CHAPTER II
Project Alternatives

A. Overview of First Tier Alternative Analysis

The tiered process for consideration of potential improvements to Interstate 70 (I-70) began with the assessment of strategies for transportation improvements within a 199-mile (320 kilometer) long corridor extending from Kansas City to St. Louis. The I-70 Study Corridor was approximately 10 miles (16.1 kilometers) wide, five miles (eight kilometers) either side of existing I-70. Consideration of alternatives within the First Tier Study process is summarized in Appendix A, First Tier Summary and entailed the evaluation of the following seven initial strategies:

- Strategy No. 1 – No Build;
- Strategy No. 2 – Transportation System and Demand Management
- Strategy No. 3 – Widen Existing I-70;
- Strategy No. 4 – New Parallel Facility;
- Strategy No. 5 – New Parallel Toll Road;
- Strategy No. 6 – High Occupancy Vehicle Lanes; and
- Strategy No. 7 – High Speed Passenger Rail.

As a result of a comparison of each of these strategies, Strategies No. 3, 4 and 5 were selected as reasonable, and were therefore, subjected to further analysis in the First Tier Environmental Impact Statement (EIS). Important elements of the purpose and need for which these strategies were effective included:

- roadway capacity;
- traffic safety;
- roadway design features;
- system preservation;
- goods movement;
- access to recreational facilities; and
- national security.

Each of the reasonable strategies differed with regard to potential adverse impacts and offsetting benefits. Table II-1 presents a summary of the distinguishing factors or issues of the reasonable strategies.

Table II-1: Summary of Issues for Reasonable Strategies

Major Categories (Evaluation Factors)	Distinguishing Factors or Issues
Engineering	**Capital Cost (Order of Magnitude**) – Relocation strategies would be approximately 10 to 15 percent less expensive. However, this would depend on the extent of access management accomplished at the existing I-70 interchanges. **Annual Operation and Maintenance and Preservation Costs** – Widen Existing I-70 Strategy would save approximately $22 million per year over the relocation strategies ($302 million from 2001 to 2030) **Implementation** – The Widen Existing I-70 Strategy would be the most flexible and responsive strategy for addressing the immediate and growing needs of the corridor as they become evident. **Constructability** – Relocation strategies would not impact existing I-70 traffic operations during construction.
Traffic	**Change in Travel Time (2030)** – Relocation strategies would reduce corridor travel times an additional 20 minutes or so over the Widen Existing I-70 Strategy. (Additional travel time savings along the corridor would be due to higher operating speed assumptions with the parallel route strategies.) **Incident Management** – The relocation strategies would provide superior alternative routing from incident management for long-distance travel.
Environmental	**Natural Resources Impacts** – The relocation strategies would directly impact roughly seven times the amount of forests, five times the amount of wetlands and two to three times the amount of farmland as the Widen Existing I-70 Strategy. **Secondary and Cumulative Impacts** – The Widen Existing I-70 Strategy would expand a corridor where impacts to the natural environment have already occurred and the relatively low magnitude of new impacts would be less measurable.
Social and Economic	**Impacts to Existing Structures** – It was estimated that up to 120 to 150 displacements would occur in the rural interchange areas with the Widen Existing I-70 Strategy. However, the majority of these same displacements would occur with the relocation strategies due to access management upgrades along the existing I-70 roadway. Other displacements would occur if a new parallel facility were constructed. **Impacts to I-70 Business Operations** – Widen Existing I-70 Strategy would impact adjacent businesses temporarily during construction and could include some acquisition. **Cost-Effectiveness** – New Parallel Toll Road Strategy would not be solely financially feasible.
Source: HNTB, 2003	

1. Selection of the Preferred Strategy

Strategy No. 3 (Widen Existing I-70) was selected as the preferred strategy. This strategy was selected for the following reasons:

- meets the long-term travel and safety needs for the corridor;
- responds to public concerns;
- replaces existing I-70 pavement;
- lowers annual maintenance;
- reinvests in existing system;
- buildable in usable increments;
- incorporates management type improvements such as Intelligent Transportation System; and
- improves incident management.

2. Summary of Preferred Strategy Impacts

a. Environmental Impacts

Through a comprehensive review of the potentially affected environment and environmental consequences during the First Tier EIS, no known issues were identified that would necessarily preclude or prevent the implementation of the Widen Existing I-70 Strategy. With respect to Section of Independent Utility (SIU) 3, there were a number of environmental issues that were recognized as needing further investigation as part of Second Tier Studies. A summary of the environmental impact issues includes the following:

- **Noise Impacts** – The project has the potential to create noise impact to adjacent receptors due to widening the right of way.
- **Parklands, Wildlife Refuges, Recreation Areas and Public Lands** – Potential impacts by the project to several existing or planned parklands, or other public lands, were identified. Each of these sites would be studied further as part of the Second Tier Studies, including a Section 4(f) evaluation if impacted. Key areas that would require special consideration during the second tier analysis within SIU 3 include Katy Trail State Park, Big Muddy National Fish and Wildlife Refuge (Big Muddy Refuge) and Overton Bottoms Conservation Area.
- **Prime Farmland** – The project was recognized as having an impact on prime farmland. More detailed assessments and estimates of the impacts would be performed during the second tier including the Farmland Conversion Impact Rating for Corridor Type Projects and a consideration of Conservation Reserve Program lands.
- **Water Quality** – The current water quality conditions would not be degraded by the project activities.
- **Floodplains** – Several floodplains would be crossed by the project. The project will entail in general the replacement in kind of all existing I-70 drainage structures and culverts. The Missouri River is the major floodplain crossing within SIU 3.
- **Wetlands** – Unavoidable impacts to wetlands would occur with the Widen I-70 Strategy. Special attention would be given to the Overton Bottoms area and the other major floodplain crossings. Other considerations would include Wetland Reserve Program lands, Natural Resources Conservation Service wetlands and wetland mitigation, as necessary.
- **Terrestrial and Aquatic Communities** – As a result of a natural heritage database review, it was determined that several areas had the potential for sensitive biological resources. Within SIU 3, buffalo grass—a state listed species, was reported to occur near the Boonville rest area.
- **Threatened and Endangered Species** – No known critical habitat for any listed species was identified within the corridor during the First Tier EIS. However, informal consultation with the U.S. Fish and Wildlife Service would be continued during the Second Tier Studies.
- **Historic and Archeological Resources** – Archaeological sites, National Register properties and cemeteries were identified at various locations within the vicinity of the existing I-70 right of way. One such resource that was identified in the vicinity of existing I-70 within SIU 3 is the Moses U. Payne home. This and other resources would require additional study and coordination as part of the Second Tier Studies.
- **Hazardous Waste Sites** – No known hazardous waste sites would be impacted.

b. Social and Economic Impacts

Interstate 70 has created a development spine across the state that has grown in intensity and breadth. It is anticipated that the Widen I-70 Strategy will continue this development trend and to some extent, accelerate its growth due to the improved access provided at the interchanges and the slightly higher traffic volumes. As part of the Second Tier Studies and subsequent design, additional consideration will be given to the direct impacts of the project to adjacent properties and structures, particularly at the interchange areas. Additional studies at each interchange area would be needed to minimize the direct impacts of the project to existing residences and businesses. Furthermore, considerations would be given to maintenance of traffic during construction to minimize the temporal impacts of construction on adjacent businesses.

c. Selection of Second Tier Studies

The Widen I-70 Strategy selected by the First Tier EIS included the identification of seven SIUs. Within two of the three urban SIUs (SIU 4-Route BB to Route Z and SIU 7-Route 19 to Lake St. Louis), this strategy called for the preparation of EISs as they included options for widening the existing roadway as well as options for constructing a relocation facility on new location. In contrast, within rural sections, the selected strategy called for the development of mainline alternatives that were immediately adjacent to the existing facility. Section of Independent Utility 3 is a rural section and entails the consideration of mainline alternatives immediately to the north or south of the existing I-70 facility. Proposed improvements within SIU 3 are evaluated as part of this Environmental Assessment.

B. Development of Second Tier Alternatives

The formulation of alternatives for the Second Tier Studies in SIU 3 was an iterative process that entailed the following considerations:

- identification of environmental and engineering constraints;
- avoidance and minimization of critical flaws and other issues;
- conceptual plan layout and design of alternatives based on the design criteria listed in Chapter I; and
- alternative analysis and evaluation.

1. Preliminary Constraints

Constraints considered during this process entailed those that represented environmental concerns as well as those that had implications with regard to engineering feasibility. Examples of environmental constraints considered during the location study included:

- residential/community/business impacts;
- wetlands;
- floodplains;
- surface water resources (streams, water bodies);
- threatened and endangered species;
- rare or unique ecological communities;
- geologic resources (areas of past mining);
- potential or known hazardous waste sites;

- Section 4(f) and 6(f) lands;
- Conservation Reserve Program/Wetland Reserve Program lands;
- archaeological or historic sites;
- noise impacts; and
- churches, schools and cemeteries.

Similarly, constraints were also identified that had implications on engineering feasibility or on the efficiency of the transportation system. Examples of such considerations included:

- terrain;
- capacity of the existing roadway (i.e., level of service [LOS]);
- accident patterns;
- access to existing development; and
- existing infrastructure (roads, utilities, transmission lines).

Constraint information was developed by acquiring and consolidating information from a variety of sources including public involvement meetings, file information from the Missouri Department of Transportation (MoDOT), other state agencies (i.e., Missouri Department of Natural Resources, Missouri Department of Conservation) and federal agencies (i.e., Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Federal Emergency Management Agency, U.S. Geological Survey, U.S. Army Corps of Engineers) and field reconnaissance.

The initial effort to consider project constraints resulted in the identification of the following critical environmental and engineering issues:

- **Cultural Resources**. A review of recorded National Register of Historic Places listings resulted in a single listed historic architectural resource in the project vicinity. The Moses U. Payne home is an I-house located along Route BB approximately 1,600 feet (488 meters) south of the existing alignment near Rocheport, Missouri. No other listed sites occur in the immediate vicinity of the project. Additionally, no listed or eligible National Register of Historic Places archaeological sites were identified within the project area. Areas with a high potential for such sites include terraces and other elevated areas along the Missouri River and other perennial streams. Several small cemeteries are also known to occur within the study corridor.
- **Rare, Threatened, or Endangered Species**. Several rare, threatened, or endangered species were identified as a result of database review and agency coordination. The primary species of concern include the federally endangered pallid sturgeon (*Scaphyrhinchus albus*) (Missouri River), several state-listed fishes within the Missouri River (sturgeon chub [*Macrhybopsis gelida*], sickelfin chub [*M. storeriana*], ghost shiner [*Notropis buchanani*], plains killifish [*Fundulus zebrinus]*) and the state-listed buffalo grass (*Buchloe dactyloides*) previously recorded from the east-bound rest area. Other species of concern known to occur within the region include the federally endangered gray bat (*Myotis griscesens*) (known from Rocheport Cave, approximately one mile [1.6 kilometers] east of the I-70 bridge over the Missouri River) and the federally endangered Indiana bat (*M. sodalis*) known to establish summer roosts within the region.
- **Parklands**. The Katy Trail State Park is a linear park used recreationally for hiking and biking. It crosses over I-70 just west of Route 5 in Boonville and is crossed by the I-70 bridge over the Missouri River at the base of Manitou Bluffs. Other publicly owned recreational areas include those within the floodplain of the Missouri River

such as the Big Muddy Refuge, the Overton Bottoms Conservation Area and the Taylor's Landing public access site.

- **Floodways/Floodplains**. The floodway and floodplain of the Missouri River represents a major engineering constraint as it directly impacts the length of any replacement bridge and consequently, project cost. The flood of 1993 was dramatic in its effect, resulting in expansive flooding and extensive scouring by the Missouri River. While I-70 was not overtopped by the event, the flood demonstrated that the existing I-70 embankment resulted in a nearly 3-foot (0.9-meter) upstream surcharge (2.6 feet [0.8 meter] at a point 1.3 miles [2.1 kilometers] upstream) for a flow event equaling the 1993 flood. Planning and designs for crossing the Missouri River via a companion bridge or a replacement bridge must, therefore, consider location and length relative to these constraints.
- **Traffic and Access Issues**. Traffic volumes on I-70 are expected to grow to a level that requires a minimum of six lanes (three lanes in each direction) in 2020 (as identified in the purpose and need). Additionally, in order to provide better levels of service and circulation at each interchange, there is a need to provide better, or more efficient, access management to the adjacent businesses and residences. This requires the closure of some business and residential driveways that are too close to a major intersection or ramp terminal. In some cases, access to these properties can be provided via frontage or backage roads. In other cases, access can be restricted to right turns or access can be removed entirely and the property purchased.
- **Engineering Issues**. Each interchange overpass needs to be completely reconstructed due to the wider proposed median as part of the Widen I-70 Strategy. The staging of construction at each interchange plays a role in the development and evaluation of proposed interchange alternatives.

Consideration of these various constraints resulted in the development of alternatives for both the mainline and each of the five interchanges that satisfactorily achieved the objectives of the project.

Alternative development within SIU 3 was undertaken by formulating reasonable alternatives that satisfactorily met the project purpose and need, while also avoiding and minimizing environmental and engineering constraints. Particular emphasis was placed on:

- avoiding those resources for which impact is regulated by existing laws or regulations (i.e., federally listed threatened and endangered species);
- avoiding or minimizing impacts to those resources that by law require avoidance and minimization measures (e.g., 404[b][1] of the Clean Water Act, the U.S. Department of Transportation policy on lands, wildlife and waterfowl refuges and historic sites for Section 4[f] resources [49 United States Code 303, Executive Orders 11988, 11990 and 12898, etc.]); and
- avoiding or minimizing impacts that would result in high mitigation commitments and overall project cost (e.g., disruption of businesses, displacement of existing infrastructure or utilities, clean-up activities of properties listed as containing hazardous materials, extensive wetland mitigation, etc.).

Alternative development was also conducted in a step-wise fashion in which the first step in the process entailed a consideration of the mainline, whereas the second step considered improvements at each of the five interchanges. A description of each of the mainline and

interchange alternatives and the factors used to evaluate them are provided in the following sections.

2. North-South Mainline Alternative Analysis

a. Summary of First Tier EIS Mainline Location

Within SIU 3, the First Tier EIS and its associated Record of Decision resulted in the identification of the Widen I-70 Strategy as the selected alternative. Improvements to I-70 considered in the selection of this strategy included widening the existing alignment to the south from the western terminus to approximately mile marker 99. From mile marker 99, the proposed improvement remained on the south side until approximately mile marker 112 at which point it crossed over to the north. From this location, the First Tier EIS entailed improvements to the north across the Overton Bottoms, the Missouri River and up the Manitou Bluffs. Just east of the interchange at Route BB (Rocheport), the proposed improvement switched again to the south side of the existing alignment to the eastern terminus of SIU 3 at approximately mile marker 116. This Second Tier EA presents a reassessment of the specific widening improvements to I-70 using more detailed information as discussed below and in Chapter III. These analyses represent a refinement of the assessment process, using greater detail with regard to natural resources (wetlands, sensitive species, visual resources, etc.) and the human environment (residential and commercial land uses, parks and recreational areas, noise impacts, cultural resources, economic impacts, etc.).

b. Overview of Scope and Level of Analysis

A detailed screening level analysis was performed for the mainline alternatives to expand upon the critical flaw level of assessment provided in the First Tier EIS. This analysis included an evaluation of updated and more detailed environmental and engineering data based on information obtained from agency correspondence, literature review, traffic data review and periodic input obtained from the Overton Bottoms Subcommittee (see Chapter IV, Coordination). The analysis also incorporated the findings based upon field reconnaissance of the mainline. However, it did not include a detailed consideration of potential interchange improvements (including access management) as these impacts were likely to be common to either a north or a south mainline alternative. Additionally, it did not incorporate the level of detailed impact analysis that considers the results of more intensive environmental investigation (i.e., wetland delineation, Phase I cultural studies, noise modeling, etc.) as would be appropriate for the analysis of a final study alternative.

A more detailed consideration of potential project impacts was undertaken in the vicinity of Overton Bottoms due to the number and kinds of resources potentially affected by proposed north/south improvements. Results of these studies are presented in detail in Chapter II.B.3.

c. Description of Alternatives Considered

Alternative development within SIU 3 considered the initial configuration as set forth in the First Tier EIS as well as other variations of north/south mainline and crossover combinations in an attempt to avoid and minimize potential environmental impacts. However, upon close examination and in consideration of more detailed environmental studies, it was found that alternatives that incorporated crossovers were not advantageous as they did not result in significant reductions in environmental impact. For example, several crossover options (from north to south and vice versa) were initially considered east of the Route 5 interchange in an

effort to avoid and minimize impacts. However, impacts associated with these adjustments persisted, as improvements at the interchanges due to ramp relocations and access management related improvements still resulted in displacements and impacts to businesses on both the north and south side of the mainline. At the same time, however, the crossovers increased the complexity of constructability of the project due to construction phase staging and traffic management issues. Additionally, the constraint that necessitated a north location near the western terminus in the First Tier Study was no longer an issue. Specifically, as discussed in Chapter III.A.2.a, the Cooper County Fairgrounds, originally considered in the First Tier Study as a potential Section 4(f) property, was determined to be privately owned and did not represent a Section 4(f) issue. Avoidance of these lands, therefore, was not necessary, and a southern mainline improvement became feasible.

Two primary alternatives were consequently developed for consideration in this analysis. One alternative was established entirely along the south side of the existing mainline, whereas a second alternative was established along the north side of the mainline. This approach (i.e., consideration of complete North Alternative or South Alternative) was used as these alternatives represented a full range of potential engineering and environmental issues and impacts.

For each alternative, an assessment of potential impacts was made by establishing a generalized footprint of the proposed improvement to a distance of approximately 300 feet (91.4 meters) north and south of the existing roadway (note: this footprint was developed from the opposite right of way line across the existing facility to a distance of 300 feet [91.4 meters]). Typical sections of the proposed roadway are provided in Figure II-1. Potential impacts within this generalized footprint were then assessed for each alternative. Results of this analysis are presented in detail in “Interstate 70 SIU 3 – J4I1341F, Analysis of Mainline Widening North vs. South, Environmental and Engineering Review” provided in Appendix C.

d. Results of Mainline Alternative Analysis: West of Overton Bottoms

Based on the known information, there are no critical flaws present in the study area west of Overton Bottoms that would preclude either a north or south alignment. The primary differentiating characteristics of the north and south mainline alternatives include the following:

- A north alignment results in two median crossovers (one at each end of the study area necessary to connect with SIU 2 located on the south) that complicate staging and maintenance of traffic during construction. Other variations on the alternatives (i.e., a hybrid of north and south) would also result in one or two median crossovers.
- West of the Missouri River, a north alignment results in somewhat fewer impacts to surface water resources, as it crosses two fewer intermittent streams and would result in one less stream relocation. Additionally, a north alignment would not directly impact water bodies (potentially isolated) whereas four open water bodies would be impacted with a south alignment. In contrast, however, a north alignment would result in increased disruption of surface waters in the vicinity of Rocheport, as it would impact a perennial stream and several springs.
- A north alignment results in more residential displacements than a south alignment (10 to 15 versus less than five, respectively). (Note: this does not include displacements at interchanges that would be common to both alternatives.)

- A north alignment results in greater disruption to utilities as it would require displacement of the water tower at the Route 5 interchange.
- A north alignment affects a greater number of noise receptors than the south alignment.

As a result of the above analysis, it was recommended that the mainline of I-70 be widened to the south of the existing highway throughout the entire SIU 3 up to the western bluff of the Missouri River. This alternative allows for connections to the adjacent SIUs without median crossovers, results in a lower degree of residential and utility disruption and lower potential noise impacts. The North vs. South Environmental and Engineering Review is provided in Appendix C.

3. Missouri River/Overton Bottoms Alternatives

In contrast to the mainline west of Overton Bottoms, the portion of SIU 3 in the vicinity of Overton Bottoms was perceived as having a greater potential for environmental impact. As a result, two alternatives (one north and one south of the existing mainline) that extend from the western bluffs, across the Missouri River and its floodplain, to a common tie-in point east of Route BB are retained for analysis. Figure II-2 presents these two alternatives. Detailed analysis of these alternatives is provided in Chapter III.

It should be noted that a North Alternative will also necessitate the inclusion of two crossovers to connect with the remainder of the SIU 3 mainline west of the Missouri River and SIU 4 at the eastern terminus of the study area. The following presents a general summary of the key alternative features and the issues in this portion of the project area. More detailed discussion and impact analysis of the North and South alternatives are provided in Chapter III.

a. Length, Constructability and Cost

The length and right of way requirements of a North Alternative or South Alternative across the Missouri River and its associated floodplain is essentially the same; therefore, there is no significant differentiation based on project cost.

In terms of constructability, as with traffic safety, a northern alignment would require two crossovers. The western crossover would likely be located on the western bluffs of the Missouri River floodplain, whereas the eastern crossover would likely be located on the curve at the eastern terminus of SIU 3. The inclusion of these crossovers would increase the cost and complexity of the construction phase of the project.

The South Alternative impacts Manitou Bluffs on the Boone County side of the Missouri River. These bluffs are higher on the south side of I-70 and result in more rock excavation for a southern alternative. By comparison, the North Alternative through Overton Bottoms may result in a longer bridge. This would result in a corresponding increase in total cost that would offset any costs associated with greater rock excavation requirements for a southern crossing of the Missouri River.

b. Bridge Condition and Location

As presented in Chapter I.D.4 and as presented in detail in the Missouri River Bridge Technical Memorandum, SIU 3 (MACTEC, 2004) (available upon request), the existing Missouri River bridge is a 44-year-old structure that includes a 1,508-foot (459.6-meter) long west approach, a 1,102-foot (335.9-meter) through-truss unit over the Missouri River and a 408-foot (124.4-meter) long east approach. It has a width of 60 feet 4 inches (18.4 meters) and carries two, 12-foot (3.7-meter) lanes of traffic in each direction; however, it has insufficient width to accommodate the needed capacity (i.e., three, 12-foot [3.7-meter] lanes in each direction).

Improvements to the bridge are required in conjunction with the need to provide increased capacity on I-70 within SIU 3. However, the main span structure cannot be widened to carry six lanes of traffic without either providing unacceptable highway geometry (splitting the roadways into two lanes within the truss lines and one single lane carried to the outside of each truss line on cantilever brackets), or total reconstruction of the entire structure. Each of these measures would necessitate a total closure of the bridge to traffic for the duration of the reconstruction (at least two years). This long closure period is also unacceptable.

As a result of this analysis, it was determined that alternatives to the mainline require the construction of a new parallel bridge facility. Such a facility would be constructed within approximately 124 feet (37.8 meters) of the existing I-70 bridge on either the north or south side of the existing alignment. Placement of new parallel facility at a greater distance from the existing bridge would not be feasible as it would conflict with the navigation channel and would not be desirable to the U.S. Coast Guard.

c. Floodway/Floodplain Encroachment and Hydraulics

A Federal Emergency Management Agency regulatory floodway boundary exists within Boone County, on the left descending (east) bank of the Missouri River. Cooper County, on the right descending (west) bank of the river, also participates in the Flood Insurance Program. However, a regulatory boundary floodway for the west bank of the Missouri River has not been adopted within Cooper County. The hydraulic model developed by Federal Emergency Management Agency for the Boone County Flood Insurance Study defines a full floodway, west bank as well as east bank, but that floodway was not adopted by Cooper County for inclusion in the Cooper County Flood Insurance Study. Those floodway widths are, however, included in the Boone County Flood Insurance Study and the hydraulic model is available in the FEMA files.

Under Governor's Executive Order 98-03, the State Emergency Management Agency is the sole regulatory agency for Flood Insurance Program compliance for MoDOT projects. Under Executive Order 98-03 and because both Boone and Cooper counties participate in the federal Flood Insurance Program, and because a floodway has been defined for the east bank of the Missouri River at the location of the proposed bridge crossing, the State Emergency Management Agency will require compliance with federal floodplain and floodway management requirements (44 Code of Federal Regulations 60.3) for this project, as indicated in comments regarding this project (State Emergency Management Agency letter dated September 11, 2002, Appendix D).

When a regulatory floodway exists, MoDOT's practice is to develop a hydraulic analysis in compliance with 44 Code of Federal Regulations 60.3(c)(3), which requires demonstration through hydrologic and hydraulic analyses using standard engineering methods that the project will cause no increase in the flood elevation for the base flood (also known as the one percent risk or 100-year flood) event.

On a more general policy level, Executive Order 98-03 further directs state agencies to use a broad and unified effort to ensure that future uses and development of the state's floodplain in a manner to lessen risk of flood losses and minimize exposure of developments to potential flood damage.

To meet the zero-rise criteria, the northern crossing may require a slightly longer bridge than the southern crossing based on typical flow contraction and expansion angles at constrictions. Additionally, relief bridges or excavation in the overbank area under and near the bridge opening are possible alternatives to assist in providing a facility that meets the zero-rise criteria. Scour of the river bed would be a consideration requiring careful consideration and controls for either the northern or southern alignments. The construction created by the existing bridge and approach embankment results in significant scour near the west abutment and a similar companion structure would have similar scour potential and control needs.

Based on hydraulic modeling results and as observed during the 1993 flood, the constriction created by the existing bridge causes backwater. Calculated backwater for the existing bridge is 1.6 foot (0.49 meter) for the 100-year flood and 2.6 feet (0.79 meter) for the 1993 flood event. The 100-year flood backwater depth exceeds one foot (0.3 meter) for a distance of approximately six miles (9.7 kilometers) upstream of the bridge. A new bridge, whether located north or south of the existing bridge that would satisfy the floodway criteria described above would also create no additional backwater in general. Results of this chapter are presented in detail in "Hydraulic Information for Floodplain Structures, I-70 Crossing of Missouri River bridge near Overton, Missouri" (MACTEC, 2004) (available upon request).

d. Wetland and Surface Water Impacts

Wetlands

Wetland extent within the Overton Bottoms portion of the study area was not well represented by existing mapping (National Wetland Inventory and Natural Resources Conservation Service mapping—see Chapter III.L and "I-70 SIU 3 Draft Wetland and Stream Delineation Report").(available upon request). Field reconnaissance of the areas north and south of the existing mainline facility was, therefore, conducted to evaluate potential wetland distribution and characteristics within the floodplain. As a result of review, it was determined that the general extent of wetlands within the Overton Bottoms area was similar on both the north and south sides of the existing facility. Additionally, many of the wetlands are located in what previously was cropland (prior to the establishment of the Big Muddy Refuge) and were of relatively low quality. Efforts to improve the quality of these wetlands are currently under way by the U.S. Fish and Wildlife Service as part of the management activities of the Big Muddy Refuge.

Several small wetlands are also present east of the Missouri River that may be affected, depending on the mainline alternative selected. For example, improvements on the north may affect a small forested wetland associated with a stream valley on the north side of existing I-70. No such wetlands exist south of the existing mainline facility east of the Missouri River.

Other "Waters of the United States"

Some differences are also noted between a north and south mainline alternative with respect to other jurisdictional "waters of the United States." In particular, greater impacts would occur with a north mainline alternative to both the scour hole within Overton Bottoms and a perennial stream and associated springs within the Manitou Bluffs. The scour hole at the base of the western bridge abutment has been shown to provide valuable habitat for fish and wildlife (U.S. Fish and Wildlife Service, personal communication) and is approximately 400 feet

(121.9 meters) wider on the north side of the existing facility. Additionally, field reconnaissance of the Manitou Bluffs area resulted in the identification of surface water resources in a highly sensitive karst area consisting of a perennial stream and several springs on the north side of the existing roadway. Improvements to the north would have an adverse impact on these surface water resources.

e. Public Lands

Parks

The Katy Trail State Park is a linear recreational facility that crosses I-70 in two places in the study area: approximately 1.4 miles (2.3 kilometers) west of Route 5 in Cooper County (the Katy Trail crosses I-70) and along the Missouri River in Boone County (I-70 crosses the Katy Trail). The Katy Trail crossing at the Missouri River in Boone County is not significantly affected by either a north or south mainline I-70 alternative (see Chapter III.A.2.a).

Conservation Areas/Wildlife Refuges

The Overton Bottoms Conservation Area is located in the Missouri River floodplain south of I-70. In contrast, the Big Muddy Refuge is located immediately opposite this conservation area on the north side of I-70. A 300-foot (91.4-meter) wide space has been reserved by the U.S. Army Corps of Engineers both north and south of existing I-70 to accommodate either a north or south mainline alternative (see letter from the U.S. Army Corps of Engineers dated Jan. 6, 2000 in Appendix D). Since there are tracts of public land on each side of I-70 through Overton Bottoms, impacts to public lands would occur with both the north and south mainline alternatives (see Chapter III.A.2.a).

Taylor's Landing is a public access facility located within the Big Muddy Refuge. It is owned and operated by the Missouri Department of Conservation and is located upstream of the existing I-70 bridge. No impact to the landing is expected with either a north or south alignment of future improvements to I-70.

4. Interchange Alternatives

Section of Independent Utility 3 contains five separate interchanges at the following crossroad locations:

- Route 5 (Mile 101) at Boonville;
- Route B (Mile 103) at Boonville;
- Route 87 (Mile 106) at Boonville;
- Route 179 (Mile 111) at Overton; and
- Route BB (Mile 115) at Rocheport.

The development of interchange alternatives at each of these locations was carefully undertaken by initially inventorying all appropriate environmental, socioeconomic and engineering constraints. Interchange options were then formulated that avoided and minimized impacts to the extent practical and that incorporated access management design guidelines, provided for outer road systems and were favorable from a constructability standpoint.

In some cases, these alternatives do not fully meet the suggested access management guidelines in order to minimize impact to existing businesses. However, such cases were only made where they did not compromise either existing or future safety or traffic operations.

Initially, interchange concepts were developed at each interchange. These concepts were refined and/or eliminated from consideration and more detailed analysis. Those alternatives carried forward for further detailed analysis are described in this chapter of the EA. For a complete discussion on the development of all interchange concepts, see Analysis of Interchanges (Appendix E).

In consideration of these factors and after studying several conceptual layouts at each location, it was determined that the interchange improvements at Route 5 and Route 179 were represented by a single reasonable option. In contrast, two reasonable options were determined to be possible at Routes B, 87 and BB.

The initial conceptual layouts mentioned above also included an alternative at Route 5 that incorporated folded loop ramps instead of a standard diamond. Additionally, the outer road layouts originally proposed at Route 5 were spaced 1,320 feet (402 meters) from the ramp terminals. However, because of impacts to adjacent properties (one of them being property owned by the Boonville School District), the outer road layouts were located closer to the ramp terminals. This action does not negatively affect traffic operations. At Route B, there were some initial outer road layouts spaced 1,320 feet (402 meters) from the ramp terminals. As with Route 5, the outer roads have been located closer to the ramp terminals without a negative impact on traffic operations. Initially, a roundabout was proposed on the south side of the Route BB interchange. This was subsequently eliminated from consideration.

Rationale for the development of the reasonable alternatives at each of these locations is presented in detail in Appendix E and summarized in the following subsections.

a. Routes 5 and 179

Route 5 is the western-most crossroad in SIU 3 and Route 179 is the first interchange west of the Missouri River. Each of these locations is characterized by a number of environmental and engineering constraints that limit alternative development. As presented in Appendix E, a total of three interchange concepts were initially developed at Route 5 and three concepts at Route 179. The preferred interchange alternative at these locations and the distribution of these constraints are presented in Figure II-3. Notable constraints that limited alternative development include those listed in Table II-2.

Table II-2: List of Environmental and Engineering Constraints at the Route 5 and Route 179 Interchanges

Interchange	Constraints to Alternative Development
Route 5	Boonville water tower – Located in the northwest quadrant of the interchange. Limited westbound on-ramp and outer road layout.
	Boonville High School – Located in the northeast quadrant of the interchange. Limited outer road configuration.
	Potential residential impact – Located in the northeast quadrant of the interchange south of Boonville High School. Limited outer road configuration. (Note: this property was also initially considered to be potentially National Register of Historic Places-eligible.)
	Development in the northwest quadrant of the interchange (e.g., Comfort Inn, Burger King, Pilot Travel Center, Russell Stovers Candies) limited the placement of a new Route 5 bridge crossing to east of the existing bridge.
Route 179	Potential residential impact – Located in the southwest quadrant of the interchange. Limited outer road configuration. (Note: this property was also initially considered to be potentially National Register of Historic Places-eligible.)
	Development in the southwest quadrant of the interchange (residential development with outbuildings) limited the placement of a new Route 179 bridge crossing to east of the existing bridge.
Source: MACTEC, 2003	

b. Routes B, 87 and BB

Two optional layouts were developed for each of the interchanges at Routes B and 87 in Boonville and Route BB in Rocheport. Configurations of each of these optional layouts along with relevant environmental and engineering constraint information are presented in Figures II-4 through II-6, respectively.

Route B

Each of the two interchange options at Route B are similar in that they would entail the construction of a replacement bridge for the crossroad immediately west of its present location (see Figure II-4). However, differences in ramp and outer road layout and configuration account for significant variability in the access to the mainline, access to local businesses and impact to environmental resources. Option A is configured with loop on-ramps to provide access to I-70, whereas Option B consists of a typical diamond configuration. Additionally, Option A differs from Option B as it incorporates tight outer roads in the southeast and northwest quadrants. Differentiating characteristics of each of these options are summarized in Table II-3 and are provided in detail in Appendix E.

Table II-3: Advantages and Disadvantages of Interchange Options at Route B

Build Alternative	Differentiating Characteristics
Option A	Lower constructability due to loop ramps and tight outer road layout Discontinuous outer road alignment on north and south Outer road on north uses existing local road Outer road in southeast quadrant bisects truck stop and reduces available area for business operations Greater commercial (seven) and residential (one) displacements 1.4 acre (0.6 hectare) of wetland/surface water impact Total estimated cost of $52.2 million
Option B*	Greater ease of construction due to diamond layout and use of backage roads Continuous outer road alignment on north and south Truck stop in southeast quadrant provided access via backage road Lower commercial (five) and residential (one) displacement 0.7 acre (0.3 hectare) of wetland/surface water impact Total estimated cost of $48.4 million

** Shading designates recommended preferred alternative.*

Source: MACTEC, 2004

As a result of these considerations, Option B was selected as a component of the recommended preferred alternative, while Option A was discontinued from further consideration.

Route 87

Each of the two interchange options at Route 87 is similar in that they consist of typical diamond configurations (see Figure II-5). Additionally, each interchange option incorporates similar outer road layouts and ramp locations. Factors considered in the formulation of the alternatives included avoidance of impact to residences (e.g., northeast quadrant), avoidance of a cemetery (northwest quadrant) and avoidance of surface water resources (e.g., northwest quadrant). Primary distinguishing features of the two options lie in the location of the crossroad bridge over mainline I-70. For Option A, the crossroad bridge is located approximately 50 feet (15.2 meters) west of its present location and is at a skewed angle. In contrast, the crossroad bridge for Option B is located approximately 50 feet (15.2 meters) east of the existing bridge and is at a

more perpendicular angle. Differentiating characteristics of each of these options are summarized in Table II-4 and are provided in detail in Appendix E.

Table II-4: Advantages and Disadvantages of Interchange Options at Route 87

Build Alternative	Differentiating Characteristics
Option A	Lower constructability rating due to skewed bridge crossing over I-70 Results in three residential displacements Results in displacement of five commercial businesses Results in displacement of government facility Results in reduced access to Conoco station Results in slight change of access to concrete plant due to outer road construction Results in 0.4 acre (0.2 hectare) of wetland impact Total estimated cost of $23.6 million
Option B*	Favorable constructability rating due to perpendicular bridge crossing over I-70 Results in three residential displacements Results in displacement of four commercial businesses Results in displacement of government facility Results in reduced access to Phillips 66 station Results in slight change of access to concrete plant due to outer road construction Results in 0.4 acre (0.2 hectare) of wetland impact Total estimated cost of $22.4 million

** Shading designates recommended preferred alternative.*

Source: MACTEC, 2004

As a result of these considerations, Option A was discontinued from further consideration and Option B was selected as a component of the recommended preferred alternative.

Route BB

The two interchange options at Route BB are similar in that they consist of typical diamond configurations (see Figure II-6). However, Option A incorporates a relocation of the crossroad west of its present location and a straightening of Route BB to allow for a perpendicular crossroad bridge. One initial concern with this interchange was the merge length between the ramp and its taper to the approach of the Missouri River bridge. This was of concern due to the interagency planning effort (see Chapter IV) to consider a Mid-Missouri Visitor Center and rest area in the vicinity of the Manitou Bluffs. Greater traffic volumes of passenger vehicles and trucks entering I-70 westbound would require an adequate merge distance prior to reaching the Missouri River bridge. The total merge distance available under Option A is 1,400 feet (426.7 meters), which was determined to be adequate for both passenger vehicles and trucks.

Option B was developed to provide an alternative with additional merge length from the westbound on-ramp to the bridge. Consequently, Option B was formulated with a crossroad location east of the existing crossroad and a total merge length of 2,100 feet (640.1 meters). This option would entail a relocation of Route BB to the east of its present location and a skewed bridge angle over mainline I-70. Outer road configurations for each option are similar. Differentiating characteristics of each of these options are summarized in Table II-5 and provided in detail in Appendix E.

Table II-5: Advantages and Disadvantages of Interchange Options at Route BB	
Build Alternative	**Differentiating Characteristics**
Option A*	Favorable constructability rating due to perpendicular bridge crossing over I-70 Results in displacement of seven commercial businesses (four are vacant) South frontage road in close proximity to church Results in one acre (0.4 hectare) of wetland and surface water impact Results in four acres (1.6 hectares) of prime farmland impact Lower potential impact to surface/groundwater resources due to greater disruption of undeveloped terrain in karst area Total estimated cost of $16.3 million
Option B	Lower constructability rating due to skewed bridge crossing over I-70 Results in one residential displacement Results in displacement of seven commercial businesses (two are vacant) South frontage road in close proximity to church Results in 5.3 acres (2.1 hectares) of wetland and surface water impact Results in 10.6 acres (4.3 hectares) of prime farmland impact Greater potential impact to surface/groundwater resources due to greater disruption of undeveloped terrain in karst area Total estimated cost of $16.9 million
** Shading designates recommended preferred alternative.* *Source: MACTEC, 2004*	

Subsequent to the development of Option B as an interchange alternative at Route BB, the Overton Bottoms Subcommittee concluded its study considering the location of a visitor center/rest area in the vicinity of the Manitou Bluffs. As a result of the group's study of this issue, the group determined that there is no interagency commitment for joint development of a Mid-Missouri Visitor Center at this time. However, such a facility may be considered in the future as joint funding commitments are made. A rest area within SIU 3 is, however, being undertaken as part of this study.

In consideration of the above factors, Option A was selected as a component of the recommended preferred alternative and Option B was eliminated from further consideration.

c. Cost Estimates

Cost was one of the factors used to screen each alternative considered in this evaluation. Cost estimates for each alternative were developed from guidance supplied by the General Engineering Consultant for cost estimating. This guidance was provided in the "Median Area Study, Design Criteria and Cost Estimating Guide, I-70 Second Tier Environmental Studies, Jan. 2003" (available upon request) and a subsequent email of clarification and revision dated Dec. 18, 2003. 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. The unit costs provided are based on 2005 dollars. Table II-6 provides a cost breakdown of each portion of the recommended preferred alternative.

Table II-6: Preliminary Costs – Recommended Preferred Alternative

Segment	Mainline Length (miles)	Costs		
		Construction	Right of Way	Total
West Terminus to Route 5	1.72	$20,359,671	$395,980	$20,755,651
Route 5 Interchange	0.70	$19,626,272	$4,475,938	$24,102,210
Route 5 to Route B	1.04	$9,439,747	$715,555	$10,155,302
Route B Interchange (Alternative B)*	0.68	$20,297,895	$12,615,616	$32,913,511
Route B to Route 87	2.01	$17,903,905	$1,251,160	$19,155,065
Route 87 Interchange (Alternative B)*	1.12	$19,198,301	$5,930,352	$25,128,653
Route 87 to Route 179	4.21	$44,571,085	$1,627,200	$46,198,285
Route 179 Interchange	0.63	$14,599,499	$2,859,660	$17,459,159
Route 179 to Route BB†	3.25	$131,507,514	$484,820	$131,992,334
Route BB Interchange (Alternative A)*	1.81	$24,669,214	$4,891,900	$29,561,114
Totals	**17.17**	**$322,173,104**	**$35,248,181**	**$357,421,285**

** recommended preferred alternative.*
† Includes the Missouri River bridge ($76,200,000)

Source: MACTEC, 2003

C. Alternatives Retained for Detailed Analysis

1. No-Build Alternative

The No-Build Alternative failed to meet the objectives and to address the needs outlined in the project purpose and need. If no action is taken, LOS can be expected to degrade to failure levels (LOS F) and accidents are likely to increase. However, the No-Build Alternative was retained as a basis for comparison against other project alternatives.

2. Build Alternatives

As a result of a thorough investigation of the environmental and engineering constraints of the project area, as well as an evaluation of both mainline and interchange alternatives, build alternatives within SIU 3 consist of the south mainline alternative and reconstructed interchanges at Routes 5, B, 87, 179 and BB. The interchange alternative selected as the recommended preferred alternative at Route B is Option B. Similarly, the preferred interchange alternative at Route 87 is Option B. Additionally, the preferred interchange alternative at Route BB is Option A. Reference Appendix E for discussion of how these interchange alternatives were selected. Planimetric depictions of the recommended preferred alternative including an illustration of proposed pavement, grades and rights of way are available upon request.

In addition, because of the potential for greater environmental impacts in the vicinity of Overton Bottoms, a second mainline alternative parallel to and north of the existing alignment was retained for detailed analysis. This alternative extends from the western Missouri River bluff, across the floodplain and the Missouri River and the eastern bluff and crosses over to the south, east of the interchange at Route BB in Rocheport. Design features and potential traffic characteristics of this northern alternative are similar to those of the south alternative.

As discussed in Chapter I, increased traffic volumes result in degradation of the LOS to F for mainline I-70 traffic flow by 2030 under the No-Build Alternative. However, traffic operations

improve to LOS D with the recommended preferred alternative (Table II-7). Likewise, increased traffic volumes result in degradation of the LOS to F at the Route 5 and Route B interchanges by 2030. At Route 87, the LOS drops to D in 2030. However, traffic operations improve to LOS A or B with the reconstruction of the crossroads at these interchanges to three lanes with the inclusion of a turn lane and the installation of signals where warranted (Table II-8).

In the summer of 2004, the existing (2000) data for mainline I-70 was updated to reflect more current (2002) data. The resulting changes in the data do not change any of the conclusions made in the forecasts for either 2020 or 2030. These results are summarized in Table II-7.

Table II-7: Mainline I-70 LOS Analysis

		Route 5 to Route B	Route B to Route 87	Route 87 to Route 179	Route 179 to Route BB
Peak Period Directional Traffic Volumes					
2000		1,320	1,310	1,300	1,570
2002		1,230	1,310	1,410	1,350
2020		2,775	2,770	2,960	3,040
2030		3,270	3,230	3,481	3,390
Peak Period LOS					
2000		B	B	B	B
2002		B	B	B	B
2020	No-Build	**E**	D	**E**	**E**
	Build	C	C	C	C
2030	No-Build				
	Build	C	C	D	D
Source: HNTB, 2004					

Table II-8: Level of Service Analysis Summary for Study Crossroads

		Route 5	Route B	Route 87	Route 179	Route BB
2000 LOS	No-Build Alternative	B	C	B	A	A
2020 LOS	No-Build Alternative	**F**	**F**	C	B	A
	Local Improvements	A*	D	B	B	A
	Build Alternative	A*	A*	B	B	A
2030 LOS	No-Build Alternative	**F**	**F**	D	B	A
	Local Improvements	B*	D*	B	B	A
	Build Alternative	A*	A*	B	B	A
** Note – Analysis assumes future signalization* *Source: Crawford Bunte Brammeier, 2003*						

For the six-lane build scenario, some I-70 links in rural areas have calculated LOS of D. One Improve I-70 objective is to provide LOS C in rural areas. Although the projected LOS from Route 87 to Route BB in the design year (2030) is listed as a D, it should be noted that this is only slightly over the LOS C/D threshold. This means that the driving experience will not be drastically different from LOS C conditions and LOS D will not be reached until late in the design period. The other factor is that these roadway links are generally on the fringe of an urban area, so commuter traffic increases the traffic volume. In these urban fringe areas the lower LOS is more acceptable.

3. Intelligent Transportation Systems

The implementation of Intelligent Transportation Systems 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 Intelligent Transportation 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 Intelligent Transportation Systems in SIU 3 is $2,600,000 with an estimated annual operation and maintenance cost of $260,000. These costs do not include the cost for developing and operating an I-70 corridor traffic operations center.

4. Bicycle and Pedestrian Use

An inventory and analysis of existing bicycle routes and pedestrian walkways was conducted within the study area. The Katy Trail is currently the only bicycle and pedestrian walkway located within the study area. For a description of the Katy Trail, see Chapter V.

The Frontage Road Master Plan for the I-70 Second Tier Study dated July 2003 (available upon request) states that the frontage roads along I-70 would incorporate two 12-foot (3.7-meter) and two eight-foot (2.4-meter) shoulders where the shoulders could also serve as one-way bike lanes. The Master Plan goes on to state that by providing continuous frontage roads along I-70, an opportunity exists for the inclusion of a bikeway across the state.

However, much of the construction of the frontage roads is likely to occur in the future and not at the time of the initial reconstruction and widening of I-70. The frontage roads as proposed in the Frontage Road Master Plan may be constructed in the future as needs arise and as funding becomes available.

D. Rest Area Site Location Study

1. Background

A rest area site location study was conducted for SIU 3 to determine the appropriate location of eastbound and westbound rest areas for the projected truck and passenger car parking. Currently, there are rest areas for both eastbound and westbound traffic just east of Route B in Boonville. The size of these rest areas is not large enough to accommodate the projected truck parking volumes. This study is based on the "I-70 Rest Area Study, (Kansas City to St. Louis), Second Tier Environmental Studies" (available upon request). That study looked at all four rest areas across the state and provided parameters for rest area layout configuration, truck parking requirements and design criteria and rest area amenities. This SIU considers relocation of only the Boonville rest area at mile marker 104. A summary of the design requirements provided by the General Engineering Consultant for the Boonville rest area is as follows:

- recommended layout configuration – eastbound and westbound side saddle;
- design vehicle – WB-67 trucks;
- parking configuration – diagonal pull-through;
- parking angle – 20 degrees;
- parking space length – 75 feet (22.9 meters);
- parking space width – 12 feet (3.7 meters); and
- recommended number of truck parking spaces – 50 in each direction.

2. Development of Alternative Site Locations

Alternative locations were identified based on limits of environmental and engineering constraints. These limits are primarily defined by the following considerations:

- Rest area ramp terminals can be no closer than 2,000 feet (606 meters) from other interchange ramp terminals.
- A rest area will not encroach upon sensitive environmental resources (e.g., wetlands and tributaries to Petite Saline Creek).
- A rest area will not be developed in Overton Bottoms in order to avoid impacts to public lands (Big Muddy Refuge and Overton Bottoms Conservation Area).
- A rest area will not be developed east of the Missouri River so as to avoid impacting the Rocheport Bluffs and the tight spacing between the river and the Route BB interchange.

Based on these constraint limits, five site locations were identified for consideration of a side saddle rest area layout. These locations are depicted on Figure II-7.

Site 1 (Existing) – Between Route B and Route 87 in Boonville

This site incorporates the existing location with a slight expansion of the site to accommodate the projected truck parking.

Advantages:

- Uses existing city utilities (electric, sanitary sewer)
- Requires the least amount of new right of way
- Relatively little impact to natural resources and no impact to known cultural resources
- Is consistent with existing land use

Disadvantages:

- Somewhat close to ramp terminals at Route B (although the proposed layout matches the existing condition)
- Requires realignment of Route U

Site 2 – Between Route 5 and Route B in Boonville

This site lies between Route 5 and Route B. The ramp terminals at Route 5 and Route B limit the size of this site.

Advantages:

- Relatively minor impact to natural resources and no impact to known cultural resources
- Close proximity to existing city utilities

Disadvantages:

- Site not large enough to accommodate projected truck parking
- Relatively greater impact to residential and commercial properties
- Requires new utility connections and new right of way
- Requires the removal of the existing rest area

Site 3 – Between Route 87 and Tributary to Petite Saline Creek

This site lies outside of the city limit of Boonville in unincorporated Cooper County. It is limited by the ramp terminals of the Route 87 interchange and the floodplain and riparian corridor of a tributary to Petite Saline Creek.

Advantages:

- Relatively minor impact to natural resources and no impact to known cultural resources
- Large enough site to accommodate projected truck parking

Disadvantages:

- Requires large footprint of new right of way
- Requires the removal of the existing rest area
- Requires cutting into roadside vertical rock embankment
- Requires new utilities and further removed from existing city utilities

Site 4 – Between Tributary to Petite Saline Creek and Route 179

This site lies outside of the city limit of Boonville in unincorporated Cooper County. It is limited by the floodplain and riparian corridor of a tributary to Petite Saline Creek and the location of Route 98 on the north side of I-70.

Advantages:
- Relatively minor impact to natural resources and no impact to known cultural resources
- Large enough site to accommodate projected truck parking
- Closer proximity to Overton Bottoms and, therefore, greater potential for incorporation of Missouri River interpretive elements

Disadvantages:
- Requires large footprint of new right of way
- Requires the removal of the existing rest area
- Requires cutting into roadside vertical rock embankment
- Requires new utilities and further removed from existing city utilities

Site 5 – Between Route 179 and West Bluff of Overton Bottoms

This site lies outside of the city limit of Boonville in unincorporated Cooper County. It is limited by the location of the ramp eastern terminals at Route 179 and the west bluff of Overton Bottoms.

Advantages:
- Relatively minor impact to natural resources
- Closer proximity to Overton Bottoms and, therefore, greater potential for incorporation of Missouri River interpretive elements

Disadvantages:
- Site not large enough to accommodate projected truck parking
- Requires the removal of the existing rest area
- Requires the relocation of a county road north of I-70
- Requires new utilities and further removed from existing city utilities

3. Preferred Site Location

Based on the information presented above, the preferred site location for the I-70 rest area in Central Missouri is Site 1 (the existing rest area location). The reasons for this selection are as follows:

- The site requires the least amount of new right of way as it is an expansion of an existing site.
- The site already has connections to existing city (Boonville) utilities.
- The required footprint accommodates projected truck parking.
- The realignment of Route U results in relatively little impact to land use and natural resources.

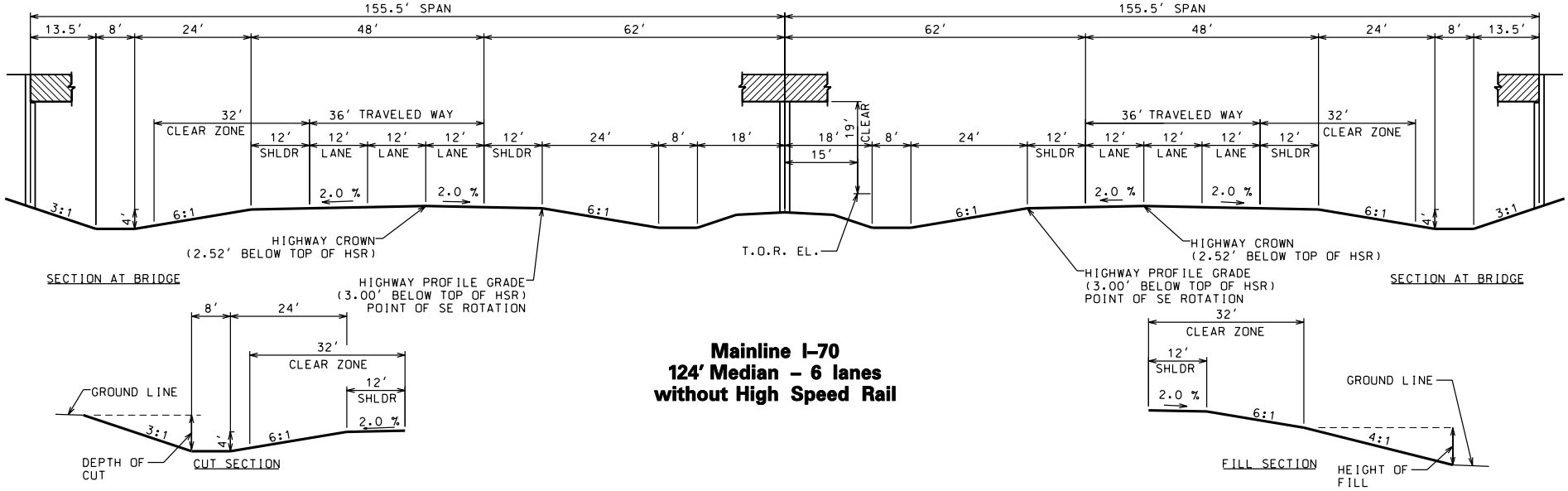
As a result, the proposed rest area improvements at Site 1 have been incorporated into the assessment of environmental consequences in Chapter III of this EA.

E. Description of the Recommended Preferred Alternative

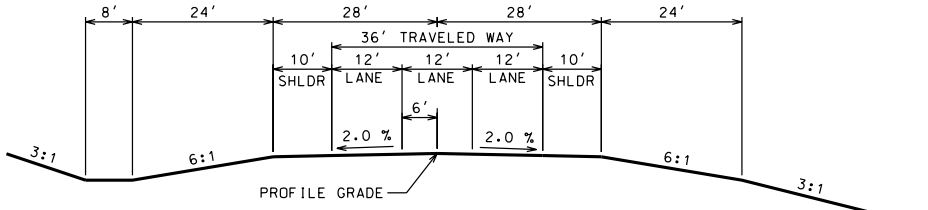
As a result of a thorough investigation of the environmental and engineering constraints of the project area, an evaluation of both mainline and interchange alternatives and an analysis of a second Missouri River crossing alternative (see Chapter III), the recommended preferred alternative within SIU 3 is proposed to consist of the south mainline alternative (including constructing a new parallel bridge over the Missouri River immediately to the south) and reconstructed interchanges at Routes 5, B, 87, 179 and BB. The interchange alternative selected as the recommended preferred alternative at Route B is Option B. Similarly, the preferred interchange alternative at Route 87 is Option B. Additionally the preferred interchange alternative at Route BB is Option A. The recommended preferred alternative also consists of reconstructed eastbound and westbound rest areas at the sites of the existing rest areas just east of Route B in Boonville. Planimetric depictions of the recommended preferred alternative including an illustration of proposed pavement, grades and rights of way are available upon request.

Final selection of the alternative, however, will not be made until the approval of the final EA after all impacts have been considered and all agency and public comments have been received and evaluated.

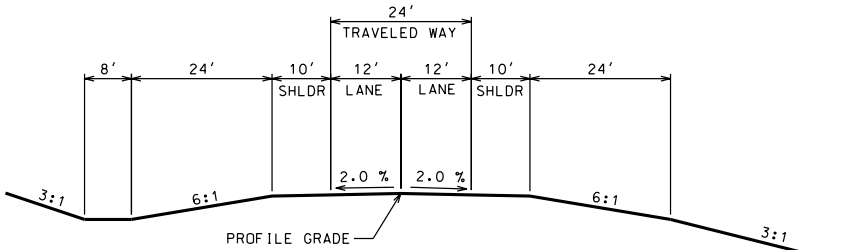
CONCEPT ONLY



Mainline I–70
124' Median – 6 lanes
without High Speed Rail



Route B and Route 5
3 – Lane Typical Section



Route 87, Route 179 and Route BB
2 – Lane Typical Section

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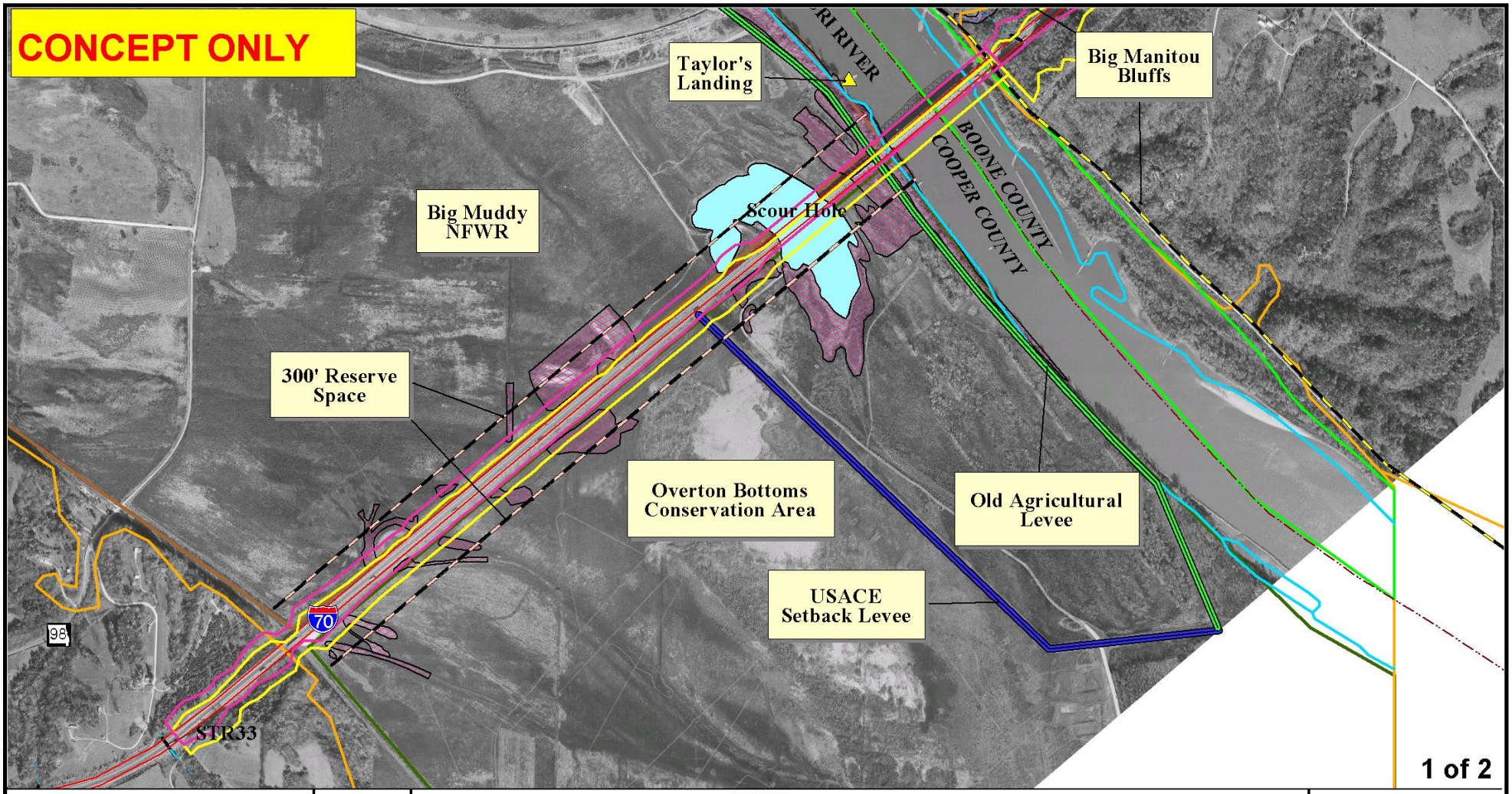
NOT TO SCALE

FIGURE II-1
Typical Sections



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SECTION 3 *Boonville to Rocheport*

LEGEND

- North Alternative
- South Alternative
- I-70 Center Line
- Stream Crossing
- Katy Trail
- 300' Reserve Space
- River/Stream
- County Line
- Old Agricultural Levee
- USACE Setback Levee
- FEMA Floodway
- Floodplain
- Big Muddy NRWR
- Overton Bottoms Conservation Area
- Wetland
- Sinkhole
- Spring

500 0 500
Feet
1" = 6,000'

N

Figure II-2
Missouri River Crossing Alternatives
Cooper & Boone Counties, Missouri

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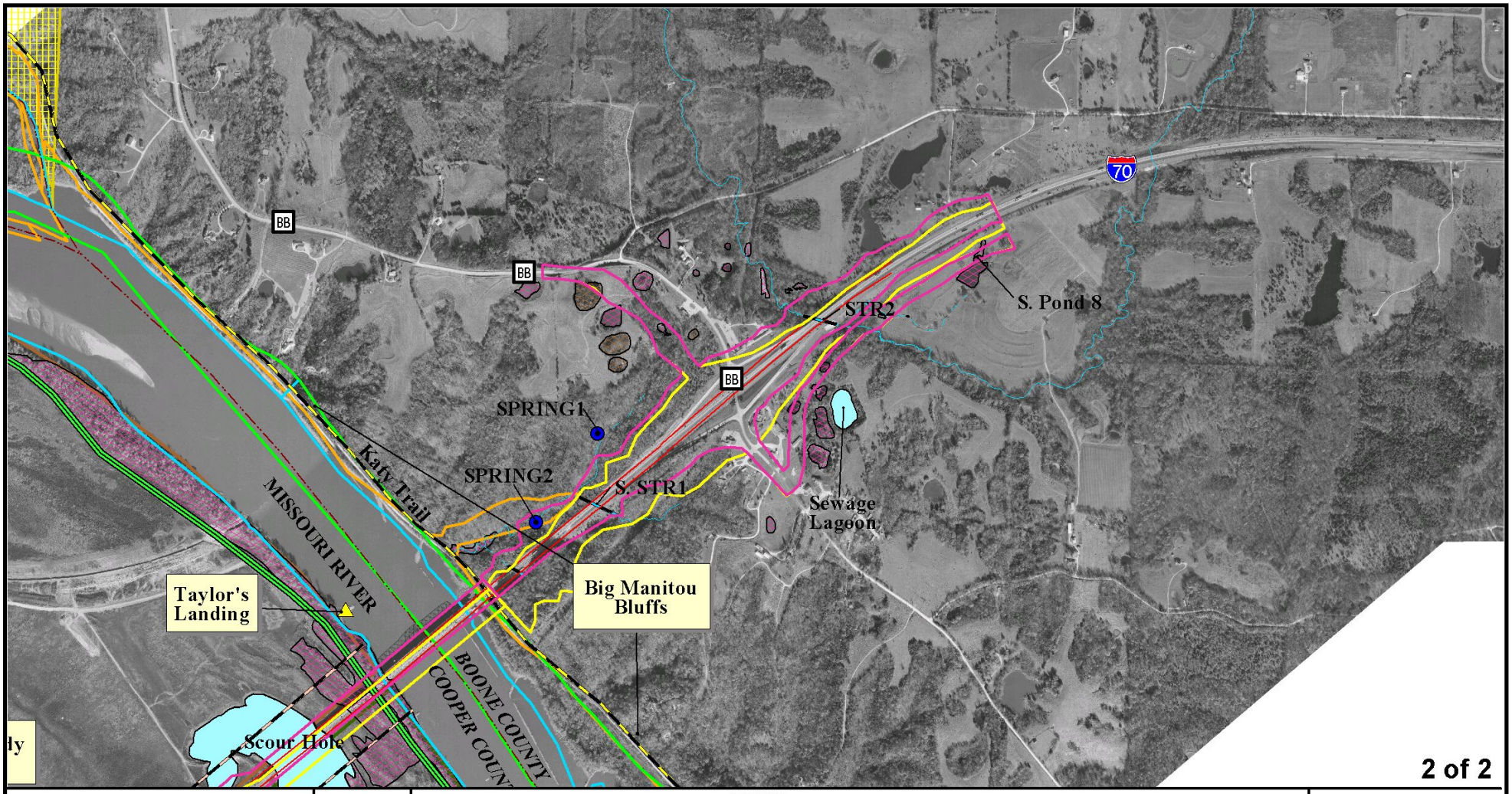

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SECTION 3 *Boonville to Rocheport*

LEGEND

- North Alternative
- South Alternative
- I-70 Center Line
- Stream Crossing
- Katy Trail
- 300' Reserve Space
- River/Stream
- County Line
- Old Agricultural Levee
- USACE Setback Levee
- FEMA Floodway
- Floodplain
- Big Muddy NRWR
- Overton Bottoms Conservation Area
- Wetland
- Sinkhole
- Spring

500 0 500

Feet

1" = 6,000'

N

Figure II-2
Missouri River Crossing Alternates
Cooper & Boone Counties, Missouri

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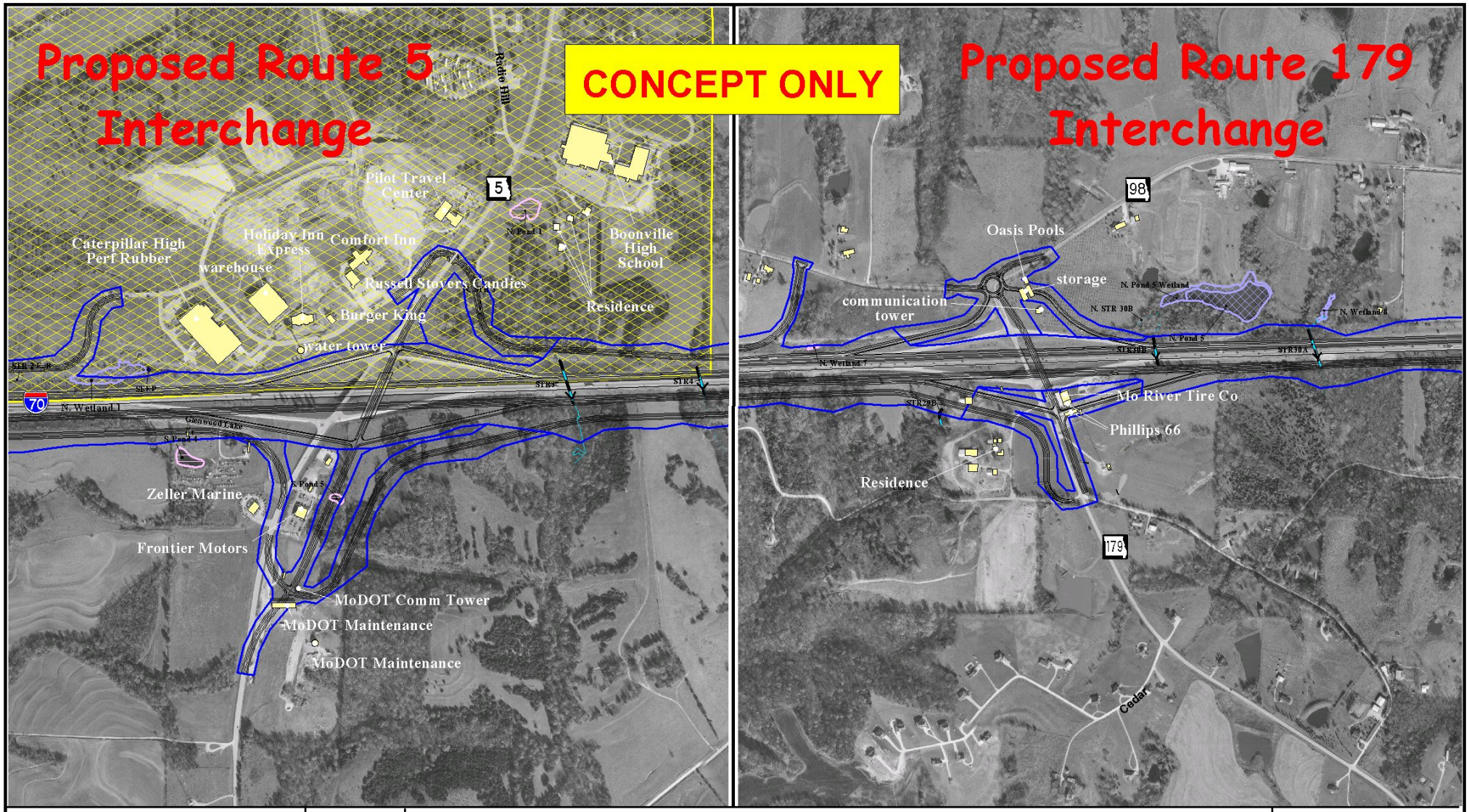


SECTION 3 Boonville to Rocheport

LEGEND

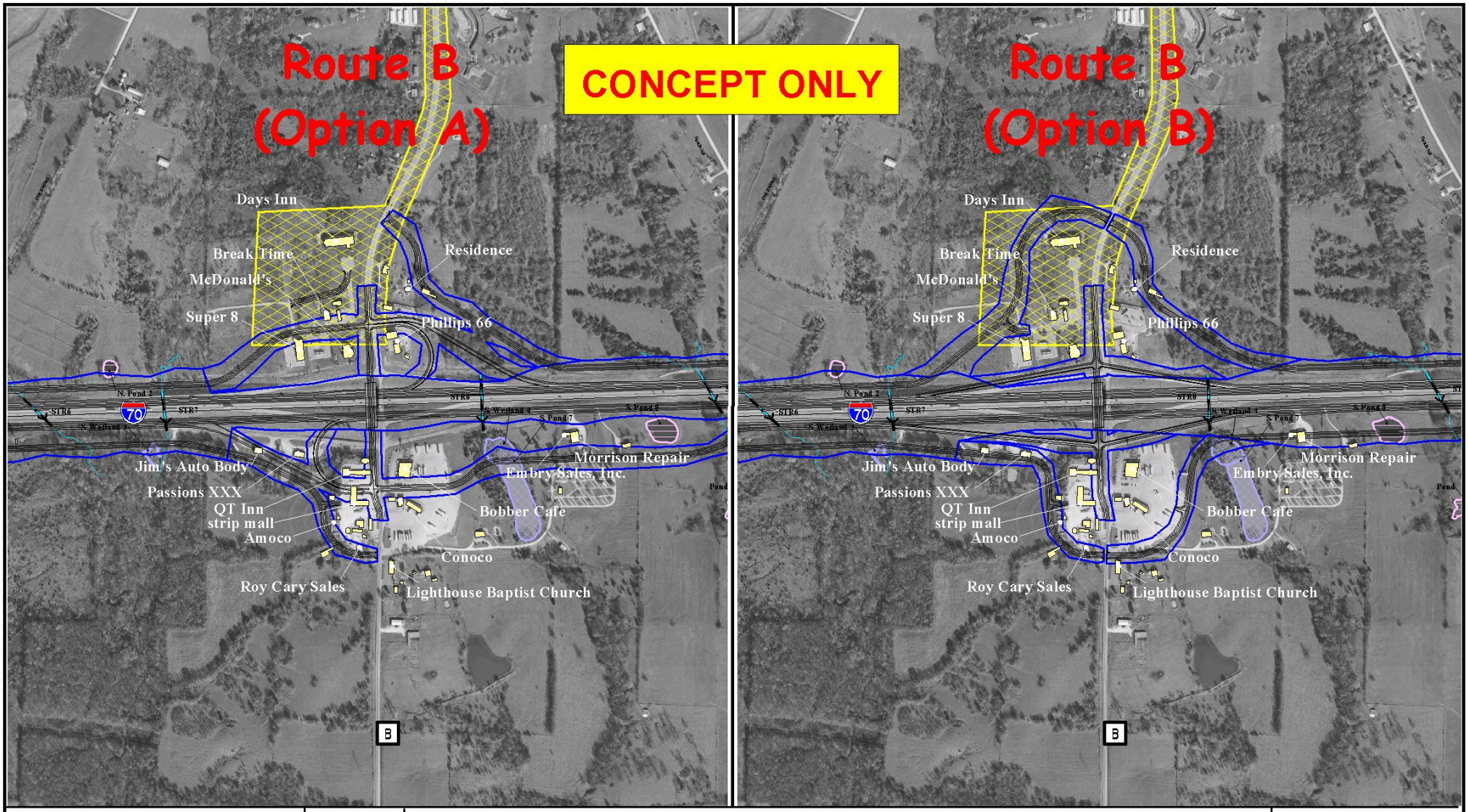
- Limits of Construction
- Edge of Pavement
- Stream/ Drainage Crossing
- Jurisdictional Perennial Stream
- Jurisdictional Intermittent Stream
- Non-Jurisdictional Drainage
- Municipal Boundary
- Jurisdictional Wetland or Pond
- Non-Jurisdictional Wetland or Pond
- Spring/Seep

500 0 500 Feet

1" = 700'

N

Figure II-3 Proposed Interchanges at Route 5 and Route 179



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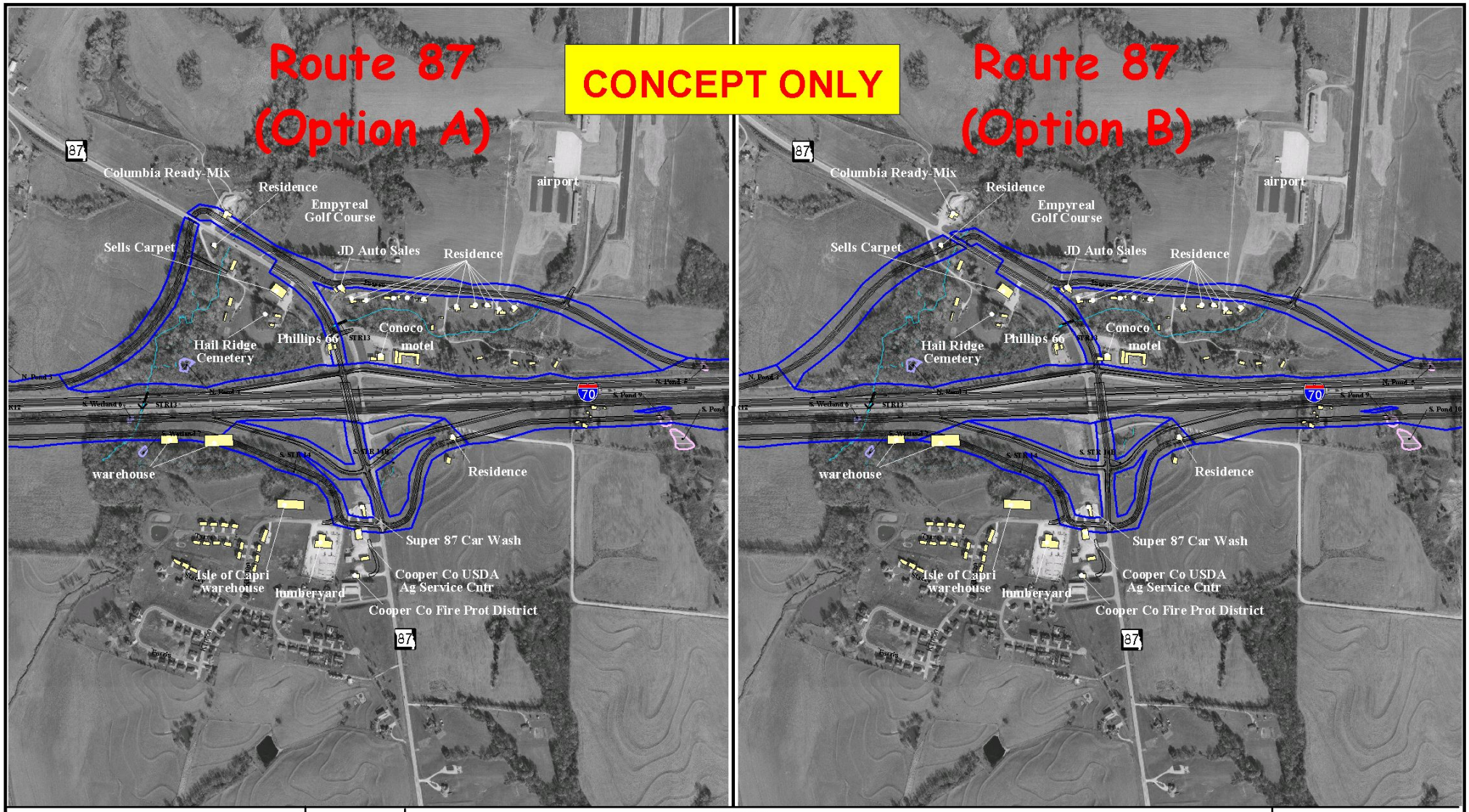
SECTION 3
Boonville to Rocheport

Figure II-4
Interchange Alternatives at Route B



MoDOT IMPROVE i70

SECTION 3
Boonville to Rocheport

LEGEND

- Limits of Construction
- Edge of Pavement
- Stream/ Drainage Crossing
- Jurisdictional Perennial Stream
- Jurisdictional Intermittent Stream
- Non-Jurisdictional Drainage
- Municipal Boundary
- Jurisdictional Wetland or Pond
- Non-Jurisdictional Wetland or Pond
- Spring/Seep

500 0 500
Feet
1" = 800'

N

Figure II-5
Interchange Alternatives at Route 87

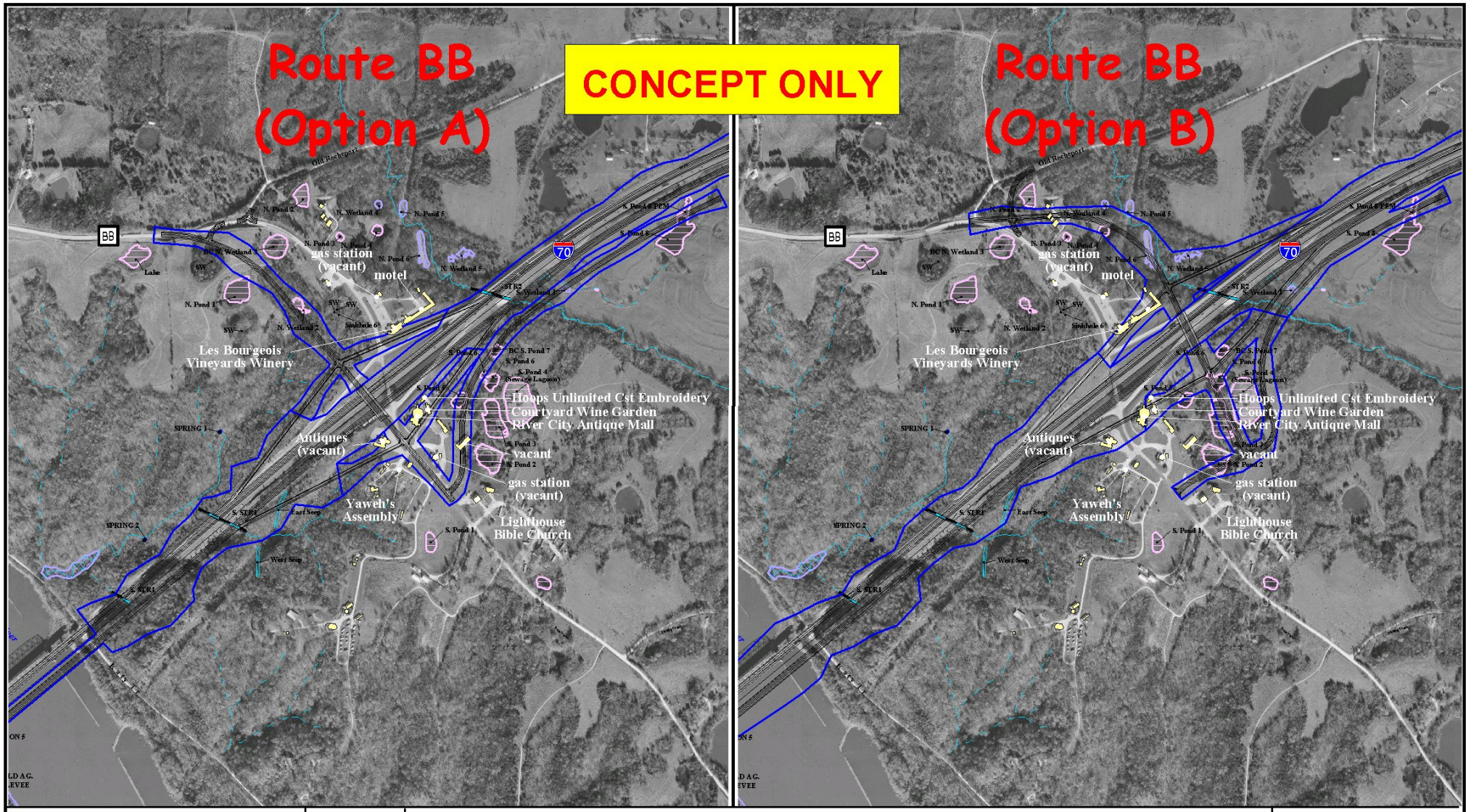
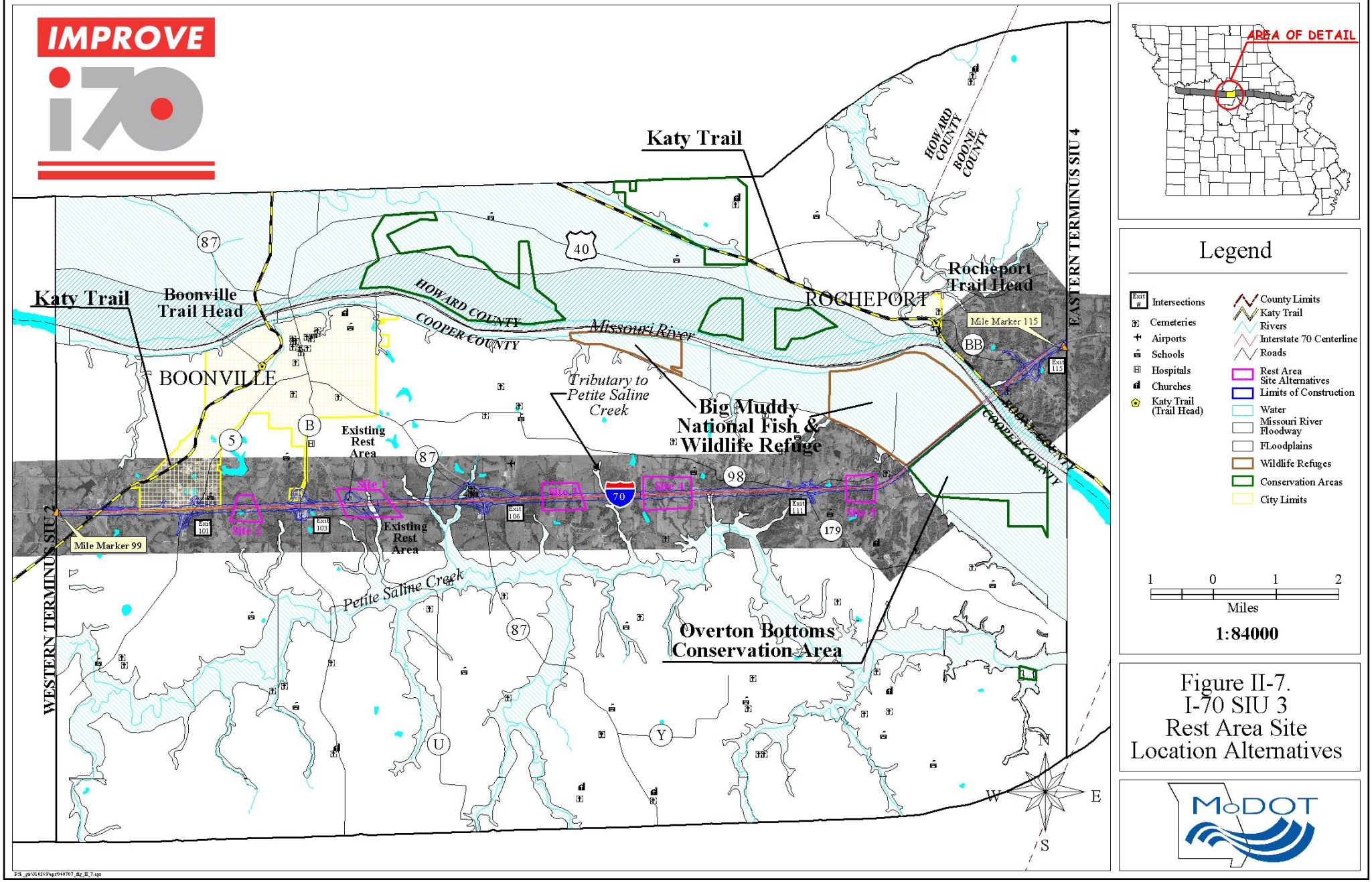


Figure II-6
Interchange Alternatives at Route BB



Legend

- Intersections
- Cemeteries
- Airports
- Schools
- Hospitals
- Churches
- Katy Trail (Trail Head)
- County Limits
- Katy Trail
- Rivers
- Interstate 70 Centerline
- Roads
- Rest Area Site Alternatives
- Limits of Construction
- Water
- Missouri River Floodway
- FLoodplains
- Wildlife Refuges
- Conservation Areas
- City Limits

1 0 1 2
Miles

1:84000

Figure II-7.
I-70 SIU 3
Rest Area Site
Location Alternatives

MoDOT