquisition and relocation of an auto salvage yard; however the site is not included in the hazardous waste program information provided by the Missouri Department of Natural Resources (MDNR). The recommendation to widen to the south within this subsection is a modification of the First Tier recommendation of widening to the north.

Roadway Subsection 3 - As indicated in the First Tier EIS, Tucker Prairie is the most significant constraint within this subsection. The analysis conducted in May 2003 did not identify anything that would cause a reconsideration of the recommendation to widen to the north. The terminus of SIU 5 in roadway Subsection 3 has been coordinated and is consistent with the beginning of SIU 6.

The location of the interchanges would not be affected by the recommendation to widen to the south within Subsection 2. At the Missouri Highway J/DD interchange the recommended widening would remain to the south. At the Missouri Highway M/HH interchange the recommendation supports widening to the north. The overall proposed alignment is shown in Exhibit II-2.

There are no topographic features or frontage road issues that result in any significant construction cost variances between widening to the north or to the south. For this reason, construction costs were not considered to be a differentiating factor between the widening alternatives.

Several different interchange concepts were considered at both the J/DD and M/HH interchanges. These concepts, which are shown in Exhibits II-3 and II-4, were developed based on impact minimization, traffic needs and access management guidance. The preferred concepts shown in this document reflect the greatest avoidance of displacement impacts.

J/DD Interchange -Three concepts were investigated at this interchange. The primary focus of the preferred concept was to avoid the Shryrock Farm, a potential Section 4(f) impact in the southwest quadrant, as well as several businesses while maintaining design criteria. As a result, the frontage road in this quadrant, near its connection with Route J, is located on the north side of the property line, thereby avoiding any acquisition of this potential Section 4(f) property. Factors which ruled out concepts 2 and 3 included the following.

J/DD Concept 2

- Degree of curve at tie-in of frontage road on the north side exceeds recommended design criteria
- Impact to potential wetland in the drainage area associated with the southeast quadrant

J/DD Concept 3

- Business displacement in northeast quadrant due to frontage road spacing
- Impact to potential wetland in the drainage area associated with the southeast quadrant

M/HH Interchange - The three concepts examined at the M/HH interchange featured steps to avoid impacts in the northeast quadrant and the south side of the interchange. A diamond interchange was preferred over two alternative concepts that included a loop ramp on the north side. The evaluation concluded that an exit ramp through the northeast quadrant was feasible because the structures located there consist of mobile homes and other movable structures. The separation between ramps and the frontage road on the south side was shortened slightly to avoid additional impacts and achieve the recommended degree of curve. Factors which ruled out concepts 2 and 3 included the following.

M/HH Concept 2

- Shortened diamond ramps on the south side to minimize impacts to property in the southeast quadrant.
- Loop ramp in northwest quadrant to avoid impacts in northeast quadrant

M/HH Concept 3

- Two displacements associated with frontage road in southwest quadrant
- Loop ramp in northwest quadrant to avoid impacts in northeast quadrant

C. Recommended Alignment

The improvements proposed for SIU 5 consist of widening along the existing alignment on the south side of the existing I-70 right of way from Route Z to approximately one-half mile west of the M/HH interchange. From there to U.S. 54, widening would shift to the north side of the existing right of way.

1. Frontage Roads

The First Tier EIS stated the long-term goal of providing continuous frontage roads for the purposes of incident management – frontage roads could provide an alternative route should an incident occur on I-70. The Missouri Department of Transportation (MoDOT) is currently in the process of developing a statewide incident management plan, including a plan for I-70 across the state, to respond quickly and efficiently to incidents. Providing continuous frontage roads along the corridor, on at least one side or the other, would provide redundancy within the system and would fully complement and further amplify the benefits of incident management. In the event of an incident, traffic can be efficiently rerouted to the adjacent frontage road system, as necessary, to maintain traffic flow in the corridor.

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. The Missouri Department of Transportation is committed, however, to construct frontage roads for the purposes of maintaining existing local service connections and maintaining existing access to adjacent properties. Each frontage road will be assessed on an individual basis as to whether or not any existing discontinuities will be addressed as part of the initial construction. Improvement of existing discontinuities will depend on the availability of construction funding and relative priorities.

For the purposes of this environmental document, since it is reasonably anticipated that full build-out of the frontage road system will occur at some point in the future, continuous frontage roads have been considered in the impact assessments as direct impacts. As such, the analysis of the improvement alternatives has fully considered the implications of the future continuous frontage system on the layout and configuration of the initial I-70 improvements (i.e., proposed action). Recommendations for the improvements have been based on the anticipated full build-out of the corridor.

The approximate right of way for these improvements, with lanes and frontage roads, is shown in Exhibit III-2 (sheets A through J). These exhibits show the future frontage road construction in a format different from the initial frontage road construction. Construction cost estimates do not include continuous frontage roads.

2. Construction Cost Estimate

The estimated construction cost for this proposed facility is shown below in Table II-1. The construction cost estimates are based on the exhibits included in this environmental document, which show differently the frontage roads to be constructed initially and those anticipated sometime in the future. For the purposes of this environmental document, the construction cost estimates include only the initial frontage road construction (those necessary, in general, to maintain existing access and local street connections).

Table II-1: Estimated Construction Cost for SIU 5 Proposed Improvements*

Right of Way Costs	$ 13,028,612
Construction Costs	$151,195,169
Total Cost To Build	$164,223,781

*Costs are presented in 2005 dollars. As the construction timeline is extended, costs are subject to change due to inflation.

The cost estimates assume that impacts to billboards will be paid for based on the actual cost to replace the billboards in kind. In some cases, existing billboards do not 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.

3. Design Criteria

The Missouri Department of Transportation, in coordination with FHWA, has established overall program-level design criteria and guidance for the Second Tier preliminary engineering studies of the I-70 improvements. These guidelines were established based on MoDOT's *Policy Procedure and Design Manual* and AASHTO's *Policy on Geometric Design of Highways and Streets*. However, recognizing that the investments in I-70 will be long term, more stringent and conservative design criteria and standards have been defined in anticipation of future corridor

needs and ever-evolving design parameters. A more stringent design standard has been established as a desired goal to allow design flexibility within the corridor such that future design evolutions can be reasonably "absorbed" within the project. Furthermore, a more stringent design standard provides a more conservative estimate of the impacts of the project for the purposes of the environmental planning process and documentation.

As an example, the minimum vertical clearance at bridges is greater than what would be required per currently adopted standards. This will allow the improvements to accept future changes in vertical clearance requirements. For all such instances, MoDOT will assess the program's overall design criteria and standards during subsequent design development to ensure the program strikes the right balance between meeting the needs of tomorrow and the additional costs and impacts of the more stringent design. MoDOT is committed to adhering, at a minimum, to the appropriate currently adopted criteria and design standards. The goal will be to provide a consistent standard throughout the corridor. However, MoDOT recognizes that constraints in some areas, such as the urban areas, may affect the ability to reasonably accomplish the more stringent standards. If necessary, the rural areas may provide a more stringent design standard while the urban areas, due to tighter constraints, may hold to the minimum design standards."

D. Corridor Enhancement

The First Tier EIS documented the commitments of MoDOT and the Federal Highway Administration (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 and appropriate special considerations would be provided for each of the Second Tier Studies.

A Corridor Enhancement Subcommittee, one of three subcommittees for the I-70 corridor, is a consortium of the project team and local, state and federal agency technical staff. This subcommittee developed a proposed enhancement plan for the overall I-70 corridor. The goals of the enhancement plan include creating an approximately 200-mile I-70 transportation corridor that:

- Complements the existing natural environment.
- Maintains sensitivity to the existing context of the corridor.
- Provides a sense of consistency along the entire route.
- Showcases Missouri natural resources through enhancements which also 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 will 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. Recommendations from this plan would be incorporated into the development of the SIU 5 proposed improvements.

E. Intelligent Transportation Systems

The implementation of Intelligent Transportation Systems (ITS) along the I-70 corridor will improve the operating efficiency of the corridor under both the No Build and Build alternatives. The movement of people and goods along the corridor will be safer, faster and more reliable. Intelligent Transportation Systems 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 will reduce the occurrences of congestion, which reduces average travel time and improves travel time reliability. Implementing ITS systems along I-70 will 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 ITS in SIU 5 is $1,600,000 with an estimated annual operation and maintenance cost of $160,000. These costs do not include the cost for developing and operating an I-70 corridor traffic operations center.

N

5000 0 5000 Feet

Subsection 1 | Subsection 2 | Subsection 3

To Columbia

State Highway Z

Cedar Creek (County Line)

Mile Marker 139

State Highway DD

Mile Marker 144

State Highway M

State Highway FF

Widen to North of I-70

Widen to North of I-70

Kingdom City

U.S. 54

Mile Marker 134
Station 1096+00

Widen to South of I-70

Boone County

Callaway County

State Highway J

South/North Crossover

State Highway HH

Mile Marker 147
Station 546+50

SIU5 Project Limits (13 Miles)

MoDOT

IMPROVE i70

SECTION 5
Route Z to U.S. 54

Legend

- Agricultural Landuse
- Church Landuse
- Commercial Landuse
- Industrial Landuse
- Park Landuse
- Public/Semi-Public Landuse
- Residential Landuse
- Utility Landuse
- Conservation Area (University of Missouri)
- I-70 Tier 1 Improvements

Overall View of Tier 1

EXHIBIT II-1

N

5000 0 5000 Feet

Subsection 1 | Subsection 2 | Subsection 3

State Highway Z

Cedar Creek (County Line)

Mile Marker 139

State Highway DD

Mile Marker 144

State Highway M

State Highway FF

Widen to North of I-70

To Columbia

Kingdom City

U.S. 54

Mile Marker 134
Station 1096+00

Widen to South of I-70

Boone County

Callaway County

State Highway J

Widen to South of I-70

State Highway HH

South/North Crossover

Mile Marker 147
Station 546+50

SIU5 Project Limits (13 Miles)

MoDOT

IMPROVE i70

SECTION 5
Route Z to U.S. 54

Legend

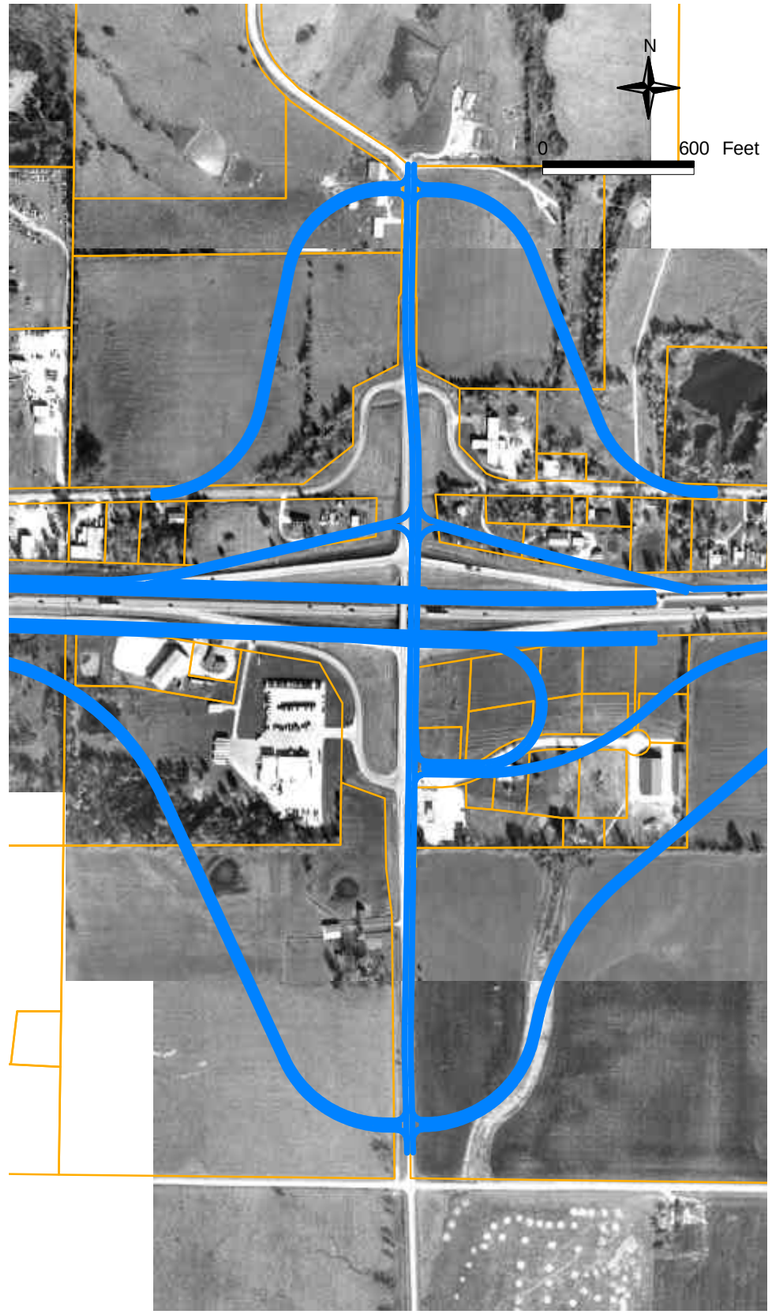
- Agricultural Landuse
- Church Landuse
- Commercial Landuse
- Industrial Landuse
- Park Landuse
- Public/Semi-Public Landuse
- Residential Landuse
- Utility Landuse
- Conservation Area (University of Missouri)
- Approximate Right of Way Limits

Overall View of Project

EXHIBIT II-2

J/DD Interchange Concept 1 (Preferred)

J/DD Interchange Concept 2



J/DD Interchange Concept 3

MoDOT IMPROVE i70

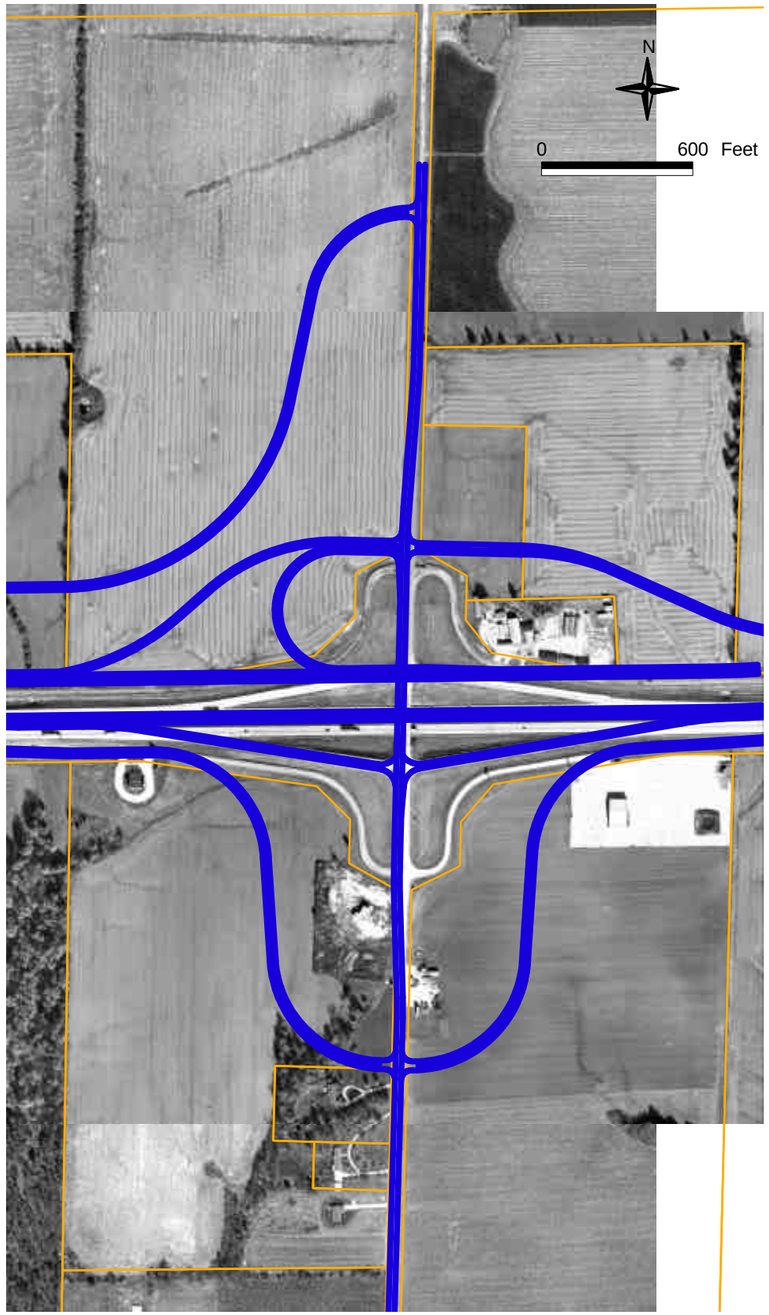
SECTION 5
Route Z to U.S. 54

Legend
- Interchange Concept 1 (Preferred)
- Interchange Concept 2
- Interchange Concept 3

J/DD Interchange Concepts

EXHIBIT II-3

M/HH Interchange Concept 1 (Preferred)



M/HH Interchange Concept 2

M/HH Interchange Concept 3

MoDOT IMPROVE I70

SECTION 5
Route Z to U.S. 54

Legend
- Interchange Concept 1 (Preferred)
- Interchange Concept 2
- Interchange Concept 3

M/HH Interchange Concepts

EXHIBIT II-4

N

5000 0 5000 Feet

Subsection 1 | Subsection 2 | Subsection 3

To Columbia

State Highway Z

Cedar Creek (County Line)

Mile Marker 139

State Highway DD

Mile Marker 144

State Highway M

State Highway FF

Widen to North of I-70

Widen to North of I-70

Kingdom City

U.S. 54

Mile Marker 134
Station 1096+00

Widen to South of I-70

Boone County

Callaway County

State Highway J

South/North Crossover

State Highway HH

Mile Marker 147
Station 546+50

SIU5 Project Limits (13 Miles)

MoDOT

IMPROVE i70

SECTION 5
Route Z to U.S. 54

Legend

- Agricultural Landuse
- Church Landuse
- Commercial Landuse
- Industrial Landuse
- Park Landuse
- Public/Semi-Public Landuse
- Residential Landuse
- Utility Landuse
- Conservation Area (University of Missouri)
- I-70 Tier 1 Improvements

Overall View of Tier 1

EXHIBIT II-1

N

5000 0 5000 Feet

Subsection 1 | Subsection 2 | Subsection 3

State Highway Z

Cedar Creek (County Line)

Mile Marker 139

State Highway DD

Mile Marker 144

State Highway M

State Highway FF

Widen to North of I-70

To Columbia

Kingdom City

U.S. 54

Mile Marker 134
Station 1096+00

Widen to South of I-70

Boone County

Callaway County

State Highway J

Widen to South of I-70

State Highway HH

South/North Crossover

Mile Marker 147
Station 546+50

SIU5 Project Limits (13 Miles)

MoDOT

IMPROVE i70

SECTION 5
Route Z to U.S. 54

Legend

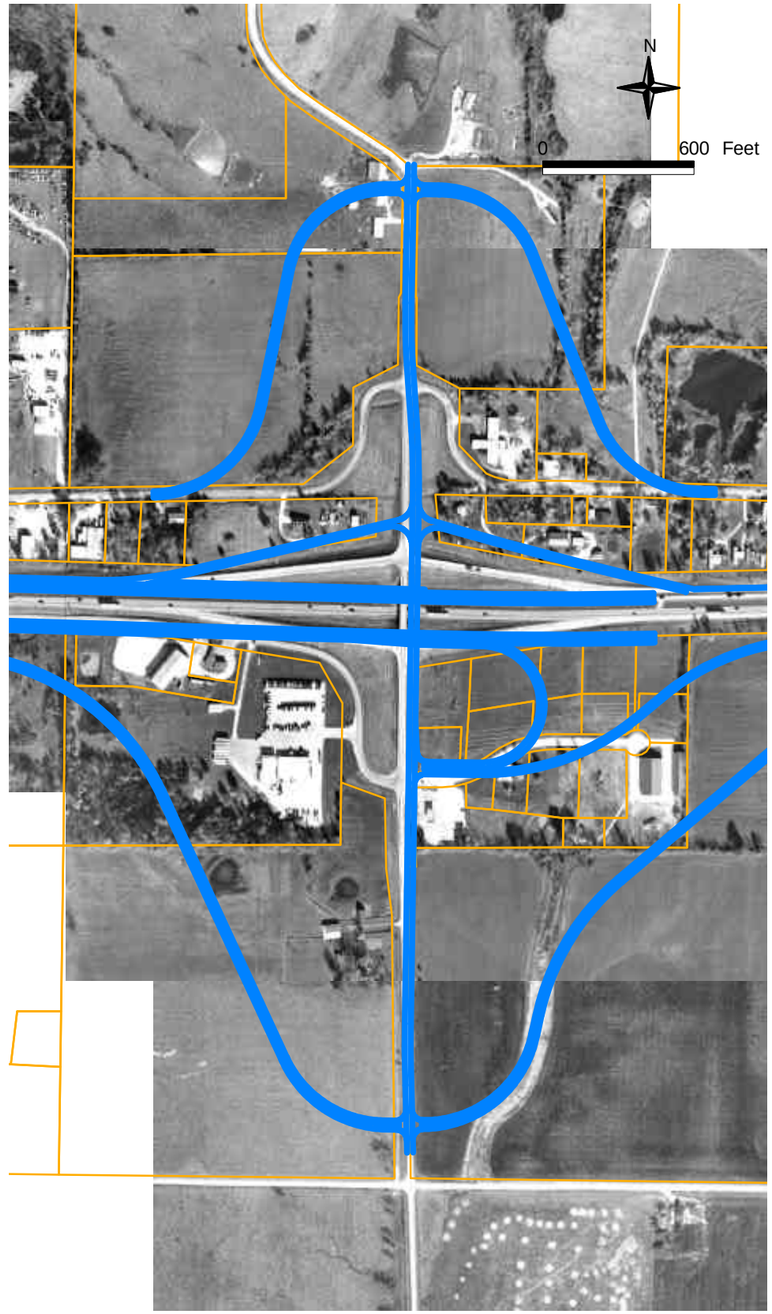
- Agricultural Landuse
- Church Landuse
- Commercial Landuse
- Industrial Landuse
- Park Landuse
- Public/Semi-Public Landuse
- Residential Landuse
- Utility Landuse
- Conservation Area (University of Missouri)
- Approximate Right of Way Limits

Overall View of Project

EXHIBIT II-2

J/DD Interchange Concept 1 (Preferred)

J/DD Interchange Concept 2



J/DD Interchange Concept 3

MoDOT IMPROVE i70

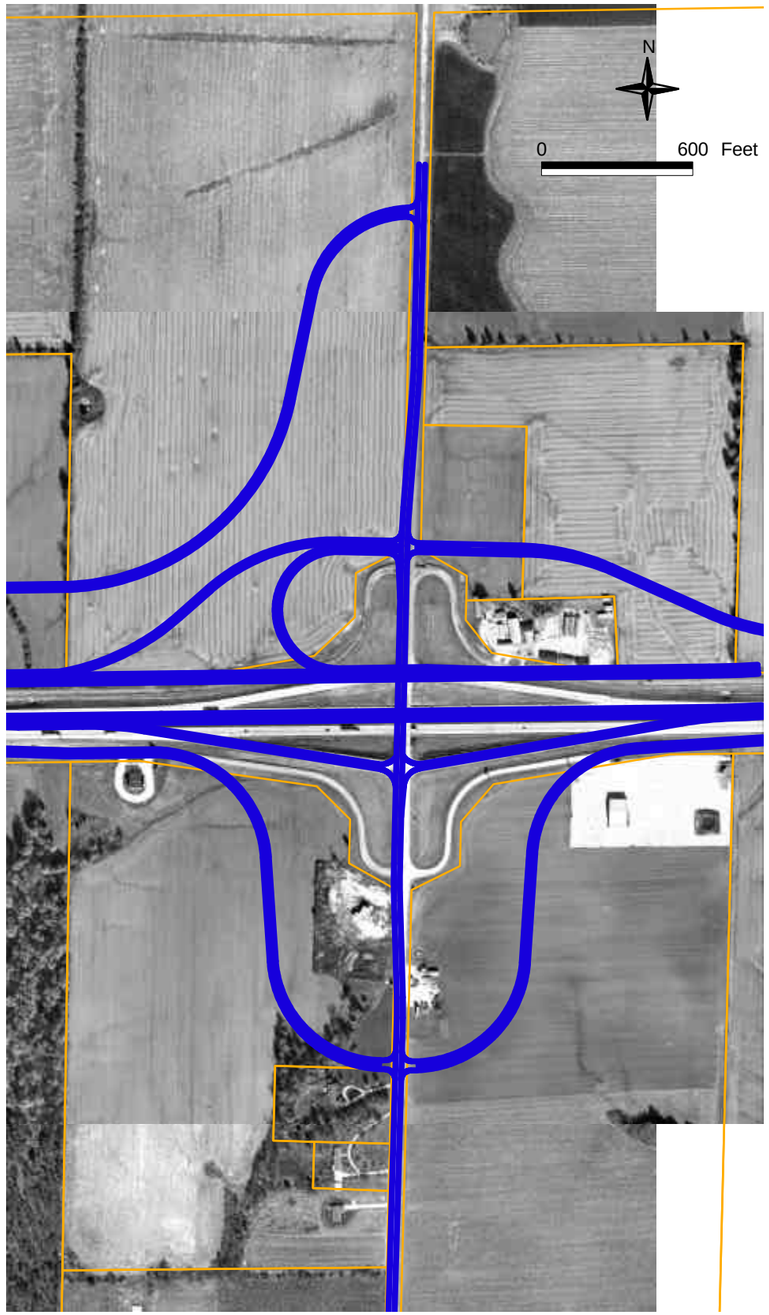
SECTION 5
Route Z to U.S. 54

Legend
- Interchange Concept 1 (Preferred)
- Interchange Concept 2
- Interchange Concept 3

J/DD Interchange Concepts

EXHIBIT II-3

M/HH Interchange Concept 1 (Preferred)



M/HH Interchange Concept 2

M/HH Interchange Concept 3

MoDOT IMPROVE I70

SECTION 5
Route Z to U.S. 54

Legend
- Interchange Concept 1 (Preferred)
- Interchange Concept 2
- Interchange Concept 3

M/HH Interchange Concepts

EXHIBIT II-4