I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

EXECUTIVE SUMMARY OF FINDINGS AND RECOMMENDATIONS

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

Qk4
Third Rock Consultants, LLC
Cultural Resource Analysts, Inc.
Fuller, Mossbarger, Scott and May Engineers, Inc.

April 2005

ES EXECUTIVE SUMMARY

The Kentucky Transportation Cabinet (KYTC), and the Missouri Department of Transportation (MoDOT), with the financial support of the Federal Highway Administration (FHWA), undertook the I-66 Corridor Planning Study. The I-66 project was identified in the KYTC's 2001–2006 Six-Year Highway Plan and this study is part of the on-going project development process to examine a feasible corridor for the portion of I-66 in western Kentucky.

The I-66 study area is located in Western Kentucky and southeastern Missouri. The study area includes portions of Marshall, McCracken, Ballard, Carlisle, and Graves counties in Kentucky as well as Scott, Mississippi, and Cape Girardeau Counties in Missouri. Sections of Southern Illinois including portions of Alexander, Pulaski, and Massac counties were also included as a corridor was analyzed in Illinois despite the limited participation of the Illinois Department of Transportation during the initial stages of the study. The project involved identifying and analyzing several possible corridors between Western Kentucky and Southeastern Missouri, including corridors through Southern Illinois. The purpose of this planning study was to identify a recommended corridor or corridors for a new Interstate I-66 to serve as a basis for identifying future alternatives in the NEPA process.

Project Goals

The project began in the fall of 2001 with a presentation to the Purchase Area Development District (PADD). Also in the fall of 2001, there was a meeting with local officials in Missouri. Both meetings were designed to introduce the project as a whole to respective political stakeholders in each state. Subsequent public workshops and Project Work Group meetings were held in the spring of 2002 to define the study goals. Those goals were:

- Support Completion of I-66 Across Southern Kentucky, Providing System Continuity from West Virginia to Missouri
- Reduce Traffic Congestion
- Improve Accessibility and Connectivity
- Enhance Roadway Safety
- Support Economic Development and Community Growth
- Capitalize on Existing and Planned Investments
- Improve Community Character / Quality of Life

As corridors were identified and evaluated, these goals were used as the basic criteria for either setting a corridor aside from further consideration or for carrying it forward in the study process.

Corridor Development

Corridors were developed through an interactive process involving the public, KYTC, MoDOT, FHWA, the Project Work Group, and the consultant staff. After the first round of meetings with these groups, 22 corridors were identified. These corridors were approximately 2,000 feet wide and generally started at I-24 near Paducah, Kentucky heading westward into Missouri and/or Illinois. All but one corridor included a new river crossing over the Ohio River or the Mississippi River.

Public Involvement

Public Involvement was a vital part of the study. There were four sets of public workshops (total of eight (8) meetings) held in both Kentucky and Missouri at each of the project's milestones.

Meetings were held in open-house workshop format. Comment forms were available at all meetings and great efforts were made to solicit public comments at each meeting. Those in attendance generally included members of the public, resource/regulatory agency staff, members of the Project Work Group, representatives from the KYTC, MoDOT, and the FHWA, as well as the consultant staff. Key issues identified during the public involvement process included the following:

- People living in the region are very supportive of the idea of a limited access highway linking western Kentucky and Missouri.

- Economic development is important to the region. Increased and improved access is a key to future economic success in this area.

- The proposed project and any other improvements would help relieve other facilities that are perceived as inadequate.

- The residents of the region are proud of the local historic and natural resources and want to protect them along with their quality of life.

- Resource agencies have identified issues related to floodway encroachment on the Birds Point – New Madrid Floodway in Missouri, navigation issues on the Mississippi River, issues associated with structures in the floodplain/floodway and potential impacts of a corridor and/or structures to the wildlife management areas in Northwest Ballard County (Kentucky).

Corridor Analysis

The corridor analysis was a three-tiered process. Level One screening was an initial qualitative based analysis focusing on general feasibility and resulted in 14 of the original 22 corridors, as well as a No-Build Option being recommended for further

screening in Level Two. Because a number of the 14 corridors were similar, they were combined into seven corridors, and a No-Build Option, which were advanced to Level Two screening. During the Level Two screening, the seven corridors and the No-Build Option were subjected to a higher level of qualitative and quantitative screening. This Level Two screening focused on:

- Transportation operations (traffic)
- Documented support for or against the corridor
- Known and potential environmental and community issues
- Estimated order of magnitude capital costs.

Five corridors, including the No-Build Option, were then advanced to the Level Three screening. They included:

1. No-Build Option – only existing and committed projects in KYTC's 2001 – 2006 Six-Year Highway Plan and MoDOT improvement program.

2. Corridor 8 – the same as Corridor 11 in/along existing KY 286, US 60 or US 62 corridors to a point north and east of Wickliffe, proceeding north west on new route across the Ohio River on a new bridge to I-57 in Illinois.

3. Corridor 8B – US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing.

4. Corridor 11/12/13/14/15 & 21 – new controlled access corridor parallel to US 62 and KY 286 with a new Mississippi River crossing.

5. Corridor 20 – unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing over the Mississippi or Ohio Rivers.

Further Corridor Analysis and Recommendations

The Level 3 Screening represented the most detailed analysis. The corridors were further refined and more details were provided in the following categories

- Transportation operations (traffic) – to include revised model runs with some manual adjustments, including vehicle miles of travel (VMT) and vehicle hours of travel (VHT)
- Documented support for or against the corridor – including all comments / support received to date
- Known and potential environmental and community impacts – including quantification of impacts to community by type as well as property impacts
- Estimated order of magnitude capital costs – refined to include separate costs for right-of-way, utilities, design, construction costs and contingencies

The following summary represents the results of the technical analysis from the most detailed screening, the Level 3 Analysis:

- The No-Build Option is sufficient to meet the needs of the region in the near future but not in the project's horizon year of 2030. It narrowly and minimally addresses the study's goals, objectives, and issues and has minimal support. Therefore, although the No-Build Option will likely meet the needs of the region in the short term, it is not sufficient for longer-term needs.

- Corridor 8 can meet the needs of the project and address some of the goals, objectives, and issues of the study. It does provide a new route and a river crossing. However, the potential impacts caused by this corridor to sensitive natural resource and wildlife management areas are extremely detrimental. These adverse potential impacts, coupled with the fact that there are other corridors with fewer potential impacts, render Corridor 8 fatally flawed from an environmental standpoint. Therefore, Corridor 8 is not recommended to proceed into the next stage(s) of project development by the KYTC.

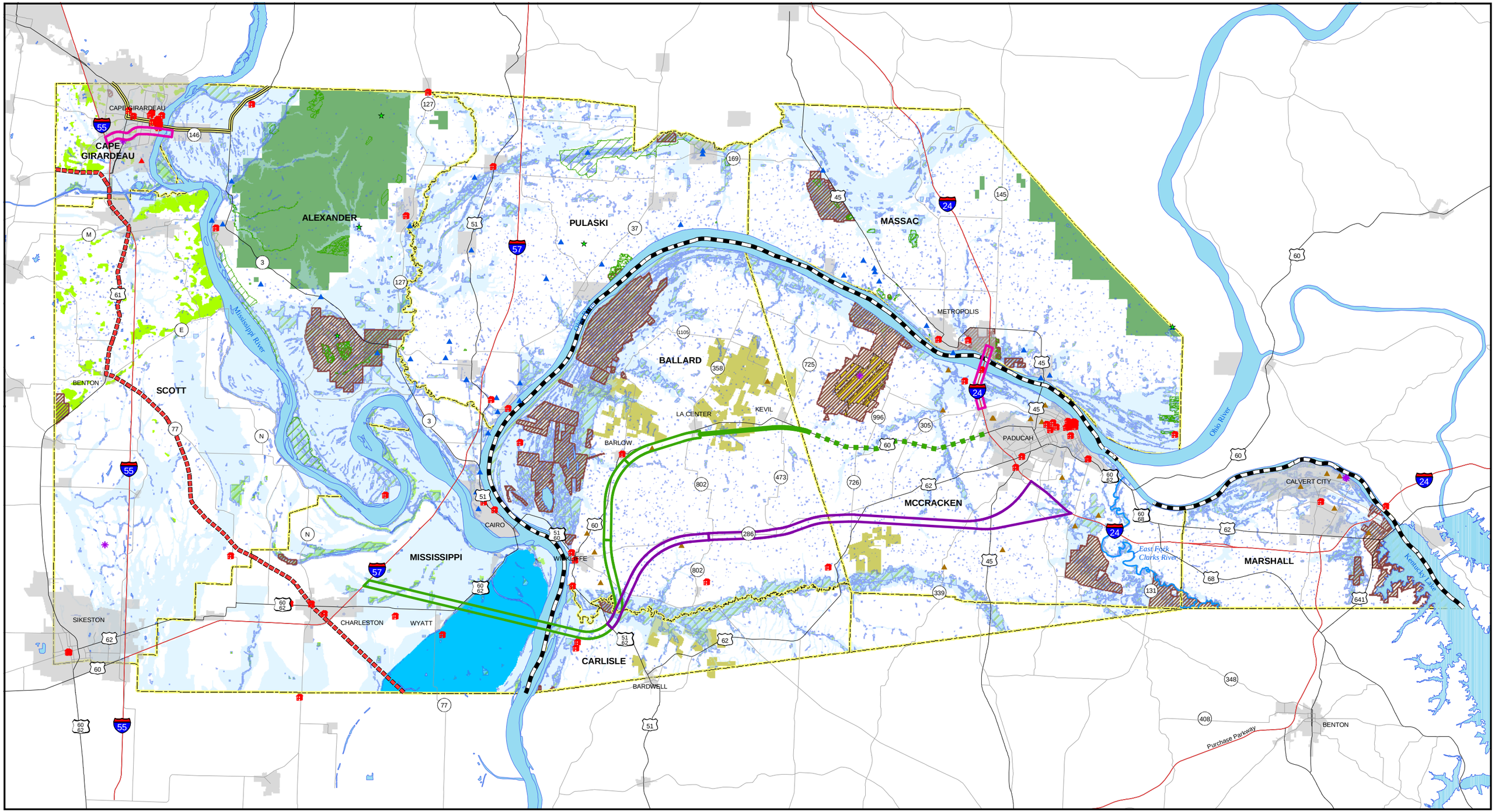
- Corridor 8B can meet the needs of the project, address the goals, objectives and issues of the study and provide a new upgraded US 60 (partially controlled access facility) in the long term with a new bridge crossing the Mississippi River south of Wickliffe, Kentucky, (no further north than Lower Mississippi River Mile Marker 949), capitalizing on improvements already made to US 60. Corridor 8B is a viable option for satisfying the short and long-term transportation needs of western Kentucky.

- Corridor 11/12/13/14/15/ and 21, can also meet the needs of the project, address the goals, objectives, and issues of the study, and provide a long-term new limited access highway with a new bridge crossing the Mississippi River near Wickliffe, Kentucky. However, given the need for additional right-of-way and the higher costs of this corridor, it is unlikely to be funded for construction in the time horizon of the study.

- Corridor 20, although unspecified as to the route through southern Illinois, does meet the needs of the project, address some of the goals, objectives, and issues of the study, and provides a new highway through southern Illinois. Further, it would satisfy the Congressional designation of a route for I-66 in this region. However, it does not address the transportation needs of western Kentucky

A project of this magnitude requires a significant level of Federal and State funding. There is currently no additional federally designated funding for this project. With the current version of the KYTC Six-Year Highway Plan significantly over-programmed and the aforementioned situation, KYTC is unable at this time to pursue a build option. If the stated conditions change, this decision does not preclude future project development activities from taking place for a limited access highway in Western Kentucky.

Independent of this decision, KYTC, MoDOT, or IDOT can restart the project development activities in their respective states using this study. In this case, the corridors from this I-66 study that should be included in a next phase of project development are Corridors 8B, 11, and 20. In addition, other corridors may be developed at a future date. (See the full project report and the various technical appendices for more details regarding this study.)

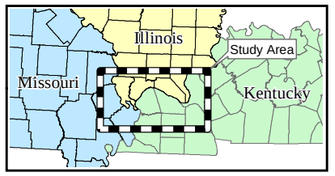


Alternative Corridors

- Existing 60 Improved
- Improvements Programmed
- 8b
- 11
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

0 2.5 5 Miles

Figure 14

LEVEL 3 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Length of Route - Total Miles / New Roadway	Traffic Operations [1]											
			Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River		
			Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	0 mi / 0 mi	43,000 (US 60)	3,400 (8%)	E (4 lanes)	17,000 (US 60)	1,500 (9%)	A-B (4 lanes)	10,000 (US 60)	1,100 (11%)	E (2 lanes)	11,000 (Bridge Over Ohio River)	1,800 (16%)	E (2 lanes)
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	33.33 mi / 33.33 mi	31,000	3,700 (12%)	C	16,000	2,400 (15%)	A-B	See Note 5 Below					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	38.50 mi / 15 mi	40,000 (US 60)	2,800 (7%)	E (4 lanes)	12,000 (US 60)	800 (7%)	A (4 lanes)	5,000 (US 60)	300 (6%)	A (4 lanes)	7,000	1,000 (14%)	A (4 lanes)
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	40.93 mi / 40.93 mi	30,000	4,000 (13%)	C	14,000	2,500 (18%)	A-B	11,000	2,700 (25%)	A	9,000	2,200 (20%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	48.32 mi / 48.32 mi	16,000	1,800 (11%)	A	16,000	1,800 (11%)	A	17,000	1,900 (11%)	A	27,000	2,100 (8%)	A-B

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations [1]						Support	
		Total Vehicle Miles of Travel (VMT in Millions)	Total Vehicle Hours of Travel (VHT in Millions)	Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access	Corridor	Issues
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	938.5	18.72	76.5 mins	93.6 mins	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	See Note 5 Below				Provides improvement - connects I-24 to I-57 in Illinois	Provides new river crossing location over Ohio River	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, Corps of Engineers preferred river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	942.5	18.76	72.7 mins (3.8 mins)	94.8 mins (N/A)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	942.6	18.76	57.9 mins (18.6 mins)	84.0 mins (9.6 mins)	Provides improvement - New bridge over Mississippi River	Provides new river crossing location over Mississippi River	Support is strong for Alternative 11/12/13/14/15/21.	Farmland impacts, uses least favorable river crossing
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	942.4	18.75	76.1 mins (0.4 mins)	68.1 mins (25.5 mins)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY	There has been strong support for Alternative 20 in Illinois. Likewise, there is no support for Alternative 20 from residents of Kentucky.	Some economic benefits to southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of Bill Emerson bridge

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I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Community Impacts					
		Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	21 mi/7,222 ac	1.3 mi/343 ac	0 mi/0 ac	1 mi/135 ac	Medium	2,113
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	30.54 mi/10,665 ac	2.58 mi/623 ac	0 mi/0 ac	1.88 mi/468 ac	Low	1,100
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	28.87 mi/8,324 ac	2.30 mi/870 ac	0 mi/0 ac	0.17 mi/74 ac	Low	2,325
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	35.23 mi/8,511 ac	N/A	8.67 mi/2,102 ac	3.88 mi/504 ac	High [2]	2,930

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I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts [3]						Capital Costs [4]				
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Bird's Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (miles/acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated						No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million				
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7.20 mi / 1,001 ac	4.0 mi/1,001ac	$265	$266	$128	$108	$767
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	82	3 mi/723 ac	11.74 mi/2,970 ac	1.56 mi/441 ac	$254	$297	$29	$111	$691
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	87	3 mi/723 ac	12.38 mi/3,323 ac	1.17 mi/509 ac	$328	$292	$151	$124	$895
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	2 (2.9 mi of Trail of Tears)	0.03 mi/64 ac	51	0 mi/ 0 ac	12.78 mi/3,113 ac	2.78 mi/843 ac	$363	$18	$128	$77	$586

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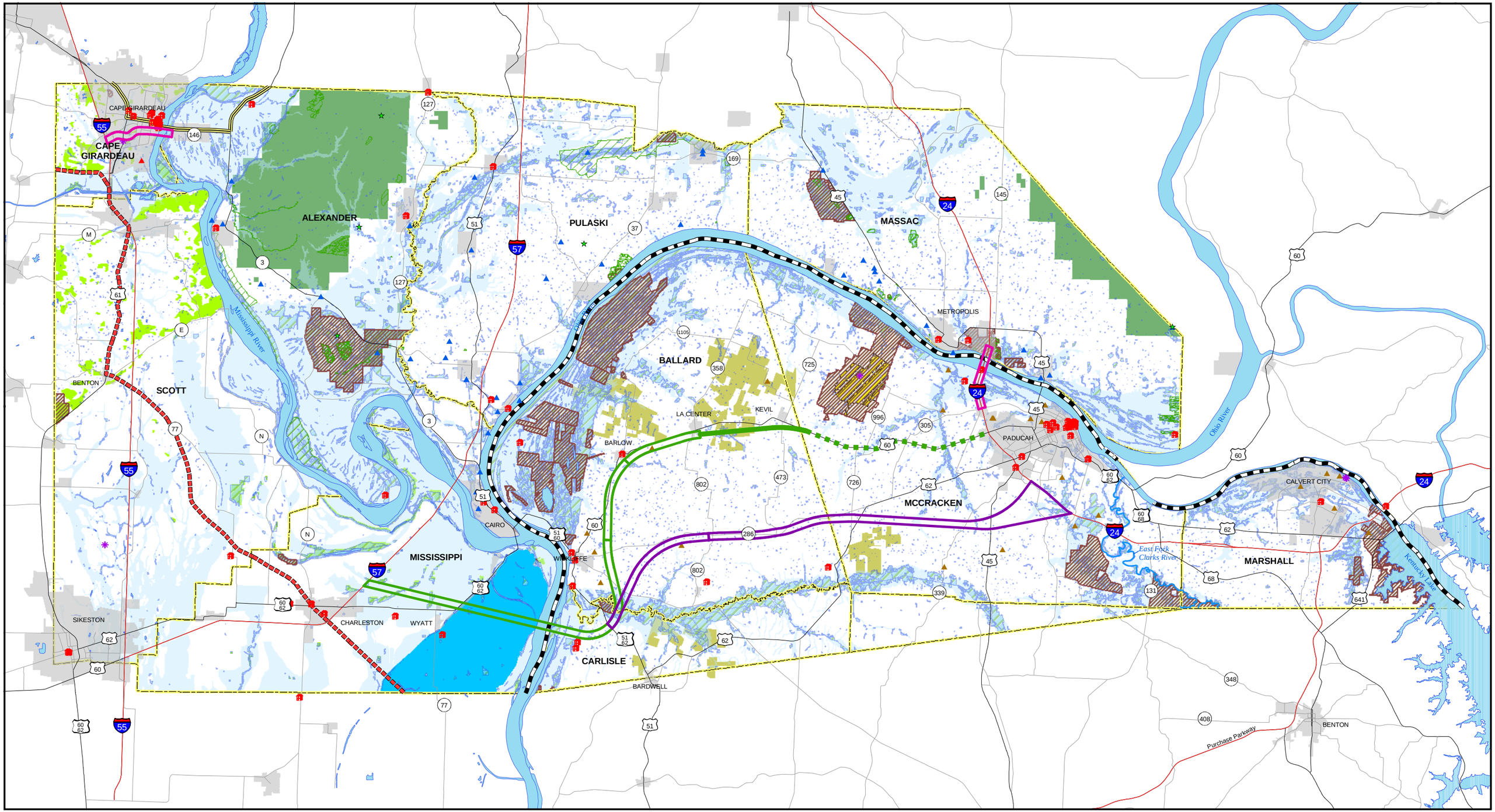
A project of this magnitude requires a significant level of Federal and State funding. There is currently no additional federally designated funding for this project. With the current version of the KYTC Six-Year Highway Plan significantly over-programmed and the aforementioned situation, KYTC is unable at this time to pursue a build option. If the stated conditions change, this decision does not preclude future project development activities from taking place for a limited access highway in Western Kentucky.

Independent of this decision, KYTC, MoDOT, or IDOT can restart the project development activities in their respective states using this study. In this case, the corridors from this I-66 study that should be included in a next phase of project development are Corridors 8B, 11, and 20. In addition, other corridors may be developed at a future date. (See the full project report and the various technical appendices for more details regarding this study.)

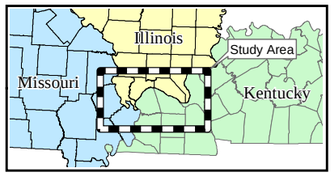


Alternative Corridors

- Existing 60 Improved
- Improvements Programmed
- 8b
- 11
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

0 2.5 5 Miles

Figure 14

LEVEL 3 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Length of Route - Total Miles / New Roadway	Traffic Operations [1]											
			Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River		
			Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	0 mi / 0 mi	43,000 (US 60)	3,400 (8%)	E (4 lanes)	17,000 (US 60)	1,500 (9%)	A-B (4 lanes)	10,000 (US 60)	1,100 (11%)	E (2 lanes)	11,000 (Bridge Over Ohio River)	1,800 (16%)	E (2 lanes)
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	33.33 mi / 33.33 mi	31,000	3,700 (12%)	C	16,000	2,400 (15%)	A-B	See Note 5 Below					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	38.50 mi / 15 mi	40,000 (US 60)	2,800 (7%)	E (4 lanes)	12,000 (US 60)	800 (7%)	A (4 lanes)	5,000 (US 60)	300 (6%)	A (4 lanes)	7,000	1,000 (14%)	A (4 lanes)
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	40.93 mi / 40.93 mi	30,000	4,000 (13%)	C	14,000	2,500 (18%)	A-B	11,000	2,700 (25%)	A	9,000	2,200 (20%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	48.32 mi / 48.32 mi	16,000	1,800 (11%)	A	16,000	1,800 (11%)	A	17,000	1,900 (11%)	A	27,000	2,100 (8%)	A-B

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations [1]						Support	
		Total Vehicle Miles of Travel (VMT in Millions)	Total Vehicle Hours of Travel (VHT in Millions)	Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access	Corridor	Issues
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	938.5	18.72	76.5 mins	93.6 mins	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	See Note 5 Below				Provides improvement - connects I-24 to I-57 in Illinois	Provides new river crossing location over Ohio River	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, Corps of Engineers preferred river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	942.5	18.76	72.7 mins (3.8 mins)	94.8 mins (N/A)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	942.6	18.76	57.9 mins (18.6 mins)	84.0 mins (9.6 mins)	Provides improvement - New bridge over Mississippi River	Provides new river crossing location over Mississippi River	Support is strong for Alternative 11/12/13/14/15/21.	Farmland impacts, uses least favorable river crossing
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	942.4	18.75	76.1 mins (0.4 mins)	68.1 mins (25.5 mins)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY	There has been strong support for Alternative 20 in Illinois. Likewise, there is no support for Alternative 20 from residents of Kentucky.	Some economic benefits to southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of Bill Emerson bridge

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Community Impacts					
		Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	21 mi/7,222 ac	1.3 mi/343 ac	0 mi/0 ac	1 mi/135 ac	Medium	2,113
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	30.54 mi/10,665 ac	2.58 mi/623 ac	0 mi/0 ac	1.88 mi/468 ac	Low	1,100
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	28.87 mi/8,324 ac	2.30 mi/870 ac	0 mi/0 ac	0.17 mi/74 ac	Low	2,325
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	35.23 mi/8,511 ac	N/A	8.67 mi/2,102 ac	3.88 mi/504 ac	High [2]	2,930

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts [3]						Capital Costs [4]				
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Bird's Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (miles/acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated						No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million				
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7.20 mi / 1,001 ac	4.0 mi/1,001ac	$265	$266	$128	$108	$767
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	82	3 mi/723 ac	11.74 mi/2,970 ac	1.56 mi/441 ac	$254	$297	$29	$111	$691
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	87	3 mi/723 ac	12.38 mi/3,323 ac	1.17 mi/509 ac	$328	$292	$151	$124	$895
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	2 (2.9 mi of Trail of Tears)	0.03 mi/64 ac	51	0 mi/ 0 ac	12.78 mi/3,113 ac	2.78 mi/843 ac	$363	$18	$128	$77	$586

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) is pursuing project development activities related to Interstate 66 (I-66) throughout the state. Previous work at the state level identified I-66 as feasible in Kentucky, identified, and prioritized segments for the roadway. These segments were then programmed into KYTC's long range planning documents. This study focused on a new route for a limited access highway facility for the western Kentucky segment, roughly from I-24 near Paducah westward to either I-55 or I-57 in Missouri or Illinois, which was prioritized by previous work as the 4th of four planned I-66 segments. .

1.1 Study Participants

This study was a cooperative undertaking of the public, the KYTC and Missouri Department of Transportation (MoDOT), with financial support and assistance of the Federal Highway Administration (FHWA). Parsons Brinckerhoff, a Louisville, Kentucky based consulting engineering and planning firm assisted the public, KYTC, MoDOT and the FHWA by providing technical assistance.

At the beginning of the study in the fall of 2001, the state of Illinois and the Illinois Department of Transportation (IDOT) were not a part of the study. Due to a change in gubernatorial administrations and new appointees at high levels of the DOT, Illinois subsequently did participate in the project. This participation began in the Spring of 2003. During that time, IDOT held one public workshop in Ullin, Illinois on June 17, 2003 at the request of KYTC, and provided KYTC and MoDOT with summary materials from that meeting. IDOT also participated in some discussions related to the Level 3 Screening of Corridors.

The Project Work Group, composed of elected officials, representatives of state and regional regulatory agencies, citizens, and representatives from the KYTC, MoDOT and FHWA, acted as an advisory body for the study. (See Appendix 1 – Public Involvement Summary for a list of study Work Group Members.) This group met periodically throughout the course of the study – usually at major milestones and provided advisory input to study goals and objectives, study issues, Level 1, Level 2, and Level 3 screening decisions, and other major project milestones.

In addition, the Project Team also briefed locally elected officials in both Kentucky and Missouri during the early stages of the project. The project also maintained a web site and routinely accepted and responded to comments from the public generated at meetings, from the web site, and through other types of outreach.

1.2 Study Goals and Objectives

The study accomplished the following purposes, which were collaboratively developed by the study participants, including the Project Team and the general public:

1. Defined the purpose and need for a proposed new highway facility (I-66)
2. Sought input from the public, elected officials, public agencies and other stakeholders
3. Gathered/developed data
4. Developed corridors for the proposed project, including the no-build corridor
5. Analyzed and evaluated the technical feasibility of all the corridors
6. Made recommendations regarding future project development

The purposes above helped define the mechanics of the study and speak to its execution rather than the need for specific project elements.

1.3 Project Issues

Issues discussed during the initial stages of the study were also important as they helped focus the development of the project corridors and detailed what study participants were most concerned about and what they looked for the corridors to solve. Issues also helped identify measures to evaluate the corridors and to frame initial important background information that needed to be gathered about the study region.

Issues were identified during the initial workshops held in both Kentucky and Missouri during the early stages of the study in May 2002. Participants at the workshops were encouraged to write their issues on a series of flip charts that were provided. Project Team staff were available to discuss the issues with the participants and the outcomes were recorded. Similarly, participants were also invited to detail their comments on specially designed forms or to deliver recorded comments. During the second set of project workshops, in August 2002, participants were presented with a summary of what they had previously developed. They were asked to comment on the draft issues and given and opportunity to modify and/or change them. After this second round of discussions, the issues were considered finalized and they were used throughout the remainder of the project in the manner described above. The project issues included:

- Environmental sensitivity – Citizens are proud of the region and its abundance of natural, cultural, and historic resources. They enjoy them and feel that they are important to the region and that they should be protected.

- Travel times – Citizens would like new corridors that connect them to regional and inter-state destinations. Many citizens drive long distances on a daily basis for routine business, to go to work, for shopping trips, or for other purposes.

They would like to have new, higher-speed highway corridors developed that reduce existing and future travel times.

- Accessibility – The study area is somewhat remote and isolated by the existing transportation system. There is a lack of roadways in the region beyond county roads and US routes, especially for east – west travel. Likewise, there are only a handful of existing river crossings and they are in fixed locations that often serve as pinch points during peak demand times. Improvements to the system would enhance overall accessibility for the region.

- Safety – The study area is dominated mostly by two-lane county roads and US routes. Often these roads have some limitations in terms of design (limited passing distance, limited sight distance, lack of adequate shoulders, etc.), especially given the current volumes of traffic that the facilities carry. Some of these problems are magnified when trucks or other larger vehicles, such as farm equipment, are present.

- System connectivity / system redundancy – The current system is constrained in that there are limited other options for travel in the area from a highway perspective. There are not many east – west roadways and there are few river crossings. If something were to happen to the existing bridges at Cairo, Illinois and Wickliffe, Kentucky for instance, the nearest bridge in the region is on I-24. Using that facility would add significantly to travel times and cause residents to use a circuitous route.

- Improve security – The area is home to the Gaseous Diffusion Plant in Paducah, Kentucky, an important and strategic facility for our nation's defense. The accessibility and security of existing and future (alternate) routes to this facility are important. Likewise, the region is in reasonably close proximity to other strategic assets including military installations, power plants, dams, hospitals and other facilities important to continued safety and security of the region and our nation. Good accessibility to these facilities over multiple routes is and will continue to be important.

- Truck traffic – Truck traffic in the region is a sizeable percentage of existing traffic. Moreover, that percentage is only destined to grow as more and more raw materials and finished goods are placed on "rolling warehouses" to accommodate just in time manufacturing and other processes. The large percentage of truck traffic is compounded and often magnified when the narrow two lane roadways are taken into account.

- Low incomes and high unemployment – The study area and the western Kentucky, southeastern Missouri, and southern Illinois areas are all part of the Delta Region in the US. This area has historically suffered from economic troubles. The region is tied to agriculture and lacks a true base of solid,

widespread employment that would lead to higher wages and economic mobility options for the residents.

- Economic development – The region is making progress and some gains in furthering economic development objectives, but needs investments in infrastructure, including the highway system to continue to support their initiatives and to sustain current activities. The region has been able to diversify somewhat away from agriculture and more traditional pursuits, and is starting to attract other industries – the new business park in southern Graves County is an example. However, it needs improved transportation as a continuing catalyst to attract and sustain this new growth.

- Recreational issues – The abundance of outdoor recreational opportunities (hunting, fishing, hiking, boating, etc.) is important to the region. It is part of the culture and heritage and is large part of what makes the region attractive for residents and special and unique for visitors. There are irreplaceable local resources of significant caliber that should be protected.

- Seismic activity – The region sits in close proximity to the New Madrid Fault. As such the area is essentially "ground zero" when a seismic event related to the fault happens. The last event shook church bells thousands of miles away and had devastating consequences. A similar outcome is expected during the next event. Not surprisingly, having multiple routes – roadways, bridges, etc., for evacuation and for distributing food, supplies, medicine, etc., during relief and recovery efforts is of critical importance.

- Floodplains and floodways – The area has numerous floodplains and floodways in and around it. These areas serve as temporary and long-term storage for floodwaters from the river systems helping protect lives and property. They also serve as habitat areas for waterfowl and other aquatic and terrestrial species, some of which are threatened and/or endangered. In addition, the Birds Point – New Madrid Floodway is in the study area. This facility serves to mitigate large floods and would be called upon in that instance. Any corridor that encroaches upon it would need to be carefully designed and studied to be consistent with its operational plan and other governance.

1.4 Projects Goals

Similarly, goals of the project, which speak more toward what the outcome(s) of the project, were also developed through close collaboration with the general public, the Project Work Group, and the Project Team. These goals, which closely relate to project issues and in some instances succinctly combine them, were also presented and discussed at the initial public workshops held in Kentucky and Missouri in May 2002. They were subsequently agreed upon during the second series of public workshops

held in August of 2002. They were used to guide decision making throughout the course of the project. The specific goals included:

- Support Completion of I-66 Across Southern Kentucky, Providing System Continuity from West Virginia to Missouri
- Reduce Traffic Congestion
- Improve Accessibility and Connectivity
- Enhance Roadway Safety
- Support Economic Development and Community Growth
- Capitalize on Existing and Planned Investments
- Improve Community Character / Quality of Life

1.5 Project Documentation

While this study is not to the level of an environmental document, such as an Environmental Impact Statement (EIS), it nevertheless is compatible with the procedures for that type of a document. Similarly, the project sponsors have taken great strides to be complete and inclusive in many project respects: public involvement, development and analysis of corridors, cooperation and coordination with resource agencies, development and use of multiple analysis criteria, etc., so that existing project work may lead to continued projected development, perhaps including an eventual environmental document. While the project has developed some specific project issues and some specific project goals, there were close to, but not quite developed to the level of a full EIS-related Purpose and Need statement. Rather, they served as explained above, and are important in the context of setting the stage for future project development and documentation as the project's purpose and need – "little p and little n". As such, they were and will be critical to future project development with regard to I-66 in western Kentucky.

1.6 Study Process

The study was executed in a highly collaborative environment with a strong public involvement component. Many opportunities for public and stakeholder involvement and comment were provided. Chief among them were four (4) sets of public workshops (one each in Missouri and Kentucky for a total of eight (8)) that were conducted to coincide with major project milestones:

- Define Issues – May 2002
- Identify Possible Corridors – August 2002
- Study Possible Corridors – December 2002
- Discuss Recommendation(s) – May 2003

In addition, the Project Team and the Project Work Group met five times throughout the duration of the study to discuss particular aspects of the project at each of the milestones. The project also involved the Illinois DOT and members of the Project

Team attended their sole public workshop once their participation in the project came to fruition.

1.7 Study Area Characteristics

The study area encompasses portions of three states: (1) western Kentucky, (2) southern Illinois, and (3) southeastern Missouri. The study area is roughly rectangular, approximately 70 miles long and 30 miles wide. It begins west of Kentucky Lake in northern Marshall County, Kentucky and extends westward past Paducah to just west of I-55 in Missouri. The study area in Kentucky includes; northern Marshall County, all of McCracken and Ballard counties, and a small section of far northern Graves and northwestern Carlisle counties respectively. In Missouri, the study area includes portions of Mississippi, Scott and Cape Girardeau counties. The study area also encompasses sections of southern Illinois including Massac, Pulaski, and Alexander counties.

The area is primarily rural in nature with some pockets of development, especially near Paducah, Kentucky, Cape Girardeau, Sikeston, and Charleston, Missouri, and Cairo, Illinois. Agriculture, manufacturing, and some other industrial applications dominate the employment sectors. The national unemployment rate for the year 2000 was approximately 4.0% according to the US Department of Labor. Each of the counties in the study area had higher than US average unemployment rates, although Marshall and Ballard counties only exceeded the national average by .2% or two-tenths of one percent. Of the five Kentucky counties in the study area, only McCracken and Carlisle counties exceeded the Kentucky state unemployment rate. In Missouri, each of the three counties in the study area had a higher rate of unemployment than the statewide average. (Data for Illinois was not produced since that state was not participating in the study during that stage of the analysis.) Large employers included local school boards, hospitals, the Paducah Gaseous Diffusion Plant, Westvaco Paper and other regional employers.

The U.S. median household income according to the 2000 Census was reported at $42, 148 annually. McCracken, Marshall, and Cape Girardeau counties were above this threshold. Ballard, Carlisle, Graves, Scott, and Mississippi counties were below the national average. The national poverty rate was 11.3% in 2000; McCracken, Graves Mississippi, and Scott counties were are all above this national average. As compared to statewide data, McCracken, Marshall, and Ballard counties were well above the Kentucky median household income, while Carlisle and Graves counties fell below the statewide average. In terms of poverty, only Carlisle County exceeded the statewide average for percentage of households in poverty. In Missouri, the statewide median household income was exceeded by both Scott and Cape Girardeau counties. Similarly, there were more households in poverty (as compared to the statewide average) in both Mississippi and Scott counties.

Commuting patterns gleaned from the most recent Census data revealed that single occupant vehicle (SOV) travel to work was by far the dominant mode of travel in the study area. This was true of many places throughout the US and is indicative of the dominant mode of auto travel and the fact that land uses, especially in rural / agricultural areas, tend to be spread out. In the study area, travel by auto was perhaps even more important as there are very limited opportunities for travel to work by other modes such as carpool and transit. It also indicated that the majority of workers are in positions / an industry where commuting via others modes is not a feasible option.

In terms of natural resources and beauty, the area has a rich abundance of farmlands and natural resource areas including numerous wildlife refuges, wildlife management areas, a large national forest, and other small habitat areas. Agricultural land use exists place extensively throughout the study area. Substantial farming operations with significant on-farm investments were evident throughout the region and the study area.

Data from the 1997 Census of Agriculture also demonstrated the magnitude of agricultural activities in the study area. For example, the average farm size in Ballard County in 1997 was 246 acres, while in Carlisle, Graves, Marshall and McCracken counties the average sizes were 279, 173, 133 and 146 acres respectively. These same counties also account for over 3,000 farms and more than 500,000 acres of production. In 1997, the five counties in the study area in Kentucky produced a variety of crops including corn, soybeans, wheat, grain sorghum, tobacco, and hay.

According to the 1997 Census of Agriculture conducted by the USDA, the state of Missouri ranked second only to Texas in the total number of farms in the state. Mississippi County alone had over 250,000 acres of farmland, with an average farm size of approximately 760 acres. Likewise, in Scott County there were over 240,000 acres of farmland with an average size of 375 acres. In Cape Girardeau County there were over 1,000 farms and approximately 270,000 acres of production. Farms in the three counties produced a variety of crops including; corn, sorghum, wheat and cotton.

The prevalence of agricultural activities in the region may be in part attributable to the availability of fertile soils in the Mississippi River valley. The fact that the study area also encompasses an area that includes the confluence of both the Mississippi and the Ohio Rivers also contributed to the fact that the region is conducive to agriculture. Not surprisingly, a large portion of the land in the study area is considered prime and unique farmland.

The examination of the study area for environmental justice (EJ) populations, specifically low incomed individuals, minorities and elderly, revealed that there are small pockets of EJ communities to be concerned about. On a large scale basis, the percentages of low incomed individuals, minorities, and/or elderly populations is similar on a county - wide basis to state wide averages for each of the populations. However, on a corridor - wide level, pockets of high concentrations of all three populations were evident near Cape Girardeau, Missouri. Additionally, there are sections of Missouri,

Southern Illinois, and some sections of Kentucky where percentages of one or two EJ categories exceeded those of the statewide averages. (Elderly populations - age 62 or above in this analysis - are not specifically recognized as an Environmental Justice community based on the legal definition. However, the U.S. DOT specifically encourages the early examination of potential elderly populations in studies.) From an analysis standpoint, the presence of one or more EJ populations relative to the corridor(s) should not pose an issue for future project development.

(See Appendix 2, Existing Conditions Summary for more detailed information about the project study area and the Environmental Justice Analysis in Appendix 3 which also provides additional details of the corridors.)

CAPE GIRARDEAU
CAPE GIRARDEAU
ALEXANDER
PULASKI
MASSAC
METROPOLIS
BENTON
SCOTT
BALLARD
LA CENTER
KEVIL
BARLOW
PADUCAH
MCCRACKEN
CALVERT CITY
MISSISSIPPI
CAIRO
WICKLIFFE
MARSHALL
SIKESTON
CHARLESTON
WYATT
CARLISLE
BARDWELL
BENTON
Mississippi River
Ohio River
Ohio River
East Fork Clarks River
Kentucky Lake
Purchase Parkway
8-B2

PROJECT STUDY AREA

Location Map
Illinois
Missouri
Kentucky
Study Area

N
W
E
S
0
2.5
5
Miles

Figure 1

STUDY AREA

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

2.0 ROADWAY AND TRANSPORTATION CHARACTERISTICS

2.1 Study Area Roadways and Bridges

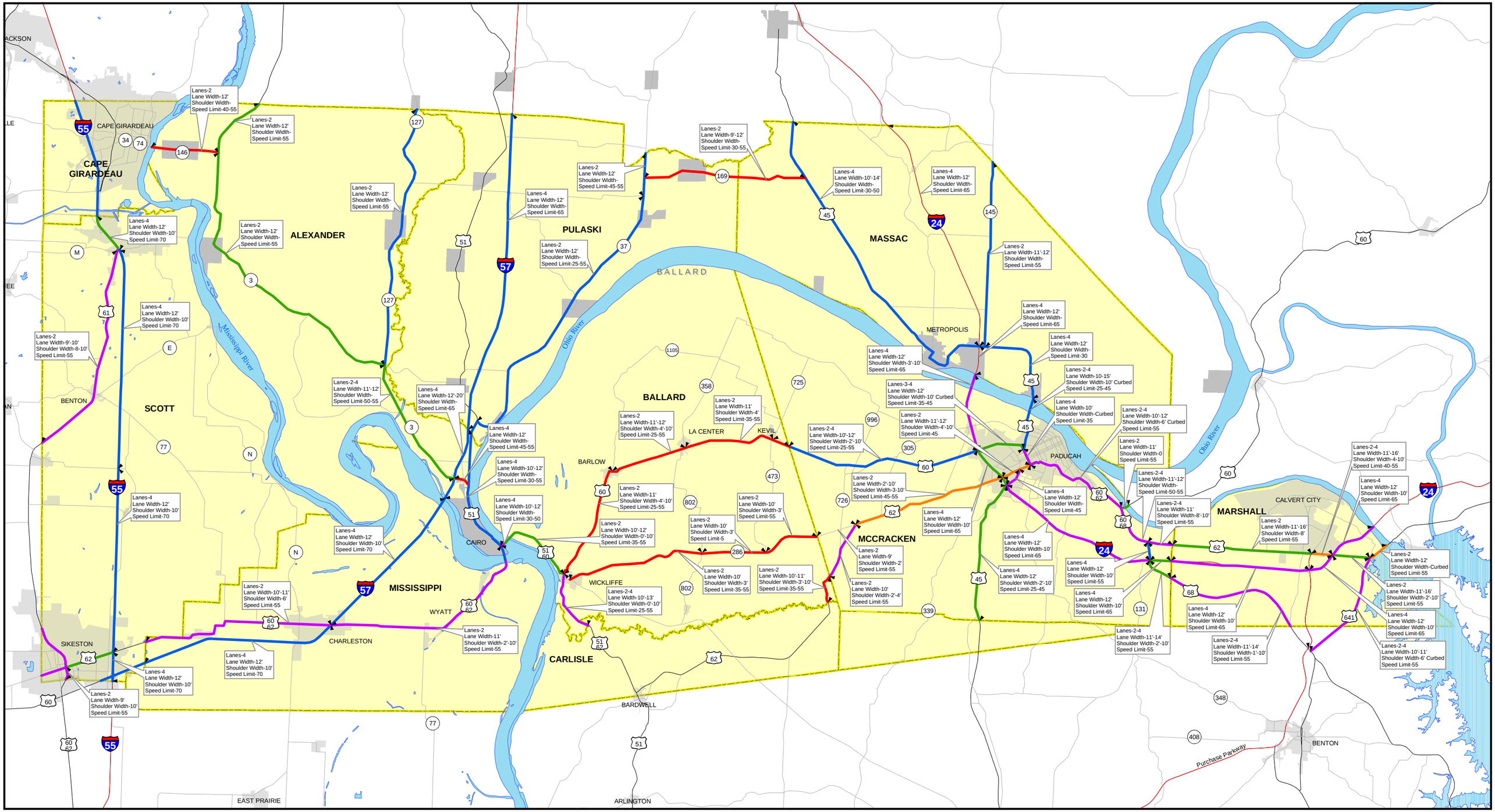
Generally, the existing interstate highways in the region traverse north-to-south; while the existing US and state highways are narrow, two-lane roads running east-to-west. The major Ohio River bridge crossings occur in the vicinity of Paducah, Kentucky and westward with bridges on I-24, US 45, and US 51/US 60 respectively. Mississippi River bridge crossings are also located near Cairo, Illinois on US 60 / US 62, at I-57, northwest of Cairo, and at Cape Girardeau, Missouri on Missouri 34 / Illinois 146 via the new Bill Emerson Bridge. There is also a US 60-bridge crossing of the Tennessee River near Paducah, Kentucky

Roadways within the study area are listed below with the states traversed indicated. Tables on the following pages indicate other pertinent data. Table 2-1 - Existing Roadway Information, highlights major roadway characteristics, features, and classifications as obtained from the Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS) database, the Missouri Department of Transportation (MoDOT), and the Illinois Department of Transportation (IDOT).

- I-24 (IL, KY)
- I-55 (MO)
- I-57 (IL, MO)
- US-45 (IL, KY)
- US-51 (KY, IL)
- US-60 (KY, IL, MO)
- US-61 (MO)
- US-62 (KY, MO)
- US-68 (KY)
- US-641 (KY)
- KY 286
- IL 3
- IL 37
- IL 127
- IL 145
- IL 146
- IL 169

The interstate highways (I-24, I-55, and I-57) are four-lane roadways. All the major east-west roadways between I-24 and I-57 are narrow, two-lane roads, except for a recently improved 10-mile section of US 60 in McCracken County. These east-west roadways have many sections that do not meet current design guidelines, and terrain in the study area are classified as “rolling” for virtually all the roadways. Figure 2 Existing Roadways, indicates roadway sections with lane and shoulder widths less than the current design guidelines of 12-foot wide driving lanes and 10-foot wide shoulders. Notable roadway deficiencies occur on US 60, US 62, and KY 286. About 64 percent of US 60 have narrow driving lane widths, and 67 percent has substandard shoulder widths. Similar conditions exist on US 62, where 82 percent of the driving lanes and 79 percent of the shoulders have inadequate widths; and KY 286 where substandard lane and shoulder widths encompass its entire length.

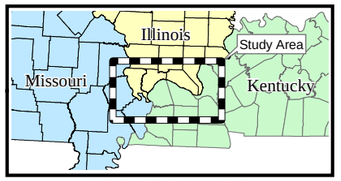
The four major bridges in the study area cross either the Ohio or Mississippi Rivers. Their major characteristics appear in Table 2 – 2 Existing Bridge Information. All four



Level of Service

- A
- B
- C
- D
- E

PROJECT STUDY AREA



LOCATION MAP

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0 2.5 5 Miles

Figure 2

EXISTING ROADWAYS

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Table 2-1
Existing Roadway Information

I 24

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	Illinois S/L to US 60	4.3	4	12'	3'-10'	65	350'-440'	n/a	Rural/Urban Interstate
	US 60 to US 62	1.9	4	12'	10'	65	350'	n/a	Urban Interstate
	US 62 to US 45	0.4	4	12'	10'	65	350'	n/a	Urban Interstate
	US 45 to US 68	9.3	4	12'	10'	65	350'	n/a	Rural/Urban Interstate
	US 68 to Marshall C/L	1	4	12'	10'	65	350'	n/a	Rural Interstate
Marshall, KY	McCracken C/L to JMC Pkwy[3]	7.7	4	12'	10'	65	300'-999'	n/a	Rural Interstate
	JMC Pkwy to US 62	1.7	4	12'	10'	65	300'	n/a	Rural Interstate
	US 62 to Livingston C/L	2.7	4	12'	10'	65	300'	n/a	Rural Interstate

US 45

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	Graves C/L to I 24	8	4	12'	2'-10'	25-45	53'-330'	n/a	Rural/Urban Principal Arterial
	I 24 to US 62	1	4	12'	2'	45	79'-90'	n/a	Urban Principal Arterial
	US 62 to US 60	0.6	4	10'	curbed	35	66'-79'	n/a	Urban Principal Arterial
	US 60 to Illinois S/L	3.9	2, 4	10'-15'	curbed-10'	25-45	60'-999'	0-23%	Urban Minor Arterial St/Rural Major Collector

US 51

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	Carlisle C/L to US 60	3.6	2-4	10'-13'	0'-10'	25-55	70'-175'	0-100%	Rural Principal Arterial
	US 60 to Illinois S/L	4.7	2	10'-12'	0'-10'	35-55	60'-270'	0-100%	Rural Principal Arterial

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	US 51 to McCracken C/L	16.8	2	11',12'	4'-10'	25-55	45'-170'	42-67%	Rural Principal Arterial
McCracken, KY	Ballard C/L to I 24	10.6	2-4	10'-12'	2'-10'	25-55	66'-160'	14-100%	Rural/Urban Principal Arterial
	I 24 to US 45	2.7	3, 4	12'	curbed-10'	35-45	160'-240'	n/a	Urban Principal Arterial
	US 45 to US 62	6.2	4	12'	curbed-10'	35-55	85'-999'	n/a	Urban Principal Arterial
	US 62 to Livingston C/L	0.3	2	11'	0'	55	100'	0%	Rural Principal Arterial

Table 2-1
Existing Roadway Information, Cont.

I 55

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Scott, Mo	I 57 to US 62	1.5	4	12'	10'	70	n/a	n/a	Interstate
	US 62 to US 61	22.3	4	12'	10'	70	n/a	n/a	Interstate
	US 61 to Cape Giradeau C/L	2.3	4	12'	10'	70	n/a	n/a	Interstate

I 57

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	Scott CL to US 62	9.7	4	12'	10'	70	n/a	n/a	Interstate
	US 62 to Illinois S/L	10.4	4	12'	10'	70	n/a	n/a	Interstate

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	I 57 to Illinois S/L	22.3	2	11'	2'-10'	55	n/a	n/a	Minor Arterial

US 61

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Scott, MO	New Madrid C/L to US 62	0.7	2	9'	10'	55	n/a	n/a	Principal Arterial
	US 62 to I 55	25.3	2	9'-10'	8'-10'	55	n/a	n/a	Principal Arterial

US 62

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	Scott C/L to I 57		2	10'-11'	6	55	n/a	n/a	Major Collector

Table 2-1
Existing Roadway Information, Cont.

US 62

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	Carlisle C/L to McCracken C/L	1.7	2	10'-11'	3'-10'	35-55	60'-490'	20%-100%	Rural Major Collector
McCracken, KY	Ballard C/L to KY 286	3.3	2	10'	2'-4'	55	60'	29%	Rural Major Collector
	KY 286 to I 24	8.6	2	9'-10'	2'-10'	45-55	60'-175'	11-100%	Rural Major Collector/Urban Minor Arterial St
	I 24 to US 45/60	1	2	11'-12'	4'-10'	35-45	60'-175'	100%	Urban Minor Arterial St
	US 45/60 to US 68	2.6	2, 4	10'-12'	curbed-6'	55	85'-245'	n/a	Urban Principal Arterial
	US 68 to Marshall C/L	1.4	2, 4	11'	8'-10'	55	200'	55-77%	Urban Minor Arterial St/Rural Major Collector
Marshall, KY	McCracken C/L to JMC Pkwy	7.6	2	11'-16'	8'	55	200'	70%	Rural Major Collector
	JMC Pkwy to I 24	1.2	2, 4	11'-16'	4'-10'	45-55	200'	66%	Rural Major Collector
	I 24 to US 641	2.2	2	11'-16'	2'-10'	55	200'	30-100%	Rural Minor Arterial
	US 641 to Livingston C/L	1.1	2	12'	curbed	35	200'	80-100%	Rural Minor Arterial

US 68

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	US 62 to I 24	1	4	12'	10'	55	200'	n/a	Rural/Urban Principal Arterial
	I 24 to Marshall C/L	1.7	2, 4	11'-14'	2'-10'	55	62'-200'	35%	Rural Principal Arterial
Marshall, KY	McCracken C/L to JMC Pkwy	9.4	2, 4	11'-14'	1'-10'	55	60'	34%	Rural Principal Arterial

US 641

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Marshall, KY	US 68 to US 62	6.4	2, 4	10'-11'	curbed-6'	55	150'	14-56%	Rural Minor/Principal Arterial

KY 286

	Description	Length	Number of Lanes	Lane Width	Shoulder Width	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	KY 121 to McCracken C/L	14.3	2	10'	3'	35-55	70'	39%	Rural Major Collector
McCracken, KY	Ballard C/L to US 62	2.3	2	9'	2'	55	60'	70%	Rural Major Collector

Table 2-1
Existing Roadway Information, Cont.

I 57

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Allexander, IL	Missouri S/L to Pulaski C/L	4.3	4	12'-20'	n/a	65	n/a	n/a	Interstate
Pulaski, IL	Allexander C/L to Union C/L	17.7	4	12'	n/a	65	n/a	n/a	Interstate

I 24

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	Kentucky S/L to US 45	1.6	4	12'	n/a	65	n/a	n/a	Interstate
	US 45 to Johnson C/L	13.5	4	12'	n/a	65	n/a	n/a	Interstate

US 45

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	Kentucky S/L to I 24	5.1	4	12'	n/a	30	n/a	n/a	Minor Urban Arterial
	I 24 to Johnson C/L	17.8	4	10'-14'	n/a	30-55	n/a	n/a	Major Collector

US 51

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	Kentucky S/L to US 60	0.7	4	10'-12'	n/a	30-50	n/a	n/a	Principal Arterial
	US 60 to Pulaski C/L	7.1	4	10'-12'	n/a	30-50	n/a	n/a	Principal Arterial

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	Missouri S/L to US 51	0.7	2	10'-14'	n/a	55	n/a	n/a	Major Collector

IL 3

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	US 51 to I 57	0.8	4	12'	n/a	45-50	n/a	n/a	Principal Arterial
	I 57 to IL 127	7.7	2-4	11'-12'	n/a	50-55	n/a	n/a	Principal Arterial
	IL 127 to IL 146	18.2	2	12'	n/a	55	n/a	n/a	Principal Arterial
	IL 146 to Union C/L	3.7	2	12'	n/a	55	n/a	n/a	Principal Arterial

Table 2-1
Existing Roadway Information, Cont.

IL 37

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Pulaski, IL	US 51 to IL 169	18.2	2	12'	n/a	25-55	n/a	n/a	Minor Arterial
	IL 169 to Johnson C/L	1.7	2	12'	n/a	45-55	n/a	n/a	Minor Arterial

IL 127

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	IL 3 to Union C/L	14.8	2	12'	n/a	55	n/a	n/a	Major Collector

IL 145

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	US 45 to Pope C/L	10.1	2	11'-12'	n/a	55	n/a	n/a	Minor Arterial

IL 146

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, C/L	Cape Girardeau C/L to IL 3	3.8	2	12'	n/a	40-55	n/a	n/a	Principal Arterial

IL 169

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Pulaski, IL	IL 37 to US 45	5.3	2	9'-12'	n/a	30-55	n/a	n/a	Major Collector

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Illinois Department of Transportation (IDOT)
Missouri Department of Transportation (MoDOT)

[1] Lane and shoulder widths that do not meet current design standards (i.e., less than 12-foot-wide driving lanes and 10-foot-wide shoulders) are shaded.

[2] Percent Passing Sight Distance - the percent of segment length (estimated to the nearest 10%) which has available passing sight distance (as measured from the driver's eye to the road surface) of at least 1,500 feet. This information is only available for Kentucky maintained roads classified as State Primary or State Secondary.

bridges have the “thru truss” design, and were built either in the 1930s, or the mid-1970s. The two older bridges (*i.e.*, US 51 and US 60) have narrow lane widths and low federal sufficiency ratings. The US 51 bridge was built in 1937, crosses the Ohio River with two driving lanes, having a curb-to-curb width of 22.5 feet, and a sufficiency rating of 24.2.

(Sufficiency rating is a “the numerical rating [from 0 to 100] of a bridge based on it structural adequacy [i.e., load bearing capacity] and safety, essentially for public use, and its serviceability and functional obsolescence [i.e., roadway geometrics].” Generally, a sufficiency rating of 50 or less indicates the bridge is eligible for federal bridge replacement funding.)

The US 60 bridge was built in 1929, crosses the Mississippi River with two driving lanes, has a 20-foot curb-to-curb width, and sufficiency rating of 19.0. The I 24 bridge was built in 1974, crosses the Ohio River with four driving lanes, has a 65.4-foot curb-to-curb width, and sufficiency rating of 64.0. The I 57 bridge was built in 1976, crosses the Mississippi River at Cairo with four driving lanes, has a 61.5-foot curb-to-curb width, and sufficiency rating of 73.0.

In addition to the existing bridges, a new bridge at Cape Girardeau was constructed. The new bridge, the Bill Emerson Memorial Bridge, is a 100-foot wide, 4,000-foot long cable stay bridge. It links Cape Girardeau, Missouri, and East Cape Girardeau, Illinois, and spans the Mississippi River on Illinois 146 / Missouri 34.

Table 2-2
Existing Bridge Information

County	Route	Bridge Number	Feature Crossed	Bridge Length[1]	Curb to Curb[1]	Year Built	Bridge Type	Sufficiency Rating[2]	Type Service
Ballard, Kentucky	US 51	B00021	Ohio River	5,865	22.5	1937	Thru Truss	24.2	Highway/Railroad-Waterway
McCracken, Kentucky	I-24	B00100	Ohio River	5,634	60	1974	Thru Truss	64	Highway/Waterway
Mississippi, Missouri	I-57	A2000	Mississippi River	2,045	61.5	1976	Thru Truss	73	Highway/Waterway
Mississippi, Missouri	US 60	K0950	Mississippi River	2,589	20	1929	Thru Truss	18.8	Highway/Waterway

[1] Measured in feet

[2] "Sufficiency rating" is defined as "the numerical rating of a bridge based on it structural adequacy [*i.e.,* load bearing capacity] and safety, essentially for public use, and its serviceability and functional obsolescence [*i.e.* , roadway geometrics]." Sufficiency ratings range from 0 to 100. Generally, a sufficiency rating of 50 or less indicates the bridge is considered eligible for federal replacement funding.

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Missouri Department of Transportation (MoDOT)

2.2 Traffic Volume Information

Traffic count information was obtained from the KYTC HIS database, MoDOT, and IDOT. Existing traffic volumes for the study area's major roadways ranged from a low of 1,150 vehicles per day (vpd) along IL 127 in Alexander County, to a high of 42,000 vpd along I-24 near Paducah. (See Table 2-3 - Existing Traffic Information, and Figure 3 - Average Daily Traffic and Truck Percentages following). These traffic volumes can be expected to increase in the future based largely upon increasing interstate and international commerce.

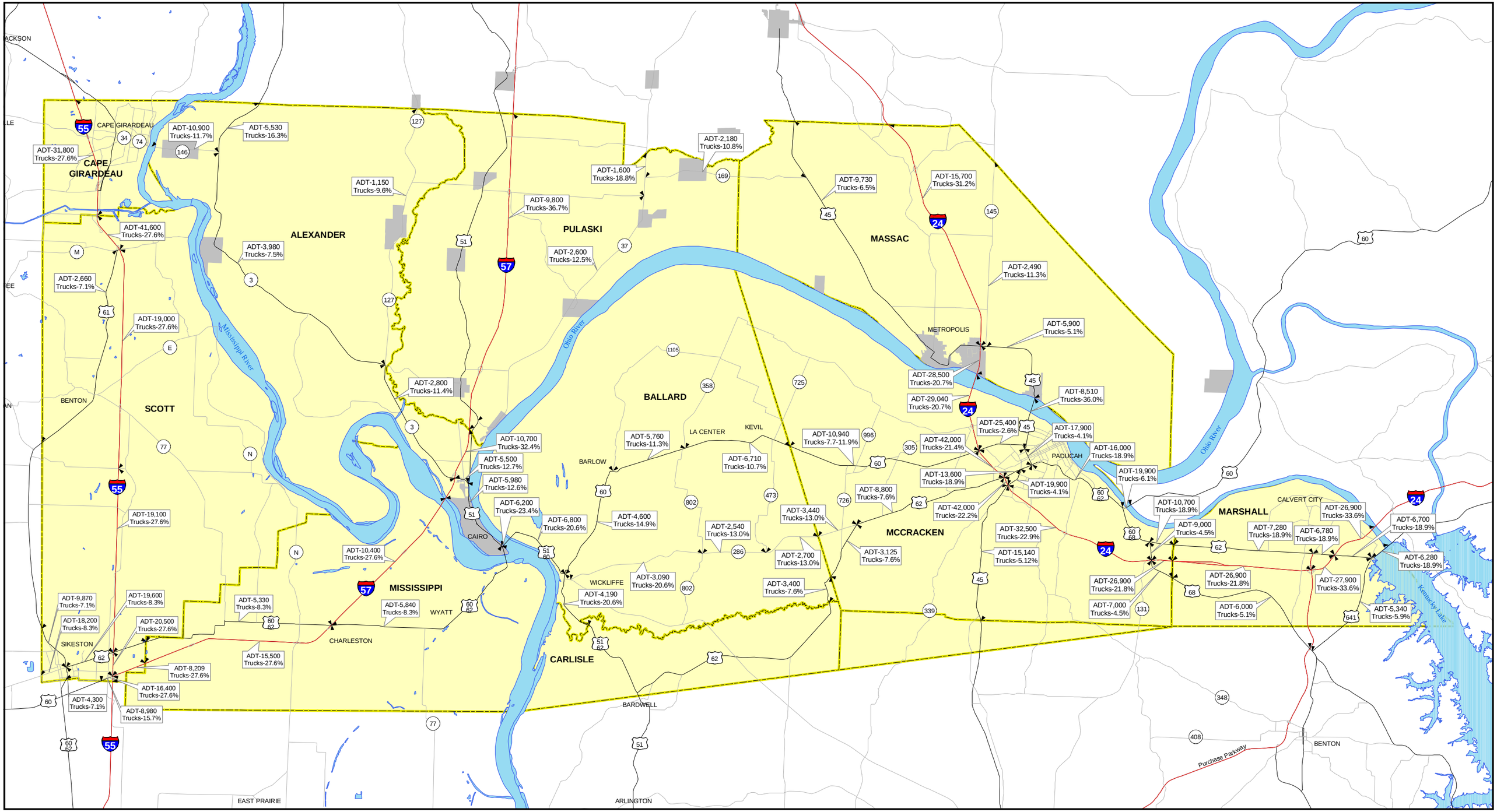
Historical traffic trends indicate that traffic volumes on the existing US and state roadways have increased roughly two percent annually since 1980, for a total increase of over 40 percent. Traffic volumes on the interstate highways have increased nearly three times as much, or about 120 percent since 1980.

2.3 Vehicle Classification Data

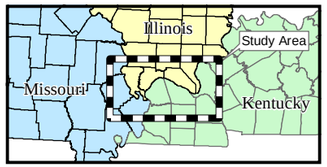
State traffic information records provided vehicle classification data. The percentage of trucks using the study area's major routes ranged from a low of 2.6 percent along US 60 near Paducah, to a high of 36.7 percent along I-57 in Pulaski County, Illinois. (See Table 2 - 3 Existing Traffic Information and Figure 3 - Average Daily Traffic and Truck Percentages following.) The three interstate highways carry most of the truck traffic, and ranged from 20.7 percent on I-24 in Illinois and Kentucky, to 36.7 percent on I-57 in Illinois.

However, the following US highways also carry significant truck percentages: in Kentucky US 45, US 51, and US 62 ranged from 19% to 36% and in Illinois US 51 and US 60 ranged from 23% to 26%. Truck traffic volumes can be expected to increase based upon the increasing interstate and international commerce patterns that are likely to occur in the future.

Table 2 - 4 - Commodities Shipped by Mode above and Table 2-5 - Freight Shipments by Weight / Value also above, contain data published in the US DOT's Freight Analysis Transportation Profile. Table 2-4 compares Freight Shipments by mode in the three states in the study area. As seen in this table, nearly twice as many goods by volume/weight were shipped by highway in each state as compared to rail, the next highest mode. Also, note that the shipments by all modes, but especially highway, are predicted to increase by the year 2020. Table 2- 5 shows the leading commodities shipped by each state ranked from highest to lowest, based on weight and value. The most commonly shipped commodities by ton varied from state to state as follows: Kentucky – Coal, Illinois – Farm Products, and Missouri – Non-Metallic Minerals. Transportation equipment ranked the highest for all states based on the value of commodities shipped.



PROJECT STUDY AREA



LOCATION MAP

N
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0 2.5 5 Miles

Figure 3

AVERAGE DAILY TRAFFIC AND TRUCK PERCENTAGES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Table 2-3
Existing Traffic Information

I-24

	Description	ADT	Truck %	LOS
McCracken, KY	Illinois S/L to US 60	29,040	20.7%	B
	US 60 to US 62	42,000	21.4%	C
	US 62 to US 45	42,000	22.2%	C
	US 45 to US 68	32,500	22.9%	B
	US 68 to Marshall C/L	26,900	21.8%	B
Marshall, KY	McCracken C/L to JMC Pkwy*	26,900	21.8%	B
	JMC Pkwy to US 62	27,900	33.6%	B
	US 62 to Livingston C/L	26,500	33.6%	B

* Julian M Carroll Parkway, formerly known as Purchase Parkway.

US 45

	Description	ADT	Truck %	LOS
McCracken, KY	Graves C/L to I 24	15,140	5.7-12.0%	B
	I 24 to US 62	19,900	4.1%	B
	US 62 to US 60	17,900	4.1%	B
	US 60 to Illinois S/L	8,510	36.0%	A

US 51

	Description	ADT	Truck %	LOS
Ballard, KY	Carlisle C/L to US 60	4,190	20.6%	B
	US 60 to Illinois S/L	6,800	20.6%	C

US 60

	Description	ADT	Truck %	LOS[1]
Ballard, KY	US 51 to McCracken C/L	5,660	10.7-14.9%	D
McCracken, KY	Ballard C/L to I 24	10,940	7.7-11.9%	A
	I 24 to US 45	25,400	2.6%	C
	US 45 to US 62	20,000	2.6-6.1%	B
	US 62 to Livingston C/L	19,900	6.1%	E

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shadec

US 62

	Description	ADT	Truck %	LOS[1]
Ballard, KY	Carlisle C/L to McCracken C/L	3,400	7.6%	D
McCracken, KY	Ballard C/L to KY 286	3,125	7.6%	B
	KY 286 to I 24	8,880	7.6%	E
	I 24 to US 45/60	13,600	18.9%	E
	US 45/60 to US 68	16,000	18.9%	B
	US 68 to Marshall C/L	10,700	18.9%	B
Marshall, KY	McCracken C/L to JMC Pkwy	7,280	18.9%	C
	JMC Pkwy to I 24	6,780	18.9%	E
	I 24 to US 641	6,700	18.9%	C
	US 641 to Livingston C/L	6,280	18.9%	E

Table 2-3
Existing Traffic Information, Cont.

US 68

	Description	ADT	Truck %	LOS
McCracken, KY	US 62 to I 24	9,000	4.5%	A
	I 24 to Marshall C/L	7,000	4.5%	C
Marshall, KY	McCracken C/L to JMC Pkwy	6,000	5.1%	B

US 641

	Description	ADT	Truck %	LOS
Marshall, KY	US 68 to US 62	5,340	5.9%	B

KY 286

	Description	ADT	Truck %	LOS[1]
Ballard, KY	KY 121 to McCracken C/L	2,670	13.0%	D
McCracken, KY	Ballard C/L to US 62	3,440	13.0%	D

I-55

	Description	ADT	Truck %	LOS
Scott, MO	I 57 to US 62	20,500	27.6%	A
	US 62 to US 61	19,340	27.6%	A
	US 61 to Cape Giradeau C/L	38,400	27.6%	C

I-57

	Description	ADT	Truck %	LOS
Mississippi, MO	Scott C/L to US 62	17,000	33.9%	A
	US 62 to Illinois S/L	10,400	33.9%	A

US 60

	Description	ADT	Truck %	LOS
Mississippi, MO	I 57 to Illinois S/L	4,470	15.7%	B

US 61

	Description	ADT	Truck %	LOS
Scott, MO	New Madrid C/L to US 62	4,300	7.1%	B
	US 62 to I 55	4,870	7.1%	B

Table 2-3
Existing Traffic Information, Cont.

US 62

	Description	ADT	Truck %	LOS
Mississippi, MO	Scott C/L to I 57	4,950	8.3%	B

I-57

	Description	ADT	Truck %	LOS
Allexander, IL	Missouri S/L to Pulaski C/L	10,700	34.2%	A
Pulaski, IL	Allexander C/L to Union C/L	9,800	36.7%	A

I-24

	Description	ADT	Truck %	LOS
Massac, IL	Kentucky S/L to US 45	28,500	20.7%	B
	US 45 to Johnson C/L	15,700	31.2%	A

US 45

	Description	ADT	Truck %	LOS
Massac, IL	Kentucky S/L to I 24	5,900	5.1%	A
	I 24 to Johnson C/L	9,725	6.5%	A

US 51

	Description	ADT	Truck %	LOS
Alexander, IL	Kentucky S/L to US 60	6,200	23.4%	A
	US 60 to Pulaski C/L	5,980	12.6%	A

US 60

	Description	ADT	Truck %	LOS
Alexander, IL	Missouri S/L to US 51	4,700	25.5%	B

IL 3

	Description	ADT	Truck %	LOS[1]
Alexander, IL	US 51 to I 57	5,500	12.7%	A
	I 57 to IL 127	2,800	11.4%	C
	IL 127 to IL 146	3,980	7.5%	C
	IL 146 to Union C/L	5,530	16.3%	D

Table 2-3
Existing Traffic Information, Cont.

IL 37

	Description	ADT	Truck %	LOS
Pulaski, IL	US 51 to IL 169	2,600	12.5%	A
	IL 169 to Johnson C/L	1,600	18.8%	A

IL 127

	Description	ADT	Truck %	LOS
Alexander, IL	IL 3 to Union C/L	1,150	9.6%	A

IL 145

	Description	ADT	Truck %	LOS
Massac, IL	US 45 to Pope C/L	2,490	11.3%	A

IL 146

	Description	ADT	Truck %	LOS[1]
Alexander, IL	Cape Girardeau C/L to IL 3	10,900	11.7%	D

IL 169

	Description	ADT	Truck %	LOS[1]
Pulaski, IL	IL 37 to US 45	2,180	10.8%	D

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shaded.

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Illinois Department of Transportation (IDOT)
Missouri Department of Transportation (MoDOT)

Table 2-4
Commodities Shipped by Mode

	Kentucky (Million Tons)		Illinois (Million Tons)		Missouri (Million Tons)	
Mode	**1998**	**2020**	**1998**	**2020**	**1998**	**2020**
Air	1	3	2	5	<1	1
Highway	304	524	658	1119	310	542
Other	<1	<1	1	1	<1	<1
Rail	160	218	371	598	104	159
Water	93	132	118	205	38	58

Source: *Freight Analysis Profile,* US Department of Transportation

Table 2-5
Freight Shipments By Weight / Value

Kentucky

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Coal	Transportation Equipment
2	Non-Metallic Minerals	Secondary Traffic
3	Secondary Traffic	Mail/Contract Traffic
4	Clay/Concrete/Glass/Stone	Chemicals/Allied Products
5	Farm Products	Machinery

Illinois

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Farm Products	Transportation Equipment
2	Non-Metallic Metals	Freight All Kinds
3	Coal	Food/Kindred Products
4	Freight All Kinds	Chemicals/Allied Products
5	Food/Kindred Products	Machinery

Missouri

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Non-Metallic Minerals	Transportation Equipment
2	Farm Products	Secondary Traffic
3	Coal	Food/Kindred Products
4	Secondary Products	Chemicals/Allied Products
5	Clay/Concrete/Glass/Stone	Farm Products

Source: *Freight Analysis Profile*, US Department of Transportation

2.4 Traffic Operations

The traffic analysis methods used are based upon generally accepted engineering practices and computer models. Data sources included individual state databases, previous traffic studies, and field surveys. The study examined Level of service (LOS) which is an analysis method commonly used to evaluate roadway functions. "Level of service" is defined as a qualitative measure of operational conditions, and the motorists' perception of those conditions. The conditions are usually defined in terms such as speed, travel time, percent following, maneuverability, and delay.

The LOS analysis performed on roadways within the study area indicated that the existing LOS ranges from A to E. The letters "A" through "F" designate the six levels of service. Level of service "A" represents the best operating conditions, while level of service "F" defines the worst. According to national standards, the lower levels of service (*i.e.*, "D," "E", and "F") do not reflect safe and efficient operations. These lower levels generally involve unstable traffic flows, and offer drivers little freedom to maneuver. The American Association of State Highway and Transportation Official's (AASHTO's) *A Policy on Geometric Design of Highways and Streets* states that the minimum desired LOS for the design of a highway in a rural area is "B", and in an urban area is "C." (Refer to Table 2-3 - Existing Traffic Information, found above for a detailed listing of LOS by roadway section.) While the desirable LOS rating for rural areas is B, this is often not attainable in a cost effective manner. Therefore, LOS C is more realistic and is often used as the threshold for those areas. As such, existing roadway sections not meeting the desired LOS C are shaded in Table 2-3. Note that US 60 had acceptable LOS ratings in Missouri and Illinois; however, in Kentucky about 47 percent of US 60 is rated as unacceptable (*i.e.*, LOS D, E, or F – probably due to higher levels of percent following – i.e. being behind a large slower farm or other type of vehicle). US 62 in Missouri had an acceptable LOS of B, but in Kentucky about 44 percent of US 62 is rated as unacceptable (again probably due to percent following). KY 286, IL 146, and IL 169 are all rated as an unacceptable LOS D for their full length (see above comments).

Analysis showed, that by 2030, without any highway improvements, the anticipated increases in traffic volumes would likely cause the design hour levels of service on some roadways in the study area to degrade. 2030 No Build, and 2030 analysis for corridors 8B, 11, and 20, traffic volumes were derived using the Kentucky Statewide Traffic Model and are shown on Figures 4 to 7 and Table 2-6 respectively. In addition, Table 2-6 shows volumes and LOS for the various roadway sections for 2030 Build and No-Build corridors. The LOS analysis performed for 2030 Build and No-Build Scenarios determined the LOS for area roadways would range from A to F for all corridors. Most area roadways showed at least a drop of one level of service with the exception of I-24 in Kentucky and Illinois were most sections had a multi-level drop in LOS. Increasing traffic volumes and lowered levels of service could eventually result in reoccurring peak

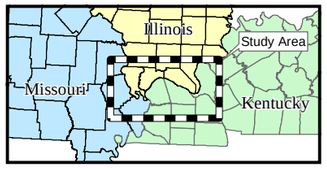
hour congestion and its associated delays in accessing businesses, along with increased driver frustration and the likelihood for higher crash rates.

CAPE GIRARDEAU
ALEXANDER
PULASKI
MASSAC
SCOTT
BALLARD
MISSISSIPPI
MCCRACKEN
MARSHALL
CARLISLE
ADT-15,000
ADT-54,000
ADT-9,000
ADT-1,150
Trucks-9.6%
ADT-10,000
ADT-16,000
ADT-25,000
ADT-32,000
ADT-8,000
ADT-12,000
ADT-7,000
ADT-10,000
ADT-27,300
ADT-4,000
ADT-17,000
ADT-6,500
ADT-6,000
ADT-15,000
ADT 6,000
ADT-66,000
ADT-75,000
ADT-49,000
ADT-69,000
ADT-50,000
METROPOLIS
PADUCAH
CALVERT CITY
LA CENTER
KEVIL
BARLOW
CAIRO
WICKLIFFE
WYATT
CHARLESTON
SIKESTON
BENTON
BARDWELL
ARLINGTON
EAST PRAIRIE
Mississippi River
Ohio River
Kentucky Lake
Purchase Parkway

Level of Service

- A
- B
- C
- D
- E
- F

PROJECT STUDY AREA



LOCATION MAP

N
W E
S

0 2.5 5 Miles

Figure 4

2030 NO-BUILD TRAFFIC AND LEVEL OF SERVICE

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

CAPE GIRARDEAU
CAPE GIRARDEAU
ALEXANDER
SCOTT
BENTON
MISSISSIPPI
PULASKI
BALLARD
MCCRACKEN
MASSAC
METROPOLIS
PADUCAH
MARSHALL
CALVERT CITY
BENTON
CARLISLE
WICKLIFFE
CAIRO
WYATT
CHARLESTON
SIKESTON
BARDWELL
ARLINGTON
EAST PRAIRIE
LA CENTER
KEVIL
BARLOW
Mississippi River
Ohio River
Kentucky Lake
Purchase Parkway
ADT-14,000
ADT-54,000
ADT-5,000
ADT-32,000
ADT-10,000
ADT-4,000
ADT-12,000
ADT-7,000
ADT-3,000
ADT-2,000
ADT-17,000
ADT-6,000
ADT-5,000
ADT-24,000
ADT-8,500
ADT 10,000
ADT-17,500
ADT-66,000
ADT-82,000
ADT-13,000
ADT-28,000
ADT-75,000
ADT-55,000

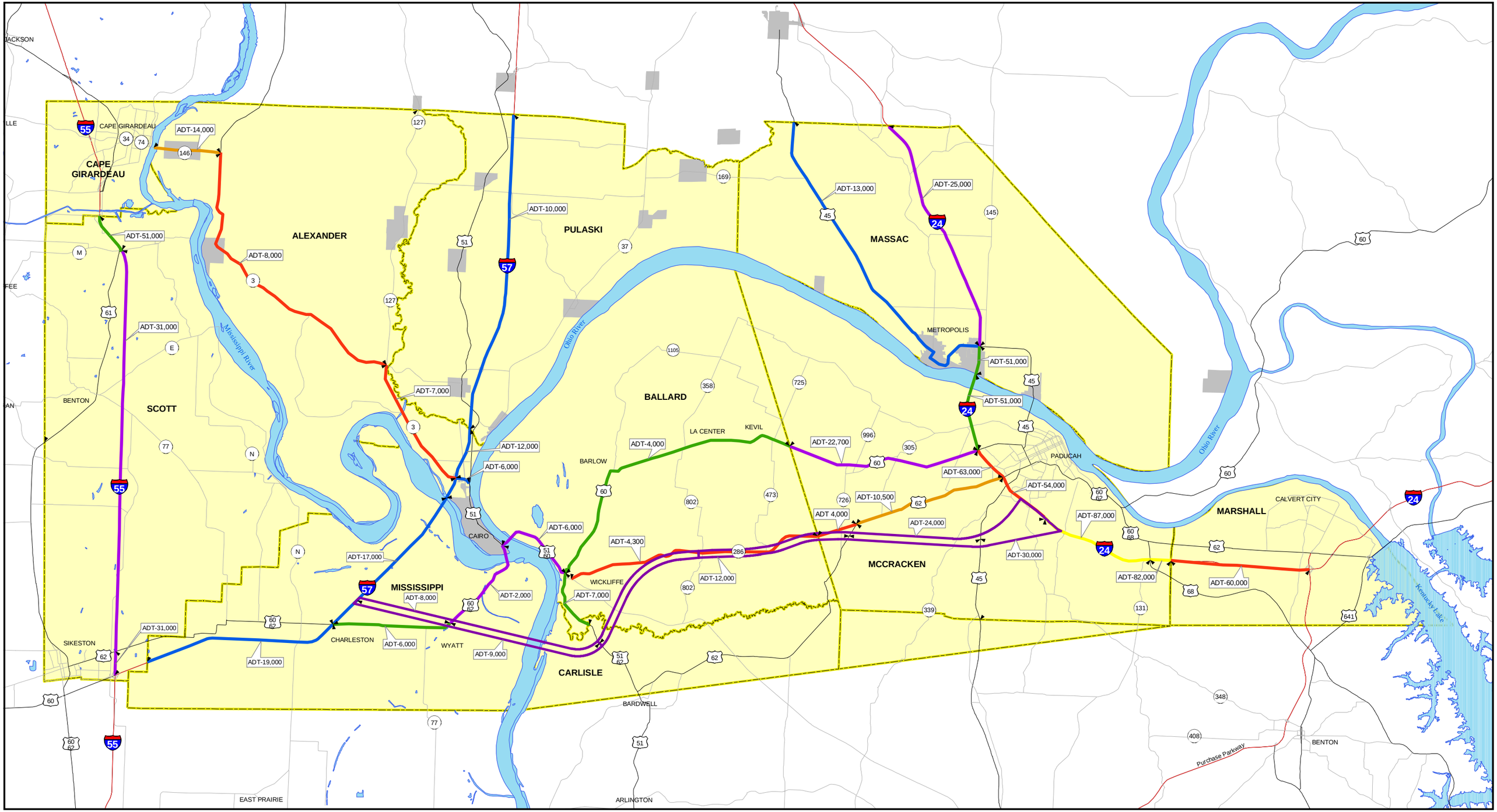
Level of Service
- A
- B
- C
- D
- E
- F
- PROJECT STUDY AREA

Alternative Corridors
- 8b
- Existing 60 Improved
- Improvements Programmed

LOCATION MAP
Illinois
Missouri
Kentucky
Study Area

N W E S
0 2.5 5 Miles

Figure 5
ALTERNATIVE 8b 2030 TRAFFIC AND LEVEL OF SERVICE
I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00



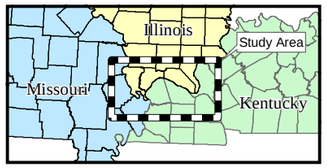
Level of Service

- A
- B
- C
- D
- E
- F

Alternative Corridors

- 11

PROJECT STUDY AREA



LOCATION MAP

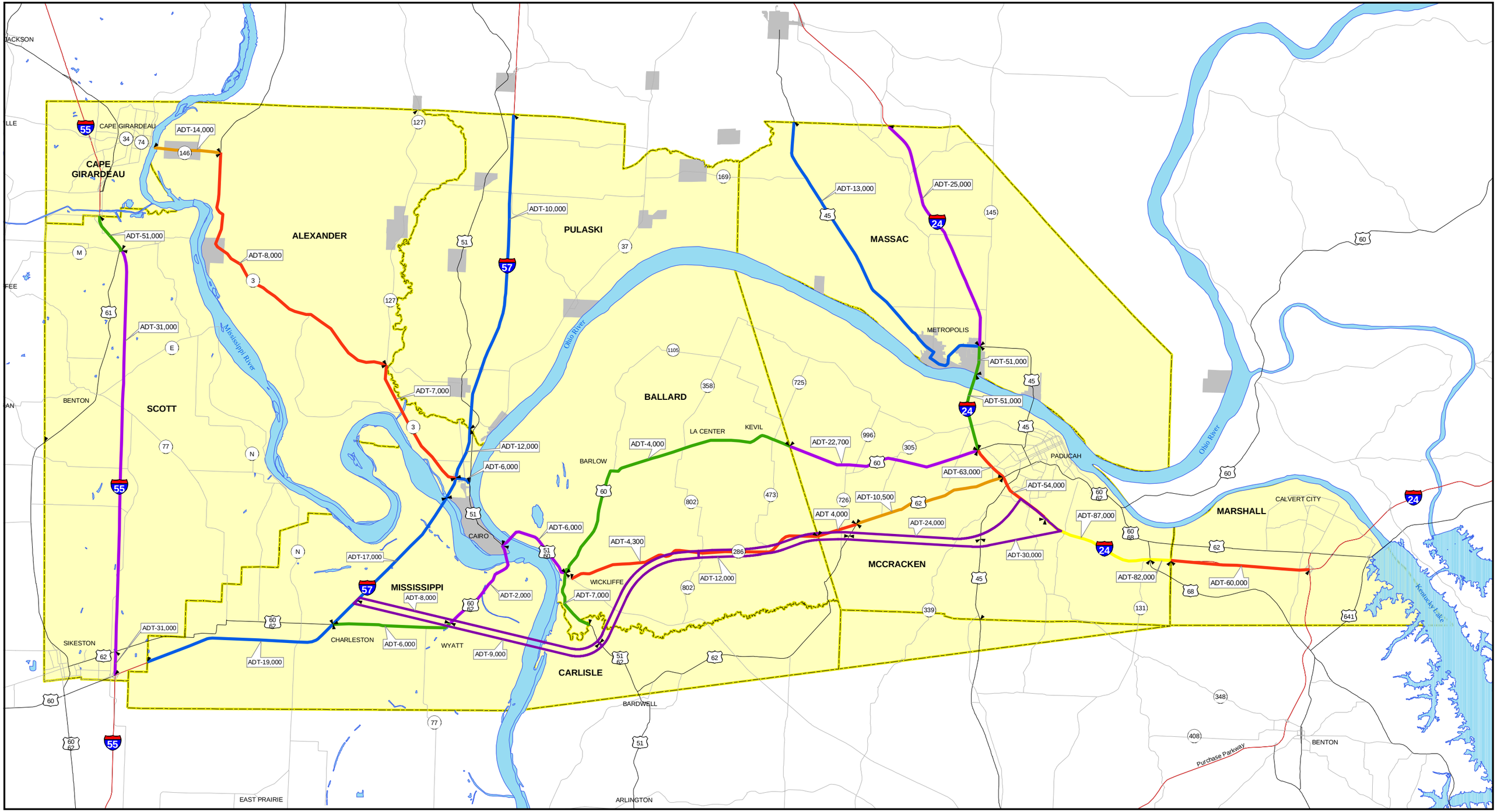
N W E S

0 2.5 5 Miles

Figure 6

ALTERNATIVE 11 2030 TRAFFIC AND LEVEL OF SERVICE

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00



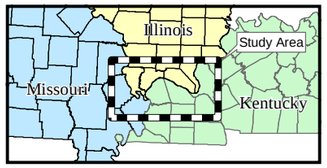
Level of Service

- A
- B
- C
- D
- E
- F

Alternative Corridors

- 11

PROJECT STUDY AREA



LOCATION MAP

N W E S

0 2.5 5 Miles

Figure 6

ALTERNATIVE 11 2030 TRAFFIC AND LEVEL OF SERVICE

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Table 2-6
Future Traffic Information

I 24

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
McCracken, KY	Illinois S/L to US 60	49000	C	54000	D	51000	C	56000	D
	US 60 to US 62	66000	D	66000	D	63000	D	72000	E
	US 62 to US 45	75000	F	82000	F	54000	D	84000	F
	US 45 to US 68	69000	E	75000	F	87000	F	84000	F
	US 68 to Marshall C/L	69000	E	75000	F	82000	F	79000	F
Marshall, KY	McCracken C/L to JMC Pkwy	50000	C	55000	D	60000	D	57000	D

US 51

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Ballard, KY	Carlisle C/L to US 60	6000	B	6000	B	7000	C	5000	B
	US 60 to Illinois S/L	11000	D	3000	B	6000	B	8000	C

US 60

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Ballard, KY	US 51 to McCracken C/L	10000	D	5000	D	4000	C	9000	D
McCracken, KY	Ballard C/L to I 24	27300	C	24000	B	22700	B	25700	B

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shaded.

US 62

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Ballard, KY	Carlisle C/L to McCracken C/L	4000	D	---	---	---	---	---	---
McCracken, KY	Ballard C/L to KY 286	4000	C	---	---	---	---	---	---
	KY 286 to I 24	15000	E	17500	E	10500	E	16000	E

KY 286

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Ballard, KY	KY 121 to McCracken C/L	4000	D	8500	E	4300	D	2000	D
McCracken, KY	Ballard C/L to US 62	6000	D	1000	C	4000	D	6000	D

I 55

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Scott, MO	I 57 to US 62	32000	B	32000	B	31000	B	32000	B
	US 62 to US 61	32000	B	32000	B	31000	B	32000	B
	US 61 to Cape Giradeau C/L	54000	D	54000	D	51000	C	52000	C

I 57

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Mississippi, MO	Scott C/L to US 62	15000	A	17000	A	19000	A	17000	A
	US 62 to Illinois S/L	17000	A	17000	A	17000	A	16000	A

Table 2-6
Future Traffic Information continued

US 60

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Mississippi, MO	I 57 to Illinois S/L	6500	C	6000	C	6000	C	6000	C

I 57

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Allexander, IL	Missouri S/L to Pulaski C/L	12000	A	12000	A	12000	A	11000	A
Pulaski, IL	Allexander C/L to Union C/L	10000	A	10000	A	10000	A	10000	A

I 24

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Massac, IL	Kentucky S/L to US 45	49000	C	54000	D	51000	C	56000	D
	US 45 to Johnson C/L	25000	B	28000	B	25000	B	40000	C

US 45

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
	I 24 to Johnson C/L	12000	A	13000	A	13000	A	3000	A

US 60

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Alexander, IL	Missouri S/L to US 51	4000	B	6000	B	2000	A	6000	B

IL 3

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Alexander, IL	US 51 to I 57	7000	A	3000	A	6000	A	3000	A
	I 57 to IL 127	8000	D	4000	C	7000	D	2000	C
	IL 127 to IL 146	9000	D	5000	C	8000	D	4000	C

IL 146

	Description	2030 No-Build ADT	2030 No-Build LOS	Alternative 8B ADT	Alternative 8B LOS	Alternative 11 ADT	Alternative 11 LOS	Alternative 20 ADT	Alternative 20 LOS
Alexander, IL	Cape Girardeau C/L to IL 3	15000	E	14000	E	14000	E	10000	D

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shaded.

Source: Kentucky Statewide Traffic Model

2.5 Crash Analysis

Crash data was used to identify roadway sections with statistically high crash rates, thus indicating a possible need for safety improvements. The crash analysis was performed on the roadways previously listed with crashes reported in the Kentucky and Missouri study area researched for a five-year period from January 1, 1996 through December 31, 2000. Information was obtained from the KYTC HIS database and MoDOT. Illinois crash data was only available for the year 2000, and was provided by IDOT. Crash data by county roadway section appears in Table 2-6 - High Crash Locations, and in Figure 8 - Existing Crashes. The crash analysis for a given section of roadway within the study area was compared to critical crash rate for similar roadways within that state to identify high crash rate roadways.

A Critical Rate Factor Analysis was performed for the various roadways in the study area. The Critical Crash Rate is a statistically derived value that is used as a threshold to identify high crash locations. To begin with crash rates were calculated for study area roadways based upon the total number of crashes, the average daily traffic (ADT), and the roadway section length. Roadway section crash rates were then normalized for comparison by either hundred-million-vehicle-miles traveled (HMVM), or millions-of-vehicles (MV), depending upon individual state records. Kentucky and Missouri crash rates are maintained in the HMVM format, while Illinois maintains rates in the MV format.

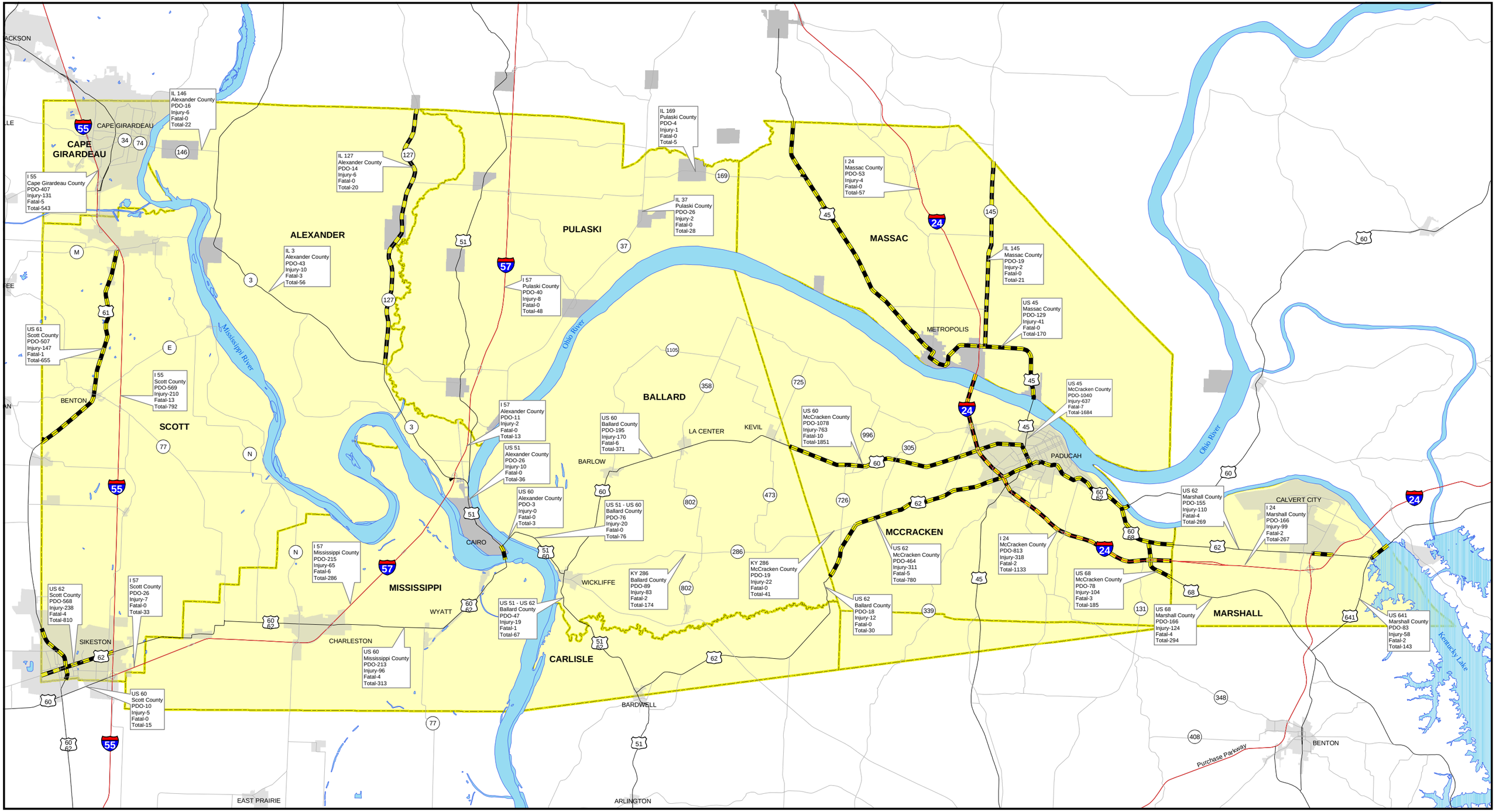
The individual states provided their statewide average crash rates by roadway classifications. Critical crash rates for area roadways were found using the following formula:

$$A_c = A_a + K\sqrt{\frac{A_a}{M} + \frac{1}{2M}}$$

Where:

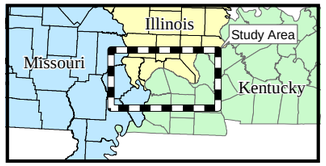
A_c = Critical Crash Rate
A_a = Statewide Average Crash Rate
K = Constant related to level of statistical significance selected (a probability of 0.995 was used wherein K=2.576), and
M = Exposure (for Kentucky/Missouri, M was in terms of 100 million vehicle-miles; for Illinois, M was in terms of million vehicles).

The critical crash rate factor is defined as the ratio of the roadway crash rate to the critical crash rate. If the ratio is greater than 1, meaning that the roadway crash rate is greater than the critical crash rate, than the roadway is can be labeled as being a high crash location.



High Crash Sections

PROJECT STUDY AREA



LOCATION MAP

NOTE: Kentucky and Missouri data is from 1996-2000. Illinois data is from 2000 only.

N W E S

0 2.5 5 Miles

Figure 8

EXISTING CRASHES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Table 2-7
High Crash Locations

Route	County, State	Segment Length (miles)	Crashes				ADT	HMVM[2]	MV[3]	Crash Rate[4]	Injury Rate	Fatal Rate	Statewide Crash Rate	Critical Rate	Critical Rate Factor[5]	Statewide Fatal Rate	Critical Fatal Rate	Fatal Rate Factor[6]
			PDO[1]	Injury	Fatal	Total												
I-24	Marshall, KY	12.1	166	99	2	267	27,300	6.034		44	16	0.33	49	56	0.78	0.6	1.492	0.22
	McCracken, KY	16.9	813	318	2	1133	36,000	11.090		102	29	0.18	92	99	1.03	0.6	1.242	0.15
	Massac, IL	15.1	53	4	0	57	17,500		96.387	0.591	0	0.00	4.172	4.711	0.13	0.6	0.808	0.00
I-55	Scott, MO	26.1	569	210	13	792	20,000	9.534		83	22	1.36	194	206	0.40	1.31	2.314	0.59
	Cape Girardeau, MO	27.3	407	131	5	543	31,800	15.826		34	8	0.32	194	203	0.17	1.31	2.080	0.15
I-57	Scott, MO	20.1	26	7	0	33	8,000	2.930		11	2	0.00	194	215	0.05	1.31	3.197	0.00
	Mississippi, MO	20.0	215	65	6	286	13,000	4.750		60	14	1.26	194	211	0.29	1.31	2.763	0.46
	Alexander, IL	4.3	11	2	0	13	10,700		16.755	0.776	0	0.00	4.172	5.483	0.14	0.6	1.116	0.00
	Pulaski, IL	17.7	40	8	0	48	9,800		63.384	0.757	0	0.00	4.172	4.838	0.16	0.6	0.858	0.00
US 45	McCracken, KY	13.5	1040	637	7	1684	14,000	3.449		488	185	2.03	501	532	0.92	1.5	3.338	0.61
	Massac, IL	22.9	129	41	0	170	9,700		81.042	2.098	1	0.00	1.651	2	1.04	1.3	1.631	0.00
US 51	Ballard, KY	8.3	98	64	1	163	5,000	0.757		215	85	1.32	248	295	0.73	3	8.770	0.15
	Alexander, IL	7.8	26	10	0	36	6,000		17.082	2.107	1	0.00	1.651	2.478	0.85	1.3	2.037	0.00
US 60	McCracken, KY	19.8	1078	763	10	1851	17,500	6.324		293	121	1.58	120	131	2.23	1.3	2.543	0.62
	Ballard, KY	16.8	195	170	6	371	5,700	1.748		212	97	3.43	248	279	0.76	3	6.649	0.52
	Mississippi, MO	22.3	213	96	4	313	5,500	2.240		140	43	1.79	232	258	0.54	2.24	5.030	0.35
	Scott, MO	0.6	10	5	0	15	9,000	0.096		156	52	0.00	232	363	0.43	2.24	19.857	0.00
	Alexander, IL	0.7	3	0	0	3	6,200		1.629	1.841	0	0.00	1.651	4.542	0.41	3	6.790	0.00
US 61	Scott, MO	26.0	507	147	1	655	3,200	1.521		431	97	0.66	232	264	1.63	2.24	5.684	0.12
US 62	Marshall, KY	12.1	155	110	4	269	7,000	1.550		174	71	2.58	248	281	0.62	3	6.894	0.37
	McCracken, KY	16.9	464	311	5	780	3,400	1.048		744	297	4.77	248	288	2.58	3	7.819	0.61
	Scott, MO	7.9	568	238	4	810	19,600	2.808		288	85	1.42	232	256	1.13	2.24	4.711	0.30
US 68	Marshall, KY	28.4	166	124	4	294	6,000	3.114		94	40	1.28	248	271	0.35	3	5.680	0.23
	McCracken, KY	2.7	78	104	3	185	7,000	0.341		543	305	8.81	248	319	1.70	3	12.085	0.73
US 641	Marshall, KY	6.4	83	58	2	143	5,800	0.676		211	86	2.96	248	298	0.71	3	9.145	0.32
IL 3	Alexander, IL	30.6	43	10	2	55	4,500		50.178	1.096	0	0.04	1.078	1.464	0.75	3	3.638	0.01
IL 37	Pulaski, IL	19.9	26	2	0	28	2,600		18.866	1.484	0	0.00	1.078	1.718	0.86	3	4.050	0.00
IL 127	Alexander, IL	14.8	14	6	0	20	1,150		6.225	3.213	1	0.00	1.078	2.227	1.44	3	4.862	0.00
IL 145	Massac, IL	10.1	19	2	0	21	2,500		9.244	2.272	0	0.00	1.078	2.009	1.13	3	4.516	0.00
IL 146	Alexander, IL	3.8	16	6	0	22	10,900		14.999	1.467	0	0.00	1.078	1.800	0.82	3	4.181	0.00
IL 169	Pulaski, IL	5.3	4	1	0	5	2,200		4.224	1.184	0	0.00	1.078	2.493	0.47	3	5.282	0.00
KY 286	McCracken, KY	2.3	19	22	0	41	3,400	0.141		290	156	0.00	248	359	0.81	3	18.355	0.00
	Ballard, KY	14.3	89	83	2	174	2,700	0.705		247	118	2.84	248	297	0.83	3	9.006	0.32

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS), Illinois Department of Transportation (IDOT), Missouri Department of Transportation (MoDOT)

[1] PDO (Property Damage Only)

[2] HMVM (Hundred Million Vehicle Miles Traveled) exposure for roadway sections (greater than 0.30 miles): (length of roadway x ADT x 365 x # of years) / (100,000,000)

[3] MV (Million Vehicles) exposure for roadway spots (0.30 miles): (ADT x 365 x # years) / (1,000,000)

[4] Kentucky and Missouri rates are calculated per hundred million vehicle miles based on data from 1996 through 2000. Illinois rates are calculated per million vehicles based on 2000 data.

[5] Crash rates greater than 1.00 are high crash rate locations with crashes occurring at statistically significant amounts that cannot be explained by other factors, and are indicated by shading.

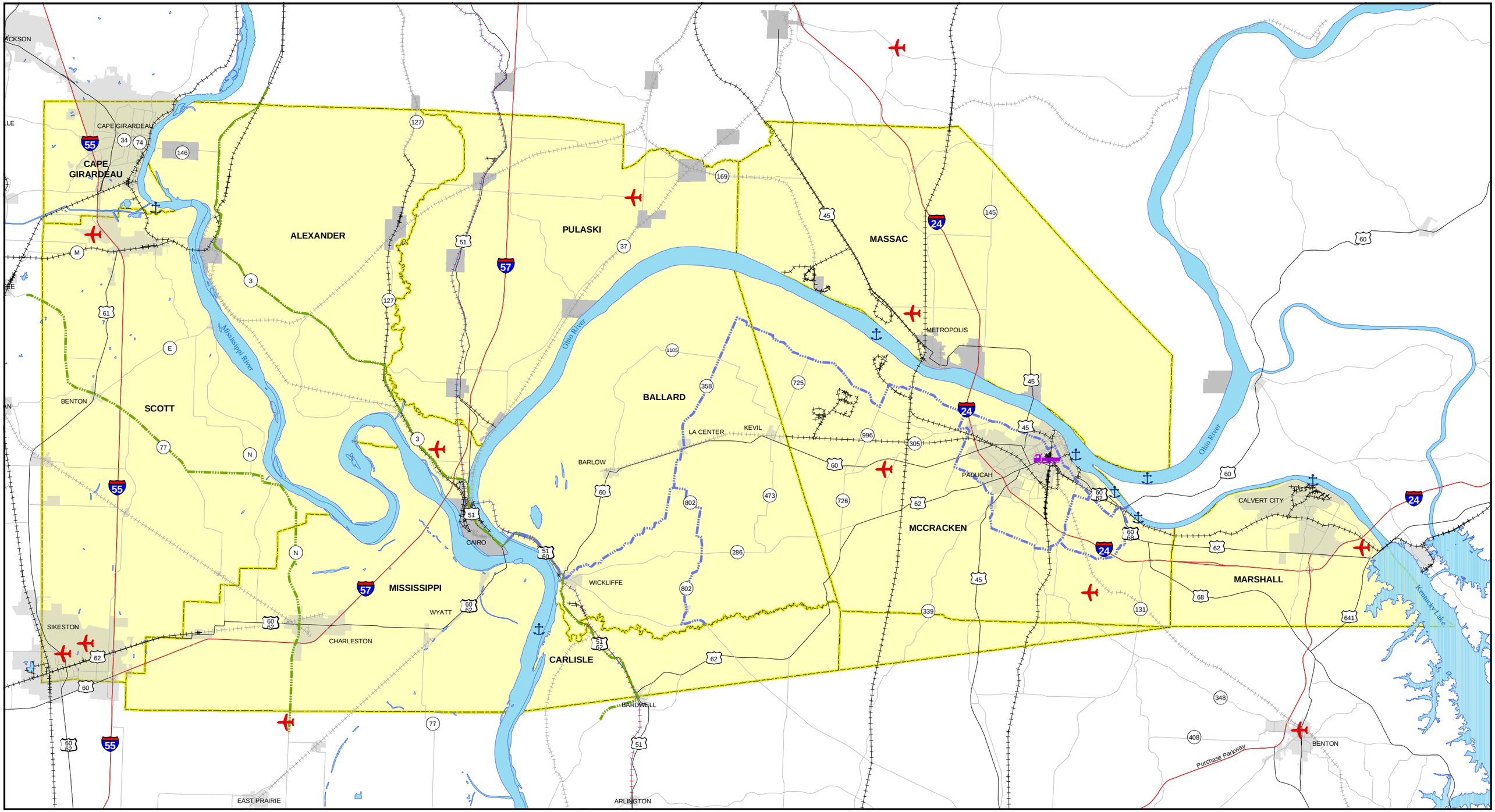
[6] Fatal Rate Factor rates greater than 1.00 are high fatality rate locations with fatalities occurring at statistically significant amounts that cannot be explained by other factors, and are indicated by shading.

Table 2-7 – High Crash Locations identified nine roadway sections with high crash rates. A similar analysis was performed for all fatal crashes. The objective was to identify any roadway sections with statistically higher than statewide average fatality rates. This analysis showed that there were no roadway sections in the study area with a statistically high fatality crash rate.

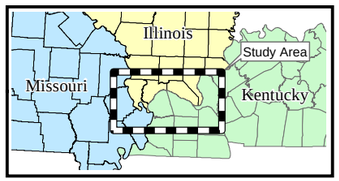
2.6 Intermodal Transportation Options

Intermodal transportation refers to modes of transportation within the study area in addition to roadways. It includes considerations such as public use airports, freight and passenger railroad terminals, bus service, marine terminals and other water ports, transfer facilities, trucking facilities, industrial parks, bicycle facilities, and pedestrian facilities. Known intermodal transportation modes are shown on Figure 9 - Intermodal Facilities. Although there are some intermodal facilities in the study area, the opportunities to take advantage of them are limited by the nature and geography of the area. The dispersed settlement patterns and lack of density for instance, make the use of transit problematic. There are however, sufficient accommodations for other modes such as bicycling on a region wide basis and for pedestrians in urban areas.

(See Appendix 2, Existing Conditions Summary for more detailed information about the project study area, including the transportation system and its characteristics.)



Flat Car Highway/Rail Transfer Terminals
Port
Public Use Airports
Ramblin River Bike Tour
Mississippi River Trail
Cargo Rail Service
Amtrak
Abandoned
Major Urban Areas
PROJECT STUDY AREA



LOCATION MAP

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Figure 9
INTERMODEL FACILITIES
I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

3.0 ENVIRONMENTAL OVERVIEW

3.1 Introduction

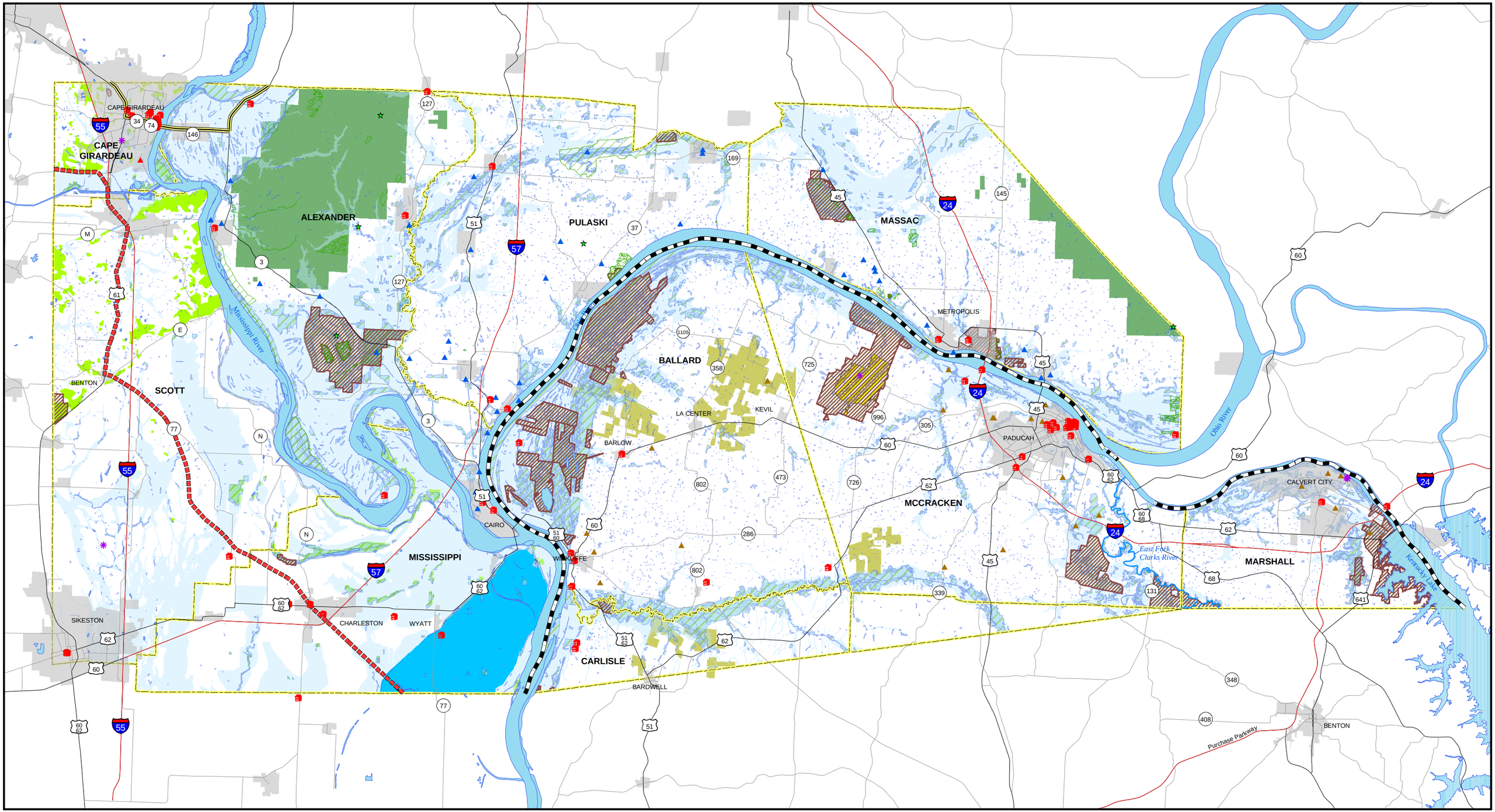
A high-level environmental overview was conducted to determine the general characteristics of the study area. This environmental overview was based on secondary sources, and very limited field verifications. The environmental characteristics areas appear on the following map highlighted by Figure 14 - Environmental Constraints, and are discussed below. For more detailed information see Appendix 2 – Existing Conditions Summary.

3.2 Environmental Constraints

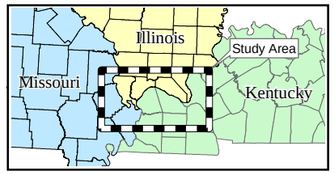
In an effort to identify major environmental constraints, a study was completed to consider documented environmental features in the overall project area and for inclusion in the development of the project corridors and eventually in their analysis. These features included known natural environmental features such as forests, wetlands, wildlife areas, wildlife management areas, conservation lands, and floodplains, as well as human environmental features such as designated agricultural districts, National Register of Historic Places (NRHP) sites, and Superfund hazardous waste sites. All of the data collected was extracted from sources via correspondence with a variety of resource agencies and from their existing databases and/or websites.

The position of the environmental features were placed in a geographic information system (GIS) database and processed to determine the relative abundance of features within the study area. This was designed to generally locate documented features for consideration, but it should be noted that highly sensitive undocumented features likely are present in the project area and were not located in this effort; such features will be identified in future project phases. In addition, some other known features may be excluded from the data set because they were not at the respective repositories contacted during this study. In any event, future project development phases will fully investigate and document the environmental constraints and will likely avoid them.

Wetland areas are one of the more prominent features noted in the study area, particularly in western Ballard County, Kentucky and Alexander County, Illinois. Large areas of wetlands are concentrated in the bottomlands along much of the Ohio and Mississippi Rivers. These areas also commonly have associated wildlife management area (WMA) or conservation area (CA) designations. Designations include large areas such as the Barlow Bottoms WMA (6,900 acres) and Ballard WMA (8,100 acres) in Kentucky and Horseshoe Lake Conservation Area (8,200 acres) in Illinois. Other large features include West Kentucky WMA and Clarks River National Wildlife Reserve in Kentucky. Large areas that would be considered sensitive in Illinois such as Bumgard Island, Burnham Island, and Brown's Bar, are designated Illinois natural areas located



- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route
- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

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Figure 10

ENVIRONMENTAL CONSTRAINTS

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

along the banks of the Mississippi River. The single largest feature in the project area is the Shawnee National Forest, located primarily in Alexander County, Illinois.

The Shawnee National Forest lies in the rough, unglaciated areas know as the Illinois Ozark and Shawnee Hills. The geology is spectacular and divergent, with numerous stone bluffs and overlooks transcending to lowland areas. Topography ranges from the flood plains of the Mississippi and Ohio Rivers, at about 325 feet above sea level to 1,064 feet at Williams Hill in Pope County. The geologic processes that formed the landscape are partially responsible for the presence of important mineral resources, including some of national significance.

Plant life is extremely diverse and ranges from sun-loving species to those that grow in dense shade. Tree cover dominates the publicly owned acreage, and is a significant component on privately owned lands. Oak-hickory is the predominant timber type; however, many other commercially important timber species also occupy significant acreages. More than 500 wildlife species can be found within the Forest, including 48 mammals, 237 birds, 52 reptiles, 57 amphibians, and 109 species of fish. There are seven federally listed threatened and endangered species inhabiting the Forest, as well as 33 species, which are considered regionally sensitive, and 114 Forest-listed species.

The precise locations of federal threatened or endangered species were not identified for this analysis. However, according to the United States Fish and Wildlife Service, there are 14 species of federal threatened or endangered animal species that may occur in the study area. A listing of the species and a brief description of their habitat is included in Tables 3-1, 3-2, and 3-3 - Threatened and Endangered Species (Kentucky, Missouri, and Illinois, respectively). The habitat for some species, such as the Indiana bat (Myotis sodalis) consisting of certain forest types, is common. Other species habitat, such as endangered freshwater mussel species, is limited to streams and rivers.

Human environmental features considered for this phase of the project were landfills, Superfund sites, and NRHP sites. The geographic size of these features varies widely from single historic structures to the Paducah Gaseous Diffusion Plant's 3,500-acre Superfund site. The Trail of Tears is a long linear feature that is present in the study area and is a sensitive Native American and cultural historic feature. Both the Trail of Tears Water Route and the Auto Route are documented throughout the study area and are incorporated into project mapping and GIS analysis databases.

Many of the communities in the project area have historic districts that will vary in size from a single block to an entire neighborhood. There are 68 previously recorded cultural historic or archaeological NRHP sites located within the study area. These resources include prehistoric archaeological sites or districts and historic districts. NRHP sites require consideration; however sites eligible for listing require the same degree of consideration. The number of sites eligible for NRHP listing is unknown but can be expected to significantly exceed the number of recorded sites.

Table 3-1
Threatened and Endangered Species - Kentucky

State	County	Taxonomic Group	Scientific Name	Common Name	Statuses	Habitat
Kentucky	Ballard	Birds	*Haliaeetus leucocephalus*	Bald eagle	Endangered	Along open bodies of water in large trees
			Sterna antillarum athalassos	Interior least tern	Endangered	Sandbars and shallow water in large rivers.
		Bivalves	*Obovaria retusa*	Ring pink	Endangered	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	Endangered	Large rivers in 15-20 feet of water with sand or gravel substrates
		Fishes	*Scaphirhynchus albus*	Pallid sturgeon	Endangered	Muddy or silty waters of large rivers with moderate currrents
			Etheostoma chienense	Relict darter	Endangered	Known only from the Bayou du Chien - a small sand and mud bottomed stream
		Mammals	*Myotis sodalis*	Indiana bat	Endangered	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Graves	Fishes	*Etheostoma chienense*	Relict darter	Endangered	Known only from the Bayou du Chien - a small sand and mud bottomed stream
	Marshall	Bivalves	*Lampsilis abrupta*	Pink mucket	Endangered	Medium to large rivers with moderate to fast flowing currents
			Obovaria retusa	Ring pink	Endangered	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	Endangered	Large rivers in 15-20 feet of water with sand or gravel substrates
			Pleurobema clava	Clubshell	Endangered	Big rivers burrowed in 2-4 inches of sand or gravel
		Birds	*Haliaeetus leucocephalus*	Bald eagle	Threatened	Along open bodies of water in large trees
	McCracken	Bivalves	*Lampsilis abrupta*	Pink mucket	Endangered	Medium to large rivers with moderate to fast flowing currents
			Obovaria retusa	Ring pink	Endangered	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	Endangered	Large rivers in 15-20 feet of water with sand or gravel substrates
			Potamilus capax	Fat pocketbook	Endangered	Backwater areas of large rivers in muddy or silty substrates
		Mammals	*Myotis sodalis*	Indiana bat	Endangered	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Carlisle	Bivalves	*Potamilus capax*	Fat pocketbook	Endangered	Backwater areas of large rivers in muddy or silty substrates
		Birds	*Haliaeetus leucocephalus*	Bald eagle	Threatened	Along open bodies of water in large trees
			Sterna antillarum athalassos	Interior least tern	Endangered	Sandbars and shallow water in large rivers.
		Mammals	*Myotis sodalis*	Indiana bat	Endangered	Limestone caves (winter) and large trees with exfoliating bark (summer)

Table 3-2
Threatened and Endangered Species - Missouri

State	County	Taxonomic Group	Scientific Name	Common Name	Statuses	Habitat
Missouri	Mississippi	Birds	Haliaeetus leucocephalus	Bald eagle	Endangered	Along open bodies of water in large trees
			Sterna antillarum athalassos	Interior least tern	Endangered	Muddy or silty waters of large rivers with moderate currrents
		Fish	Scaphirhynchus albus	Pallid sturgeon	Endangered	Muddy or silty waters of large rivers with moderate currrents
		Plants	Boltonia decurrens	Decurrent false aster	Endangered	Floodplain of the Illinois and Mississippi rivers
	Cape Girardeau	Birds	Haliaeetus leucocephalus	Bald eagle	Threatened	Along open bodies of water in large trees

Table 3-3
Threatened and Endangered Species - Illinois

State	County	Taxonomic Group	Scientific Name	Common Name	Statuses	Habitat
Illinois	Alexander	Birds	*Sterna antillarum*	Least tern	Endangered	Bare alluvial and dredged spoil islands, Mississippi & Ohio Riv.
		Mammals	*Myotis grisescens*	Gray bat	Endangered	Caves/abandoned mines
			Myotis sodalis	Indiana bat	Endangered	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Fish	*Scaphirynchus albus*	Pallid Sturgeon	Endangered	Muddy or silty waters of large rivers with moderate currrents
	Pulaski	Mammals	*Myotis grisescens*	Gray bat	Endangered	Caves/abandoned mines
			Myotis sodalis	Indiana bat	Endangered	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Bivalve	*Plethobasis cooperianus striatus*	Orange-footed pearly mussel	Endangered	Ohio River
			Lampsilis orbiculata abrupta	Pink mucket pearly mussel	Endangered	Ohio River
	Massac	Bivalve	*Potamilis capax*	Fat pocketbook pearly mussel	Endangered	Wabash River
		Birds	*Sterna antillarum*	Least tern	Endangered	Sandbars and shallow water in large rivers.

Agricultural lands are also abundant in the study area. Kentucky has designated agricultural districts, which are identified areas of farms. Those areas are documented on the environmental constraints mapping. Agricultural land use takes place extensively throughout the study area. Substantial farming operations with significant on-farm investments are evident throughout the region and the study area and are not limited to any one portion of them respectively.

The prevalence of agricultural activities in the region may be in part attributable to the availability of fertile soils in the Mississippi River valley. The fact that the study area also encompasses an area that includes the confluence of both the Mississippi and the Ohio Rivers also contributes to the fact that the region is conducive to agriculture. Not surprisingly, a large portion of the land in the study area is considered prime and unique farmland.

Landfills are also a common feature in the study area. Many of these facilities are not currently active and can be difficult to identify in the field. The presence of a landfill in a project corridor requires significant consideration as a potential liability and can require substantial mitigation. The databases available that identify such features are incomplete and do not always identify all landfills.

The Birds Point-New Madrid Floodway is a component of the Mississippi River and Tributaries Project, and is located on the west bank of the Mississippi River in Mississippi and New Madrid Counties, Missouri, just below the confluence of the Ohio and Mississippi Rivers. The Floodway is approximately 33 miles long and up to 10 miles wide. Its area comprises approximately 205 square miles of alluvial valley land and is enclosed by Mississippi River Project levees except for a 1,500-foot gap at the lower end, which provides a drainage outlet and allows flood backwaters to enter the Floodway. The upper St. Francis levee (called the Floodway frontline levee) which forms the eastern boundary, and the Birds Point-New Madrid Floodway Levee, called the setback levee, which forms the western boundary. The frontline levee consists of three parts: the upper fuse plug section (11 miles in length), the lower fuse plug section (5 miles in length), and the section between the two fuse plugs (38 miles in length). The fuse plug sections are designed 2 feet lower in grade than the remainder of the frontline levee and will convey the flow into and out of the Floodway. The Floodway setback levee extends from its junction with the Floodway frontline levee at Birds Point, Missouri, directly across the Mississippi River from Cairo, IL, southwesterly for a distance of about 36 miles, and ties in with the St. Johns Bayou levee near the mouth of that stream at the city of New Madrid. Forty one percent of Mississippi County, Missouri lies within the Floodway. The purpose of the Floodway is to prevent an increase in river stages upstream and adjacent to the Floodway during major flood events, which require its use.

4.0 GEOTECHNICAL OVERVIEW

The Kentucky Transportation Cabinet (KYTC) is evaluating potential roadway corridors for the construction of Interstate Route I-66 through portions of Marshall, Graves, Ballard, Carlisle, and McCracken Counties, Kentucky; Mississippi, Scott and Cape Girardeau Counties, Missouri; and Alexander, Pulaski, and Massac Counties in Illinois. Also under review are potential river crossings. Maps presenting the various corridors studied during each level of evaluation are presented throughout the project report.

Note: There is limited information and analysis presented for Illinois. This is because Illinois was not a participant in the study when the majority of the geotechnical work was completed. There are similar geotechnical issues faced in Illinois, especially in southern Illinois, as those documented for Kentucky and Missouri.

The scope of work for this study consists of performing a geotechnical overview for the study area based upon research of available published data; experience with highway design and construction within the Mississippi Embayment physiographic region; and field reconnaissance of the region. General geotechnical/geologic characteristics of the study area have been identified with special attention given to the potential Mississippi River and/or Ohio River crossings. A literature search was performed using a variety of sources. Tasks performed for this aspect of the study included reviews of the following items:

- Available topographic and geologic mapping of the project area published by the United States Geological Survey (USGS) and the Kentucky Geological Survey (KGS);
- The Geologic Map of Missouri, published by the State of Missouri, the Department of Natural Resources, and the Missouri Geological Survey;
- KGS Oil and Gas Development Activity mapping;
- National Wetlands and Wildlife Management Areas as recognized by the U.S. Department of the Interior, Fish and Wildlife Service;
- KYTC data from geotechnical explorations for roadway bridges in the vicinity of Wickliffe, Kentucky;
- Websites of various bridge projects of Mississippi River crossings.

A field reconnaissance of the region and the proposed roadway corridors was performed on July 3, 2003. Based upon the results of the field reconnaissance and reviews of the noted information, the general site physiology has been summarized, and corridor features of geotechnical significance that may influence alignment and grade selection have been identified. The following sections present the results of this overview.

4.1 Topography and Drainage

Figure 4-1. Mississippi River and Adjacent Flood Plains

The proposed roadway corridors are primarily located in Western Kentucky and Southeastern Missouri, and lie within the Mississippi Embayment physiographic region which is part of the Coastal Plain physiographic province. In Kentucky, these corridors are situated on portions of seven USGS 7.5-minute topographic quadrangle maps. They are the Barlow (1977), Wickliffe (1983), La Center (1975), Blandville (1977), Heath (1978), Lovelaceville (1978), and Paducah West (1982) Quadrangles. In Missouri, the corridors are situated on the Wyatt (1979) and Charleston (1979) Quadrangles. The surface topography varies within the project corridors from well-dissected uplands in the northern and eastern portions of the areas in Kentucky, to large areas of nearly level flood plain in the vicinity of the Ohio and Mississippi Rivers in both Kentucky and Missouri. Figure 4-1 is a typical view of the topography of the flood plains adjacent to the Ohio and Mississippi Rivers. The upland areas are composed of rolling hills, locally flat-topped ridges, and broad valleys. Bottomlands adjacent to the Ohio and Mississippi Rivers are relatively flat, and marked by north-south oriented lakes, ponds, sloughs, chutes, and swamps, all former routes of these rivers in normal or flood-flow conditions. Additionally, loessal silt bluffs rise as much as 150 feet above the Mississippi River flood plain near Wickliffe, Kentucky. The bedrock surface is deep within both Kentucky and Missouri in this study area (generally in excess of two hundred feet). Therefore fluvio-lacustrine soil deposits dominate the area physiology.

Surface drainage within these area of Kentucky and Missouri is directed towards numerous swales, ditches, creeks and streams, and ultimately to the Ohio and Mississippi Rivers. Backwater sloughs are present within the project vicinity at lower elevations and retain water depending on the elevation stage of the adjacent river.

4.2 Stratigraphy

Corresponding USGS geologic quadrangles are available for Barlow (1971), Wickliffe (1974), La Center (1978), Blandville (1971), Heath (1966), Lovelaceville (1968), and Paducah West (1966). The 1979 Geologic Map of Missouri, published by the State of Missouri, the Department of Natural Resources, and the Missouri Geological Survey was used to describe geologic conditions relevant to the Missouri portion of the corridors and Mississippi River crossings. Based on the various geologic mapping and literature reviewed, the proposed corridors are primarily underlain by deeply buried Paleozoic era bedrock. Thick Tertiary sediments lie under a mostly complete covering

of Ice Age deposits of sand. Alluvial deposits of gravel, silt, clay, and loess from the meltwater swollen Ice Age Mississippi River and its tributaries are also present.

Specifically, the eastern (Kentucky) portions of the corridors will cross over well dissected, Quartenary age Peoria Loess silt as well as Tertiary and Quartenary Continental deposits comprised of sandy chert gravel and gravelly sand. Within creek bottoms the surface materials are Quaternary age alluvial silt, sand, and clay deposits. In the study areas of Kentucky and Missouri adjacent to the Mississippi and Ohio river bottoms, surface materials are composed of Quaternary age fluvio-lacustrine silt, sand, and clay deposits. Throughout the project corridors, these deposits are underlain by Tertiary age silts, sands, and clays of the Clairborne and Wilcox Formations. Underlying these deposits is the Lower Tertiary Porters Creek Clay. This Paleocene formation of the Midway Group is comprised of over-consolidated, montmorillinitic clay with interlensed fine sand. Below these deposits are Upper Cretaceous and Tertiary clays and sands of the McNairy and Clayton Formation. The Paleozoic age bedrock (including Mississippian limestone and sandstone) is indicated to be at depths in excess of several hundred feet below the ground surface throughout the study limits.

4.3 Soils and Unconsolidated Materials

A thin mantle of wind blown silt material (loess) covers a large portion of the study area. Loess thicknesses are shown on the referenced geologic mapping to be up to 30 feet along the Mississippi River bluffs near Wickliffe, Kentucky. This material is described as yellowish-brown to medium-gray silt, unstratified, and containing minor amounts of clay and sand. Loess deposits are generally highly erodible and flatter cut slopes should be anticipated in these areas. Wetlands, such as marshes, natural ponds, and floodplains are common in low-lying areas in both Kentucky and Missouri. These situations often contain organic material and soft, unconsolidated soils that may require stabilization prior to constructing roadway improvements.

Alluvial materials comprised of sands, silts and gravels cover the floodplains of the Mississippi and Ohio Rivers, as well as major tributaries in the study area. The referenced mapping indicates the alluvium has been encountered in thicknesses up to 73 feet beneath the Mississippi River floodplain. These alluvial deposits overlay the fluvio-lacustrine silts, clay and sand deposits noted in Section 4.2.

4.4 Groundwater

The project corridors addressed in this overview lie within relatively flat areas of Western Kentucky and Southeastern Missouri in proximity to the Tennessee, Ohio, and Mississippi Rivers watersheds. Because of the permeable nature of the subsurface stratum, the groundwater table is close to the ground surface in floodplain or backwater areas. During design of the project roadways and associated structures, the effects of groundwater on soil strengths and stability will need to be taken into account.

4.5 Regional Seismicity

Review of available geologic mapping indicates that the roadway corridors and potential bridge sites are within the New Madrid Seismic Zone (NMSZ). The NMSZ lies within the central Mississippi Valley, extending from northeast Arkansas, through southeast Missouri, western Tennessee, western Kentucky to southern Illinois. The NMSZ is a series of faults associated with the Reelfoot Rift, and is the most seismically active region in the United States east of the Rocky Mountains. Historically, this area has been the site of some of the largest earthquakes in North America. Between 1811 and 1812, four catastrophic earthquakes, with magnitudes estimated to be greater than 8.0 on the Richter Scale, occurred during a 3-month period. Hundreds of aftershocks followed over a period of several years. The largest earthquakes to have occurred since then were on January 4, 1843 and October 31, 1895. Instruments were installed in and around this area in 1974 to closely monitor seismic activity. Since then, more than 4000 earthquakes have been detected, most of which are too small to be felt by human senses. On average one earthquake per year will be large enough to be felt by communities in the area.

On the basis of the large area of damage (230,000 square miles), the widespread area of perceptibility (1,930,000 square miles), and the complex physiographic changes that occurred, the Mississippi River valley earthquakes of 1811-1812 rank as some of the largest in the United States since its settlement by Europeans. The area of strong shaking associated with these shocks is two to three times larger than that of the 1964 Alaska earthquake and 10 times larger than that of the 1906 San Francisco earthquake.

Although earthquakes in the central and eastern United States are less frequent than in the western United States, they affect much larger areas. Figure 4-2 (Source: http://quake.wr.usgs.gov/) shows two areas affected by earthquakes of similar magnitude-the 1895 Charleston, Missouri, earthquake in the New Madrid seismic zone and the 1994 Northridge, California, earthquake. Red indicates minor to major damage to buildings and their contents. Yellow indicates shaking felt, but little or no damage to objects.

Earthquake epicenters and magnitudes for the Central and Eastern United States are presented in Figure 4-3. This figure indicates all of the corridors within this study are in areas of significant seismic potential.

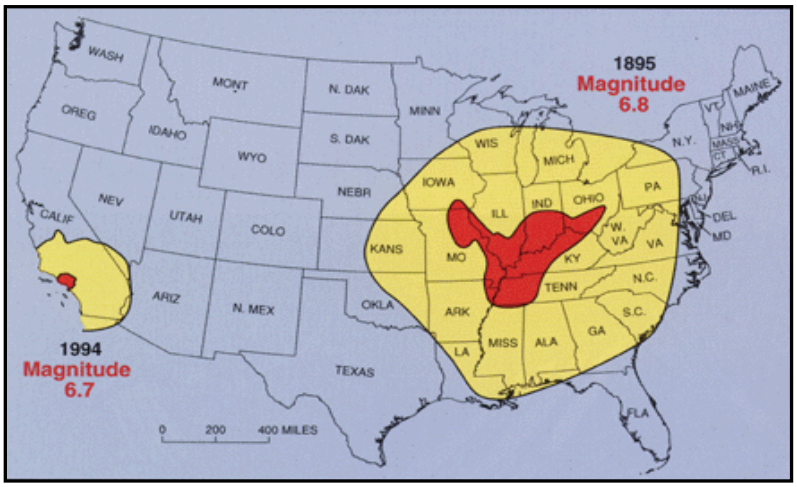


Figure 4-2. Relative Size of Affected Areas

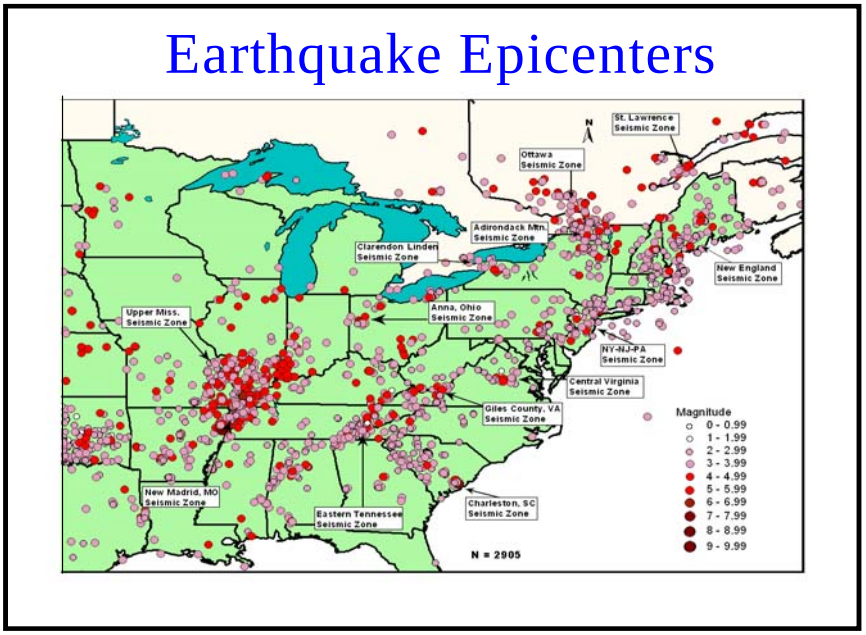


Figure 4-3. Earthquake Epicenters and Magnitudes in the Central and Eastern United States

4.6 Corridor Features

The primary land uses within the project corridors are farmland cultivated for crops; undeveloped forest, grasslands and wetlands; single-family dwellings; and commercial entities commonly associated with small towns. The area is extensively farmed both within and outside the flood plains of the Ohio and Mississippi Rivers. Levee systems, both privately and publicly owned, are located adjacent to the Ohio and Mississippi Rivers and function as flood control structures during high water events. Additionally, sand and gravel has been quarried and timber logging has occurred throughout the region.

McCracken, Ballard, and Carlisle counties Kentucky are within a predominantly rural farm community setting. Likewise, Mississippi County Missouri is also heavily agricultural in land use. Small towns are usually situated at the intersection of county and state routes or historic railroad depots. Numerous schools and churches are located within the proposed corridors presented herein. Gas stations, stores, small commercial businesses and residences are common within these communities. Many of the stores sell gas and diesel fuel. Existing gas stations and stores that handle petroleum products and chemicals often have numerous storage tanks for their products. Small businesses such as auto body and repair shops, farm equipment and supply stores, construction companies and equipment rental companies have tanks and other environmentally sensitive concerns that need to be considered when evaluating a corridor. Locations of former gas stations, stores and other businesses may have abandoned storage tanks, unstable refuse storage areas, or debris dumpsites.

The rural areas generally have various homestead and farm situations that exist within subwatersheds off a primary watershed. These properties are often owned by families that have been in the area for many decades. Lumberyards, farm equipment stores, and community groceries are commonplace in rural areas. Family and community cemeteries are common throughout the region. The field reconnaissance of July 3, 2003 noted that the corridor which follows US 60 to be the more heavily populated of the corridors. In addition, US 60 is the primary arterial road between the major communities in this area, and is therefore much more heavily traveled than the roads associated within other corridors.

The Peal and Swan Lake Wildlife Management Areas (WMA's) are located approximately two miles west of the community of Barlow, Kentucky. The Winford WMA is located nearly 2.5 miles southeast of Wickliffe, Kentucky.

The Barlow Bottoms area on the Ohio River floodplain is in the study area. This area consists primarily of north-south oriented ancient river channels of the Ohio River which were abandoned during channel migration and have been filled in over time by alluvial sediments. Geotechnically, each trough may present its own individual subsurface profile and strength characteristics. Also, these wetlands typically present high water tables as well as soft and/or unconsolidated soils which present issues regarding foundation stability, settlement and sensitivity to seismic events.

Another prominent feature is the Mayfield Creek. This is a low gradient stream which is prone to flooding by backwaters of the Mississippi River. A bridge will be required to cross this stream, and the substructure elements will be required to resist alternating flow directions and forces from debris/drift.

The Birds Point – New Madrid Floodway is located on the Mississippi River Floodplain in Southeastern Missouri, south of the confluence of the Mississippi and Ohio Rivers. The central purpose of the floodway is to provide additional floodwater storage in this part of the river to prevent the Project Design Flood from exceeding its design elevation at and above Cairo, Illinois. Therefore, it is anticipated that any roadway crossing the floodway will be elevated in the form of a bridge to reduce the impact upon the floodway capacity. Substructure elements of these bridges should be designed to resist extreme flow conditions and scour events resulting from levee breaches and inundation during the operation of the flood way. In order to cross the floodway at the proposed locations, bridge lengths must be on the order of 2.8 and 4.2 miles, respectively. Such bridge crossings would necessitate the construction of large numbers of deep foundations.

The 1965 Flood Control Act provides for operation of the floodway in the event floods reach a height of 58 feet, and are projected to exceed 60 feet on the Cairo, Illinois gauge. The current operation plans entail artificially crevassing sections of the levee at the upper and lower “fuse plugs” using explosives having a cratering effect 1.5 times greater than TNT. The Upper Fuse Plug section is approximately 11.3 miles long and includes an area to be breached (the inflow crevasse) approximately 11,000 feet in length. Figures presented in the USACE letter indicate that only crossing 11, 12, 13, 14, 15 and 21 will be within the inflow crevasse area. A safety zone for liquefaction potential, airblast, and ground motion has been established to be one half mile from any of the detonation sites. Additionally, a one-half mile strip along the length of the Upper Fuse Plug was purchased by the USACE and quit claimed to the local levee district. The quit-claim deed(s) reportedly contain a clause stipulating that no permanent structures may be built on this property because of anticipated damage from blueholing (deep scour) and sanding (sandbar deposition) resulting from floodway operations. The USACE operation of the floodway would require that all roadways entering the area be closed until recession of floodwaters and safety inspections of the floodway area have been performed.

Flood control levees were noted to border other portions of the flood plains of the Ohio and Mississippi Rivers, as well as smaller tributaries. These earthen levees were placed to protect both developed and agricultural areas during high water events. In addition, structures comprised of large cyclopean stone dikes were noted along the banks of the Mississippi and Ohio Rivers jutting into the river channels in the study area. These structures are typically under the jurisdiction of local levee districts or the United States Army Corps of Engineers and are used to control or channel flow within the river. Close interaction with these entities will be required because these levees and dikes will have to be accounted for in evaluation of any corridors to reduce the potential of the I-66 roadway jeopardizing their effectiveness.

4.7 Geotechnical Concerns

4.7.1 Roadway

Existing roadways within the proposed corridors typically follow existing topography with little excavation or fill placement. In areas of Kentucky and Missouri crossing significant floodplains and streams, planned roadways are often elevated atop existing earthen levees or in the form of bridges. As previously noted, local soils are primarily loessal in nature, and are highly erodible. Soil embankments should be designed with as flat an outslope as practical (maximum of 3 horizontal to 1 vertical) to reduce erosion and promote revegetation. Embankments crossing areas subject to inundation by flooding may require the application of slope protection, and/or require construction using freely draining materials up to the high water elevation, in order to reduce the loss of embankment material and improve stability during floodwater recession.
Soil cuts may occur in upland loess soils, and should also be designed with as flat an outslope as possible to reduce erosion and promote revegetation. Additionally, intercept ditching may be required above the daylight points of soil cuts to direct surface runoff away from soil cut faces.

In addition to being highly erodible, the referenced loessal soils are extremely moisture sensitive, and this characteristic should be considered in all aspects of design. Dry loess deposits subjected to moisture intrusion may lose interparticle bonds and therefore experience a loss of strength and an increase in compressibility. In addition, the saturation of a loess soil and the subsequent loading/unloading can fluctuate pore water pressures within the soil and create quick (free flowing) conditions. Because these loess soils are highly moisture sensitive, the KYTC typically avoids the use of these soils as roadway subgrade.

Figure 4-4. View of Illinois Approach, Cape Girardeau, IL

4.7.2 Structures

Bridges will be required in each of the corridors to carry the roadways over small streams, backwater sloughs, major rivers, and possibly over sensitive wetland areas. Crossing 8 – Level 2 Alternatives will require a bridge over the Ohio River into Illinois. At this location, the Ohio River is approximately 4,000 feet wide. Other corridors will require bridges over the Mississippi River into the state of Missouri. At these crossings, the Mississippi River is on the order of 4,000 to 5,000 feet wide. There are two new major bridge projects over the Mississippi River which are similar to this project. The first, as shown in Figure 4-4 (Source: http://www.modot.state.mo.us/) is a cable-stayed structure connecting Cape

Girardeau, Missouri and East Cape Girardeau, Illinois. This structure has a main span length of approximately 1,150 feet. The second structure carries US Highway 82 between Greenville, Mississippi and Lake Village, Arkansas. The main span length of the Greenville bridge is to be approximately 1,370 feet and when completed, will have the longest cable-stayed span over the Mississippi River. Figure 4-5 (Source: http://www.greenvillebridge.com/), shows the construction of a dredged caisson main span pier for the Greenville Bridge.

Figure 4-5. Greenville Bridge Pier 37

Approach embankments to structures in upland areas away from major streams will likely be designed using traditional soil fill placement techniques. Structures over floodplains subject to frequent or severe flooding may require elevated approach spans. Existing bridges within the corridors over low or 'backwater' areas such as Mayfield Creek and Minor Slough were noted during the field reconnaissance to be comprised of multiple short spans with reduced intrusion of approach embankment construction within the floodway.

Because of the depth to bedrock in each of the corridors, it is probable that all foundation systems for the bridges will be soil-bearing deep foundations. Typical foundation types for bridges with similar subsurface conditions include: driven piles, drilled shafts, and dredged caissons. Conversations with Kentucky Transportation Cabinet (KYTC) personnel indicate that the most widely used foundation type for short span bridges in the area is driven piles. The bridge crossings over the Ohio and Mississippi Rivers will require main span lengths approximately 1,500 feet to meet navigation requirements. With increasing span length, increased foundation capacity is required. Therefore, each type of foundation system should be evaluated to determine which is the most efficient and cost effective. Both driven piles and drilled shafts are considered slender foundations, and will develop axial capacity from the friction between the pile/shaft perimeter and the surrounding soils. Resistance to lateral movement of the slender deep foundations will be derived from the surrounding soils and is dependent upon the embedment lengths, diameters and material properties of the piles or shafts. Dredged caisson foundations follow a spread footing concept which derives bearing capacity at the bearing surface under the caisson. This type of foundation is typically massive, and can withstand significant lateral loads. Because of the significant regional seismicity described in Section 4.5, the ability of a particular foundation type to withstand seismically induced forces will likely govern foundation selection.

4.7.3 Seismic

Regardless of which roadway corridor and bridge crossing are selected for final design, seismic considerations will play a significant role in design and construction. As noted in Section 4.5, the proposed corridors lie within the New Madrid Seismic Zone. A seismic event could create several geotechnical problems. One of which could be a seismic event inducing liquefaction of foundation soils beneath embankments and substructure locations. Liquefaction induces a reduction of the load bearing capacity of the soils in the affected areas. This loss of strength could cause embankment settlement/failures, or the loss of frictional soil resistance to bridge substructure foundations. The loss of frictional strength could leave the foundations laterally unsupported, and in the case of friction piles or drilled shafts bearing in soil, axially unsupported. A second potential geotechnical concern could be a seismic event introducing lateral movements and therefore loads into the foundation systems of structures. Introducing lateral loads while there is a loss of soil strength would require the foundation system to carry all structural and induced loads internally. Additionally, the proposed bridge site should be characterized seismically in order to provide spectra response to the bridge design team.

It is recommended that seismic analyses be performed using data collected from sample borings along the proposed centerlines of any bridge structures. Analyses may include simplified seismic site response, equivalent one-dimensional site response, liquefaction and post-liquefaction settlement. In addition, static slope stability, pseudo-static slope stability, and permanent seismic deformation analyses should be performed for all approach embankment locations.

4.7.4 Scour

Because of the previously described loess, clay, sand, and gravel soil types present throughout the corridors, scour will be of concern in areas surrounding bridge foundations, and embankments adjacent to streams. Both local and contraction scour potential should be estimated for each potential corridor prior to selection. Contraction scour is initiated because of increased flow velocities through the bridge openings, changes in local base-level elevations, or flow around a bend. The most common cause of contraction scour is the contraction of flow by bridge approach embankments that encroach on the floodplain or the main channel, or both. Local scour is the removal of material around piers, abutments, spur dikes, and embankments caused by flow acceleration and turbulence near bridge sub-structure elements and embankments. Local scour can be increased as the result of accumulation of debris in a bridge opening. Figure 4-6 (Source: http://www.missouri.usgs.gov/) illustrates the potential of local scour on a typical bridge pier location.

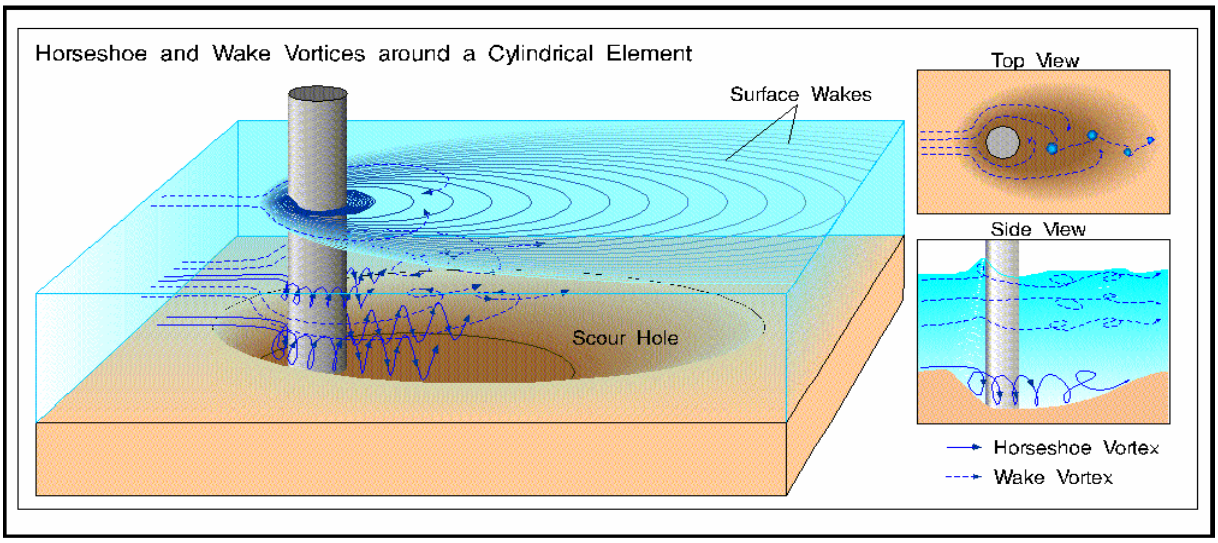


Figure 4-6. Scour

A final scour study should be performed in conjunction with hydrological and hydraulic modeling during the design of the selected bridge structure. Major floods on the Mississippi and Ohio Rivers can create very high flow conditions. Local scour depths greater than 10 feet were reported, (on the above referenced website), after the 1993 Upper Mississippi/Missouri River floods. All bridge foundation designs in the study area will require that the results of detailed scour analyses be incorporated into establishing the embedment depth of individual substructure foundations. Typically, the KYTC requires that the tops of all spread footings and the bases of all shaft/pile caps be constructed below the anticipated maximum scour elevation

4.8 Conclusions

The purpose of this overview was to provide a general summary of the soil and stratigraphic features likely to be encountered within the study area, and to identify geotechnical features which could have adverse impacts on design and construction.

Based on this study, the area is geotechnically feasible to accommodate a roadway corridor. These new corridors will encounter features associated with loessal deposits, deep soils, wetland and major stream crossings. Moisture-sensitive loessal deposits present erosion problems as well as stability issues. Deep subsurface soils typically increase the foundation costs of bridges, and can be more sensitive to seismic events. Because of the substantial length of the main span and approaches as well as the seismic, scour, and deep foundation aspects of design, any Mississippi River and/or Ohio River crossing will require significant design efforts.

Roadway aspects to be addressed as design continues are associated with use of flatter cut and embankment slopes to reduce soil erodibility, stabilization of soft/wet

areas prior to embankment construction, and the construction of roadway embankments subject to floodwater inundation using free draining and/or scour resistant materials.

The roadway corridors will encounter wetlands, streams, rivers, and other types of conditions where structures will be needed. Any crossings will require extensive amounts of bridging. Bridge substructure elements and foundations in the areas of the Ohio River and Mississippi River would be required to meet much more stringent (USACE) criteria than traditional bridging over non-floodway lands in the area. These increased requirements within the floodway would likely require substantial supplemental geotechnical investigations and analyses.

The information presented in this section of the report should be viewed in the general nature in which it was intended. A more detailed study, which was beyond the scope of this work, would be required to more specifically define potential problem areas within the proposed corridors. A thorough geotechnical exploration and seismic evaluation of the selected alignment and grade will be required to help the design team anticipate and plan for special requirements necessary for design and construction of a roadway and major river bridge.

5.0 PRELIMINARY CORRIDORS

This section presents the initial corridor development process used for the I-66 Corridor Study Western Kentucky to Missouri section. It also includes a description of the preliminary corridors themselves.

5.1 Development Process

A wide-range of corridors was developed in response to the study's goals and objectives and identified issues. The corridor development process was interactive and took into account suggestions and input from a wide variety of sources, including:

- Stakeholders / Public at the public workshops in both Kentucky and Missouri
- Project Work Group input
- Project Team input
- Previous studies
- Existing transportation plans

Specific activities to solicit input for the corridors development process included:

- Project Work Group input in a workshop style meeting where numerous corridors were developed and discussed. This meeting was held in Charleston, Missouri on July 25, 2002.

- A set of two (2) public workshops also held in workshop format, specifically designed to receive public comments and feedback on three sample corridors and to receive suggestions for other potential corridors developed by participants at the workshops. These workshops were held in Sikeston, Missouri and in LaCenter, Kentucky respectively on August 19 and 20, 2002. (See Technical Appendix 1 – Public Involvement Summary for more details regarding these and other meetings. Also, even more details are available in the individual Public workshop summaries available from the KYTC Division of Planning.)

5.2 Issues Addressed

The initial corridors were designed to address many observed transportation system deficiencies, problems and other issues in the study area including:

- Identify a viable corridor(s) from I-24 in Western Kentucky to Missouri consistent with national and / or Kentucky legislation, previous national and Kentucky studies, and the goals of the Delta Commission, including improved access and mobility in depressed or impoverished regions
- Maximize connectivity between Kentucky and Missouri

- Stimulate the economic development potential in Western Kentucky and Southeastern Missouri
- Accommodate increasing automobile and truck traffic
- Improve traveler safety
- Support completion of I-66 across southern Kentucky, providing system continuity from West Virginia to Missouri

Although not all encompassing, the list provides a good indication of the types of problems and issues that were of consequence or had an impact on the development of the preliminary corridors.

5.3 Corridor Descriptions

Public stakeholders (citizens), the Project Work Group, and the Project Team identified 23 initial corridors – including combinations and hybrids, and an assumed No - Build Option (for comparison to other "build" corridors).

No - Build Corridor - Includes all existing and committed plans in the KYTC's Six Year Highway Plan and MoDOT's Long Range Transportation Plan.

Corridor 1 - From existing I-24 corridor in Illinois due westward on new right-of-way through Shawnee National Forest in southern Illinois to Missouri 146 near Cape Girardeau via new bridge to I-55

Corridor 2 - From existing I-24 corridor in Illinois due southwestward on new right-of-way avoiding major environmental areas in Illinois and Missouri around the Shawnee National Forest in southern Illinois to Missouri 34 near Cape Girardeau over new bridge to I-55

Corridor 3 - From I-24 north of Metropolis, Illinois follow US 45 in Illinois northwest then following corridor 2 as described above to I-55

Corridor 4 - From existing I-24 corridor in Illinois due southwestward on new right-of-way avoiding major environmental areas in Illinois and Missouri around Shawnee National Forest to new bridge over Mississippi River south of Cape Girardeau to I-55

Corridor 5 - From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe, Kentucky over the Mississippi River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57

Corridors 6 / 7 - From existing US 60 east of Kevil, Kentucky go southwest on a new corridor towards Wickliffe over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57

Corridor 8 - From I-24 at Paducah, Kentucky along existing KY 286, US 60 or US 62 corridor to a point east of Wickliffe, proceed northwest on new route across the Ohio River on a new bridge to I-57 in Illinois

Corridors 9 / 10 - From I-24 near Paducah, Kentucky follow a new route southwesterly to Wickliffe (parallel to US 62 and KY 286) across the Mississippi River on a new bridge to I-57

Corridors 11 / 12 / 13 / 14 / 15 / and 21 - From I-24 south of Paducah follow new route southwest parallel to KY 286 to a point south of Wickliffe over the Mississippi River on a new bridge to I-57 *NOTE: For the remainder of the document, this corridor is sometimes simply referred to as Corridor 11*.

Corridor 16 - From I-24 in Marshall County, Kentucky proceed west along a new route to McCracken County then follow parallel route to Corridor 14 above

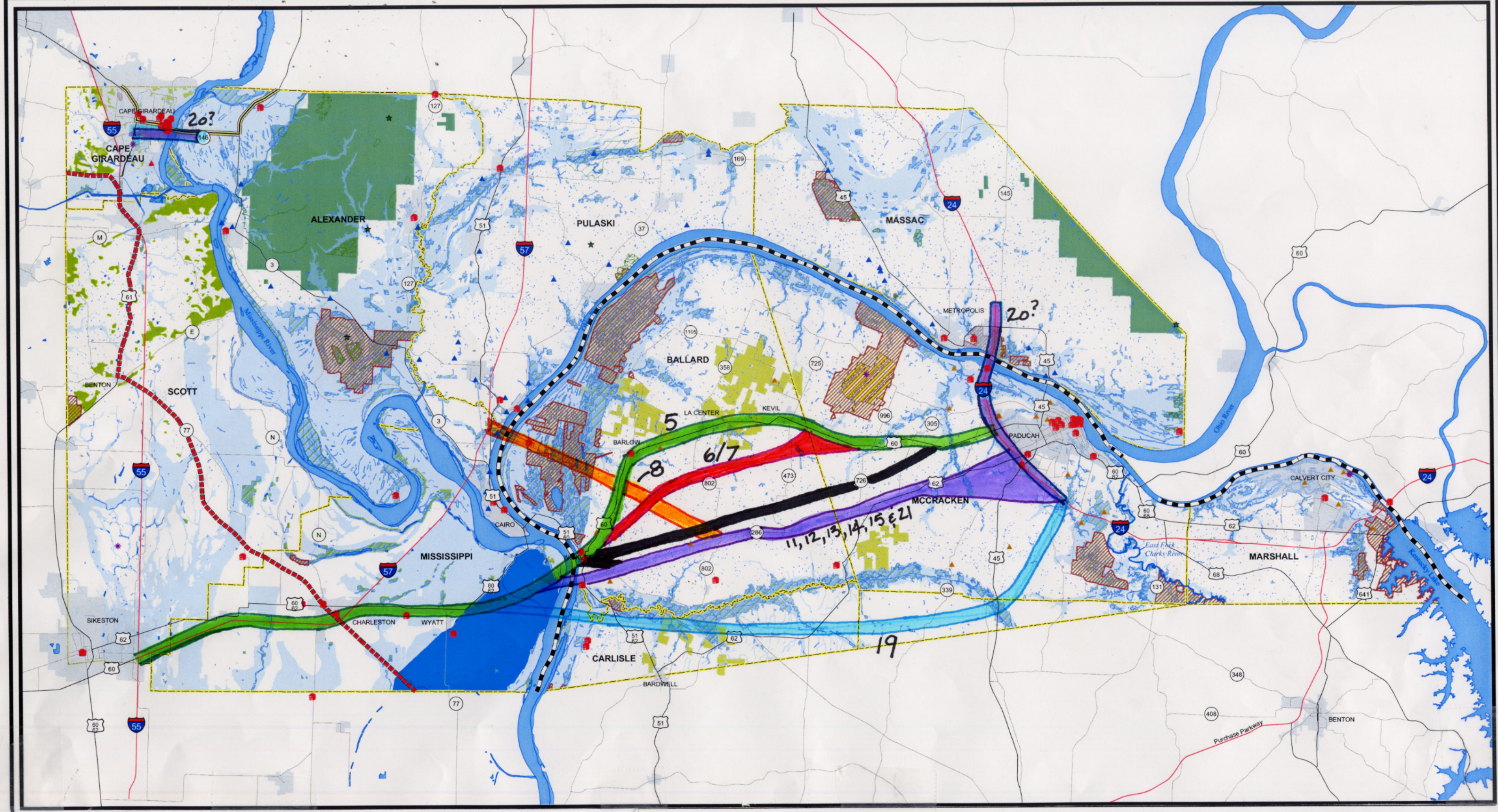
Corridor 17 - From I-24 near US 68 in Marshall County, Kentucky proceed west to McCracken County along new route parallel to 16 above to similar route as 14 west and south of Paducah

Corridor 18 - From I-24 / US 60 / US 68 location in Marshall County, Kentucky proceed west along new route to McCracken County with 17 then follow parallel route to option 14 above

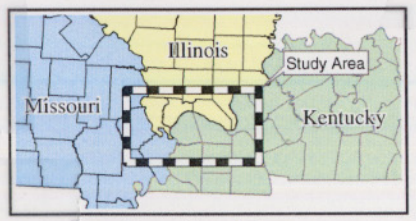
Corridor 19 - From existing US 60 bridge across Tennessee River in Kentucky proceed south west across I-24 to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston

Corridor 20 - Re-badge existing interstate I-24 in Kentucky as I-66

Corridor 22 - From existing I-24 corridor proceed due southwest on new right-of-way avoiding major environmental area(s) in Illinois to existing I-57



- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route
- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- PROJECT STUDY AREA



Location Map

N W E S

0 2.5 5 Miles

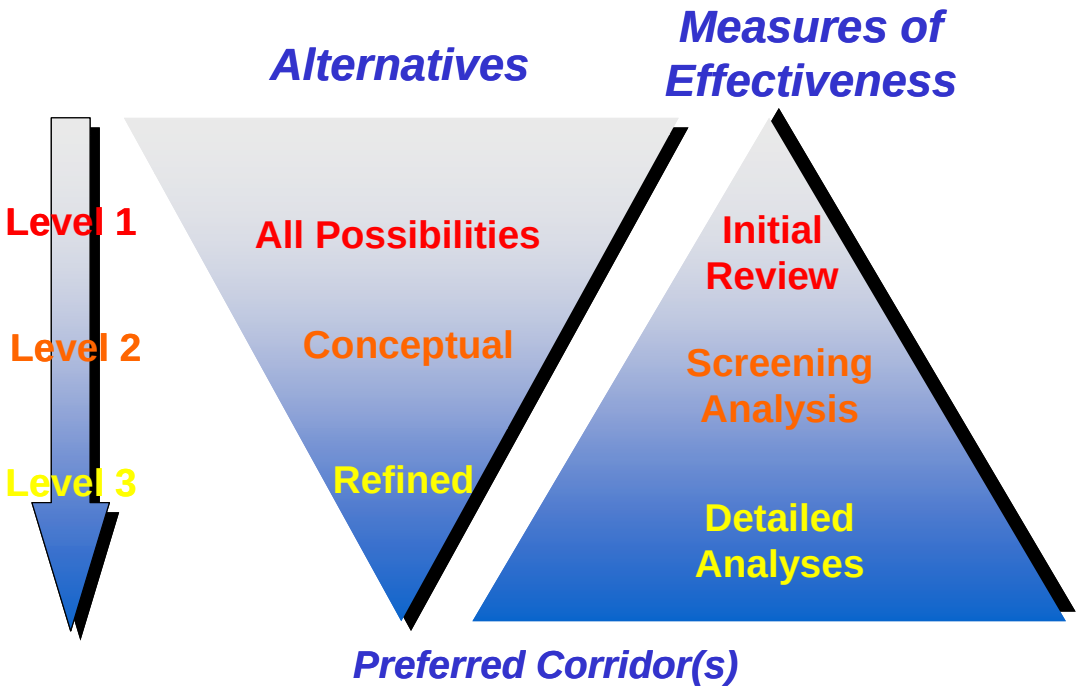
Figure 11
LEVEL 1 ALTERNATIVES
I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

6.0 CORRIDOR EVALUATION METHODOLOGY

6.1 Introduction

This section describes the project's screening and analysis process that was applied to the corridors developed for the I-66 Corridor Study Western Kentucky to Missouri segment. The screening and evaluation process used for this entire project was undertaken collaboratively by the Project Team (representatives of the KYTC Central Office Planning staff, KYTC District 1 and Missouri DOT staffs, the consultant team), the I-66 Project Work Group, and the public who attended a total of the eight (8) open-house workshops (4 meetings each in Missouri and Kentucky). All input from these individuals, along with the objective screening results were put into the evaluation and analysis process.

The purpose of the process was to refine the list of possible corridors from a long list of many / all-possible corridors (universe) at the start of the project, to a shorter list of recommended one(s) at the conclusion of the study. Initially, a few pertinent, qualitative details were identified for the initial group of corridors. As progress was made through the three levels of screening, the amount of information grew and became more quantitative as the number of corridors under consideration decreased.



The first phase of analysis, the Level 1 screening, focused on more qualitative, rather than quantitative analysis. This first level was an initial analysis of the general feasibility of the corridors. As the screening process progressed, more detailed information was

developed. The criteria for Levels 2 and 3 gradually became more definitive and utilized more quantitative rather than qualitative data for the respective analysis.

The following sections detail the three-level screening process.

6.2 Level 1 – Initial Screening

The initial level of analysis sought to apply limited measures of evaluation to all corridors that were developed in order to eliminate some of them from further consideration. Sometimes referred to as a "fatal flaw" screening, this first level of analysis relied on rather qualitative criteria and analysis garnered from the study's internal working staff or Project Team as well as input from the Project Work Group and the public. Simply put, the evaluative criteria for Level 1 screening focused on whether or not it was likely that a corridor could be developed successfully into the project development phase. The focus of this initial analysis included:

- **Constructability / Implementation / Feasibility -** To what extent is a corridor implementable? This included issues such as ease of construction, political support, and funding.
- **Compatibility with Goals, Objectives, and Issues -** To what extend is a corridor compatible with identified and adopted Goals, Objectives? To what extent does it address identified problems and/or issues?
- **Community / Environmental Impacts -** To what extent does a corridor enhance or degrade the natural, social, built, or economic environments?

6.3 Level 2 – Screening Analysis

The Level 2 evaluation was performed on a smaller set of corridors for which more details were developed. Some criteria from Level 1 shown above were carried through to Level 2, although these criteria were expanded and more detailed measures and information were applied. More specific measures were developed and refined to quantify and evaluate potential impacts of each corridor in greater detail.

Building on Level 1, criteria for Level 2 included:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time (savings), number of users (volume / average daily traffic (ADT)), truck percentages, safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation

- **Support** – likelihood that one or more corridors was supported /is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., to

date. This description also contains relevant criteria or issues to be scrutinized or that were identified as important during the public workshops.

- **Community Impacts** – compatibility with adjacent and proposed land uses and the effects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc.), calculated by lane miles of adjacent property. Also included an environmental justice analysis

- **Property Impacts** – more specific impact determining need for new right-of-way quantified in acres

- **Environmental Impacts** – impacts on known mapped historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat areas, number of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands

- **Capital cost considerations** – order of magnitude capital costs for proposed corridors derived on a built up unit cost and cost per mile basis from typical sections for roadway (at-grade and elevated) and bridge improvements, and typical cost basis for interchanges

6.4 Level 3 – Refinement

Finally, a third round of screening took place based on the most detailed analysis. This third round of refinement used the processes described above to focus even more detailed analysis on the corridors that survived from the first two rounds of screening. This analysis phase brought more depth and a finer detail to the range of information known about the final corridors and sought to determine the most refined quantitative and definitive information about each corridor. At this point, the volume of technical data about each of the corridors was at its peak. Measures from Level 2 will were refined to include the following measures:

- **Traffic Operations** – refinement for Level 3 involved revised model runs with some manual adjustments / interpolation to account for model conditions. This new round of analysis included total vehicle miles of travel (VMT) and total vehicle hours of travel (VHT) for the entire statewide model

- **Support** – no refinement for Level 3, however subsequent public / stakeholder comments from all meetings received were incorporated

- **Community Impacts** – refined to include more quantitative number of impacts to community by type

- **Property Impacts** – refined to include more specific impacts determining need for new right-of-way quantified in acres and with refined approximate costs of that property by corridor

- **Environmental Impacts** – refined to include threatened rare and endangered species locations (corridor specific), and bridge location geology / compatibility

- **Capital cost considerations** – refined to separate costs for right-of-way, utilities, design, construction costs and contingencies

7.0 COORDINATION WITH AGENCIES

The Project Team discussed several issues relative to the project's study area that would influence the development and evaluation of the corridors. Various Federal and state agencies were consulted. Issues discussed included various Mississippi River bridge crossing locations and their navigation impacts with the US Coast Guard, and the impacts of roadways and bridges on the Birds Point New Madrid Floodway with the US Army Corps of Engineers, Memphis District. In addition, the Project Team also discussed the potential impacts to the wildlife management areas in northwest Ballard County with the Kentucky Department of Fish and Wildlife and the Kentucky Nature Preserves Commission.

7.1 Mississippi River Navigation Impacts

Upon discussing potential Mississippi River crossing locations – one just south of Wickliffe, Kentucky and one in Carlisle County, Kentucky with the US Coast Guard, it was learned that the north Mississippi River crossing location (roughly near mile marker 951 just south of Wickliffe) is close enough to the confluence of the Ohio and Mississippi rivers that it effectively would interfere with safe river navigation. In fact, the affects of a bridge location, including piers, anywhere between mile makers 951 and 949.5 (nearer Wickliffe) would have negative impacts on safe river navigation and thus any bridge location in this area is problematic from that standpoint.

The Coast Guard is more comfortable with and accepting of a river crossing south of mile marker 949 in Carlisle County. This is far enough south of the confluence area of the rivers and would allow for barge tows to have adequate time to maintain a proper and safe course to avoid the bridge piers and other obstructions. Possibly at this point, the right descending pier would be located on the Missouri bank with the left descending pier being placed behind a dikefield. A 1,500+ foot horizontal clearance would be required to safely meet the need of waterway navigation traffic below the bridge. Pier protection, including the use of dolphins would need to be examined during further project stages.

These conclusions were reached based upon advice and consultation given in written correspondence from the Coast Guard dated February 13, 2003 from Mr. Roger Wiebusch, Bridge Administrator for the St. Louis district and detailed discussions during a conference call with the Project Team and Mr. Wiebusch held on June 25, 2003. The subject letter and the conference call also indicated that the Ohio River crossing location (Corridor 8) is also acceptable with the 1,500+ span. Therefore, it is concluded that any Mississippi River bridge location that is should be no further north than LMR mile marker 949 in Carlisle County, Kentucky.

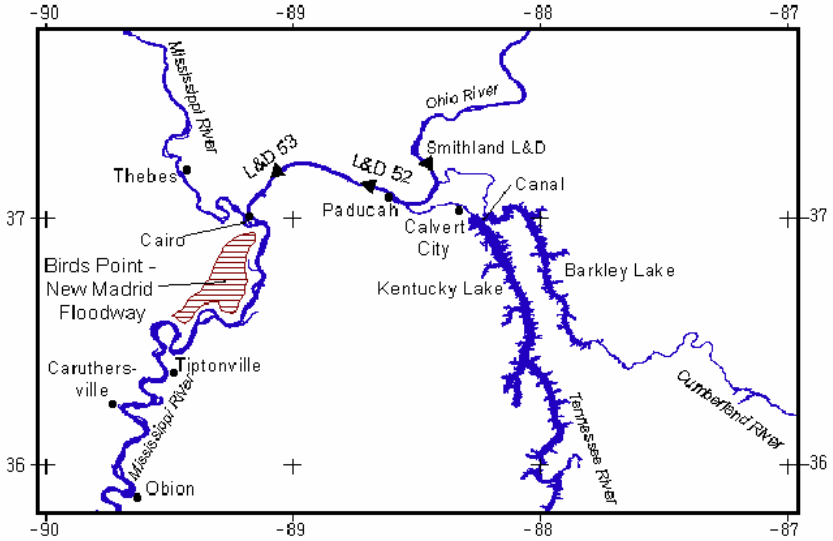
7.2 Birds Point-New Madrid Floodway Impacts

The Project Team also coordinated the bridge location's impacts on the Birds Point-New Madrid Floodway with US Army Corps of Engineers, Memphis District. The Birds Point-New Madrid Floodway is a component of the Mississippi River and Tributaries (MR&T) Project, and is located on the west bank of the Mississippi River in southeast Missouri just below the confluence of the Ohio and Mississippi Rivers. The construction and operation of the floodway was authorized by the 1928 Flood Control Act and later modified by the 1965 Flood Control Act. The purpose of the floodway is to lower flood stages upstream and adjacent to the floodway during major flood events. The Floodway is roughly 35 miles in length and varies from 4 to 12 miles in width. It comprises about 205 square miles of alluvial valley land.

The primary features of the floodway are the setback (mainline) levee, which extends from Birds Point, Missouri, to New Madrid, Missouri, and the frontline levee which is located on the west bank of the river and generally follows its alignment. Within the frontline levee, there are two fuse plug sections. These sections were designed and built 2 feet lower than the remaining portions of the frontline levee. The upper fuse plug section is 11 miles in length and is located in the northernmost reach of the frontline levee. The lower fuse plug is 5 miles in length and is located in the extreme lower end of the frontline levee. In addition, there is an existing 1,500-foot gap, which is located between the setback levee and the end of the frontline levee. This opening currently provides a drainage outlet for interior run-off and allows flood backwaters to enter the floodway. (Note: The Corps has recently proposed a project to fill the 1,500 gap and replace it with a pumping station. To date, the project has not yet begun.)

The existing Plan of Operation for the Floodway, which was reviewed by Missouri state officials in November 1985 and approved by the President, Mississippi River Commission, in January 1986, calls for crevassing the levees to allow excess water into the floodway. There are three crevasse locations designated as Inflow, Inflow/Outflow No. 1, and Inflow/Outflow No. 2. In order to assure adequate water access to the crevasse sites access lanes are required from the Mississippi River to and along the designated crevasses. With a project design flood rate of rise, approximately 2 feet per day, initial preparation of floodway is required when the stage at the Cairo, IL, gage is approximately 59 feet; completion of preparation of the Inflow Crevasse at 60 feet; and operation of the floodway begins upon order of the President, MRC. (See diagram of the Birds Point New Madrid Floodway on the following page.) Again, it is concluded that the ultimate alignment and engineering solution is workable through the floodway. The location of the bridge and the impacts to the floodway should be fully explored during the next stages of project development.

Figure 7 -1 Location of Birds Point – New Madrid Floodway



Source: US Army Corps of Engineers

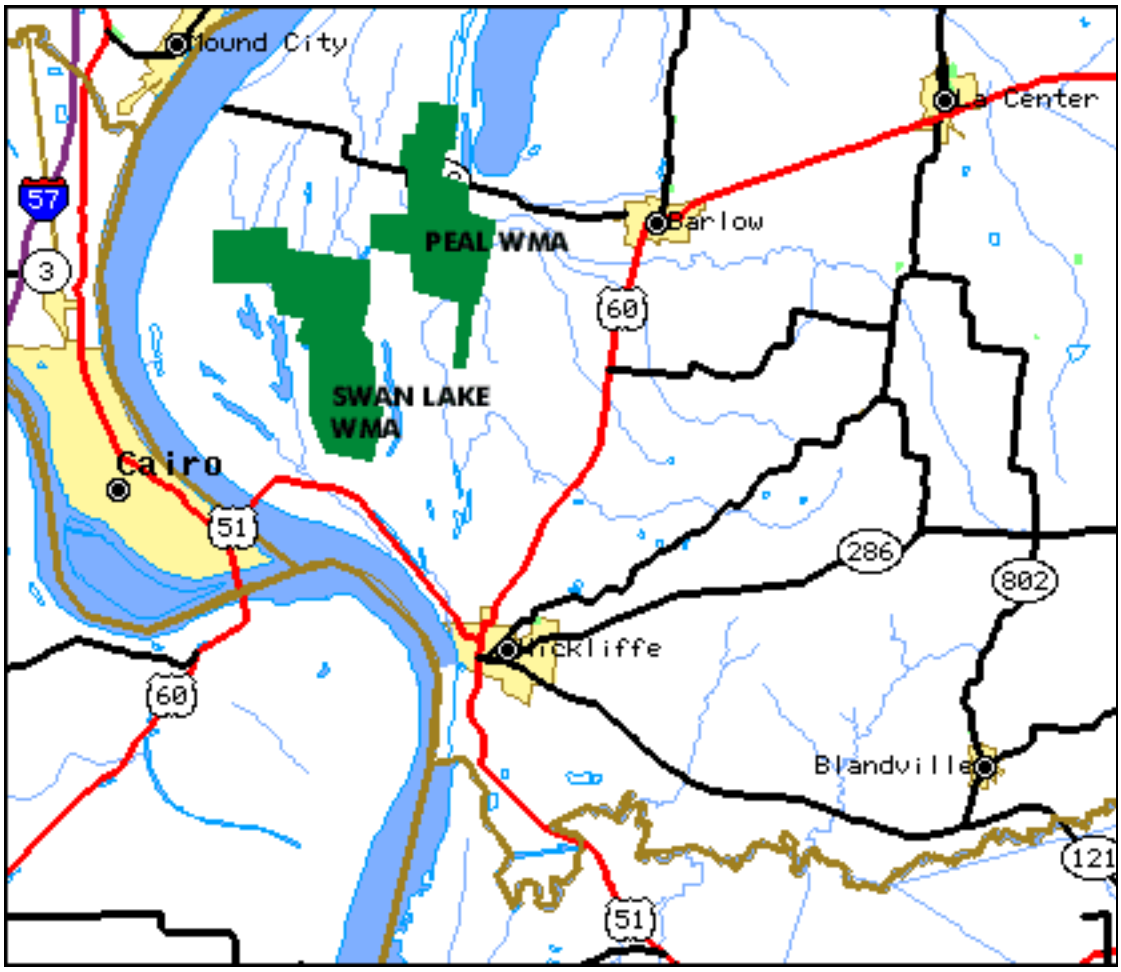
7.3 Ballard County Wildlife Management Areas

The Kentucky Department of Fish and Wildlife and the Kentucky Nature Preserves Commission Corridor have jurisdiction on lands associated with the wildlife management areas. Specifically, the Barlow Bottoms Wildlife Management Area (WMA) controlled by the Kentucky Department of Fish and Wildlife Resources. The area is composed of seven (7) individual tracts of land. However, only two (2) tracts are potentially impacted by corridors proposed by the study. Those tracts are:

- Swan Lake – a 2,100-acre tract, 6 miles northwest of Wickliffe on US 51/US60 has the state's largest natural lake and an observation tower for wildlife viewing. The habitat is primarily bottomland and flood plain area of the Ohio River, with several lakes and some interior gravel roads. Several migratory species winter here each year, including ring-billed and herring gulls, double-crested cormorants, waterfowl, and bald eagles.

- Peal – a 2,219-acre tract, 4 miles west of Barlow on Mounds City Landing Road. This area is composed of Ohio River bottomland with marshlands and cypress swamps. It has two roads, which provide access to three oxbow lakes. Bird watching, camping, hiking, fishing, and hunting activities are permissible.

Figure 7 – 2 Location of Wildlife Management Areas



Coordination between the KYTC and the Kentucky Department of Fish and Wildlife and the Kentucky Nature Preserves Commission have taken place. The KYTC had a briefing with the agencies and discussed the project with them. The agencies in turn discussed their concerns and agreed to detail them in writing. Essentially, each agency has serious concerns about the impacts of a bisecting roadway corridor on the WMAs and the wildlife that inhabit the areas. They have documented their concerns and essentially view that any impacts to associated lands and wildlife areas as a “fatal flaw”. The WMAs are home to several species that inhabit the area and need it for winter migration. Impacts to these parts of the WMAs could NOT be mitigated in the estimation of these agencies. In addition, some portions of the WMAs were purchased with federal funds and therefore other uses, such as for a highway are currently prohibited.

8.0 LEVEL 1 EVALUATION

8.1 Introduction

The following discussion presents a summary of the analysis and outcomes for the Level 1 screening analysis. This discussion, together with the Level 1 Screening Summary sheets and the Level 1 Working Paper in the Appendix 6 depict known information related to the corridors. Note that the decision to advance or not consider further in the next level of analysis a particular corridor was a collaborative decision made by the Project Work Group and Project Team with input from the public at large through meetings in both Kentucky and Missouri. Decisions were based on the evaluation of each corridor relative to the screening criteria. The decision to not advance a corridor to the next level of screening was for this study only. (Note that for ease of analysis, some similar corridors where combined, which are evident below.)

8.2 Level 1 Evaluation

The focus of this initial Level 1 analysis included:

- **Constructability / Implementation / Feasibility -** To what extent is a corridor implementable? This included issues such as ease of construction, political support, and funding.
- **Compatibility with Goals, Objectives, and Issues -** To what extend is a corridor compatible with identified and adopted Goals, Objectives? To what extent does it address identified problems and/or issues?
- **Community / Environmental Impacts -** To what extent does a corridor enhance or degrade the natural, social, built, or economic environments?

No - Build Option – The No - Build Option was not explicitly evaluated in Level 1. However, it was assumed to be carried forward as a basis for comparison in later evaluation stages consistent with current practices.

Corridor 1

Constructability / Implementation / Feasibility – Rated Low.

- Most sections of the proposed corridor lend themselves to being constructed via staged methods over wetlands and flood plains.
- Has a large section of the route is in Illinois, which was neither interested in an I-66 corridor nor participating in this study at the time of the Level 1 Screening.

Compatibility with Goals, Objectives, and Issues – Rated Medium

- Satisfies some of the goals, objectives and issues, although on a very basic level.

- Provides a new route and makes use of portions of the existing interstate
- Does little for western Kentucky in terms of supporting economic development or improving community character and quality of life.
- Improves accessibility and connectivity but is not the most direct route

Impacts – Rated Low for Community and High for Environmental

- Requires new right-of-way, although in less populated areas
- Bisects a large portion of the Shawnee National forest in southern Illinois just east of Cape Girardeau.

Overall, the corridor was not recommended for further consideration in Level 2. Its environmental impacts, especially to the forest, lack of support and interest from Illinois (at the time of the Level 1 screening), and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues all limit its ability to be implemented successfully; especially when other corridors under consideration are more viable. (Although going through a national forest may not be in and of itself a "fatal flaw"; if another feasible and prudent corridor exists, it must be considered. In the case of Corridor 1, other corridor options exist that do not involve impacts to the forest).

Corridor 2 –

Constructability / Implementation / Feasibility – Rated Low

- Most sections of the proposed corridor lend themselves to being constructed.
- Large portions to be built over wetlands and/or 100-year flood plains that would require staged construction.
- A large section of the route is in Illinois, which was not interested in an I-66 corridor, nor participating in this study at the time of the Level 1 Screening.

Compatibility with Goals, Objectives, and Issues – Rated Medium

- Minimally satisfies the goals, objectives, and issues
- Provides a new, yet circuitous route and makes use of portions of the existing interstate.
- Does little for economic development or improving community character and quality of life, especially in western Kentucky
- Provides for some improved accessibility and connectivity

Impacts – Rated Low for Community and Medium for Environmental

- Uses existing interstate right-of-way for a portion of the corridor from Paducah to Illinois.
- Requires new right-of-way but areas needed are less likely to be populated
- Avoids the large portion of the Shawnee National Forest

- Encroaches on existing natural areas, wetlands and the 100-year floodplain near the Mississippi River.

Overall, the circuitous corridor was not recommended for further consideration in Level 2. Its environmental impacts, lack of support and interest from Illinois (at the time of the Level 1 analysis), and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues combine to limit its ability to be implemented especially when other corridors are more viable.

Corridor 3 –

Constructability / Implementation / Feasibility – Rated Low

- Readily constructible, although over wetlands and/or 100 year flood plains
- Requires staged construction
- Lack of Illinois interest

Compatibility with Goals, Objectives, and Issues – Rated Medium

- Basically satisfies goals, objectives and issues
- Provides a new route and makes use of portions of the existing interstate
- Circuitous path to avoid major environmental areas
- Little economic development or improvements to community character and quality of life, especially in Western Kentucky

Impacts – Rated Low for Community and Medium for Environmental

- Uses existing interstate right-of-way for a portion of the corridor
- New right-of-way is in less populated and/or developed areas.
- Misses the large portion of the Shawnee National forest
- Encroaches on and has impacts to existing natural areas including wetlands and 100-year floodplains.

Overall, the corridor was not recommended for further consideration in Level 2. Its environmental impacts, lack of support and interest from Illinois, and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues all limit its ability to be implemented successfully. This is especially true when other corridors are more viable in the study area.

Corridor 4 -

Constructability / Implementation / Feasibility – Rated Low

- Readily constructible
- Some sections to be built over wetlands and/or 100-year flood plains requiring staged construction
- Lack of interest in Illinois

Compatibility with Goals, Objectives, and Issues – Rated Medium

- Basically satisfies some of the goals, objectives and issues
- Provides a new, circuitous route and makes use of portions of the existing interstate
- Little economic or other benefits for western Kentucky
- Provides for improved accessibility and connectivity

Impacts – Community Impacts rated Medium, Environmental Impacts rated High

- Uses existing interstate right-of-way for a portion of the corridor
- New right-of-way in areas of southwestern Illinois that is less likely to be populated and/or developed.
- Misses the Shawnee National forest
- Encroaches on existing natural areas - wetlands, 100-year floodplains and forested areas.
- New river crossing would have environmental affects on the adjacent Mississippi River aquatic ecosystem.

Overall, the corridor was not recommended for further consideration in Level 2. This corridor, like others in the same area, has environmental impacts, lacks support and interest from Illinois (at the time of the Level 1 analysis), and does little to facilitate economic development in western Kentucky. It also only minimally satisfies goals, objectives, and issues. These factors limit its ability to be implemented, especially when other corridors are more viable.

Corridor 5 –

Constructability / Implementation / Feasibility – Medium

- Readily constructible – runs through existing highway corridor
- Includes new river crossing south of Wickliffe, Kentucky, - endorsed by the McCracken County Fiscal Court

Compatibility with Goals, Objectives, and Issues – Rated High

- Satisfies a large majority of the goals, objectives, and issues.
- Provides a new route and makes use of portions of the existing facilities
- Direct route would likely facilitate economic development and provide other benefits in western Kentucky and southeastern Missouri
- Provides for improved accessibility and connectivity in the region

Impacts – Rated Medium for both Community and Environmental

- New facility would be in existing transportation corridor
- Incremental impacts would largely be similar to what already exists
- Some changes in local access points for many residences and businesses
- Avoids many of the sensitive environmental areas in the region

- May impact farmlands and other areas especially the aquatic ecosystem(s) of the Mississippi River

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives, and issues and its impacts are commensurate with likely positive regional benefits.

Corridor 6 / 7

Constructability / Implementation / Feasibility – Rated Medium
- Readily constructible - on new right-of-way
- Corridor is largely situated in undeveloped areas and farmlands

Compatibility with Goals, Objectives, and Issues – Rated High
- Satisfies a large majority of the goals, objectives, and issues
- Provides a new route and makes use of portions of the existing facilities (US 60)
- Direct route - facilitates economic development
- Improves accessibility and connectivity

Impacts – Rated Medium for both Community and Environmental
- Existing transportation corridor
- Impacts to undeveloped areas and/or farmlands
- Some changes in local farm access points
- Misses many of the most sensitive areas in the region
- Impacts on farmlands and the aquatic ecosystem(s) of the Mississippi River

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridor 8 –

Constructability / Implementation / Feasibility – Rated Medium
- Constructed on new right-of-way, including farmlands
- Staged construction over the sensitive aquatic / habitat areas near Mississippi River

Compatibility with Goals, Objectives, and Issues – Rated Medium
- Satisfies many of the goals, objectives and issues

- Provides a new route and makes use of large portions of the existing facilities (I-57)
- Not as direct as other corridors
- Provides some improved accessibility and connectivity in the region

Impacts – Rated Medium for both Community and Environmental

- New right-of-way would be needed – although in undeveloped areas
- Impacts to farms / agricultural lands
- Impacts to sensitive aquatic and wildlife habitat areas in the region, especially those near the Mississippi River and the Barlow Bottoms and Barlow Flats
- Impacts to 100-year floodplains in Missouri

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented and would provide a connection between I-24 and I-57. It does satisfy the goals, objectives and issues and its impacts are commensurate with its likely benefit.

Corridor 9 / 10

Constructability / Implementation / Feasibility – Rated Medium

- Readily constructed on new right-of-way
- Situated in farmland and / or undeveloped areas
- River crossing backed by McCracken County Fiscal Court

Compatibility with Goals, Objectives, and Issues – Rated High

- The corridors satisfy a majority of the goals, objectives, and issues
- It provides a new route and makes use of a small portion of existing roadways (US 60)
- The route is fairly direct and would likely facilitate economic development
- The route provides for improved accessibility and connectivity

Impacts – Rated Medium for both Community and Environmental

- Required right-of-way confined to existing highway, farm and undeveloped areas
- Few impacts to existing communities
- Avoids most environmentally sensitive areas in the region
- Impacts on the aquatic ecosystem(s) of the Mississippi River near new bridge

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridors 11 / 12/ 13/ 14/ 15 and 21

Constructability / Implementation / Feasibility – Rated Medium
- Readily constructible
- Built on new right-of-way
- Corridor is largely situated in farmland and /or undeveloped areas
- Corridor is well south of populated localities.
- Includes a new river crossing south of Wickliffe

Compatibility with Goals, Objectives, and Issues – Rated High
- Satisfies a majority of the goals, objectives, and issues
- Provides a new route that is fairly direct
- Would likely facilitate economic development in western Kentucky
- Provides for improved accessibility and connectivity
- Includes a new bridge to in addition to the two that are currently in use
- Closest corridor to the new industrial park planned for the western Kentucky

Impacts – Rated Medium for both Community and Environmental
- New right-of-way confined to undeveloped areas and/or farmlands
- Few impacts to existing communities or developed areas
- The corridor avoids most of the sensitive areas in the region
- Impacts to nearby agricultural district
- Will affect the aquatic ecosystem(s) of the Mississippi River

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridor 16

Constructability / Implementation / Feasibility – Rated Low
- Lengthy sections of staged construction
- Corridor runs through the wildlife preserve / conservation areas and 100 year floodplains
- Impacts to Clarks River National Wildlife Reserve

Compatibility with Goals, Objectives, and Issues – Rated Medium
- The corridor satisfies some of the goals, objectives, and issues
- Provides a new route but is longer than others
- Minimizes connectivity without a connection to I-24 in Marshall County
- Makes little use of existing facilities
- Does support economic development in the western Kentucky and southeastern Missouri regions however

Impacts – Rated Medium for both Community and Environmental

- New right-of-way needed along the entire route
- Results in community impacts
- Some impacts to existing natural areas
- Natural impacts largely confined to two locations however

Overall, the corridor was not recommended for further consideration in Level 2. It's localized environmental impacts, the fact that it does not lend itself to being readily implemented, its lack of system connectivity east of Marshall County, and its level of impacts all combine to make it less likely to be implemented, especially when other corridors are more viable.

Corridor 17

Constructability / Implementation / Feasibility – Rated Low

- Staged / launched construction over a large section
- Section for staged / launched construction is in the Clarks River National Wildlife Reserve

Compatibility with Goals, Objectives, and Issues – Rated Medium

- Satisfies some of the goals, objectives, and issues
- Provides a new route but that route is long, and makes little use of existing facilities
- Supports economic development in western Kentucky and southeast Missouri
- Improves accessibility and connectivity, but may not provide the most desirable or direct route
- Does not use I-24 as its eastern terminus

Impacts – Rated Medium for Community and Environmental

- New right-of-way needed along the entire route
- More community impacts likely
- Impacts to existing natural areas, including wildlife preserve and conservation / park areas, wetlands and 100-year floodplains

Overall, the corridor was not recommended for further consideration in Level 2. Its localized environmental impacts, its lack of system connectivity east of Marshall County, the fact that it does not lend itself to being readily implemented and its community and especially environmental impacts, all combine to make it less likely to be continued in the analysis, especially when other corridors are more viable.

Corridor 18

Constructability / Implementation / Feasibility –Rated Low
- Requires staged / launched construction
- Impacts to Clarks River National Wildlife Reserve

Compatibility with Goals, Objectives, and Issues – Rated Medium
- Satisfies some of the goals, objectives, and issues
- Provides a new route but is long and makes little use of existing facilities
- May support economic development in the region
- Improves accessibility and connectivity
- May not be most direct route

Impacts – Medium for both Community and Environmental
- New right-of-way would be needed along the entire length of the route.
- Anticipated community impacts
- Impacts to existing natural areas, wildlife preserve and conservation / park areas, wetlands and 100-year floodplains

Overall, the corridor was not recommended for further consideration in Level 2. Its localized environmental impacts, lack of system connectivity east of Marshall County, the fact that it does not lend itself to being readily implemented and its impacts, especially those to the natural environment, all combine to make it less likely to be continue in the analysis, especially when other corridors are more viable.

Corridor 19

Constructability / Implementation / Feasibility – Rated Medium
- Some sections to require staged / launched construction
- Other section in undeveloped areas
- Closest corridor to the proposed western Kentucky industrial /business park in Graves County

Compatibility with Goals, Objectives, and Issues – Rated Medium
- Satisfies some of the goals, objectives, and issues
- Provides a new route but is long and circuitous
- May support economic development in the region

Impacts –Rated Low for Community and Medium for Environmental
- Corridor is lengthy but isolated, remote and sparsely developed
- Environmental impacts to Clarks River National Wildlife Reserve, wetlands, and 100-year floodplains

Overall, the corridor was recommended for advancement to Level 2 and for further consideration. Although there are localized environmental impacts, they are not "fatal flaws". The corridor does lend itself to being implemented, as it may be easier to locate needed new right-of-way especially when compared to other corridors that are the near the developed and congested Paducah / McCracken County area.

Corridor 20

Constructability / Implementation / Feasibility – Rated High
- The corridor reuses existing facilities
- The improvements to US 60 are consistent with existing plans

Compatibility with Goals, Objectives, and Issues – Rated High
- Satisfies a large majority of the goals, objectives and issues
- Provides a new route per se by using substantial portions of existing facilities
- Provides for improved accessibility and connectivity

Impacts – Rated Low for Community and Low for Environmental
- New right-of-way needed for some sections in areas that are not populated / built up
- Planned improvements to US 60 have been documented
- Misses many of the sensitive areas in the region
- Impacts to aquatic ecosystem(s) of the Mississippi River and along US 60 / 62

Overall, the corridor was recommended for advancement and further consideration in Level 2 screening. The corridor can be readily implemented, it would have political support, it does take advantage of existing or planned investments, satisfies most of the goals, objectives and issues, and its impacts are low and commensurate with likely benefits.

Corridor 22

Constructability / Implementation / Feasibility – Rated Low
- Readily constructible
- Corridor is predominantly in Illinois, which has shown little support for the project during the Level 1 screening stage

Compatibility with Goals, Objectives, and Issues – Rated Low
- Satisfies some of the goals, objectives and issues
- Provides a new route and makes use of portions of the existing facilities
- Not as direct as others under consideration
- May facilitate limited economic development and other benefits, few of them likely in western Kentucky

- Some improved accessibility and connectivity

Impacts – Low for Community and Medium for Environmental

- Need for new right-of-way minimized
- Most new right -of-way in less populated and/or developed areas
- Misses many of the major environmentally sensitive areas in Kentucky
- Impacts on natural areas and wetlands in Illinois

Overall, the corridor was not recommended for further consideration in Level 2 screening. The corridor would have little support for implementation. Although it does satisfy some of the goals, objectives and issues in a minimal fashion, the environmental impacts are not commensurate with likely positive benefits.

8.3 Level 1 Screening Summary / Conclusions

In summary, of the 22 initial corridors, eight (8) were not recommended for further study in Level 2 Screening. Those corridors included: 1, 2, 3, 4, 16, 17, 18, and 22. Similarly, fourteen (14) corridors were recommended to advance into Level 2. For simplicity, these fourteen (14) corridor were combined for analysis purposes in Level 2 into seven (7) corridors, Those corridors, included: 5, 6 / 7 (combined corridor), 8, 9 / 10 (combined corridor), 11 / 12 / 13 / 14 / 15 / 21 (combined corridor), 19, and 20. The Level 2 analysis also included examination of the No - Build Option.

The following matrix presents a summary of the discussion above and the recommendations and analysis for the Level 1 Screening.

The following map depicts the corridors that were selected to continue in the Level 2 Evaluation

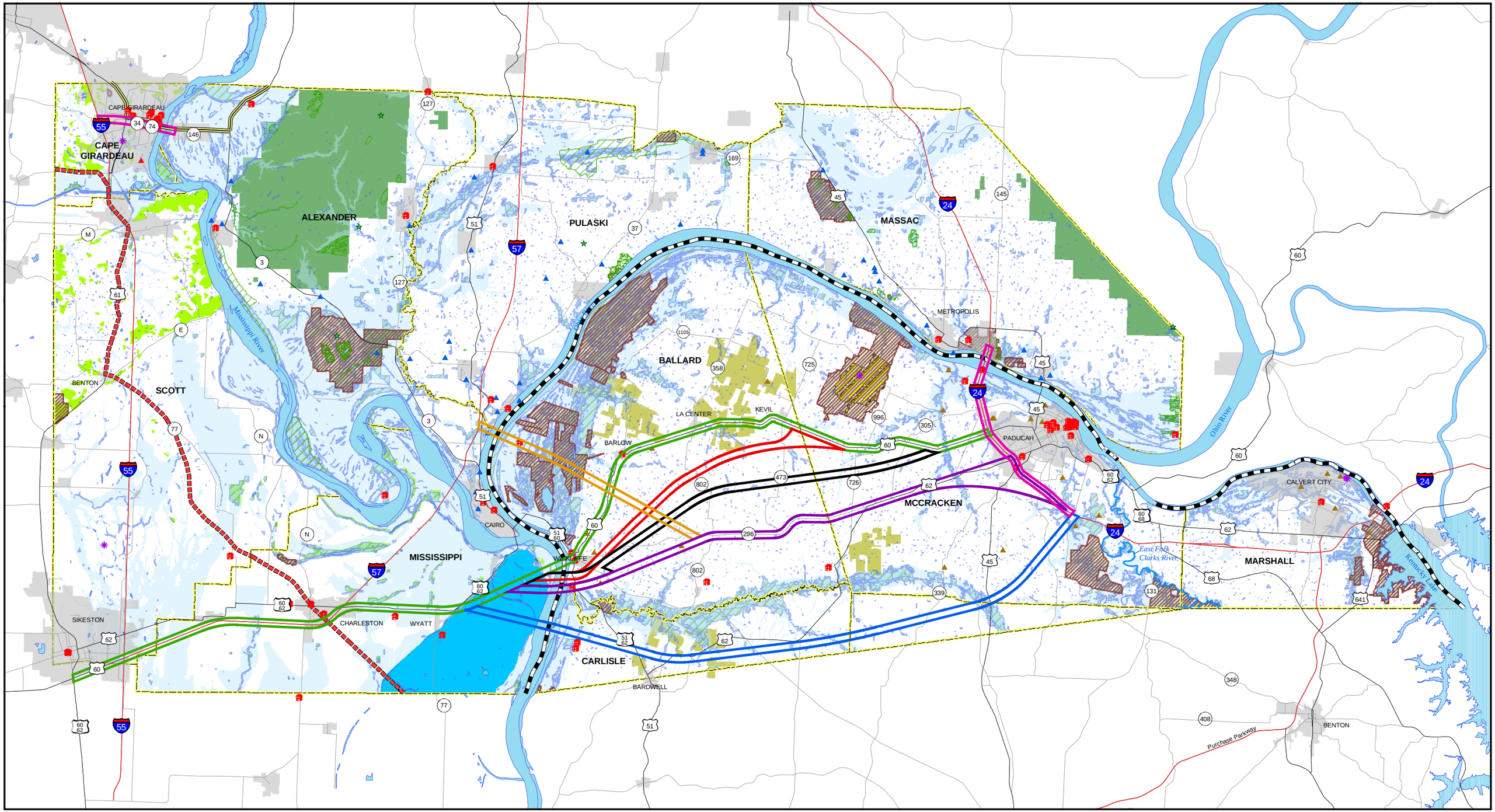
I-66 Corridor Study
Western Kentucky to Missouri
Level 1 Screening Summary

Alt. / Corridor No.	Description	Constructability / Implementation / Feasibility	Compatibility with Goals, Objectives and Issues	Impacts		Advance to Level 2 Screening?
				Community Impacts	Environmental Impacts	
1	From existing I-24 alignment in Illinois due westward on new ROW through Shawnee National Forest to MO 146 near Cape Girardeau via existing bridge to I-55	Low	Medium	Low	High	No
2	From existing I-24 alignment in Illinois due southwestward on new ROW missing major environmental area in Illinois and Missouri around Shawnee National Forest to MO 146 near Cape Girardeau over existing bridge to I-55	Low	Medium	Low	Medium	No
3	From I-24 north of Metropolis, follow US 45 in Illinois northwest then following alternative 2 as described above to I-55	Low	Medium	Low	Medium	No
4	From existing I-24 alignment in Illinois due southwestward on new ROW missing major environmental area in Illinois and Missouri around Shawnee National Forest to new bridge over Miss. River south of Cape Girardeau to I-55	Low	Medium	Medium	High	No
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Medium	High	Medium	Medium	Yes
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Medium	High	Medium	Medium	Yes
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Missouri	Medium	Medium	Medium	Medium	Yes
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	Medium	High	Medium	Medium	Yes
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	Medium	High	Medium	Medium	Yes

I-66 Corridor Study
Western Kentucky to Missouri
Level 1 Screening Summary

Alt. / Corridor No.	Description	Constructability / Implementation / Feasibility	Compatibility with Goals, Objectives and Issues	Impacts		Advance to Level 2 Screening?
				Community Impacts	Environmental Impacts	
16	From I-24 in Marshall County proceed west along new route to McCracken County then follow parallel route to option 14 above	Low	Medium	Medium	Medium	No
17	From I-24 near US 68 in Marshall County proceed west to McCracken County along new route parallel to 16 above to similar route as 14 west and south of Paducah	Low	Medium	Medium	Medium	No
18	From I-24 / US 60 / US 68 location in Marshall County proceed west along new route to McCracken County with 17 then follow parallel route to option 14 above	Low	Medium	Medium	Medium	No
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	Medium	Medium	Low	Medium	No
20	Rebadge existing interstate I-24 as I-66	High	High	Low	Low	Yes
22	From existing I-24 alignment proceed due southwest on new ROW missing major environmental area(s) in Illinois to existing I-57	Low	Low	Low	Medium	No

Shaded corridors indicate those that are not recommended for further consideration

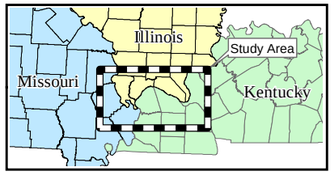


Alternative Corridors

- 5
- 6/7
- 8
- 9/10
- 11/12/13/14/15/21
- 19
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N
W E
S

0 2.5 5 Miles

Figure 12

LEVEL 1 REFINED ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

9.0 LEVEL 2 EVALUATION

As noted earlier, fourteen (14) corridors, combined for analysis purposes into seven (7) corridors (described above), as well as an eighth corridor the No - Build Option (used for comparison purposes to other corridors) were all advanced to Level 2 Screening and were studied in further detail. In addition, through the course of screening and refining these corridors, two (2) new additional corridors were developed and added to the analysis. Those corridors included:

- Corridor 8A - US 60 planned highway improvements per KYTC's 2002 – 2006 6 Year Highway Plan and Long Range Plan from Paducah to Wickliffe. This corridor includes a new connector road and new bridge over the Ohio River connecting US 60 southwest of Barlow, Kentucky to I-57 in Illinois.

- Corridor 8B - US 60 planned highway improvements per KYTC's 2002 – 2006 6 Year Highway Plan and Long Range Plan from Paducah to Wickliffe. Includes a new connector road from US 60 to a new bridge over the Mississippi River south of Wickliffe then to US 60 in Missouri to I-57.

These corridors were added to develop some lower cost solutions to observed congestion and safety problems, and to accomplish the goals and objectives and address the issues of the project in a fiscally restrained manner. They were also developed to examine alternative river crossing locations.

The analysis for this level was more expansive and quantitative than that which was conducted for Level 1, which was largely qualitative in nature. New subcategories were introduced in Level 2 to provide a more detailed comparison of the corridors. The evaluation categories and subcategories for Level 2 include:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time, number of users (volume / ADT), truck percentage(s), safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation. Measures were taken at four (4) screen line locations, which are common points in the study area used to calculate the various measures. The screen lines are generally described as: (1) Paducah, Kentucky (2) Western McCracken County, Kentucky, (3) Ballard County, Kentucky and (4) a Mississippi River / Ohio River crossing. Specific measures examined in this category for the future year 2030 included:

    1. Average Daily Traffic (ADT) – How many vehicles per day will use the new corridor (estimates for 2003 – base year / No - Build and future year of 2030)
    2. Level of Service (LOS)

3. Travel Time / Travel Time Savings (note: travel time and travel time savings are derived for two trips (1) from I-24 to I-55 south – essentially from Paducah, Kentucky to Sikeston, Missouri and (2) from I-24 to I-55 north – essentially Paducah, Kentucky to Cape Girardeau, Missouri. Travel time savings are expressed as a comparison of each corridor as compared to the No - Build Option
4. Safety / Security

To facilitate the analysis, the Kentucky statewide I-66 model was used as the basis for coding and running the analysis of the corridors under evaluation for Level 2 screening.

- **Support** – likelihood that one or more corridors will be supported / is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., received to date. Also contains description of relevant criteria or issues to be scrutinized. Specific measures included:

  1. Corridor - Based on input from public workshops, project work group, and stakeholder meetings, what percentage of the community favored a corridor?
  2. Issues - Based on input from public workshops, project work groups, and stakeholder meetings, what community issues are addressed or will need to be addressed by the corridor and the analysis?

- **Community Impacts** – compatibility with adjacent and proposed land uses and the affects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc.), calculated by miles and acres of adjacent property. Also included was an Environmental Justice Analysis (See Technical Appendix 3 Environmental Justice Analysis for more information on this analysis). Specific impacts include those to:

  1. Farmland
  2. Kentucky Agricultural Districts
  3. State / Federal Forest – Parks / Recreation lands / COE floodways
  4. Urban areas
  5. Probable Environmental Justice Impacts

- **Property Impacts** – more specific impact which determined a need for new right-of-way quantified in acres

- **Environmental Impacts** – impacts on known and mapped historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat

areas, number of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands. Specific measures included:

1. Number of Listed National Historic Registry Sites
2. Nature / Wildlife Preserves / Conservation Lands
3. Number of Stream Crossings
4. Birds Point - New Madrid Floodway impacts
5. Floodplain / Floodway (100 yr. / 500 yr.) – expressed in miles and acres
6. Wetlands

- **Capital cost considerations** – order of magnitude capital costs for proposed corridors derived on a cost build up / unit cost basis from typical sections for roadway (at-grade and elevated) and bridge improvements, also included typical costs for interchanges, and appropriate costs for engineering, contingencies, etc. Specific costs included:

  1. Roadway
  2. Bridge
  3. Right-of-way
  4. Engineering / Mobilization / Demobilization
  5. Total

9.1 No - Build Option

Traffic Operations

- Screen line #1 – 45,000 ADT, 3,500 ADT trucks (7%), LOS E
- Screen line #2 – 11,000 ADT, 1,500 ADT trucks (14%), LOS A
- Screen line #3 – 10,000 ADT, 1,000 ADT trucks (10%), LOS E
- Screen line #4 – 11,500 ADT, 2,000 ADT trucks (17%), LOS E

The travel time for the No - Build serves as the baseline for comparison to other corridors. For the two trips; Paducah to Sikeston and Paducah to Cape Girardeau, the travel times are 76 and 98 minutes respectively.

The No - Build Option will make some improvements to US 60; but only those programmed in the KYTC's 2001 – 2006 Six Year Highway Plan. This will have some very tangible improvements in terms of safety and security, including the provision of an upgraded route and improved / increased access to points west of Paducah. It does not however provide for a new bridge over the Mississippi River, which would provide a great deal of redundancy in terms of connectivity (east – west connections) and access for the transportation system in western Kentucky / southeastern Missouri.

Support
There is some minimal support for the No - Build Option in both Kentucky and Missouri. Most of those who are interested in the No - Build Option want more improvements than just those that are currently programmed. These same individuals also tend to be concerned with the anticipated impacts of the US 60 improvements on adjacent communities including nearby residences, businesses, farms, etc.

Community Impacts
Community impacts have been fully documented in previous studies. The no-build corridor for the I-66 project also does not recommend further improvements beyond those existing and committed, therefore no anticipated incremental impacts are anticipated. In addition, there are no adverse potential environmental justice (EJ) issues.

Property Impacts
Property impacts have been fully documented in previous studies. The no-build corridor also does not recommend further improvements beyond those existing and committed, therefore no new property impacts are anticipated.

Environmental Impacts
Environmental impacts have been fully documented in previous studies. The no-build corridor also does not recommend further improvements beyond those existing and committed, therefore no environmental impacts are anticipated.

Capital Costs
The current total for existing and committed projects is $26.3 million dollars.

The No - Build Option was recommended to be carried forward into Level 3 analysis for comparison to other corridors.

9.2 Corridor 5

Traffic Operations

- Screen line #1 – 50,000 ADT, 5,000 ADT trucks (10%), LOS D
- Screen line #2 – 11,500 ADT, 3,000 ADT trucks (26%), LOS A
- Screen line #3 – 13,500 ADT, 2,500 ADT trucks (19%), LOS A
- Screen line #4 – 7,000 ADT, 1,500 ADT trucks (21%), LOS A

The travel times for Corridor 5 represented an improvement from the No - Build. Travel timesavings of 13 minutes for the Paducah to Charleston trip and travel time savings of 9 minutes for the Paducah to Cape Girardeau trip were recognized.

Corridor 5 goes beyond the programmed improvements of the No - Build Option and improves US 60 all the way from Paducah to Wickliffe. The corridor also includes a new bridge over the Mississippi River. This new facility would add to safety of the system and provide a redundant link from Kentucky to Missouri for security and other purposes. The bridge location is the least preferred by the Coast Guard as it adversely affects river traffic. Corridor 5 improves system connectivity and access.

Support

There is a minimal level of support for this corridor. Issues raised in regard to Corridor 5 include concerns over impacts to residences, businesses, farms, etc., that are parallel to existing US 60.

Community Impacts

Corridor 5 impacted farmlands, Kentucky agricultural districts, urban areas, and had property impacts and potential environmental justice (EJ) impacts.

- 30 miles or 9,506 acres of adjacent roadway / farmland impacts throughout the corridor
- 1.3 mile or 343 acre of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 2 miles or 288 acres of impacts to urban areas are anticipated
- medium probability of adverse Environmental Justice impacts

Property Impacts

Total property impacts are anticipated to be 2,800 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts

The anticipated environmental impacts are to stream crossings, the Birds Point - New Madrid Floodway, other floodplains and floodways (100 and 500 year) and to wetlands.

- no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands
- 56 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to the Birds Point - New Madrid Floodway
- 12 miles or 2,944 acres of impacts to the 500 year floodplain
- 0.2 miles or 35 acres of impacts to the 100 year flood plain
- 1.7 miles or 466 acres of impacts to adjacent wetlands

Capital Costs

The total capital costs for Corridor 5 are $536 million (2003 dollars). $272 million is for roadway construction, $100 million for construction of a new bridge across the Mississippi River, $89 million for right-of-way and utilities and $75 million for contingencies, engineering, design, and mobilization / demobilization of construction.

Corridor 5 was not recommended for further consideration in Level 3.

9.3 Corridor 6/7

Traffic Operations

- Screen line #1 – 50,000 ADT, 5,500 ADT trucks (11%), LOS D
- Screen line #2 – 11,500 ADT, 3,000 ADT trucks (26%), LOS A
- Screen line #3 – 14,000 ADT, 2,500 ADT trucks (18%), LOS A
- Screen line #4 – 7,000 ADT, 1,500 ADT trucks (21%), LOS A

The travel times for Corridor 6/7 represented an improvement from the No - Build. Travel timesavings of 14 minutes for the Paducah to Charleston trip and travel time savings of 9 minutes for the Paducah to Cape Girardeau trip were recognized.

Corridor 6/7 provides a new limited access highway corridor and also includes a new bridge over the Mississippi River. These new facilities would add to safety of the system and provide a redundant link from Kentucky to Missouri for security and other purposes. The bridge location is the least preferred by the Coast Guard. Corridor 6/7 also improves system connectivity and access.

Support
There is a minimal level of support for this corridor. Issues raised in regard to Corridor 6/7 include concerns with impacts to residences, businesses, farms, etc., that are parallel to existing US 60.

Community Impacts
Community impacts for Corridor 6/7 are similar in scope to those for Corridor 5. There are impacts to farmlands, Kentucky agricultural districts, urban areas, property impacts and potential EJ impacts.

- 30 miles or 8,671 acres of adjacent roadway / farmland impacts throughout the corridor
- 1.4 miles or 352 acre of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 2 miles or 285 acres of impacts to urban areas are anticipated
- medium probability of adverse Environmental Justice impacts

Property Impacts
Total property impacts are anticipated to be 2,700 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts
The anticipated environmental impacts are to stream crossings, the Birds Point - New Madrid Floodway, other floodplains and floodways (100 and 500 year) and to wetlands.

- no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands
- 54 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to the Birds Point - New Madrid Floodway
- 12 miles or 2,944 acres of impacts to the 500 year floodplain
- 0.2 miles or 35 acres of impacts to the 100 year flood plain
- 1.8 miles or 425 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 6/7 are $528 million (2003 dollars). $260 million is for roadway construction, $106 million is for construction of a new bridge across the Mississippi River, $88 million is for right-of-way and utilities and $74 million is for contingencies, engineering, design, and mobilization / demobilization of construction.

Corridor 6/ 7 was not recommended for further consideration into Level 3.

9.4 Corridor 8

Traffic Operations

- Screen line #1 – 50,000 ADT, 5,000 ADT trucks (10%), LOS D
- Screen line #2 – 13,000 ADT, 3,000 ADT trucks (23%), LOS A
- Screen line #3 – 11,500 ADT, 2,500 ADT trucks (24%), LOS A
- Screen line #4 – 10,000 ADT, 1,500 ADT trucks (15%), LOS A

The travel time for Corridor 8 represents an improvement from the No - Build. The travel time for the Paducah to Sikeston trip decreases by 10 minutes. Similarly, the travel time for the Paducah to Cape Girardeau trip also decreases by 15 minutes from the baseline.

Corridor 8 provides a new limited access highway connector from other corridors near KY 286, and includes a new bridge over the Ohio River. These new facilities would add to safety of the system and provide a redundant link from Kentucky to Illinois and into Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. Corridor 8 also improves system connectivity and access.

Support
There is some support for Corridor 8. Issues associated with this corridor include impacts to wetlands, floodplains, and potential wildlife refuge and habitat area impacts near Barlow, Kentucky.

Community Impacts

Community impacts for Corridor 8 are slightly smaller in scope than those for Corridor 5 or 6/7. There are impacts to farmlands, Kentucky agricultural districts, urban area, property impacts, and potential EJ impacts.

- 21 miles or 7,222 acres of adjacent roadway / farmland impacts throughout the corridor
- 1.3 miles or 343 acre of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 1 mile or 135 acres of impacts to urban areas are anticipated
- Medium probability of adverse Environmental Justice impacts, mainly near Cape Girardeau due to the presence of minority, elderly and low income persons at the end of the corridor

Property Impacts

Total property impacts are anticipated to be 2,113 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts

The anticipated environmental impacts of Corridor 8 are to a NHR site, nature / wildlife preserves and conservation lands, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands.

- 1 anticipated impact to listed National Historic Register (NHR) site, a 0.4 mile segment of the Trail of Tears National Historic Trail
- 2 miles or 455 acres of impacts to nature, wildlife preserves and conservation lands
- 49 stream crossings throughout the corridor
- no impacts to the Birds Point - New Madrid Floodway
- 7 miles or 1,810 acres of impacts to the 500 year floodplain
- 0.5 miles or 123 acres of impacts to the 100 year flood plain
- 4 miles or 1,001 acres of impacts to adjacent wetlands

Capital Costs

The total capital costs for Corridor 8 are $517 million (2003 dollars). $206 million is for roadway, construction, $129 million for construction of a new bridge across the Ohio River, $114 million for right-of-way and utilities and $68 million for contingencies, engineering, design and mobilization / demobilization of construction.

Corridor 8 was not recommended for further consideration into Level 3.

9.5 Corridor 8A

Traffic Operations

- Screen line #1 – 51,500 ADT, 4,000 ADT trucks (8%), LOS F
- Screen line #2 – 14,000 ADT, 2,000 ADT trucks (14%), LOS B
- Screen line #3 – 12,500 ADT, 1,500 ADT trucks (12%), LOS A
- Screen line #4 – 7,000 ADT, 500 ADT trucks (7%), LOS A

The travel times for Corridor 8A represent slight improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreased by 2 minutes from baseline, while the travel time for the Paducah to Cape Girardeau trip decreased by 7 minutes.

Corridor 8A provides a new bridge connector from US 60 in Kentucky to I-57 in Illinois. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky to Illinois and into Missouri for security purposes. This corridor's bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. The location across the Ohio River would have minimum impacts on river traffic. Likewise, Corridor 8A also improves system connectivity and access.

Support
Support exists for continuing the programmed US 60 improvements and for upgrading the corridor. There is some support for a potential new bridge somewhere over the Ohio River northwest of Barlow, Kentucky. Issues of concern include impacts to areas adjacent to US 60 as well as wetland and wildlife habitat area impacts and concerns over the river crossing location near Barlow.

Community Impacts
Community impacts are documented in the US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River.

Property Impacts
Property impacts are documented in the US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River.

Environmental Impacts
Environmental impacts are documented in the US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River. For analysis purposes, no other details are provided in the level of screening. Environmental impacts can be assumed to be similar to those of the No Build Corridor for the roadway. There is anticipated to be considerable impacts

to the wildlife management / recreation areas (including wetlands and waterfowl habitat areas) southwest of Barlow, Kentucky for the location of the river crossing / bridge.

Capital Costs
The total capital costs for Corridor 8A are assumed to be more than $184 million (2004 dollars). There are no additional costs assumed for roadway improvements for this corridor due to the fact that the existing US 60 will be upgraded. Incremental costs for the roadway component from east of LaCenter, Kentucky to southwest of Barlow, Kentucky were not available for the Level 2 evaluation. The cost of a new bridge over the Ohio River northwest of Barlow, Kentucky, for this corridor is $129 million. Costs for right-of-way and utilities are $29 million, while contingencies, engineering, design and mobilization / demobilization of construction are estimated at $26 million.

Corridor 8A was not recommended for further consideration into Level 3.

9.6 Corridor 8B

Traffic Operations

- Screen line #1 – 44,500 ADT, 3,500 ADT trucks (8%), LOS E
- Screen line #2 – 7,000 ADT, 1,500 ADT trucks (21%), LOS A
- Screen line #3 – 6,000 ADT, 500 ADT trucks (8%), LOS A
- Screen line #4 – 5,500 ADT, 500 ADT trucks (9%), LOS A

The travel time for Corridor 8B represents very slight improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreases by 2 minutes from while the travel time for the Paducah to Cape Girardeau trip represents no change from the No - Build Option.

Corridor 8B provides a new bridge connector from US 60 in Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on Mississippi River traffic. Likewise, Corridor 8B also improves system connectivity and access.

Support
Support exists for continuing the US 60 improvements and for upgrading the corridor. There is also support for a new bridge over the Mississippi River near Wickliffe, Kentucky. Issue of concern include impacts to areas adjacent to US 60 as well as wetland impacts and concerns over the river crossing location, especially impacts to river traffic and impacts to the Birds Point - New Madrid Floodway in Missouri.

Community Impacts
Community impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River.

Property Impacts
Property impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. For analysis purposes, no other details are provided in this level of screening. However, property impacts can be assumed to be similar to those of the No - Build or Corridor 0.

Environmental Impacts
Environmental impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. For analysis purposes, no other details are provided in this level of screening. However, environmental impacts can be assumed to be similar to those of the No - Build or Corridor 0. There is anticipated to be considerably impacts to the Birds Point - New Madrid Floodway in Missouri, due west of Wickliffe, Kentucky.

Capital Costs
The total capital costs for Corridor 8A are assumed to be greater than $209 million (2003 dollars). There are no additional costs assumed for the roadway due to the fact that US 60 will be upgraded. Incremental costs for the roadway component from east of LaCenter, Kentucky to Wickliffe, Kentucky were not available for Level 2 evaluation. The cost of a new bridge over the Mississippi River near Wickliffe, Kentucky is $140 million. Costs for right-of-way and utilities are $41 million, while contingencies, design, engineering and mobilization / demobilization of construction are estimated at $28 million.

Corridor 8B was recommended to be carried forward into Level 3 analysis.

9.7 Corridor 9/10

Traffic Operations

- Screen line #1 – 25,000 ADT, 3,500 ADT trucks (14%), LOS B
- Screen line #2 – 15,500 ADT, 3,000 ADT trucks (19%), LOS A
- Screen line #3 – 9,500 ADT, 2,500 ADT trucks (26%), LOS A
- Screen line #4 – 7,000 ADT,1,500 ADT trucks (21%), LOS A

The travel time for Corridor 9 / 10 represents significant improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreased by 15 minutes and the travel time for the Paducah to Cape Girardeau trip decreased by 11 minutes.

Corridor 9/10 provides a new bridge connection from Kentucky to I-57 in Missouri with a new limited access highway corridor. These new facilities would add significantly to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on river traffic as it causes disruptions to river traffic on the Mississippi River because of the location of the piers and the proximity of the structure to the confluence of the Ohio and Mississippi rivers. Likewise, this Corridor also improves system connectivity and access.

Support

Support is somewhat strong for Corridor 9/10. It is equal to the support for Corridor 11/12/13/14/15/ & 21. Issues of concern include farmland impacts and river crossing location.

Community Impacts

Community impacts for Corridor 9/10 are similar in scope to those for similar corridors, namely 6/7 and 11/12/13/14/15 & 21. There are impacts to farmlands, urban areas, property impacts, and potential EJ impacts.

- 28 miles or 8,618 acres of adjacent roadway / farmland impacts throughout the corridor
- no impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 1 mile or 264 acres of impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts

Total property impacts for right-of-way purposes are anticipated to be 2,643 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts

The anticipated environmental impacts of Corridor 9/10 are to stream crossings, the Birds Point - New Madrid Floodway, other floodplains and floodways (100 and 500 year) and to wetlands.

- No impacts to National Historic Register Sites or nature / wildlife preserves or conservation lands
- 46 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to Birds Point - New Madrid Floodway
- 11.5 miles or 2,787 acres of impacts to the 500 year floodplain
- 0.1 miles or 33 acres of impacts to the 100 year flood plain
- 1.4 miles or 357 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 9/10 are $551 million (2003 dollars). $274 million is for roadway, construction, $105 million for construction of a new bridge across the Mississippi River, $95 million for right-of-way and utilities and $77 million for contingencies, design, engineering and mobilization / demobilization of construction.

Corridor 9 / 10 was not recommended for further consideration into Level 3.

9.8 Corridor 11/12/13/14/15 and 21

Traffic Operations

- Screen line #1 – 35,000 ADT, 5,000 ADT trucks (14%), LOS C
- Screen line #2 – 19,000 – 30,000 ADT, 3,500 – 4,500 ADT trucks (15 - 18%), LOS A - B
- Screen line #3 – 12,500 ADT, 3,000 ADT trucks (24%), LOS A
- Screen line #4 – 7,500 ADT,1,500 ADT trucks (20%), LOS A

The travel time for Corridor 11/12/13/14/15/&21 represents significant improvements from the base line for the No - Build Option. The travel time for the Paducah to Sikeston trip decreased by 18 minutes while the travel time for the Paducah to Cape Girardeau also decreased by 14 minutes.

Corridor 11/12/13/14/15 & 21 provides a new bridge connector along the proposed new limited access highway from Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on river traffic. This corridor would also improve system connectivity and access.

Support
Support is strong for Corridor 11/12/13/14/15/ & 21. It is equal to the support for Corridor 9/10. The river crossing is of concern to the US Coast Guard as it causes disruptions to river traffic because of the location of the piers and the proximity of the structure to the confluence of the Ohio and Mississippi rivers. The location would also impact the operation of the Birds Point - New Madrid Floodway in Missouri. Issues of concern include farmland impacts and river crossing location.

Community Impacts

Community impacts for Corridor 11/12/13/14/15 & 21 are similar in scope to those for similar corridors, namely 6/7 and 9/10.

- 29 miles or 7,319 acres of adjacent roadway / farmland impacts throughout the corridor
- 1.7 miles or 420 acres of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 0 miles or 144 acres of impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts
Total property impacts for right-of-way purposes are anticipated to be 2,786 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 11/12/13/14/15 & 21 are to stream crossings, the Birds Point - New Madrid Floodway, other floodplains and floodways (100 and 500 year) and to wetlands.

- No impacts to National Historic Register Sites or nature / wildlife preserves or conservation lands
- 54 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to Birds Point - New Madrid Floodway
- 11.5 miles or 2,774 acre of impacts to the 500 year floodplain
- less than 1 mile or 21 acres of impacts to the 100 year flood plain
- 1.2 miles or 312 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 11/12/13/14/15 & 21 are $624 million (2003 dollars). $287 million is for roadway construction, $109 million for construction of a new bridge across the Mississippi River, $148 million for right-of-way and utilities and $80 million for contingencies, design, engineering and mobilization / demobilization of construction.

Corridor 11/12/13/14/15 & 21 was recommended to be carried forward into Level 3 analysis.

9.9 Corridor 19

Traffic Operations

- Screen line #1 – 16,000 ADT, 3,500 ADT trucks (22%), LOS A
- Screen line #2 – 17,500 ADT, 3,000 ADT trucks (17%), LOS A
- Screen line #3 – 10,500 ADT, 2,000 ADT trucks (19%), LOS A
- Screen line #4 – 8,000 ADT, 1,500 ADT trucks (19%), LOS A

The travel times for Corridor 19 represent improvements from the No - Build Option ... The travel time for the Paducah to Sikeston trip decreased by 16 minutes and the travel time for the Paducah to Cape Girardeau trip decreased by 10 minutes.

Corridor 19 provides a new bridge connection from the new limited access highway facility in Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. Likewise, Corridor 19 also improves system connectivity and access, especially to the planned business / industrial park in Graves County.

Support

There is modest geographical support for Corridor 19. Issues associated with this corridor include impacts to wetlands and floodplains. The bridge crossing location is preferred by the US Coast Guard, as it would not affect Mississippi River traffic.

Community Impacts

Community impacts for Corridor 19 are slightly more in scope than others that involve a Mississippi River crossing. There are impacts to farmlands, Kentucky agricultural districts, State / Federal / Forests – Parks and Recreation lands, property impacts and potential EJ impacts.

- 34 miles or 10,134 acres of adjacent roadway / farmland impacts throughout the corridor
- 0.8 miles or 269 acres of impacts to agricultural districts
- < 1 mile or 8 acres of impacts to state / Federal forests, parks, and/or recreation land
- no anticipated impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts

Total property impacts are anticipated to be 3,049 acres for right-of-way purposes. The needed right-of-way is a mixture of farmlands, agricultural district lands, and other land uses.

Environmental Impacts

The anticipated environmental impacts of Corridor 19 are to a NHR site, nature / wildlife preserves and conservation lands, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands.

- 1 impact to a 0.4 mile segment of the Trail of Tears National Historic Trails
- < 1 mile or 8 acres of impacts to nature / wildlife preserves or conservation lands
- 77 stream crossings throughout the corridor
- 4.5 miles or 1,068 acres of impacts to Birds Point - New Madrid Floodway
- 13 miles or 3,179 acres of impacts to the 500 year floodplain
- 0.2 miles or 54 acres of impacts to the 100 year flood plain

- 1.6 miles or 615 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 19 are $713 million (2003 dollars). $317 million is for roadway construction, $140 million for construction of a new bridge across the Mississippi River, $163 million for right-of-way and utilities and $93 million for contingencies, design, engineering and mobilization / demobilization of construction.

Corridor 19 was not recommended for further consideration into Level 3.

9.10 Corridor 20

Traffic Operations

- Screen line #1 – 15,500 ADT, 1,500 ADT trucks (10%), LOS A
- Screen line #2 – 15,500 ADT, 1,500 ADT trucks (10%), LOS A
- Screen line #3 – 16,000 ADT, 1,500 ADT trucks (10%), LOS A
- Screen line #4 – 17,000 ADT, 2,000 ADT trucks (12%), LOS A

The travel time for Corridor 20 represent very slight improvements for the Paducah to Sikeston trip, which decreased by 2 minutes, while the travel time savings for the Paducah to Cape Girardeau trip deceased by 31 minutes.

Corridor 20 provides no new bridge connector but does provide a new limited access highway across southern Illinois. It may also require some widening of I-24 in Kentucky and the need for a connector roadway of interstate quality from the bridge at Cape Girardeau to I-55. These new facilities would add to safety of the system and add benefits for security purposes. This Corridor provides good access and connectivity benefits for southern Illinois and the Cape Girardeau Missouri areas. It provides little benefit for Western Kentucky because the new route is located in Illinois.

Support
There is strong support for Corridor 20 mainly from constituencies in the Cape Girardeau area. There has been almost an equal amount of opposition to Corridor 20 from study participants who reside in Kentucky. Issues associated with this corridor include impacts to the Shawnee National Forest. The bridge crossing location at Cape Girardeau would make use of the Bill Emerson Bridge. However, the connection to the bridge from I-55 may not be interstate quality.

Community Impacts

Community impacts for Corridor 20 include impacts to farmlands, State / Federal / Forests – Parks and Recreation lands, urban area impacts, property impacts and potential EJ impacts.

- 33 miles or 7,957 acres of adjacent roadway / farmland impacts throughout the corridor
- no anticipated impacts to agricultural districts
- 8 miles or 1,964 acres of impacts to state / Federal forests, parks, and/or recreation land
- 3 miles or 469 acres of no anticipated impacts to urban areas
- high probability of adverse Environmental Justice impacts

Property Impacts

Total property impacts are anticipated to be 3,514 acres, largely for right-of-way purposes. The needed right-of-way is a mixture of farmlands, forests / recreation areas, urban areas, and other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 20 are to a NHR site, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands.

- 1 impact to a 4.5 mile segment of the Trail of Tears National Historic Trails
- no anticipated impacts to nature / wildlife preserves or conservation lands
- 41 stream crossings throughout the corridor
- no anticipated impacts to the Birds Point - New Madrid Floodway
- 8 miles or 1,991 acres of impacts to the 500 year floodplain
- 1 mile or 300 acres of impacts to the 100 year flood plain
- 1.9 miles or 530 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 20 are more than $536 million (2003 dollars). $340 million is for construction of the roadway, $127 million for right-of-way and utilities and $69 million for contingencies, design, engineering and mobilization / demobilization of construction. There are no costs assumed for the bridge at Cape Girardeau since, at the time of the Level 2 screening, it was still under construction and already funded. Additional costs that were not quantified for the analysis would include any new widening of I-24 in Kentucky and/or Illinois and the construction of an interstate quality connector from the Bill Emerson Bridge to I-55 near Cape Girardeau.
Corridor 20 was recommended to be carried forward into Level 3 analysis.

9.11 Level 2 Screening Summary / Conclusions

The more detailed analysis performed in the Level 2 screening / evaluation further reduced the corridors being considered from nine (9) (eight (8) build corridors plus the No - Build) to four (4) total Corridors that are recommended for further evaluation in the Level 3 Screening. Those Corridors included:

- No - Build Option – Only existing and committed projects in the KYTC 2001 – 2006 Six Year Highway Plan and MoDOT improvement program.

- Corridor 8B – US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing

- Corridor 11 – new limited access highway corridor parallel to US 62 and KY 286 with a new Mississippi River crossing

- Corridor 20 – unspecified corridor-connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

All other corridors not listed above are not being carried forward for further consideration in Level 3 screening. This is because one or more of the impacts significantly reduced the viability of that corridor or that there are other corridors still under consideration that are better at satisfying the goals, objectives, and issues of the study.

The matrices and map on the following pages summarize the details above and depict the corridors that are being advanced to the Level 3 screening.

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*											
		Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River (Ohio River for 8 & 8A)		
		Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	45,000 (US 60)	3,500 (7%)	E (4 lanes)	11,000 (US 60)	1,500 (14%)	A (4 lanes)	10,000 (US 60)	1,000 (10%)	E (2 lanes)	11,500 (Bridge Over Ohio River)	2,000 (17%)	E (2 lanes)
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,000 (10%)	D	11,500	3,000 (26%)	A	13,500	2,500 (19%)	A	7,000	1,500 (21%)	A
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,500 (11%)	D	11,500	3,000 (26%)	A	14,000	2,500 (18%)	A	7,000	1,500 (21%)	A
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	50,000	5,000 (10%)	D	13,000	3,000 (23%)	A	11,500	2,500 (24%)	A	10,000 (Bridge Over Ohio River)	1,500 (15%)	A
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	51,500 (US 60)	4,000 (8%)	F (4 lanes)	14,000 (US 60)	2,000 (14%)	B (4 lanes)	12,500 (US 60)	1,500 (12%)	A (4 lanes)	7,000 (Bridge Over Ohio River)	500 (7%)	A (4 lanes)
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	44,500 (US 60)	3,500 (8%)	E (4 lanes)	7,000 (US 60)	1,500 (21%)	A (4 lanes)	6,000 (US 60)	500 (8%)	A (4 lanes)	5,500	500 (9%)	A (4 lanes)
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	25,000	3,500 (14%)	B	15,500	3,000 (19%)	A	9,500	2,500 (26%)	A	7,000	1,500 (21%)	A
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	35,000	5,000 (14%)	C	19,000 - 30,000	3,500-4,500 (15-18%)	A-B	12,500	3,000 (24%)	A	7,500	1,500 (20%)	A
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	16,000	3,500 (22%)	A	17,500	3,000 (17%)	A	10,500	2,000 (19%)	A	8,000	1,500 (19%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	15,500	1,500 (10%)	A	15,500	1,500 (10%)	A	16,000	1,500 (10%)	A	17,000	2,000 (12%)	A

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*			
		Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	76	98	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	63 (13)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	62 (14)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	66 (10)	83 (15)	Provides some level of improvement - New bridge over Ohio River	Makes some new system connections
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	74 (2)	91 (7)	Provides some level of improvement - New bridge over Ohio River	Keeps existing connectivity and access, provides for new river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	74 (2)	98 (0)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	61 (15)	87 (11)	Provides improvement - New bridge over Mississippi River	Makes new system connections
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	58 (18)	84 (14)	Provides improvement - New bridge over Mississippi River	Makes new system connections
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	60 (16)	88 (10)	Provides improvement - New bridge over Mississippi River	Connects to planned regional industrial / development site
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	74 (2)	67 (31)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

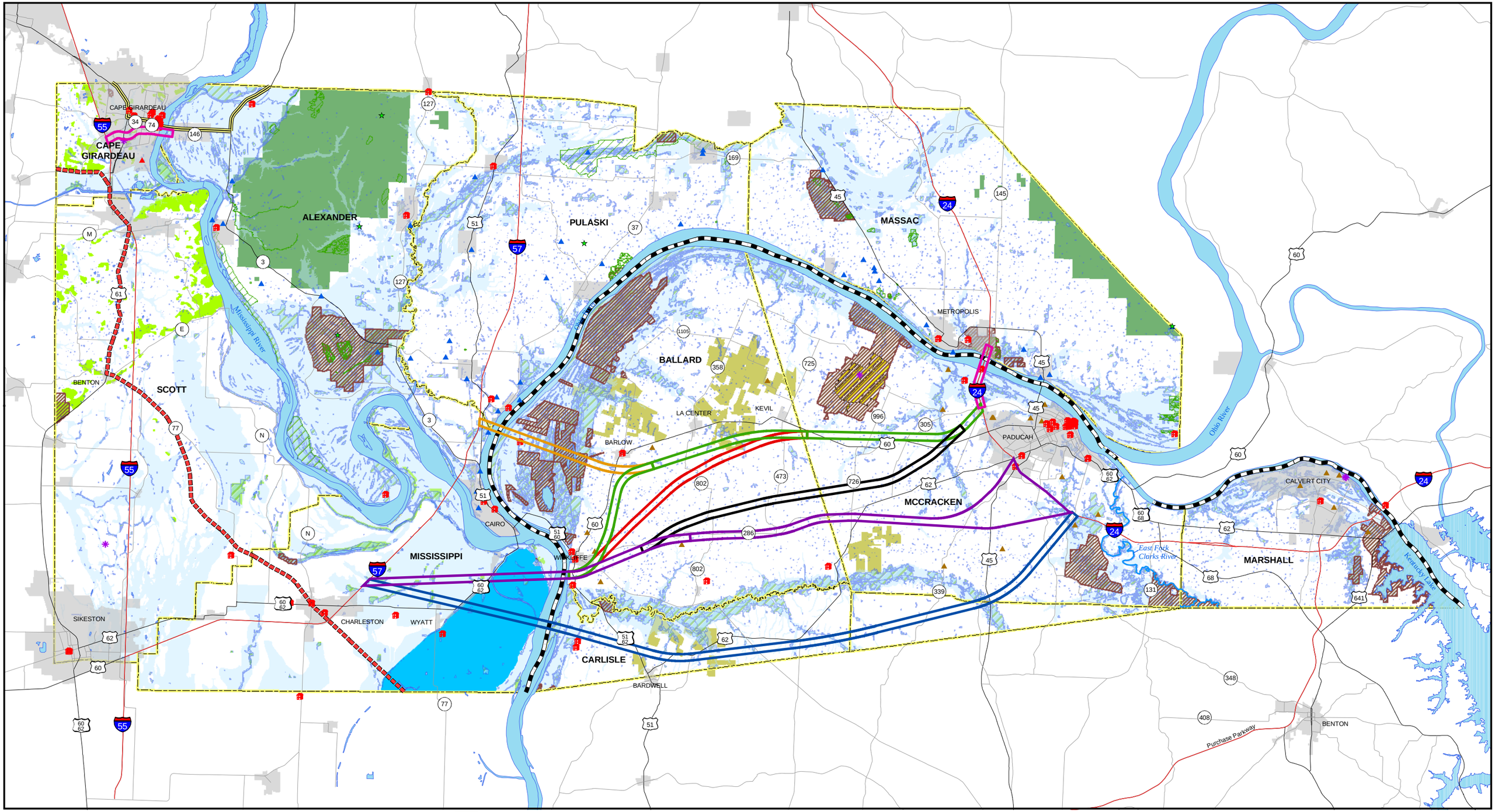
Alt. / Corridor No.	Description	Support		Community Impacts					
		Corridor	Issues	Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 5	Parallels US 60 corridor, some farm and / or residential impacts, least favorable river crossing location	30 mi/9,506 ac	1.3 mi/343 ac	None	2 mi/288 ac	Medium	2,800
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 6 / 7	Farm impacts, least favorable river crossing location	30 mi/8,671 ac	1.4 mi/352 ac	None	2 mi/285 ac	Medium	2,700
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, preferred river crossing	21 mi/7,222 ac	1.3 mi/343 ac	None	1 mi/135 ac	Medium	2,113
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Support exists for US 60 improvements; however little support has been expressed for a new bridge southwest of Barlow, KY	Impacts to adjacent development on US 60 plus wetland, floodplain and potential wildlife refuge impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and south of Wickliffe, impacts to farmland in Missouri					
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	Support is somewhat strong for Alternative 9/10. It is equal to Alternative 11/12/13/14/15/21	Farmland impacts, uses least favorable river crossing	28 mi/8,618 ac	None	None	1 mi/264 ac	Low	2,643
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	Support is strong for Alternative 11/12/13/14/15/21. It is equal to Alternative 9/10	Farmland impacts, uses least favorable river crossing	29 mi/7,319 ac	1.7 mi/420 ac	None	0 mi/144 ac	Low	2,786
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	There has been no vocal support for Alternative 19 during public	Large need for new right of way, closest to planned industrial park, impacts to flats area, preferred river crossing location	34 mi/10,134 ac	0.8 mi/269 ac	< 1 mi/8 ac	None	Low	3,049
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	There has been some level of support for Alternative 20, there has also been equal support against the alternative especially from residents of KY	In southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of newly built bridge	33 mi/7,957 ac	None	8 mi/1,964 ac	3 mi/469 ac	High	3,514

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts**							Capital Costs***					Advance to Level 3 Screening?
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Birds Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (100 yr. / 500 yr.) (in miles)	Floodplain / Floodway (100 yr. / 500 yr.) (in acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total	
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated							No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million					Yes
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	56	3 miles/723 acres	12/0.2	2,944/35	1.7 mi/466 ac	$272	$100	$89	$75	$536	No
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	54	3 miles/723 acres	12/0.2	2,944/35	1.8 mi/425 ac	$260	$106	$88	$74	$528	No
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7/0.5	1,810/123	4.0 mi/1,001ac	$206	$129	$114	$68	$517	No
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and northwest of Barlow - impacts to Barlow Flats and adjacent wildlife management area in northeastern Ballard County, KY							$0	$129	$29	$26	$184	No
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated south of Wickliffe and to Bird's Point floodway area in Missouri							$0	$140	$41	$28	$209	Yes
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	None	None	46	3 miles/723 acres	11.5/0.1	2,787/33	1.4 mi/357 ac	$274	$105	$95	$77	$551	No
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	None	None	54	3 miles/723 acres	11.5/ < 1	2774/21	1.2 mi/312 ac	$287	$109	$148	$80	$624	Yes
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	1 (0.4 miles of Trail of Tears NHT)	< 1 mi/8 ac	77	4.5 miles/1,068 acres	13/0.2	3,179/54	1.6 mi/615 ac	$317	$140	$163	$93	$713	No
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	1 (4.5 miles of Trail of Tears NHT)	None	41	None	8/1	1,991/300	1.9 mi/530 ac	$340	$0	$127	$69	$536	Yes

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

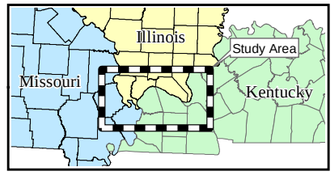


Alternative Corridors

- 5
- 6/7
- 8
- 9/10
- 11,12,13,14,15 & 21
- 19
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N
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0 2.5 5 Miles

Figure 13

LEVEL 2 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

10.0 LEVEL 3 EVALUATION

The analysis for this level is the most extensive and quantitative that the project undertook. Although no new evaluation categories were introduced for Level 3, the analysis was to a greater level of detail than previous. In addition, more coordination with other agencies (US Army Corps of Engineers, US Coast Guard, and Illinois Department of Transportation) took place. (See Section 7- Agency Coordination for more details.) The evaluation categories and subcategories for Level 3 included:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time, number of users (volume / ADT), truck percentages, safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation. Four (4) screen line locations were used to estimate the various measures. The locations are common points in the study area, and are generally described as: (1) Paducah, KY (2) Western McCracken County, KY, (3) Ballard County, KY, and (4) a Mississippi or Ohio River crossing. Specific measures examined in this category for the base year 2003 and the future year 2030 included:

    1. Average Daily Traffic (ADT) – How many vehicles per day will use the new highway corridor at a “screen line”? (Note that for this analysis, a screenline was defined as a specific point for that corridor only. It is not an additive measure of all volumes for all corridors at a certain point.)
    2. Average Daily Truck Traffic – How many trucks per day will use the new highway corridor at a “screen line”?
    3. Level of Service (LOS)
    4. Vehicle Miles of Travel (VMT) – measure of total miles of travel across the model area of travel for all vehicles
    5. Vehicle Hours of Travel (VHT) – measure of total hours of travel across the model area for all vehicles
    6. Travel Time / Travel Time Savings (note: travel time and travel time savings are derived for two trips (1) from I-24 to I-55 south – essentially from Paducah, KY to Sikeston, MO and (2) from I-24 to I-55 north – essentially Paducah, KY to Cape Girardeau, MO. Travel time savings are expressed as a comparison of each corridor as compared to the No - Build (Corridor 0)
    7. Safety / Security
    8. Connectivity / Access

To facilitate the analysis, the Kentucky statewide I-66 model was used as the basis for coding and running the analysis of the corridors under evaluation.

- **Support** – likelihood that one or more corridors will be supported / is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., to date. Also contains description of relevant criteria or issues to be scrutinized. Specific measures included:

    1. Corridor - Based on input from public workshops, project work group, and stakeholder meetings, what percentage of the community favors a corridor
    2. Issues - Based on input from public workshops, project work groups, and stakeholder meetings, what community issues are addressed or will need to be addressed by the corridor and the analysis

- **Community Impacts** – compatibility with adjacent and proposed land uses and the affects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc., calculated by miles and acres of adjacent property. Also included was an environmental justice analysis. Specific impacts included those to:

    1. Farmland
    2. Kentucky Agricultural Districts
    3. State / Federal Forest – Parks / Recreation lands
    4. Urban areas
    5. Environmental Justice Communities

- **Property Impacts** – specific new right-of-way quantified in acres

- **Environmental Impacts** – refinements to impacts on known historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat areas, number of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands, based on refined alignments. Specific measures included:

    1. Number of Listed National Historic Register Sites
    2. Nature / Wildlife Preserves / Conservation Lands
    3. Number of Stream Crossings
    4. Birds Point Floodway Impacts
    5. Floodplain / Floodway – expressed in miles and acres
    6. Wetlands – expressed in miles and acres

- **Capital cost considerations** – order of magnitude capital costs for proposed corridors derived on a cost build up basis from typical sections for roadway (at-grade and elevated) and bridge improvements, also includes typical costs for interchanges, and appropriate costs for engineering, contingencies, etc. Specific costs included:

    1. Roadway
    2. Bridge
    3. Right-of-way
    4. Engineering / Mobilization / Demobilization
    5. Total

  Note that although seemingly detailed estimates of impacts and costs are provided, the analysis was NOT to an engineering level. Assumptions are for analysis purposes, and include a 180-foot wide typical section for current year 2003 cost estimating and a 600-foot section for right-of-way purposes calculated on an average cost per acre basis. For environmental analysis, a bandwidth of 2,000 from an imaginary centerline of the corridor was used for analysis purposes with all data assumed available from the project's mapping databases. Comparisons should only be made to other corridors within the context of this study.

The more detailed analysis performed in the Level 3 screening / evaluation further examined the remaining four (4) corridors and re-examined Corridor 8. The Project Team, decided to reexamine a modified Corridor 8 – essentially Corridor 11 in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceeding north west on new route across the Ohio River on a new bridge to I-57 in Illinois, in the Level 3 Screening. This occurred because of several reasons:

- It was necessary to look at an alternative river crossing that would minimize disruptions to barge traffic on the Mississippi River. This was evident after further discussions with the US Coast Guard about the location of a possible bridge across the Mississippi River
- Illinois DOT became interested in another corridor other than Corridor 20 and KYTC and MoDOT and the Project Team concurred.
- Potential corridors that did not impact the Birds Point – New Madrid Floodway were revisited It became clear after talking with the US Army Corps of Engineers that corridors that would not impact the floodway should also be examined due to the technical challenges that traversing the floodway would present.

Thus, the corridors examined during Level 3 included:

- No - Build Option – Only existing and committed projects in KYTC 2001 – 2006 Six Year Highway Plan and MoDOT improvement program.

- Corridor 8 – essentially Corridor 11 in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceeding north west on new route across the Ohio River on a new bridge to I-57 in Illinois.
- Corridor 8B – US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing
- Corridor 11/12/13/14/15 & 21 – new limited access highway corridor parallel to US 62 and KY 286 with a new Mississippi River crossing
- Corridor 20 – unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

The following presents the detailed analysis for the corridors examined in Level 3. Please note that the data presented here and in the final Level 3 matrix that follows includes the *refined* Level 3 traffic results. There are some minor differences between these numbers and the original numbers presented in the Level 3 Report (Appendix 8).

10.1 No - Build Option

Traffic Operations

- Screen line #1 – 43,000 ADT, 3,300 ADT trucks (7%), LOS E
- Screen line #2 – 11,000 ADT, 1,500 ADT trucks (13%), LOS A
- Screen line #3 – 9,000 ADT, 900 ADT trucks (10%), LOS E
- Screen line #4 – 11,000 ADT, 1,900 ADT trucks (17%), LOS E

- 938.5 million miles of travel
- 18.72 million hours of travel

(***Note**: In terms of million miles of travel and million hours of travel, there is little difference between the options under consideration. This is because the analysis was derived from Kentucky's Statewide Travel Forecasting Model, which aggregates travel on the basis of the entire state, not a particular corridor.)*

The travel time for the No - Build serves as the baseline for comparison to other corridors. For the two trips; Paducah to Sikeston and Paducah to Cape Girardeau, the travel times are 76 and 95 minutes respectively.

The No - Build Option will make some improvements to US 60; but only those programmed in the KYTC's 2001 – 2006 Six Year Highway Plan. This will have some very tangible improvements in terms of safety and security, including the provision of an upgraded route and improved / increased access to points west of Paducah. It does not however provide for a new bridge over the Mississippi River, which would provide a great deal of redundancy in terms of connectivity (east – west connections) and access for the transportation system in western Kentucky / southeastern Missouri.

Support
There is some minimal support for the No - Build Option in both Kentucky and Missouri. Most of those who are interested in the No - Build Option want more improvements than just those that are currently programmed. These same individuals also tend to be concerned with the anticipated impacts of the US 60 improvements on adjacent communities including nearby residences, businesses, farms, etc.

Community Impacts
Community impacts have been fully documented in previous studies. The no-build corridor for the I-66 project also does not recommend further improvements beyond those existing and committed, therefore no anticipated incremental impacts are anticipated. In addition, there are no adverse potential environmental justice (EJ) issues.

Property Impacts
Property impacts have been fully documented in previous studies. The no-build corridor also does not recommend further improvements beyond those existing and committed, therefore no new property impacts are anticipated.

Environmental Impacts
Environmental impacts have been fully documented in previous studies. The no-build corridor also does not recommend further improvements beyond those existing and committed, therefore no environmental impacts are anticipated.

Capital Costs
The current total for existing and committed projects is $26.3 million dollars.

10.2 Corridor 8

Traffic Operations

- Screen line #1 – 30,000 ADT, 4,400 ADT trucks (14%), LOS C
- Screen line #2 – 18,000 ADT, 3,000 ADT trucks (16%), LOS A - B

Screen line #3 and Screen line #4 parameters were not calculated because it was deemed that Corridor 8 was fatally flawed from an environmental standpoint

The total vehicle miles of travel, total vehicle hours or travel and travel times for Corridor 8 were also not calculated for the Level 3 Screening because it was deemed that the corridor was fatally flawed from an environmental standpoint.

Corridor 8 provides a new limited access highway connector from other options nearest KY 286 also includes a new bridge over the Ohio River. These new facilities would add to safety of the system and provide a redundant link from Kentucky to Illinois and into

Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. Corridor 8 also improves system connectivity and access.

Support
There is some support for Corridor 8. Issues associated with this corridor include impacts to wetlands, floodplains, and potential wildlife refuge and habitat area impacts near Barlow, Kentucky.

Community Impacts
Community impacts for Corridor 8 are to farmlands, Kentucky agricultural districts, urban area, property impacts, and potential EJ impacts.

- 21 miles or 7,222 acres of adjacent roadway / farmland impacts throughout the corridor
- 1.3 miles or 343 acre of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 1 mile or 135 acres of impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts
Total property impacts are anticipated to be 2,113 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 8 are to a NHR site, nature / wildlife preserves and conservation lands, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands. The largest impacts are to the Peal and Swan Lake Wildlife Management Areas near Barlow, Kentucky.

- 1 anticipated impact to listed National Historic Register (NHR) sites, a 0.4 mile segment of the Trail of Tears National Historic Trail
- 2 miles or 455 acres of impacts to nature, wildlife preserves and conservation lands
- 49 stream crossings throughout the corridor
- no impacts to the Birds Point - New Madrid Floodway
- 7.2 miles or 1,001 impact to adjacent floodplains
- 4 miles or 1,001 acres of impacts to adjacent wetlands

Through correspondence with agencies in Kentucky, it was determined that Corridor 8 was fatally flawed from an environmental analysis perspective.

Capital Costs
The total capital costs for Corridor 8 are $767 million (2003 dollars). $265 million is for roadway, construction, $266 million for construction of a new bridge across the Ohio

River, $128 million for right-of-way and utilities and $108 million for contingencies, engineering, design and mobilization / demobilization of construction.

10.3 Corridor 8B

Traffic Operations

- Screen line #1 – 40,000 ADT, 2,000 ADT trucks (7%), LOS E
- Screen line #2 – 9,000 ADT, 1,300 ADT trucks (14%), LOS A
- Screen line #3 – 5,500 ADT, 400 ADT trucks (7%), LOS A
- Screen line #4 – 7,000 ADT, 1,000 ADT trucks (14%), LOS A

- 942.5 million miles of travel
- 18.76 million hours of travel

The travel time for Corridor 8B represents very slight improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreases by approximately 3 minutes from the No - Build, while the travel time for the Paducah to Cape Girardeau trip represents no change from the No - Build Option.

Corridor 8B provides a new bridge connector from US 60 in Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on Mississippi River traffic. Likewise, Corridor 8B also improves system connectivity and access.

Support
Support exists for continuing the US 60 improvements and for upgrading the corridor. There is also support for a new bridge over the Mississippi River near Wickliffe, Kentucky. Issue of concern include impacts to areas adjacent to US 60 as well as wetland impacts and concerns over the river crossing location, especially impacts to river traffic and impacts to the Birds Point - New Madrid Floodway in Missouri.

Community impacts for Corridor 8B are to farmlands, urban areas, property impacts and potential EJ impacts.

- 30.54 miles or 10,665 acres of adjacent roadway / farmland impacts throughout the corridor
- 2.58 miles or 623 acres of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 1.88 miles or 468 acres of impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts
Total property impacts for right-of-way purposes are anticipated to be 1,100 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 8B are to stream crossings, the Birds Point - New Madrid Floodway, floodplains, and floodways and to wetlands.

- 1 impacts to a 0.4 mile long segment of the National Historic Register Site the Trail of Tears
- no impacts to nature / wildlife preserves / conservation lands
- 82 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to Birds Point - New Madrid Floodway
- 11.74 miles or 2,970 acres of impacts to floodplain / floodways
- 1.56 miles or 441 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 8B are $691 million (2003 dollars). $254 million is for roadway, construction, $297 million for construction of a new bridge across the Mississippi River, $29 million for right-of-way and utilities and $111 million for contingencies, design, engineering and mobilization / demobilization of construction.

10.4 Corridor 11 / 12/ 13/ 14 / 15/ and 21

Traffic Operations

- Screen line #1 – 30,000 ADT, 4,400 ADT trucks (14%), LOS C
- Screen line #2 – 18,000 ADT, 3,000 ADT trucks (16%), LOS A - B
- Screen line #3 – 7,000 ADT, 2,500 ADT trucks (35%), LOS A
- Screen line #4 – 9,000 ADT, 2,200 ADT trucks (20%), LOS A

- 942.6 million miles of travel
- 18.76 million hours of travel

The travel time for Corridor 11 et al represents improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreased by almost 19 minutes when compared to the No - Build. The travel time for the Paducah to Cape Girardeau trip represents a 9-minute decrease.

Corridor 11 et al provides a new bridge over the Mississippi River to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is more preferable in terms of the Coast Guard's analysis of affects on

Mississippi River traffic. Likewise, Corridor 11 et al also improves system connectivity and access.

Support
Strong support exists for Corridor 11 et al. Issues of concern include impacts to areas adjacent to the corridor as well as farmland impacts.

Community impacts for Corridor 11 et al are to farmlands, agricultural districts, urban areas, property impacts and potential EJ impacts.

- 28.87 miles or 8,324 acres of adjacent roadway / farmland impacts throughout the corridor
- 2.30 miles or 870 acres of impacts to agricultural districts
- no anticipated impacts to state / Federal forests, parks, and/or recreation land
- 0.17 miles or 74 acres of impacts to urban areas are anticipated
- low probability of adverse Environmental Justice impacts

Property Impacts
Total property impacts for right-of-way purposes are anticipated to be 2,325 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 11 et al are to stream crossings, the Birds Point - New Madrid Floodway, floodplains and floodways and to wetlands.

- 1 impact to a 0.4 mile long segment of the National Historic Register Site the Trail of Tears
- no impacts to nature / wildlife preserves / conservation lands
- 87 stream crossings throughout the corridor
- 3 miles or 723 acres of impacts to Birds Point - New Madrid Floodway
- 12.38 miles or 3,323 acres of impacts to floodplain / floodways
- 1.17 miles or 509 acres of impacts to adjacent wetlands

Capital Costs
The total capital costs for Corridor 11 et al are $895 million (2003 dollars). $328 million is for roadway, construction, $292 million for construction of a new bridge across the Mississippi River, $151 million for right-of-way and utilities and $124 million for contingencies, design, engineering and mobilization / demobilization of construction.

10.5 Corridor 20

Traffic Operations

- Screen line #1 – 15,000 ADT, 1,600 ADT trucks (10%), LOS A

- Screen line #2 – 16,000 ADT, 1,600 ADT trucks (10%), LOS A
- Screen line #3 – 16,000 ADT, 1,600 ADT trucks (10%), LOS A
- Screen line #4 – 17,000 ADT, 2,100 ADT trucks (12%), LOS A

- 942.4 million miles of travel
- 18.75 million hours of travel

The travel time for Corridor 20 represents improvements from the No - Build Option. The travel time for the Paducah to Sikeston trip decreased by 3 minutes when compared to the No - Build. The travel time for the Paducah to Cape Girardeau trip represents a 25-minute decrease.

Corridor 20 provides a link from I-24 across southern Illinois to Cape Girardeau. This provides improved access for southern Illinois and Missouri, but does little for western Kentucky.

Support
Strong support exists for Corridor 20 in Illinois and near Cape Girardeau. Likewise, there is no support for Corridor 20 in western Kentucky.

Community impacts for Corridor 20 are to farmlands, urban areas, state / Federal Forests / park, property impacts and potential EJ impacts.

- 35.23 miles or 8,511 acres of adjacent roadway / farmland impacts throughout the corridor
- no impacts to agricultural districts (since the proposed corridor is in Illinois)
- 8.67 miles or 2,102 acres of impacts to state / Federal forests, parks, and/or recreation land, mainly to the Shawnee National Forest
- 3.88 miles or 504 acres of impacts to urban areas are anticipated
- high probability of adverse Environmental Justice impacts, mainly near the Cape Girardeau area

Property Impacts
Total property impacts for right-of-way purposes are anticipated to be 2,930 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts
The anticipated environmental impacts of Corridor 20 are to National Historic Register Sites, stream crossings, floodplains and floodways and to wetlands.

- 2 impacts totaling 2.9 miles to segments of the National Historic Register Site the Trail of Tears
- .03 miles of 64 acres of impacts to nature / wildlife preserves / conservation lands
- 51 stream crossings throughout the corridor
- no anticipated impacts to the Birds Point - New Madrid Floodway

- 12.78 miles or 3,113 acres of impacts to floodplain / floodways
- 2.78 miles or 843 acres of impacts to adjacent wetlands

Capital Costs

The total capital costs for Corridor 20 are $586 million (2003 dollars). $363 million is for roadway, construction, $18 million for construction / modifications to link the roadway to the existing Bill Emerson Bridge, $128 million for right-of-way and utilities and $77 million for contingencies, design, engineering and mobilization / demobilization of construction.

10.6 Level 3 Screening Summary / Conclusions

Based on the analysis, the following can be concluded:

- The No - Build Option is sufficient to meet the needs of the region in the near future, but will be inadequate to accommodate future traffic closer to the project's horizon year - 2030. It does address the study's goals, objectives, and issues and has some level of support. The No - Build Option will likely meet the needs of the region in the short term, although it is not sufficient for longer-term transportation needs.

- Corridor 8 can meet the needs of the project and address some of the goals, objectives, and issues of the study. It does provide a new route and a river crossing. However, the impacts caused by this corridor to sensitive natural resource and especially the impacts to wildlife management areas are too great to make the corridor feasible. These impacts, coupled with the fact that there are other corridors with less impacts, make Corridor 8 fatally flawed. This determination was also corroborated by agencies in Kentucky with jurisdiction over the wildlife management areas.

- Corridor 8B can meet the needs of the project, address the goals, objectives and issues of the study and provide a new upgraded US 60 (controlled access facility) in the long term with a new bridge crossing the Mississippi River south of Wickliffe, Kentucky, (no further north than Lower Mississippi River Mile marker 949), capitalizing on improvements already made to US 60. Corridor 8B is a viable option for satisfying both the short and long-term transportation needs of western Kentucky.

- Corridor 11 / 12 / 13/ 14/ 15/ and 21, can also meet the needs of the project, address the goals, objectives, and issues of the study, and provides a long term new limited access highway with a new bridge crossing the Mississippi River near Wickliffe, Kentucky. However, given the need for additional right-of-way and the higher costs of this type of corridor, it is unlikely to be funded for construction in the time horizon of the study.

- Corridor 20, although unspecified as to the route through southern Illinois, does meet the needs of the project, addresses only some of the goals, objectives, and issues of the study, and provides a new highway through southern Illinois. It is supported by Illinois and from the contingent of stakeholders near Cape Girardeau, Missouri. However, it does not provide for benefits to western Kentucky and has impacts to the Shawnee National Forest that other corridors do not.

This concludes the technical analysis portion of the I-66 corridor study. This technical analysis may be used as the basis for future project development.

The following matrices and map depict the results of the Level 3 Screening and portray the final set of corridors that are thought to be workable for the project.

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Length of Route - Total Miles / New Roadway	Traffic Operations [1]											
			Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River		
			Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	0 mi / 0 mi	43,000 (US 60)	3,400 (8%)	E (4 lanes)	17,000 (US 60)	1,500 (9%)	A-B (4 lanes)	10,000 (US 60)	1,100 (11%)	E (2 lanes)	11,000 (Bridge Over Ohio River)	1,800 (16%)	E (2 lanes)
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	33.33 mi / 33.33 mi	31,000	3,700 (12%)	C	16,000	2,400 (15%)	A-B	See Note 5 Below					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	38.50 mi / 15 mi	40,000 (US 60)	2,800 (7%)	E (4 lanes)	12,000 (US 60)	800 (7%)	A (4 lanes)	5,000 (US 60)	300 (6%)	A (4 lanes)	7,000	1,000 (14%)	A (4 lanes)
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	40.93 mi / 40.93 mi	30,000	4,000 (13%)	C	14,000	2,500 (18%)	A-B	11,000	2,700 (25%)	A	9,000	2,200 (20%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	48.32 mi / 48.32 mi	16,000	1,800 (11%)	A	16,000	1,800 (11%)	A	17,000	1,900 (11%)	A	27,000	2,100 (8%)	A-B

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations [1]						Support	
		Total Vehicle Miles of Travel (VMT in Millions)	Total Vehicle Hours of Travel (VHT in Millions)	Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access	Corridor	Issues
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	938.5	18.72	76.5 mins	93.6 mins	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	See Note 5 Below				Provides improvement - connects I-24 to I-57 in Illinois	Provides new river crossing location over Ohio River	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, Corps of Engineers preferred river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	942.5	18.76	72.7 mins (3.8 mins)	94.8 mins (N/A)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	942.6	18.76	57.9 mins (18.6 mins)	84.0 mins (9.6 mins)	Provides improvement - New bridge over Mississippi River	Provides new river crossing location over Mississippi River	Support is strong for Alternative 11/12/13/14/15/21.	Farmland impacts, uses least favorable river crossing
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	942.4	18.75	76.1 mins (0.4 mins)	68.1 mins (25.5 mins)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY	There has been strong support for Alternative 20 in Illinois. Likewise, there is no support for Alternative 20 from residents of Kentucky.	Some economic benefits to southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of Bill Emerson bridge

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

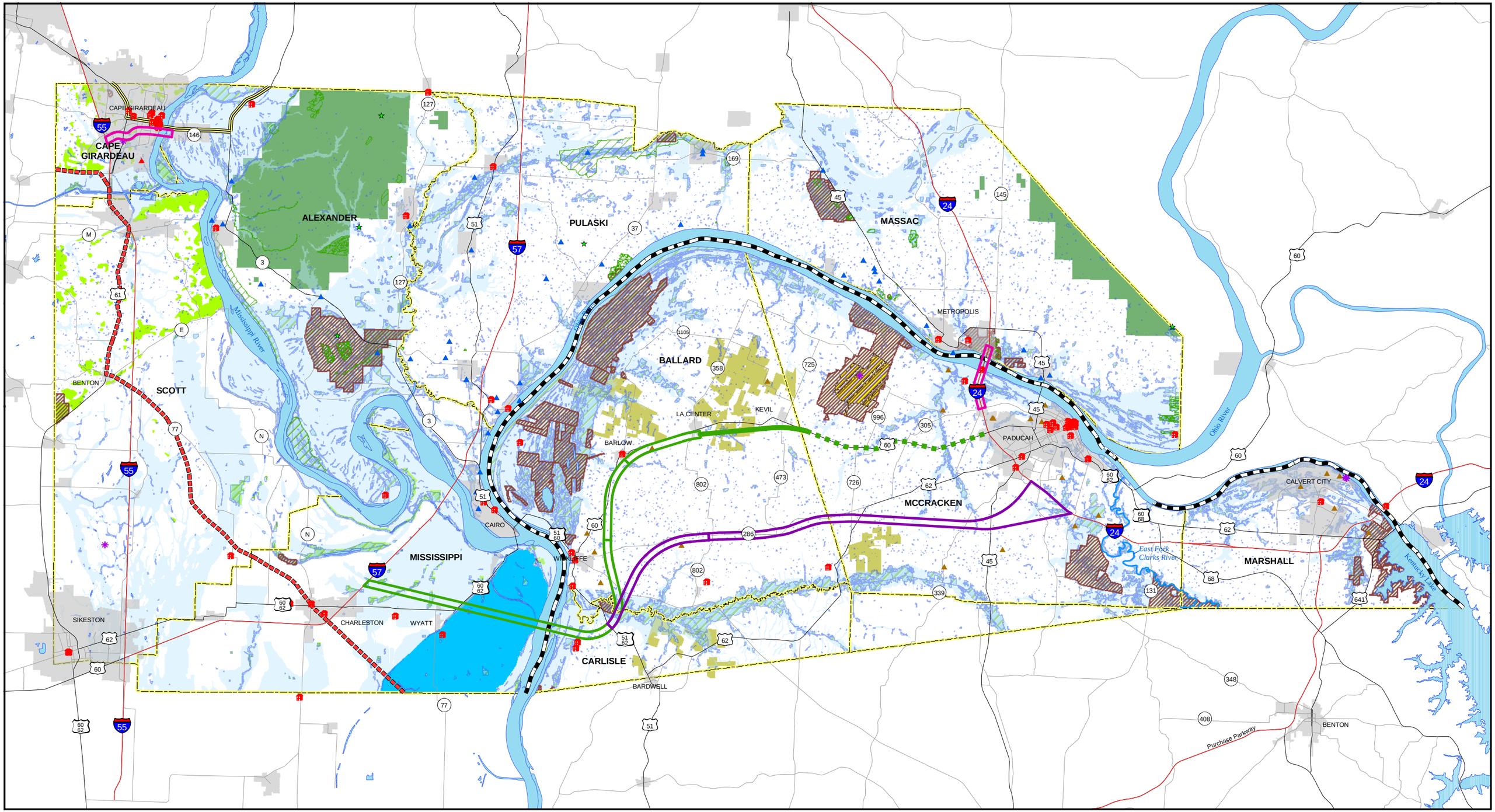
Alt. / Corridor No.	Description	Community Impacts					
		Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	21 mi/7,222 ac	1.3 mi/343 ac	0 mi/0 ac	1 mi/135 ac	Medium	2,113
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	30.54 mi/10,665 ac	2.58 mi/623 ac	0 mi/0 ac	1.88 mi/468 ac	Low	1,100
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	28.87 mi/8,324 ac	2.30 mi/870 ac	0 mi/0 ac	0.17 mi/74 ac	Low	2,325
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	35.23 mi/8,511 ac	N/A	8.67 mi/2,102 ac	3.88 mi/504 ac	High [2]	2,930

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Final Level 3 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts [3]						Capital Costs [4]				
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Bird's Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (miles/acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated						No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million				
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7.20 mi / 1,001 ac	4.0 mi/1,001ac	$265	$266	$128	$108	$767
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	82	3 mi/723 ac	11.74 mi/2,970 ac	1.56 mi/441 ac	$254	$297	$29	$111	$691
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	87	3 mi/723 ac	12.38 mi/3,323 ac	1.17 mi/509 ac	$328	$292	$151	$124	$895
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	2 (2.9 mi of Trail of Tears)	0.03 mi/64 ac	51	0 mi/ 0 ac	12.78 mi/3,113 ac	2.78 mi/843 ac	$363	$18	$128	$77	$586

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

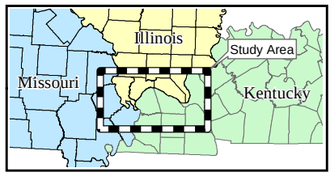


Alternative Corridors

- Existing 60 Improved
- Improvements Programmed
- 8b
- 11
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

0 2.5 5 Miles

Figure 14

LEVEL 3 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

11.0 RECOMMENDATION AND NEXT STEPS

Given the current fiscal constraints in the Commonwealth and the KYTC and the lack of firm commitments for project funding the KYTC has chosen not to pursue a build option at this time. If the stated conditions change, this decision does not preclude future project development activities from taking place for a limited access highway in Western Kentucky. Independent of this decision, KYTC, MoDOT, and/or IDOT can restart the project development activities in their respective states using this study. The corridors from this study that would be included in a next phase of project development are Corridors 8B, 11, and 20. However, other corridors may also be developed at a future date.

When future project development activities take place, a number of issues identified during this initial I-66 study will need to be dealt with appropriately. Those issues and the commitments to deal with them include:

- Type, size and location (TS&L) study of a bridge spanning either the Mississippi River or the Ohio River. This will be needed to analyze the bridge's impact on the natural and human environments.

- Hydraulic analysis of bridge pier locations, including an analysis of scour will be needed, and the impacts of pier locations and other structures to the Birds – Point New Madrid Floodway. This was specifically mentioned by the US Army Corps of Engineers.

- Navigational impacts study of proposed pier locations. This was requested by US Coast Guard.

- No Rise / floodway impacts to FEMA jurisdictional and other agency floodways / floodplains.

- Examination of and incorporation of multimodal alternatives (bicycling, walking, etc.). This is necessary to comply with environmental regulations and KYTC practices.

- In depth examination of Environmental Justice (EJ) effects at a more finite level. Although this project examined potential EJ effects, it did so at a larger scale – at the county and block group level. Once a corridor is advanced further in project development, it will be appropriate to examine potential affects at the block and/or tract level for a more thorough analysis.

- In depth investigation – perhaps including field surveys and analysis – of corridors and their potential affects on the natural and human environments.

Although this initial project examined potential affects to the natural and human environments, it did so at a large scale, and utilized GIS resources. Once a corridor is advanced further in project development, it may be appropriate to examine potential affects at a more in-depth level.

- Continued coordination with other state DOTs, regulatory and jurisdictional agencies. This initial study used many types of coordination efforts, and they should be continued through the next phases of project development.

12.0 TECHNICAL APPENDICES

Appendix 1 – Public Involvement Summary

Appendix 2 – Existing Conditions Summary

Appendix 3 – Environmental Justice Analysis

Appendix 4 – Traffic Methodology

Appendix 5 – Geotechnical Overview

Appendix 6 – Level 1 Screening

Appendix 7 – Level 2 Screening

Appendix 8 – Level 3 Screening

Appendix 9 – Contacts

Appendix 10 – Resource Agency Correspondence

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 1 - PUBLIC INVOLVEMENT SUMMARY

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

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Fuller, Mossbarger, Scott & May

FEBRUARY 2005

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I-66 Public Involvement

The purpose of the Public Involvement Program was to allow various stakeholders, including landowners, citizens, and public interest groups to understand the project and be able to voice their concerns, thoughts and ideas. This section outlines the Public Involvement Program that took place during the I-66 Southern Kentucky Corridor Study from July 2001 to December 2003.

Objectives

The key to any successful project is public Involvement. The following objectives were developed to guide the public involvement process. These objectives were realized through the techniques described in this section.

- Provide a high degree of public involvement for the project, minimizing controversy and avoiding "public burnout";
- Gain public support and trust at the outset of the study, and retain it through the end of the study; build public support for the best alternative strategy;
- Be proactive and reach out to the broader general public, including those who don't usually attend public meetings;
- Be innovative and creative, setting a special positive tone for the project;
- Keep it simple; make project concepts, techniques, methods analysis, etc., understandable, so that complex questions can be translated into easy choices at key decision points.

Study Identity

In order to effectively communicate with the diverse project stakeholders within the I-66 project area, the project utilized and built upon the existing I-66 logo/theme. The logo helped to define the project and unify communications.

Figure 1- 66 Logo

Project Work Group

A Project Work Group (PWG) was created to work in partnership with the Project Team throughout the process. The PWG members represent applicable resource agencies, public interest groups and local community stakeholders and organizations. A complete

list of the PWG is included with this report. *Note that Mr. Thomas Tucker of the Southeast Missouri Regional Planning and Economic Development Commission passed away in early 2004. Mr. Tucker was a long standing member of the PWG and his efforts were greatly appreciated.*

The Project Team and PWG worked in conjunction to achieve a comprehensive examination of the proposed I-66 corridors in Western Kentucky. The PWG was consulted throughout the process and provided specific input for the following four crucial milestones of the project;

1) The development of project goals and issues, purpose and need;
2) The development of preliminary alternatives;
3) The refinement and evaluation of alternatives; and
4) The recommendation of a preferred corridor.

A total of five (5) PWG meetings were held during the project. The dates and objectives of the meetings are outlined below.

Meeting Date	Objective
February 21, 2002	A project introduction and development of Draft Goals and Objectives
July 25, 2002	The development of initial project corridors
November 7, 2002	Discussion and feedback of Level 1 Screening
April 24, 2003	Discussion and feedback of Level 2 Screening
August 28, 2003	Discussion and feedback of Level 3 Screening

Each PWG member also received an individual study notebook that was utilized during the project to compile memorandums, meeting minutes and meeting materials.

Public Workshops

Four rounds of public workshops were held during the project process to gain additional project input and to validate and give feedback on the recommendations/findings of the Project Team and PWG. Below is a brief description of each meeting, for a more detailed synopsis please refer to the public involvement summaries available from the KYTC.

- The first Public Workshops were held on May 13 and 14, 2002 in Sikeston, Missouri and Paducah, Kentucky respectively. The purpose of the workshop was to provide an introduction to the study and to gain information regarding project issues and project goals. 52 citizens attended the Missouri meeting and 47 citizens were in attendance in Kentucky.

- The second Workshops were held on August 19 and 20, 2002 in Sikeston, Missouri and LaCenter, Kentucky, respectively. The objective of the meeting was to present and receive feedback on the draft project goals and the three (3) initial I-66 corridors. An opening presentation was given by the Project Team

and open house stations were set up throughout the meeting room. 24 citizens attended the workshop in Missouri, while 95 attended the meeting in Kentucky.

- The third workshops were held on December 9 and 10, 2002 in Sikeston, Missouri and LaCenter, Kentucky, respectively. A brief introductory presentation was prepared and exhibits depicting twenty-two (22) potential corridors, developed during the second Public Workshop were shown. The public had the opportunity to discuss the corridors with project staff and were asked to complete a feedback survey. 30 citizens were in attendance in Sikeston and 12 attended the workshop in LaCenter.

- The final workshops were held on May 5 and 6, 2003 in LaCenter, Kentucky and Sikeston, Missouri, respectively. 80 citizens were in attendance in Kentucky and 32 citizens attended the Missouri meeting. The meeting included an introductory presentation and exhibits depicting the four (4) remaining alternatives that existing after the completion of Level 2 screening. Attendees were given the opportunity to discuss the Alternative with project staff and provide feedback through a survey.

More information about the meetings, specific comments, handout materials, etc., is available from the KYTC Division of Planning. Individuals interested in these materials should contact the department.

Local Official and Agency Meetings

The Project Team held meetings with local officials and local agencies in both Missouri and Kentucky. Meetings with local officials were held in Sikeston, Missouri in September of 2001, and in Mayfield, Kentucky in August of 2001. The purpose of the meetings was to inform locally elected officials about the study and to encourage them and their constituents to participate. Some meeting minutes are included with this report.

A conference call with the US Army Corps of Engineers was held in June of 2003. The purpose of the call was to discuss the preliminary alternative corridor locations for a new bridge across the Mississippi River in the vicinity of Wickliffe, Kentucky for I-66. A meeting summary is included in this report.

The following pages contain various attachments providing more in-depth details about various meetings.

Project Workgroup Members

I-66 Corridor Study
Western KY
Current Work Group Roster

	First Name	Last Name	Organization Name	Title	Address	City	State	Postal Code	Work Phone	Fax Number	Email Address
	Elected Officials										
1	Bob	Buchanan	Ballard County	Judge/Executive	PO Box 276	Wickliffe	KY	42086	(270) 335-5176	(270) 335-3010	BCJudge@BRTC.net
2	Danny	Orazine	McCracken County	Judge/Executive	301 S. 6th St.	Paducah	KY	42003-1700	(270) 444-4707	(270) 444-4731	
	Judge Orazine represented by Dan Key				631 Washington St	Paducah	KY	42002-2733	(270) 442-9600	(270)442-1062	key@washburnkey.com
3	Mike	Miller	Marshall County	Judge/Executive	1101 Main Street	Benton	KY	42025	(270) 527-4750	(270) 527-4795	mike.miller@mail.state.ky.us
	Judge Miller represented by Magistrate Galen Edwards				67 McGregor	Benton	KY	42025	(270) 527-3173	(270) 527-5428	
4	James	Blumerberg	Mississippi County	Presiding Commissioner	P.O. Box 112	East Prairie	MO		(573) 683-2146	(573) 683-6071	mlucas@tristateonline.net
5	David B.	Brewer	City of Charleston	City Manager	204 North Main Street	Charleston	MO	63834	(573) 683-3325	(573) 683-3297	charcity@midwest.net
6	Lewis	Hicks	City of LaCenter	Mayor	P.O. Box 420	LaCenter	KY	42056	(270) 665-5162	(270) 665-9113	
7	Bill	Paxton	City of Paducah	Mayor	300 S. 5th St.	Paducah	KY	42002-2267	(270) 444-8530	(270) 443-5058	
	Mayor Paxton represented by George Sirk				817 Broadway	Paducah	KY	42001	(270) 442-7810	(270) 442-7852	sirk260@aol.com
8	Phil	Boyer	City of Sikeston	Mayor	105 E Center St.	Sikeston	MO	63801	(573) 471-1398		
9	Sylvio	Mayolo	City of Wickliffe	Mayor	P.O. Box 175	Wickliffe	KY	42087	(270) 335-3557	(270) 335-3557	wcw@brtc.net
	Resource Agencies										
10	Hugh	Archer	KY Dept for Natural Resources	Commissioner	663 Teton Trail	Frankfort	KY	40601	(502) 564-2184	(502) 564-6193	Hugh.Archer@mail.state.ky.us
11	Jerry	Conley	Missouri Dept. of Conservation	Director	PO Box 180	Jefferson City	MO	65102	(573) 751-4115		
12	Wayne	Davis	KY Dept of Fish and Wildlife Resources	For Commissioner	#1 Game Farm Road	Frankfort	KY	40601	(800) 858-1549	(502) 564-4519	Wayne.Davis@mail.state.ky.us
13	David	Morgan	KY Heritage Council	Executive Director and State Historic Preservation Officer	300 Washington Street	Frankfort	KY	40601	(502) 564-7005	(502) 564-5820	DavidL.Morgan@mail.state.ky.us
14	Claire	Blackwell	Missouri Dept. of Natural Resources	State Historic Preservation Officer	100 East High Street	Jefferson City	MO	65102	(573) 751-7858	(573) 522-6262	moshpo@mail.dnr.state.mo.us
	Local Transportation Members										
15	Pat	Stephenson	McCracken County	County Road Supervisor	3700 Coleman Rd.	Paducah	KY	42001	(270) 442-9163		
16	Terry	Simmons	Ballard County	Chairman, Economic Development Board	1502 Hinleville Rd	LaCenter	KY	42056	(270) 744-3232	(270) 744-3308	bceidb@brtc.net
17	Richard	Wallace	Mississippi County	County Highway Engineer	P.O. Box 369	Charleston	MO	63834	(573) 683-6428	(573) 649-5967	
	Regional Agencies										
18	Henry	Hodges	Purchase ADD	Executive Director	1002 Medical Drive	Mayfield	KY	42066	(270) 251-6146		henry.hodges@mail.state.ky.us
	Stacey	Courtney	Purchase ADD	Transportation Planner	1002 Medical Drive	Mayfield	KY	42066	(270) 247-7171	(270) 251-6110	stacey.courtney@mail.state.ky.us
19	Steve	Zea	West Kentucky Corporation	Executive Director	P.O. Box 1428	Murray	KY	42071	(270) 762-3294	(270) 762-3295	steve.zea@murraystate.edu
20	George	Harben	Greater Paducah Economic Development Council		PO Box 1155 333 Broadway/Suite 603	Paducah	KY	42002-1155	(270) 575-6633	(270) 575-6648	
21	Kim	Logsdon	West KY Economic Development Office	Director	145 E Center St.	Madisonville	KY	42431	(270) 824-7053	(270) 824-7056	klogsdon@mail.state.ky.us
22	Kathleen M	Hall	Southeast Missouri Regional Planning and Economic Development Commission	Executive Secretary	PO Box 366	Perryville	MO	63775	(573) 547-8357	(573) 547-7283	semorpc@semorpc.org
23	Mike	Dumey	Bootheel RPC	Executive Director	PO Box 397	Malden	MO	63863	(573) 276-2242	(573) 276-6034	
24	Jackie	Terrell	Ballard County Chamber of Commerce		P.O. Box 509	LaCenter	KY	42056	(270) 665-5156	(270) 665-9655	jterrell@brtc.net
24	Julie A	Thomas	Ballard County Chamber of Commerce		P.O. Box 575	Wickliffe	KY	42087	(270) 335-5999	(270) 335-5999	bcchamberinfo@brtc.net
25	Liz	Anderson	Mississippi Co. Industrial Development Authority		P.O. Box 69	Charleston	MO	63834-0069	(573) 683-3351	(573) 683-2217	lizanderson@enterprisecourier.com
	Interested Organizations										
26	Oscar	Geralds	Sierra Club	Cumberland Chapter	259 West Short St.	Lexington	KY	40507	(859) 255-7946		ogeralds@lexkylaw.com
27	Tom	Miller	Ballard County Cooperative Extension Office	Agriculture Agent	P.O. Box 237	LaCenter	KY	42056-0237	(270) 665-9118	(270) 665-5241	tmiller@uky.edu
28			Kentucky Motor Transport Association		134 Walnut St	Frankfort	KY	40601	(502) 695-4055	(502) 695-9026	
29	John	Tedder	West KY Allied Community Services	Executive Director	P.O. Box 736	Mayfield	KY	42066	(270) 247-4046	(270) 247-2158	
30	Dr. Hilary	Lambert	KICK 66		720B Aurora Ave.	Lexington	KY	40502			
	Citizens										
31	Earl	Norman	Benton Hill Investment Co.	Chairman and CEO	276 South Mount Auburn Road	Cape Girardeau	MO	63703	(573) 332-1616	(573) 332-7979	
	Walter B	Wildman			3905 Valley View Lane	Cape Girardeau	MO	63701	(573) 332-8300	(573) 335-6628	wildman@clas.net
32	Betty	Hearns			P.O. Box 509	Charleston	MO	63834	(573) 683-6011	(573) 683-6011	
33	Delphine	Operle			52 Martin Circle	Paducah	KY	42001	(270) 554-7588		delphine@hcis.net
32	Homer D	Oliver			404 East Commercial Street	Charleston	MO	63834	(573) 675-3440	(573) 683-6071	
	State and Federal DOT										
33	Mary	Murray	FHWA - KY	Area Engineer	330 West Broadway	Frankfort	KY	40601	(502) 223-6745	(502) 223-6735	Mary.Murray@fhwa.dot.gov
34	Wayne	Mosley, PE	KYTC - District One	Chief District Engineer	P.O. Box 3010	Paducah	KY	42002-3010	(270) 898-2431	(270) 898-7457	D.Wayne.Mosley@mail.state.ky.us
35	Annette	Coffey, PE	KYTC Division of Planning	Director	125 Holmes Street	Frankfort	KY	40622	(502) 564-7183	(502) 564-2865	Annette.Coffey@mail.state.ky.us
36	Scott	Meyer	Missouri Dept. of Transportation	Sikeston District Engineer	P.O. Box 160	Sikeston	MO	63801	(573) 472-5341	(573) 472-5381	meyers@mail.modot.state.mo.us
	Duke	Steve	Missouri Dept. of Transportation	Trans Planning Coordinator	PO Box 160 2675 N. Main	Sikeston	MO	63801	(573) 472-5296	(573) 472-5364	dukes1@mail.modot.state.mo.us
	Consultant Team										
37	Barbara	Michael, AICP	Parsons Brinckerhoff	Project Manager	1951 Bishop Lane	Louisville	KY	40218	(502) 479-9318	(502) 479-9301	michael@pbworld.com
38	David	Smith, PE	Qk4	Deputy Project Manager		Louisville	KY		(502) 566-3071	(502) 585-2222	smith@presnellgroup.com

MODOT Local Officials Meeting
9-14-01

I-66 CORRIDOR PLANNING STUDY
Missouri Elected Officials and Interested Stakeholders Meeting
9-14-01
Sikeston, Missouri

Attendees:

DawnRae Clark – CCSE
Clyde Haus – New Madrid County
Chap Arnold – Scott County Chamber
David Brewer – City of Charleston
Kent Bratton – City of Cape Girardeau
Josh Bill – Sikeston
Bill Green – Sikeston DED
Ty Thompson – Bootheel RPC
Walt Wildman – Cape Girardeau
Royce Fugate – City of West Plains
Laurel Thompson – City of West Plains
Stan Crader – Marble Hill / RCGA
Earl Norman – Cape Girardeau
Martin Griggel – Scott County
Janet Coleman – City of Dexter
Jerry Pullen
Greg Williams – RCGA
Ron Steele – SEMO Regional Planning
Jim Schwaninger
Leon Steinbrueck – Miss. County Port Auth.
Liz Anderson
Aaron Washburn – Rep. Emerson's Office
Jerry Pullen – Mayor of Sikeston
Mary Murray – FHWA, KY
Scott Meyer – MoDOT
Cheryl Ball – MoDOT
Angela Wilson – MoDOT
Wayne Moseley – KYTC
Bryan Stewart – KYTC
Bruce Siria – KYTC
Carl Dixon – KYTC
Shawn Dikes – Parsons Brinckerhoff

Meeting Summary:

Introductory Remarks - Scott Meyer of MoDOT welcomed those present and gave some introductory remarks about the meeting. Scott thanked participants for coming and encouraged them to participate.

Introductions - Carl Dixon of KYTC invited everyone to introduce him or herself.

Purpose of Meeting - After introductions, Carl presented some details of the history of the I-66 project. Carl described how the concept of an I-66 eat-west corridor came from the ISTEA legislation. An initial study of the feasibility of the nationwide corridor concluded it was not economically justified to pursue the entire corridor coast to coast.

Carl relayed that some states, such as Kentucky, pursued studies of individual segments in their own state. Kentucky examined a statewide corridor and determined that it was feasible to continue examining the development of I-66 in Kentucky. Kentucky has multiple segments under various stages of study and or design.

He said that the segment for Western Kentucky that concerns the meeting today is getting under way in a corridor study.

Carl described the purpose as the study as determining where the segment goes through western KY and where it arrives in Missouri. The meeting is designed to announce the project in Missouri and to gather input on concerns, problems, benefits, issues, and other feedback in the region. He encouraged those present to speak up and to be active in the discussion.

Project Overview - Bruce Siria of KYTC presented some more background on the I-66 corridor. Bruce elaborated that the study of I-66 began 10 years ago with the nationwide study. KYTC picked up the nationwide study and continued to examine I-66 in KY. The KY statewide study determined that the new route would pass an initial feasibility test. The state is studying various segments of I-66 in KY, including the segment currently under study from Paducah to Missouri.

Bruce described the purpose of the initial components of the study as to (1) tie down the starting location in western KY, (2) tie down the starting location in Missouri, and (3) identify a point / location for a river crossing over the Mississippi River.

The study will examine various socioeconomic and environmental factors. The key will be to avoid, minimize, and mitigate any negative impacts.

Since the study is probably going to fall under the NEPA umbrella, the determination of the study Purpose and Need is important. The project will eventually be advanced through environmental documentation.

Shawn Dikes then described the study process. The study process will follow a classic planning process roughly with the following steps: (1) goals / objectives, purpose and need, (2) develop full range of alternatives, (3) screen and refine alternatives based on “fatal flaws”, (4) detailed analysis, (5) recommend alternative.

The level of detail is broad and the corridors that will be defined, analyzed, and recommended will be broad. The process is interactive and is driven by input from the public.

The schedule will roughly be 12 months from now.

Possible Alternatives and Corridors – Carl discussed possible alternatives and altered those present to the stance the Illinois DOT has taken concerning the project. Illinois DOT is, at this point, not interested in the project at all. This mainly lies in the fact that they do not want an alternative that goes through the Shawnee National Forest. This may be a significant obstacle to overcome, especially for an option that goes through Cape Girardeau.

Options include several alignments in KY. Options will come from throughout the study area that ranges from the Paducah area south to the crossing of the Land Between the Lakes near Aurora. River crossing options include locations such as Cape Girardeau, Wickliffe, and south of Wickliffe.

Environmental Footprint – Shawn discussed the development of the environmental footprint in the study area. The process will collect and identify on project mapping all known environmental features / constraints (wetland, streams, threatened, rare or endangered species, historic areas and structures, under ground storage tanks, HAZMAT areas, etc.) so these areas may be avoided during the

development of alternatives. The project mapping will marry GIS and aerial photographs and will allow the project team to develop better alternatives.

Agency Coordination – Shawn also discussed how various local, regional, state, and national agencies, including resource agencies will be integrated into the study. Various agencies will be contacted for data in advance of the environmental documentation for input into the study. The agencies will provide expertise in determining the location of various constraints.

Public Involvement – Shawn also discussed public involvement. As mentioned before, the project will be highly driven by interactive and cooperative public involvement. The project will utilize a Work Group that will contain representatives of various local, regional, and state agencies who will oversee the project.

During roughly 4 phases of public input during the project, the general public will have a chance to provide project input as well. Open house style public meetings are planned for these events.

Question and Answer Discussion Summary:

Josh Bill asked a question about whether or not funding was in place. Carl responded that funding for the next phase if the study is in place. For other studies, the funding is undetermined. The project is not in the KYTC Six Year Plan. At this stage, funding is an issue, especially for funding the capital costs. Funding is just one of the many factors, including environmental and others that will be considered.

Walt Wildman mentioned that the route near Metropolis at Ullin would avoid environmental factors. The route could also recycle bridges and provide a link to I-57.

Dave Brewer countered that the narrow spot of the Mississippi near Wickliffe off the bluffs would avoid much environmental impacts. It would stay out of the Bird's Point Wildlife Area near New Madrid and would tend to make more sense than a northern (Cape Girardeau) option.

Earl Norman gave some background information as to why the option of Cape Girardeau is being considered. The corridor came about from the desire to have an additional east – west corridor in southeast Missouri. It is the second corridor other than 60. The concept ahs garnered support for 12 years. It would connect the only MSA in the region and would provide an upgrade to 34. Earl supports going to I-57.

Car replied that the project would indeed consider routes, 60, and 34.

Earl replied that the $900M bridge in St. Louis would possible siphon off project funds for a new bridge at Wickliffe. He expressed optimism that perhaps Illinois DOT could be persuaded in due time, perhaps once a new administration is in place, to change their minds with regard to the Cape Girardeau option.

Bill Green expressed less optimism about Illinois DOT changing their mind. He said that waiting for a more favorable response from Illinois DOT does not serve southeastern Missouri. He also said that locations around Wickliffe match up well with location in Missouri. Both areas an economically depressed and anew interstate would stimulate both areas. He read from a statement from Joe Mickes, Former MoDOT State Highway Engineer that said "highway 60 is the most likely route in south east Missouri".

With regard to funding and financing, it was mentioned that a toll could be utilized to pay for capital as well as operations and maintenance costs of a new bridge. The concept of bi-state commission as a planning, construction, and funding source for a bridge, off-line from state DOT budgets was also mentioned.

Laurel Thompson mentioned the fact that connecting the military bases on both states would be important. There is no efficient connection between Fort Leonard Wood in Missouri and Fort Campbell in Kentucky. An improved link would serve national security purposes.

Earl Norman again spoke of the need for an east – west route. There needs to be a reliever for I-80 and I-40 in this park of the country.

Josh Bill mentioned that 412 in Missouri has been the target of on-going upgrades and any funding priorities in Missouri need to take into account the need for I-66. He mentioned that fact that it would be a shame to be in a situation where there is a bridge without a highway (34 - Cape Girardeau) or where there is a highway without a bridge (Wickliffe / Sikeston - 60).

Clyde Haus mentioned the fact that if a new bridge were built at Wickliffe this would be the third bridge in that area.

Jerry Pullen stated that most truck traffic in the region heads for the bridges at Wickliffe. The extra time to travel to the Cape Girardeau area may be detrimental to trucking businesses.

DawnRae Clark mentioned that the project should consult the Lower Mississippi Delta Commission and the port authorities for input.

Janet Coleman expressed an opinion that the use of 60 will open up southeast Missouri for renewed economic development.

Carl then summarized the needs that have been expressed: economic development, safety, intermodal issues, access, mobility, military areas, and tourism (access to national Forest, Branson and Highway 21).

As for negative environmental impacts, there seems to be no voiced opinion against a river crossing or improvements to a roadway. The only thought here is to not impede river traffic on the Mississippi.

Doug Leslie expressed a desire to keep examining an interstate compatible bridge at Cape Girardeau despite the current obstacles.

Larry Payne asked what was / is Kentucky's capacity / desire to have toll roads.

Bruce responded that the state still has toll authority but that they are largely on the way out. That is however not cast in stone, but they are not actively looking at tolls.

Ron Steele mentioned that freight projections in the area / state / region are expected to double by 2020. He also said that congestion of all modes must be examined.

A statement of support form the Bootheel RPC and from Rep. Lanny Black would be forthcoming to the project.

The RPCs from both the Sikeston and Cape Girardeau areas would be represented on the Work Group.

PADD Local Officials Meeting
8-20-01

PB will finalize the work group roster and make the list available to the Cabinet.

Sites for public involvement meetings for the project include: Wickliffe at the Baptist Church or fellow ship hall. Other options include schools, although we may want to avoid gyms. Libraries, civic halls, and other public / private buildings, including Westvaco are options on the area.

The Paducah area continues to be challenging for the Cabinet. The key is to understand how the various issues interrelate and what can be done to build appropriate consensus for various projects.

US 68 / KY 80 may be a segment or connector for I-66 corridor.

Members from the Missouri group Close The Gap will be in attendance today.

County extension or coop agencies can be used to get a list of stakeholders involved / concerned with farm issues.

The north Graves County industrial park is a concern. Bryan can supply the location.

PADD Meeting Presentation Summary:

Carl gave some background on the history of the I-66 corridor /project and mentioned that the idea for the roadway came from ISTEA and TEA-21. He talked about the work of previous studies in KY the Cabinet has done and the development of the various segments in KY.

Carl mentioned the fact that Western Kentucky segment this is one of several studies / projects examining I-66 in KY and the fact that it may involve a potential river crossing.

He acknowledged the help and support of the MoDOT and others from Missouri including the Close the Gap Group. Carl also discussed the fact that Illinois DOT is less enthusiastic about the project. This stems from the fact that they want to minimize impacts to the Shawnee National forest. Essentially, Illinois is NOT interested in a corridor that runs north along I-24.

Carl also alluded to the fact that since Illinois is not interested in an I-24 or related corridor, that an alternative to Cape Girardeau is not viable.

Carl then introduced Barbara Michael, PB, who talked about specific aspects of the study.

Barbara mentioned the fact that the study will examine wide corridors in Ballard, McCracken, Graves, Marshall, and Carlisle counties. The study will not produce engineering level details.

She relayed that the project will last approximately one year, and will involve the development and examination of several corridors / options for locating the new interstate.

The project will have significant public involvement elements including a Project Work Group and opportunities for public input through various public meetings in both KY and MO. She invited all the elected officials to participate on the Work Group and to encourage their constituents to participate as well.

The goal of the project is to develop a corridor for the new roadway and perhaps develop a river crossing option perhaps near Wickliffe.

She invited those assembled to stay after the meeting and discuss any aspects of the project with representatives of KYTC and the consultant team after the meeting.

Army Corps of Engineers Bridge Location Conference Call
6-25-03

MEMORANDUM OF CONFERENCE CALL

Date / Time: June 25, 2003

Location: Conference Call

Attendees:

Roger Wiebusch, US Coast Guard
Jim Lloyd, US Army Corps of Engineers
Mike Parks, US Army Corps of Engineers
Dick LaMocha, US Army Corps of Engineer
Tim Choate, KYTC Dist. 1
Chris Kuntz, KYTC Dist. 1
Jeff Thompson, KYTC Dist. 1
Stacey Courtney, PADD
Bruce Siria, KYTC CO Planning
Scott Murray, FMSM
Mark Litkenhus, FMSM
Greg Yankey, FMSM
Kurt Schaeffer, FMSM
Barbara Michael, PB
Mike Baron, PB
Shawn Dikes, PB

Minutes Prepared By: Shawn Dikes, PB

Items and Issues

This call was held to discuss the preliminary alternative corridor locations for a new bridge across the Mississippi River in the vicinity of Wickliffe, Kentucky for I-66. The concept is in the planning stage and the corridors under consideration are 2,000 feet wide.

1. Introduction / Purpose
    A. Self introductions were made
    B. Parsons Brinckerhoff is conducting a preliminary planning study for the Kentucky Transportation Cabinet (KYTC) and Missouri Department of Transportation (MoDOT). The client and consultant team have two alternative corridor river crossing locations they are currently examining. One is just south of Wickliffe, KY near Lower Mississippi River (LMR) mile mark 951 close to Ballard County. The other is near LMR mile mark 948 closer to Carlisle County.
    C. The previous locations of a corridor over the Ohio River are not being pursued in further detail at the moment.
    D. The discussion today centers around the conditions under which a new bridge across the Mississippi River is acceptable to the US Army Corps of Engineers and the US Coast Guard. KYTC, MoDOT and PB want to understand what they have to do individually and collectively to satisfy the needs of these agencies to make the bridge location work.

2. Floodway Issues Discussion
    A. Navigation on the river is an important and significant issue. Likewise, the impact to the Bird's Point Floodway is also important. Design considerations of the bridge, approaches and the roadway and additional analysis on all will have to be done in later project phases and are beyond the scope of the current study.

B. The approach roadway in Missouri would need to be elevated. Piers and support columns would need to withstand a high velocity and quantity of water.

C. The Corps plans on removing the top 8 feet of the levee along a very long linear stretch within a one-hour time frame in its response to floods. They require a 2,500-foot safety area from each of the detonation sites. Any roadway would need to located at least this far away from each of the detonation sites.

D. The new roadway and its supporting structures should not raise the flow line. The Corps will articulate other constraints and defining conditions in writing.

E. The northern alternative corridor bridge location is not acceptable to the Corps. (It's also not acceptable to the Coast Guard.)

F. It appears that the southern location is not in any of the detonation areas. However, it will be subject to height restrictions with regard to the flow line and other conditions.

G. A discussion of Alternative 8, which had not advanced to further consideration beyond the Level 2 screening, was undertaken. The fact that the alternative goes through the wetlands / floodplains / wildlife management area was discussed. Tim Choate of District 1 again expressed concern over this alternative not being advanced to Level 3 screening for more detailed analysis and commented that it might make sense to revisit it again.

H. The Corps will also communicate in writing to the Cabinet what additional analysis they will require.

I. According to remarks from the Corps, 404 Permits for the wetlands may not be as bad as perhaps we have thought. Other concerns include the three wildlife management areas, including the KY Nature Preserve.

3. Geotechnical and Hydrologic Issues Discussion

A. Thick soil deposits are present in this area. It is estimated that rock is on the order of 200+ feet deep. This will likely require deep foundation systems such as drilled shafts either designed to bear on bedrock or designed as friction shafts in soil.

B. Detailed hydrologic and geotechnical explorations will be required in a future project phase. The geotechnical exploration should include studies to evaluate seismic, scour and barge impact issues. Intensive hydrologic modeling is also likely to be needed.

4. Navigation Issues Discussion

A. The river is very active. Barge traffic is heavy on the river. The confluence point of the Mississippi and Ohio Rivers and points to the south of that towards Wickliffe to river mile mark 949.5 are unacceptable to the U.S. Coast Guard for a bridge location. This makes a bridge location just south of Wickliffe, KY, roughly at mile marker 950 also unacceptable.

B. The preferred location from the Coast Guard's standpoint is no farther north than LMR mile mark 948, which is closer to Carlisle County.

C. The towline changes depending upon river level and traffic. The US Coast Guard is not aware of any sandbars on the Missouri side of the river.

D. A long span bridge 1,500+ is acceptable to minimize impacts to river traffic.

5. Next Steps

A. A bridge at LMR mile mark 948 in Carlisle County seems acceptable to the U.S.Coast Guard and will be pursued with further study. There are some engineering challenges that must be fully analyzed and addressed as the project proceeds.

B. The Corps and Coast Guard both agreed to write letters articulating their areas of concern and what further analysis they expect with regard to this and future studies.

C. The letters should be sent to the KYTC and addressed to:

Ms. Annette Coffey, P.E., Director
Division of Planning (A-2)
125 Holmes Street
Frankfort, KY 40622

D. The KYTC will keep the Corps and Coast Guard informed of decision making as the study progresses.

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 2 - EXISTING

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

Qk4
Third Rock Consultants, LLC
Cultural Resource Analysts, Inc.
Fuller, Mossbarger, Scott & May

FEBRUARY 2005

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1.0 INTRODUCTION

In the early 1990s, Section 1105(e) of the Intermodal Surface Transportation Efficiency Act (ISTEA) designated all or portions of nine high priority corridors as future parts of the Interstate system and authorized the Secretary of Transportation to add segments of the corridors to the Interstate System when certain criteria are met. Funding for study of these corridors including Corridor 3 – East – West Transamerica Corridor was made available.

The East – West Corridor was described as "commencing on the Atlantic Coast in the Hampton Roads area going westward across Virginia to the vicinity of Lynchburg, Virginia, continuing west to serve Roanoke and then to a West Virginia corridor centered around Beckley to Welch as part of the Coalfields Expressway described in section 1069(v), then to Williamson sharing a common corridor with the I-73/74 Corridor (referred to in item 12 of the table contained in subsection (f)), then to a Kentucky Corridor centered on the cities of Pikeville, Jenkins, Hazard, London, and Somerset; then, generally following the Louie B. Nunn Parkway corridor from Somerset to Columbia, to Glasgow, to I-65; then to Bowling Green, Hopkinsville, Benton, and Paducah, into Illinois, and into Missouri and exiting western Missouri and moving westward across southern Kansas".

After the nationwide analysis was completed, the study concluded that such a coast-to-coast transportation facility did not meet economic feasibility criteria because of its high cost and low travel demand in some segments. The national study did conclude however, that individual segments of the proposed coast-to-coast new highway that provided linkages to key elements of a particular state's transportation system might prove economically feasible. Therefore, it proposed, and the Federal Highway Administration (FHWA) subsequently allowed individual states to study the economic feasibility of the corridor within, and immediately adjacent to their own boundaries.

Subsequently, Kentucky conducted a statewide study in the mid 1990s, focusing on an I-66 corridor that included the city of Paducah in far Western Kentucky. The Kentucky study concluded that, if constructed, an interstate-type highway facility would deliver substantial economic development and quality-of-life benefits for Kentucky. A segmented approach for planning, environmental documentation / permitting and ultimately construction, linking new roadway segments to existing ones, was the recommended strategy for development of I-66 in Kentucky.

The Kentucky Transportation Cabinet (KYTC) has already pursued project development activities on the first two priority segments (Somerset to London and Hazard east to the Kentucky state line). The Kentucky study left unspecified the precise corridor to be followed in far Western Kentucky, and identified the segment from I-24 near Paducah westward to Missouri as the third overall priority segment in Kentucky. This current I-66 Corridor Study – Western Kentucky to Missouri will make recommendations for the recommended corridor in the region.

1.1 Study Purpose

The Kentucky Transportation Cabinet (KYTC) Division of Planning is undertaking this study along with the Missouri Department of Transportation (MoDOT) and the FHWA to explore options for developing a new I-66 corridor in western Kentucky. Specifically, this project will:

1. Define the purpose and need for a proposed new highway facility (I-66)
2. Seek input from the public, elected officials, public agencies and other stakeholders
3. Gather/develop data
4. Develop alternatives for the proposed project, including the no-build alternative
5. Analyze and evaluate the technical feasibility of all the alternatives
6. Make recommendations regarding future project development

Note: The state of Illinois and the Illinois Department of Transportation (DOT) have had limited participation in the study, beginning only in the Spring of 2003. Illinois DOT held one public meeting in Ullin, Illinois on June 17, 2003. They also participated in some discussion related to Level 3 Screening of Corridors.

1.2 Study Area Characteristics

The study area begins from west of Kentucky Lake in northern Marshall County, Kentucky and extends westward to just west of Interstate 55 (I-55) in Missouri. The study area in Kentucky includes; northern Marshall County, all of McCracken and Ballard County, and a small section of far northern Graves and northwestern Carlisle counties respectively. In Missouri, the study area includes portions of Mississippi, Scott and Cape Girardeau counties. The study area also encompasses sections of southern Illinois including Massac, Pulaski and Alexander counties. See study area map on page 9 of the main report, with the study area highlighted by the shaded areas. The following is a profile of the primary eight county study area in Kentucky and Missouri.

1.2.1 Kentucky

<u>Marshall County</u>

Marshall County is approximately 340 square miles and is bordered by McCracken County, the Tennessee River and Kentucky Lake. Marshall County was established in 1842 and the county seat is located in Benton. Interstate 24 (I-24) and US Highways 68, 62 and 641, respectively serve the county. Numerous recreation activities are available within Marshall County including the “Land Between the Lakes” area.

Ballard County

Ballard County is approximately 273 square miles and is bordered on the north by the Ohio River and on the west by the Mississippi River. The county was established in 1842 and is named for Bland W. Ballard (1761-1853). Cities within the county include Bandana, Barlow, Kevil, LaCenter and Wickliffe. Major trucking highways serving Ballard County include US Highways 51, 60 and 62 and Kentucky Routes 121, 286 and 358. Illinois Central Railroad provides main line freight rail service to Wickliffe, while the Barkley Regional Airport serves as the commercial airline service to the area. Currently, there is no passenger rail service in the county.

Carlisle County

Carlisle County is approximately 192 square miles and is located in the far western portion of Kentucky in the Jackson Purchase region along the Mississippi River. It is bounded by Ballard, graves and Hickman counties. The county seat is Bardwell and the county was formed in 1886. As of the 2000 census 5,351 people reside in Carlisle County. Other cities in the county include Arlington, Cunningham, Kirbyton and Milburn. Major roadways are US 51and US 62.

Graves County

Graves County is approximately 555 square miles and is located in the Jackson Purchase region of Kentucky. The county was settled in 1819 and the county seat is Mayfield, located in the center of the county. The population of Graves County as recorded by the 2000 census was approximately 37,000 persons. Major roadway facilities include the Purchase Parkway, US 45 and KY 80. The Mayfield-Graves County Airport also serves the general aviation needs of the county.

1.2.2 Missouri

Mississippi County

Mississippi County is located in southeast Missouri in the easternmost part of the state and is approximately 428 square miles. It is bordered by the Mississippi River on the east. The city of Charleston is the county seat. Other communities include East Prairie, Bertrand, Wyatt, Anniston, Wilson City and Pinhook. US Highways 60 and 62 and Interstates 55 and 57 all serve the county.

Scott County

Scott County was founded in 1821 and is approximately 426 square miles. It is bordered on the north by Cape Girardeau County and on the east by the Mississippi River. The county seat is in Benton, while other communities include Sikeston, Chattee and Scott City. Interstate 55 and US Highway 61 serve the county.

Cape Girardeau

Cape Girardeau County was established in 1812 and is approximately 586 square miles. The county seat Cape Girardeau lies along the Mississippi River and is home to Southeast Missouri State University. A regional airport in Cape Girardeau and Interstate 55 and US Highways 60 and 67 all serve the county. Other communities in the County include Burfordville, Jackson and Oakridge.

2.0 SOCIOECONOMIC PROFILE

Information for the socioeconomic profile was gathered from the U.S. Census Bureau, Census 2000. This information was developed for areas of Kentucky and Missouri only. This section includes data and discussions for population, employment, economic and commuting patterns and trends from each of the counties contained within the primary study area for both Kentucky and Missouri.

2.1 Population

As illustrated in Tables 2.1 and 2.2, the population in the counties in the primary study area is generally increasing but at a rate that is lower than the respective statewide averages for Kentucky in 3 of the 5 counties and in Missouri in 2 of the 3 counties. These rates are also lower than average national population increase of 13.2%. This generally indicates that while there is some growth in the region, it is not uniform and is lagging behind other parts of the respective states and the nation as a whole.

Table 2.1 Study Area Population (Kentucky)

Population	County					
	Statewide	Marshall	McCracken	Ballard	Carlisle	Graves
1990	3,685,296	27,205	32,879	7,902	5,238	33,550
2000	4,041,769	30,125	65,514	8,286	5,351	37,028
% Change	+9.7%	+10.7%	+4.2%	+4.9%	+2.2%	+10.4%

Source: U.S. Census Bureau, Census 2000

Table 2.2 Study Area Population (Missouri)

Population	County			
	Statewide	Mississippi	Scott	Cape Girardeau
1990	5,117,073	14,442	39,376	61,693
2000	5,595,211	13,427	40,422	68,693
% Change	+9.3%	-7.0%	+2.7%	+11.5%

Source: U.S. Census Bureau, Census 2000

2.2 Employment

The tables below list the employment characteristics of the primary study area. The national unemployment rate for the year 2000 was approximately 4.0% according to the US Department of Labor. Each of the counties in the study area has a higher than US average unemployment rates, although Marshall and Ballard counties only exceed the national average by .2% or two-tenths of one percent. Of the five Kentucky counties in the study area, only McCracken and Carlisle counties exceed the Kentucky state unemployment rate. In Missouri, each of the three counties in the study area has a higher rate of unemployment than the statewide average.

Table 2.3 Study Area Employment (Kentucky)

	Kentucky					
Employment	**Statewide**	**Marshall**	**McCracken**	**Ballard**	**Carlisle**	**Graves**
Total Employment	1,798,264	13,374	29,359	3,848	2,221	28,979
% Unemployed	5.70%	4.2%	6.0%	4.2%	6.20%	5.50%
Agriculture	59,729	278	337	142	150	795
Construction	129,618	1,161	2,167	455	207	1,148
Manufacturing	315,774	2,559	3,786	706	471	3,510
Wholesale/ Retail	60,854	2,120	5,735	618	385	2,610
Transportation and Warehousing	108,738	1,022	1,999	211	194	862
Information	39,303	257	788	153	36	266
Finance	97,350	619	1,215	117	72	596
Professional	111,878	583	1,756	231	53	598
Educational, Health	365,605	2,295	6,053	639	398	3,237
Arts, Entertainment, Recreation, Food Service	129,973	1,163	2,291	161	122	853
Public Administration	77,128	501	1,062	271	47	490
Other	85,150	816	1,540	144	86	946

Source: U.S. Census Bureau, Census 2000

Table 2.4 Study Area Employment (Missouri)

	Missouri			
Employment	**Statewide**	**Mississippi**	**Scott**	**Cape Girardeau**
Total Employment	4,331,369	5,395	18,220	34,821
% Unemployed	3.40%	8.8%	6.3%	5.0%
Agriculture	58,415	473	668	722
Construction	182,858	333	1,473	2,393
Manufacturing	393,440	811	3,171	4,904
Wholesale/ Retail	412,893	879	3,411	6,429
Transportation and Warehousing	150,641	541	1,320	1,447
Information	80,623	65	331	819
Finance	177,651	141	875	1,663
Professional	198,547	210	714	1,878
Educational, Health	541,715	1,055	3,578	9,042
Arts, Entertainment, Recreation, Food Service	206,295	345	1,221	2,741
Public Administration	121,906	238	651	1,540
Other	132,940	304	807	1,243

Source: US Census Bureau, Census 2000

2.3 Economics

Tables 2.5 and 2.6 list the income and economic information for the primary study area. The U.S. median household income according to the 2000 Census is reported at $42, 148 annually. McCracken, Marshall and Cape Girardeau counties are above this threshold. Ballard, Carlisle, Graves, Scott and Mississippi counties areas are below the average. The national poverty rate was 11.3% in 2000; McCracken, Graves Mississippi and Scott counties are all above this average. As compared to statewide data, McCracken, Marshall and Ballard counties are well above the Kentucky median

household income, while Carlisle and Graves county fall below the average. In terms of poverty, only Carlisle County exceeds the statewide average for percentage of households in poverty. In Missouri, the statewide median household income is exceeded in both Scott and Cape Girardeau counties. Similarly, there are more households in poverty (as compared to the statewide average) in both Mississippi and Scott counties.

Table 2.5 Study Area Economic Information (Kentucky)

	Kentucky					
Income Information	**Statewide**	**Marshall**	**McCracken**	**Ballard**	**Carlisle**	**Graves**
Median Household Income	$33,672	$43,670	$42,513	$41,386	$30,874	$30,087
Per Capita Income	$18,093	$18,069	$19,533	$19,035	$16,834	$16,276
% Households below Poverty	12.7%	6.6%	11.4%	10.7%	13.1%	10.5%

Source: U.S. Census Bureau, Census 2000

Table 2.6 Study Area Economic Information (Missouri)

	Missouri			
Income Information	**Statewide**	**Mississippi**	**Scott**	**Cape Girardeau**
Median Household Income	$37,934	$28,833	$38,090	$45,518
Per Capita Income	$19,936	$13,038	$15,620	$18,593
% Households below Poverty	8.6%	19.0%	12.3%	6.7%

Source: U.S. Census Bureau, Census 2000

2.4 Commuting

Commuting patterns gleaned from the most recent Census data, illustrated in tables 2.7 and 2.8, reveal that single occupant vehicle (SOV) travel to work is by far the dominant mode of travel in the study area. This is true of many places throughout the US and is indicative of the dominant mode of auto travel and the fact that land uses, especially in a rural / agricultural areas, tend to be spread out. In the study area, travel by auto is perhaps even more important as there are very limited opportunities for travel to work by other modes such as carpool and transit. It also indicates that the majority of workers are in positions / industries where commuting via others modes is not a workable option. The data also show that travel times for work trips are within a few minutes when aggregated by county within the individual state. This shows that many people work within the county and/or region in which they live and that they commute a reasonable distance to work.

Table 2.7 Study Area Commuting (Kentucky)

	County				
Commuting Mode	**Kentucky**				
	Marshall	**McCracken**	**Ballard**	**Carlisle**	**Graves**
Drive Alone	10,939	24,514	3,272	1,788	12,643
Carpool	1,465	2,771	323	290	1,923
Transit	32	214	-	2	40
Walk	219	329	49	43	236
Other	132	290	24	17	244
Work at Home	375	770	92	62	528
Mean Travel Time to Work (minutes)	22.3	17.8	23.7	28.2	23.8

Source: U.S. Census Bureau, Census 2000

Table 2.8 Study Area Commuting (Missouri)

Commuting Mode	County		
	Missouri		
	Mississippi	Scott	Cape Girardeau
Drive Alone	3,952	14,684	28,321
Carpool	910	2,152	3,479
Transit	14	94	141
Walk	141	178	1,104
Other	108	141	250
Work at Home	158	505	940
Mean Travel Time to Work (minutes)	19.7	19.1	18.6

Source: U.S. Census Bureau, Census 2000

2.5 Agricultural Activity

Agricultural land use takes place extensively throughout the study area. Substantial farming operations with significant on-farm investments are evident throughout the region and the study area and are not limited to any one portion of them respectively.

Data from the 1997 Census of Agriculture also demonstrates the magnitude of agricultural activities in the study area. For example, the average farm size in Ballard County in 1997 was 246 acres; while in Carlisle, Graves, Marshall and McCracken counties the average sizes were 279, 173, 133 and 146 acres respectively. These same counties also account for over 3,000 farms and more than 500,000 acres of production. Most farms are in the range of 10 – 49 or 50 – 179 acres. In 1997, the five counties in the study area in Kentucky produced a variety of crops including: corn, soybeans, wheat, grain sorghum, tobacco, and hay.

According to the 1997 Census of Agriculture conducted by the USDA, the state of Missouri ranks second only to Texas as far as the total number of farms in the state. Mississippi County alone has over 250,000 acres of farmland, with an average farm size of approximately 760 acres. Likewise, in Scott County there is over 240,000 acres of farmland with an average size of 375 acres. In Cape Girardeau County there are over

1,000 farms and approximately 270,000 acres of production. Farms in the three counties produce a variety of crops including; corn, sorghum, wheat and cotton.

The prevalence of agricultural activities in the region may be in part attributable to the availability of fertile soils in the Mississippi River valley. The fact that the study area also encompasses an area that includes the confluence of both the Mississippi and the Ohio Rivers also contributes to the fact that the region is conducive to agriculture. Not surprisingly, a large portion of the land in the study area is considered prime and unique farmland.

2.6 Summary

While Western Kentucky and Southeast Missouri are somewhat growing in population they are not meeting the national population growth rate of 13.2%, and Mississippi County Missouri is actually losing population. As compared to the statewide population growth, Marshall and Graves counties are exceeding the Kentucky average rate and Cape Girardeau county's population is growing more rapidly in comparison to the Missouri state average. Measures such as economic development and revitalization are needed in the region to stem the tide of out migration and boost population growth, employment and overall investment in the region. Poverty rates in three of the study area counties (Carlisle, Mississippi and Scott) are above their respective state averages. The unemployment rates in six of the eight counties in the primary study area also exceed their respective state averages. While farming and some pockets of manufacturing remain strong in the area, there are limited opportunities especially in the growth industries like high tech manufacturing and those related to the computer and information technology industries. The average and overall size of farms under production has increased as mechanization and other production methods increase worker productivity levels. New efforts are targeting the attraction of business and industry in the region and a new highway / interstate facility could help to bring new business and population to the area.

3.0 ROADWAY AND TRANSPORTATION CHARACTERISTICS

3.1 Study Area Roadways

The study area encompasses portions of three states: (1) western Kentucky, (2) southern Illinois, and (3) southeastern Missouri (see Table 3.1, Existing Roadway Information*)*. The study area is roughly rectangular, approximately 70 miles long and 30 miles wide. The proposed highway project involves constructing a new limited access, interstate type highway, generally running east-to-west, in the study area, and may include a new bridge.

The existing major roadways (interstates, US routes and major state routes) within the project area were identified and studied for this section. Generally, the existing interstate highways traverse north-to-south; while the existing US and state highways are narrow, two-lane roads running east-to-west. The major Ohio River bridge crossings occur in the vicinity of Paducah, Kentucky bridges on I-24, and US 45, and US 57 near Wickliffe, and Cairo, Illinois with a bridge on US 51. A Mississippi River bridge crossing is also located near Cairo, Illinois on US 60 / US 62 and at Cape Girardeau, Missouri on Illinois 146. The following paragraphs provide summaries of roadway and bridge inventories, traffic information, and crash analyses.

3.2 Roadway and Bridge Data

Roadways within the study area considered for traffic analysis are listed below with the states traversed indicated. Table 3.1, Existing Roadway Information, provides the major roadway characteristics, features, and classifications as obtained from the Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS) database, the Missouri Department of Transportation (MoDOT), and the Illinois Department of Transportation (IDOT).

- I-24 (IL, KY)
- I-55 (MO)
- I-57 (IL, MO)
- US-45 (IL, KY)
- US-51 (KY, MO)
- US-60 (KY, MO)
- US-61 (MO)
- US-62 (KY, MO)
- US-68 (KY)
- US-641 (KY)
- KY 286
- IL 3
- IL 37
- IL 127
- IL 145
- IL 146
- IL 169

The interstate highways (I-24, I-55, I-57) are four-lane roadways, and generally progress north-south through the study area. All the major east-west roadways between I-24 and I-57 are narrow, two-lane roads, except for a recently improved 10-mile section of US 60 in McCracken County.

These east-west roadways have many sections that do not meet current design guidelines, and terrain in the study area is classified as “rolling” for virtually all the roadways. These roadway sections are lane and shoulder widths less than the current design guidelines of 12-foot wide driving lanes and 10-foot wide shoulders. Notable roadway deficiencies occur on US 60, US 62, and KY 286. About 64 percent of US 60 has narrow driving lane widths, and 67 percent has substandard shoulder widths. Similar conditions exist on US 62, where 82 percent of the driving lanes and 79 percent of the shoulders have inadequate widths; and KY 286 where substandard lane and shoulder widths encompass its entire length.

Only the bridges crossing major waterways were considered at this stage of the study. The four major bridges in the study area cross either the Ohio or Mississippi Rivers. Their major characteristics appear in Table 3.2, *Existing Bridge Information*. All four bridges have the “thru truss” design, and were built either about the 1930s, or the mid-1970s. The two older bridges (*i.e.*, US 51 and US 60) have narrow lane widths and low federal sufficiency ratings. The US 51 bridge was built in 1937, crosses the Ohio River with two driving lanes, has a curb-to-curb width of 22.5 feet, and a sufficiency rating of 24.2. The US 60 bridge was built in 1929, crosses the Mississippi River with two driving lanes, has a 20-foot curb-to-curb width, and sufficiency rating of 19.0. The I-24 bridge was built in 1974, crosses the Ohio River with four driving lanes, has a 65.4-foot curb-to-curb width, and sufficiency rating of 64.0. The I-57 bridge was built in 1976, crosses the Mississippi River at Cairo with four driving lanes, has a 61.5-foot curb-to-curb width, and sufficiency rating of 73.0. “Sufficiency rating” is defined as “the numerical rating [from 0 to 100] of a bridge based on it structural adequacy [*i.e.,* load bearing capacity] and safety, essentially for public use, and its serviceability and functional obsolescence [*i.e.*, roadway geometrics].” Generally, a sufficiency rating of 50 or less indicates the bridge is considered eligible for federal bridge replacement funding.

A new bridge at Cape Girardeau is being constructed. The new bridge, the Bill Emerson Memorial Bridge is named for the eight-term Southeast Missouri congressman who helped lead efforts to secure funding for its construction. The bridge is scheduled for completion in 2003. The structure will be a 100-foot wide, 4,000-foot long cable stay bridge. It will link Cape Girardeau, Missouri, and East Cape Girardeau, Illinois, and span the Mississippi River on Illinois / Missouri 146.

Table 3.1
Existing Roadway Information

I 24

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	Illinois S/L to US 60	4.3	4	12'	3'-10'	65	350'-440'	n/a	Rural/Urban Interstate
	US 60 to US 62	1.9	4	12'	10'	65	350'	n/a	Urban Interstate
	US 62 to US 45	0.4	4	12'	10'	65	350'	n/a	Urban Interstate
	US 45 to US 68	9.3	4	12'	10'	65	350'	n/a	Rural/Urban Interstate
	US 68 to Marshall C/L	1	4	12'	10'	65	350'	n/a	Rural Interstate
Marshall, KY	McCracken C/L to JMC Pkwy[3]	7.7	4	12'	10'	65	300'-999'	n/a	Rural Interstate
	JMC Pkwy to US 62	1.7	4	12'	10'	65	300'	n/a	Rural Interstate
	US 62 to Livingston C/L	2.7	4	12'	10'	65	300'	n/a	Rural Interstate

US 45

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	Graves C/L to I 24	8	4	12'	2'-10'	25-45	53'-330'	n/a	Rural/Urban Principal Arterial
	I 24 to US 62	1	4	12'	2'	45	79'-90'	n/a	Urban Principal Arterial
	US 62 to US 60	0.6	4	10'	curbed	35	66'-79'	n/a	Urban Principal Arterial
	US 60 to Illinois S/L	3.9	2, 4	10'-15'	curbed-10'	25-45	60'-999'	0-23%	Urban Minor Arterial St/Rural Major Collector

US 51

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	Carlisle C/L to US 60	3.6	2-4	10'-13'	0'-10'	25-55	70'-175'	0-100%	Rural Principal Arterial
	US 60 to Illinois S/L	4.7	2	10'-12'	0'-10'	35-55	60'-270'	0-100%	Rural Principal Arterial

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	US 51 to McCracken C/L	16.8	2	11',12'	4'-10'	25-55	45'-170'	42-67%	Rural Principal Arterial
McCracken, KY	Ballard C/L to I 24	10.6	2-4	10'-12'	2'-10'	25-55	66'-160'	14-100%	Rural/Urban Principal Arterial
	I 24 to US 45	2.7	3, 4	12'	curbed-10'	35-45	160'-240'	n/a	Urban Principal Arterial
	US 45 to US 62	6.2	4	12'	curbed-10'	35-55	85'-999'	n/a	Urban Principal Arterial
	US 62 to Livingston C/L	0.3	2	11'	0'	55	100'	0%	Rural Principal Arterial

Table 3.1
Existing Roadway Information, Cont.

US 62

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	Carlisle C/L to McCracken C/L	1.7	2	10'-11'	3'-10'	35-55	60'-490'	20%-100%	Rural Major Collector
McCracken, KY	Ballard C/L to KY 286	3.3	2	10'	2'-4'	55	60'	29%	Rural Major Collector
	KY 286 to I 24	8.6	2	9'-10'	2'-10'	45-55	60'-175'	11-100%	Rural Major Collector/Urban Minor Arterial St
	I 24 to US 45/60	1	2	11'-12'	4'-10'	35-45	60'-175'	100%	Urban Minor Arterial St
	US 45/60 to US 68	2.6	2, 4	10'-12'	curbed-6'	55	85'-245'	n/a	Urban Principal Arterial
	US 68 to Marshall C/L	1.4	2, 4	11'	8'-10'	55	200'	55-77%	Urban Minor Arterial St/Rural Major Collector
Marshall, KY	McCracken C/L to JMC Pkwy	7.6	2	11'-16'	8'	55	200'	70%	Rural Major Collector
	JMC Pkwy to I 24	1.2	2, 4	11'-16'	4'-10'	45-55	200'	66%	Rural Major Collector
	I 24 to US 641	2.2	2	11'-16'	2'-10'	55	200'	30-100%	Rural Minor Arterial
	US 641 to Livingston C/L	1.1	2	12'	curbed	35	200'	80-100%	Rural Minor Arterial

US 68

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
McCracken, KY	US 62 to I 24	1	4	12'	10'	55	200'	n/a	Rural/Urban Principal Arterial
	I 24 to Marshall C/L	1.7	2, 4	11'-14'	2'-10'	55	62'-200'	35%	Rural Principal Arterial
Marshall, KY	McCracken C/L to JMC Pkwy	9.4	2, 4	11'-14'	1'-10'	55	60'	34%	Rural Principal Arterial

US 641

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Marshall, KY	US 68 to US 62	6.4	2, 4	10'-11'	curbed-6'	55	150'	14-56%	Rural Minor/Principal Arterial

KY 286

	Description	Length	Number of Lanes	Lane Width	Shoulder Width	Speed Limit	Average ROW	% PSD[2]	Functional Class
Ballard, KY	KY 121 to McCracken C/L	14.3	2	10'	3'	35-55	70'	39%	Rural Major Collector
McCracken, KY	Ballard C/L to US 62	2.3	2	9'	2'	55	60'	70%	Rural Major Collector

Table 3.1
Existing Roadway Information, Cont.

I 55

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Scott, Mo	I 57 to US 62	1.5	4	12'	10'	70	n/a	n/a	Interstate
	US 62 to US 61	22.3	4	12'	10'	70	n/a	n/a	Interstate
	US 61 to Cape Giradeau C/L	2.3	4	12'	10'	70	n/a	n/a	Interstate

I 57

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	Scott CL to US 62	9.7	4	12'	10'	70	n/a	n/a	Interstate
	US 62 to Illinois S/L	10.4	4	12'	10'	70	n/a	n/a	Interstate

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	I 57 to Illinois S/L	22.3	2	11'	2'-10'	55	n/a	n/a	Minor Arterial

US 61

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Scott, MO	New Madrid C/L to US 62	0.7	2	9'	10'	55	n/a	n/a	Principal Arterial
	US 62 to I 55	25.3	2	9'-10'	8'-10'	55	n/a	n/a	Principal Arterial

US 62

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Mississippi, MO	Scott C/L to I 57		2	10'-11'	6	55	n/a	n/a	Major Collector

Table 3.1
Existing Roadway Information, Cont.

I 57

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Allexander, IL	Missouri S/L to Pulaski C/L	4.3	4	12'-20'	n/a	65	n/a	n/a	Interstate
Pulaski, IL	Allexander C/L to Union C/L	17.7	4	12'	n/a	65	n/a	n/a	Interstate

I 24

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	Kentucky S/L to US 45	1.6	4	12'	n/a	65	n/a	n/a	Interstate
	US 45 to Johnson C/L	13.5	4	12'	n/a	65	n/a	n/a	Interstate

US 45

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	Kentucky S/L to I 24	5.1	4	12'	n/a	30	n/a	n/a	Minor Urban Arterial
	I 24 to Johnson C/L	17.8	4	10'-14'	n/a	30-55	n/a	n/a	Major Collector

US 51

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	Kentucky S/L to US 60	0.7	4	10'-12'	n/a	30-50	n/a	n/a	Principal Arterial
	US 60 to Pulaski C/L	7.1	4	10'-12'	n/a	30-50	n/a	n/a	Principal Arterial

US 60

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	Missouri S/L to US 51	0.7	2	10'-14'	n/a	55	n/a	n/a	Major Collector

IL 3

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	US 51 to I 57	0.8	4	12'	n/a	45-50	n/a	n/a	Principal Arterial
	I 57 to IL 127	7.7	2-4	11'-12'	n/a	50-55	n/a	n/a	Principal Arterial
	IL 127 to IL 146	18.2	2	12'	n/a	55	n/a	n/a	Principal Arterial
	IL 146 to Union C/L	3.7	2	12'	n/a	55	n/a	n/a	Principal Arterial

Table 3.1
Existing Roadway Information, Cont.

IL 37

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Pulaski, IL	US 51 to IL 169	18.2	2	12'	n/a	25-55	n/a	n/a	Minor Arterial
	IL 169 to Johnson C/L	1.7	2	12'	n/a	45-55	n/a	n/a	Minor Arterial

IL 127

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, IL	IL 3 to Union C/L	14.8	2	12'	n/a	55	n/a	n/a	Major Collector

IL 145

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Massac, IL	US 45 to Pope C/L	10.1	2	11'-12'	n/a	55	n/a	n/a	Minor Arterial

IL 146

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Alexander, C/L	Cape Girardeau C/L to IL 3	3.8	2	12'	n/a	40-55	n/a	n/a	Principal Arterial

IL 169

	Description	Length	Number of Lanes	Lane Width[1]	Shoulder Width[1]	Speed Limit	Average ROW	% PSD[2]	Functional Class
Pulaski, IL	IL 37 to US 45	5.3	2	9'-12'	n/a	30-55	n/a	n/a	Major Collector

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Illinois Department of Transportation (IDOT)
Missouri Department of Transportation (MoDOT)

[1] Lane and shoulder widths that do not meet current design standards (i.e., less than 12-foot-wide driving lanes and 10-foot-wide shoulders) are shaded.

[2] Percent Passing Sight Distance - the percent of segment length (estimated to the nearest 10%) which has available passing sight distance (as measured from the driver's eye to the road surface) of at least 1,500 feet. This information is only available for Kentucky maintained roads classified as State Primary or State Secondary.

3.3 Traffic Volume Information

Traffic count information was obtained from the KYTC HIS database, MoDOT, and IDOT. Existing traffic volumes for the study area's major roadways range from a low of 1,150 vehicles per day (vpd) along IL 127 in Alexander County, to a high of 42,000 vpd along I-24 near Paducah. (See Table 3.3, Existing Traffic Information). These traffic volumes can be expected to increase in the future based upon increasing population growth, and increasing interstate and international commerce.

Historical traffic trends indicate that traffic volumes on the existing US and state roadways have increased roughly two percent annually since 1980, for a total increase of over 40 percent. Traffic volume on the interstate highways has increased nearly three times as fast, or about 120 percent since 1980.

3.4 Vehicle Classification Data

State traffic information records provided vehicle classification data. The percentage of trucks using the study area's major routes range from a low of 2.6 percent along US 60 near Paducah, to a high of 36.7 percent along I-57 in Pulaski County, Illinois. (see Table 3.3, Existing Traffic Information) The three interstate highways carry most of the truck traffic, and range from 20.7 percent on I-24 in Illinois and Kentucky, to 36.7 percent on I-57 in Illinois. However, some US highway sections also carry significant truck traffic volumes ranging from approximately 19 to 36 percent. These US highway sections are generally located in the vicinity of river crossings. US 45 experiences 36 percent truck traffic near its Ohio River Bridge crossing at Paducah. Other highways with notable truck traffic near major river crossings are: US 51 with 20.6 percent truck traffic, US 60 with 25.5 percent truck traffic, and US 62 with 18.9 percent truck traffic. Truck traffic volumes can be expected to increase based upon the increasing interstate and international commerce patterns.

Tables 3.4 and 3.5 contain data published in the US DOT's *Freight Analysis Transportation Profile*. Table 3.4 compares Freight Shipments by mode in the three states in the study area. As seen in this table nearly twice as many goods were shipped by highway in each state as compared to rail, the next highest mode.

Table 3.5 show the leading commodities shipped by each state ranked from highest to lowest, based on weight and value. The most commonly shipped commodities by ton varied from state to state as follows: Kentucky – Coal, Illinois – Farm Products, and Missouri – Non-Metallic Minerals. Transportation equipment ranked the highest for all states based on value.

Table 3.2
Existing Bridge Information

County	Route	Bridge Number	Feature Crossed	Bridge Length[1]	Curb to Curb[1]	Year Built	Bridge Type	Sufficiency Rating[2]	Type Service
Ballard, Kentucky	US 51	B00021	Ohio River	5,865	22.5	1937	Thru Truss	24.2	Highway/Railroad-Waterway
McCracken, Kentucky	I-24	B00100	Ohio River	5,634	60	1974	Thru Truss	64	Highway/Waterway
Mississippi, Missouri	I-57	A2000	Mississippi River	2,045	61.5	1976	Thru Truss	73	Highway/Waterway
Mississippi, Missouri	US 60	K0950	Mississippi River	2,589	20	1929	Thru Truss	18.8	Highway/Waterway

[1] Measured in feet

[2] "Sufficiency rating" is defined as "the numerical rating of a bridge based on it structural adequacy [*i.e.,* load bearing capacity] and safety, essentially for public use, and its serviceability and functional obsolescence [*i.e.* , roadway geometrics]." Sufficiency ratings range from 0 to 100. Generally, a sufficiency rating of 50 or less indicates the bridge is considered eligible for federal replacement funding.

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Missouri Department of Transportation (MoDOT)

Traffic Operations

The traffic analysis methods used are based upon generally accepted engineering practices and computer models. Data sources included individual state databases, previous traffic studies, and field surveys.

3.4.1 Levels of Service

Level of service (LOS) is a method commonly used to evaluate roadway functions. "Level of service" is defined as a qualitative measure of operational conditions, and the motorists' perception of those conditions. The conditions are usually defined in terms such as speed, travel time, maneuverability, and delay. The letters "A" through "F" designate the six levels of service. Level of service "A" represents the best operating conditions, while level of service "F" defines the worst. According to the national standards, the lower levels of service (*i.e.*, "D," "E," and "F") are unacceptable for safe and efficient operation. The lower levels generally involve unstable traffic flows, and offer drivers little freedom to maneuver. The American Association of State Highway and Transportation Official's (AASHTO) *A Policy on Geometric Design of Highways and Streets* states that the desired LOS for the design of a highway in a rural area is "B," and in an urban area is "C."

The LOS analysis performed on roadways within the study area indicates that the existing LOS ranges from A to E. Refer to Table 3.3, Existing Traffic Information, for a detailed listing of LOS by roadway section. Desired LOS ratings can vary somewhat from state to state, however, generally, the desirable LOS rating for a rural area is typically B. Often however, LOS B is not attainable in a cost effective manner.

Therefore, LOS C is sometime used as the threshold for those areas. As such, roadway sections not meeting the desired LOS C are shaded in Table 3.3. Note that US 60 has acceptable LOS ratings in Missouri and Illinois; however, in Kentucky about 47 percent of US 60 is rated as unacceptable (*i.e.*, LOS D, E, or F). US 62 in Missouri has an acceptable LOS of B, but in Kentucky about 44 percent of US 62 is rated as unacceptable. KY 286, IL 146, and IL 169 are all rated as an unacceptable LOS D for their full length.

In 2030, without any highway improvements, the anticipated increases in traffic volumes would likely cause the existing LOS to decrease, eventually causing regularly occurring peak hour congestion and its associated delays in accessing businesses, along with increased driver frustration and the likelihood for higher crash rates.

Table 3.3
Existing Traffic Information

I-24

	Description	ADT	Truck %	LOS
McCracken, KY	Illinois S/L to US 60	29,040	20.7%	B
	US 60 to US 62	42,000	21.4%	C
	US 62 to US 45	42,000	22.2%	C
	US 45 to US 68	32,500	22.9%	B
	US 68 to Marshall C/L	26,900	21.8%	B
Marshall, KY	McCracken C/L to JMC Pkwy*	26,900	21.8%	B
	JMC Pkwy to US 62	27,900	33.6%	B
	US 62 to Livingston C/L	26,500	33.6%	B

* Julian M Carroll Parkway, formerly known as Purchase Parkway.

US 45

	Description	ADT	Truck %	LOS
McCracken, KY	Graves C/L to I 24	15,140	5.7-12.0%	B
	I 24 to US 62	19,900	4.1%	B
	US 62 to US 60	17,900	4.1%	B
	US 60 to Illinois S/L	8,510	36.0%	A

US 51

	Description	ADT	Truck %	LOS
Ballard, KY	Carlisle C/L to US 60	4,190	20.6%	B
	US 60 to Illinois S/L	6,800	20.6%	C

US 60

	Description	ADT	Truck %	LOS[1]
Ballard, KY	US 51 to McCracken C/L	5,660	10.7-14.9%	D
McCracken, KY	Ballard C/L to I 24	10,940	7.7-11.9%	A
	I 24 to US 45	25,400	2.6%	C
	US 45 to US 62	20,000	2.6-6.1%	B
	US 62 to Livingston C/L	19,900	6.1%	E

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shaded.

US 62

	Description	ADT	Truck %	LOS[1]
Ballard, KY	Carlisle C/L to McCracken C/L	3,400	7.6%	D
McCracken, KY	Ballard C/L to KY 286	3,125	7.6%	B
	KY 286 to I 24	8,880	7.6%	E
	I 24 to US 45/60	13,600	18.9%	E
	US 45/60 to US 68	16,000	18.9%	B
	US 68 to Marshall C/L	10,700	18.9%	B
Marshall, KY	McCracken C/L to JMC Pkwy	7,280	18.9%	C
	JMC Pkwy to I 24	6,780	18.9%	E
	I 24 to US 641	6,700	18.9%	C
	US 641 to Livingston C/L	6,280	18.9%	E

Table 3.3
Existing Traffic Information, Cont.

US 68

	Description	ADT	Truck %	LOS
McCracken, KY	US 62 to I 24	9,000	4.5%	A
	I 24 to Marshall C/L	7,000	4.5%	C
Marshall, KY	McCracken C/L to JMC Pkwy	6,000	5.1%	B

US 641

	Description	ADT	Truck %	LOS
Marshall, KY	US 68 to US 62	5,340	5.9%	B

KY 286

	Description	ADT	Truck %	LOS[1]
Ballard, KY	KY 121 to McCracken C/L	2,670	13.0%	D
McCracken, KY	Ballard C/L to US 62	3,440	13.0%	D

I-55

	Description	ADT	Truck %	LOS
Scott, MO	I 57 to US 62	20,500	27.6%	A
	US 62 to US 61	19,340	27.6%	A
	US 61 to Cape Giradeau C/L	38,400	27.6%	C

I-57

	Description	ADT	Truck %	LOS
Mississippi, MO	Scott C/L to US 62	17,000	33.9%	A
	US 62 to Illinois S/L	10,400	33.9%	A

US 60

	Description	ADT	Truck %	LOS
Mississippi, MO	I 57 to Illinois S/L	4,470	15.7%	B

US 61

	Description	ADT	Truck %	LOS
Scott, MO	New Madrid C/L to US 62	4,300	7.1%	B
	US 62 to I 55	4,870	7.1%	B

Table 3.3
Existing Traffic Information, Cont.

US 62

	Description	ADT	Truck %	LOS
Mississippi, MO	Scott C/L to I 57	4,950	8.3%	B

I-57

	Description	ADT	Truck %	LOS
Allexander, IL	Missouri S/L to Pulaski C/L	10,700	34.2%	A
Pulaski, IL	Allexander C/L to Union C/L	9,800	36.7%	A

I-24

	Description	ADT	Truck %	LOS
Massac, IL	Kentucky S/L to US 45	28,500	20.7%	B
	US 45 to Johnson C/L	15,700	31.2%	A

US 45

	Description	ADT	Truck %	LOS
Massac, IL	Kentucky S/L to I 24	5,900	5.1%	A
	I 24 to Johnson C/L	9,725	6.5%	A

US 51

	Description	ADT	Truck %	LOS
Alexander, IL	Kentucky S/L to US 60	6,200	23.4%	A
	US 60 to Pulaski C/L	5,980	12.6%	A

US 60

	Description	ADT	Truck %	LOS
Alexander, IL	Missouri S/L to US 51	4,700	25.5%	B

IL 3

	Description	ADT	Truck %	LOS[1]
Alexander, IL	US 51 to I 57	5,500	12.7%	A
	I 57 to IL 127	2,800	11.4%	C
	IL 127 to IL 146	3,980	7.5%	C
	IL 146 to Union C/L	5,530	16.3%	D

Table 3.3
Existing Traffic Information, Cont.

IL 37

	Description	ADT	Truck %	LOS
Pulaski, IL	US 51 to IL 169	2,600	12.5%	A
	IL 169 to Johnson C/L	1,600	18.8%	A

IL 127

	Description	ADT	Truck %	LOS
Alexander, IL	IL 3 to Union C/L	1,150	9.6%	A

IL 145

	Description	ADT	Truck %	LOS
Massac, IL	US 45 to Pope C/L	2,490	11.3%	A

IL 146

	Description	ADT	Truck %	LOS[1]
Alexander, IL	Cape Girardeau C/L to IL 3	10,900	11.7%	D

IL 169

	Description	ADT	Truck %	LOS[1]
Pulaski, IL	IL 37 to US 45	2,180	10.8%	D

[1] Roadway segments with LOS levels considered unacceptable for safe and efficient operation are shaded.

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS)
Illinois Department of Transportation (IDOT)
Missouri Department of Transportation (MoDOT)

Table 3.4
Commodities Shipped by Mode

	Kentucky (Million Tons)		Illinois (Million Tons)		Missouri (Million Tons)	
Mode	**1998**	**2020**	**1998**	**2020**	**1998**	**2020**
Air	1	3	2	5	<1	1
Highway	304	524	658	1119	310	542
Other	<1	<1	1	1	<1	<1
Rail	160	218	371	598	104	159
Water	93	132	118	205	38	58

Source: *Freight Analysis Profile,* US Department of Transportation

Table 3.5
Freight Shipments By Weight / Value

Kentucky

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Coal	Transportation Equipment
2	Non-Metallic Minerals	Secondary Traffic
3	Secondary Traffic	Mail/Contract Traffic
4	Clay/Concrete/Glass/Stone	Chemicals/Allied Products
5	Farm Products	Machinery

Illinois

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Farm Products	Transportation Equipment
2	Non-Metallic Metals	Freight All Kinds
3	Coal	Food/Kindred Products
4	Freight All Kinds	Chemicals/Allied Products
5	Food/Kindred Products	Machinery

Missouri

Rank	By Weight (Million Tons)	By Value (Billion $)
1	Non-Metallic Minerals	Transportation Equipment
2	Farm Products	Secondary Traffic
3	Coal	Food/Kindred Products
4	Secondary Products	Chemicals/Allied Products
5	Clay/Concrete/Glass/Stone	Farm Products

Source: *Freight Analysis Profile*, US Department of Transportation

3.4.2 Crash Analysis

Crash data was used to identify roadway sections with statistically high crash rates, thus indicating a possible need for safety improvements. The crash analysis was performed on the roadways previously listed with crashes reported in the Kentucky and Missouri study area researched for a five-year period from January 1, 1996 through December 31, 2000. Information was obtained from the KYTC HIS database and MoDOT. Illinois crash data was only available for the year 2000, and was provided by IDOT. Crash data by county roadway section appears in detail in Table 3.4, *Existing Crash Locations*. The crash analysis for a given section of roadway within the study area was compared to the statewide averages for other similar roadways within that state to identify high crash rate roadways.

A Critical Rate Factor Analysis was performed for the various roadways in the study area. The Critical Crash Rate is a statistically derived value that is used as a threshold to identify high crash locations. To begin with crash rates were calculated for study area roadways based upon the total number of crashes, the average daily traffic (ADT), and the roadway section length. Roadway section crash rates were then normalized for comparison by either hundred-million-vehicle-miles traveled (HMVM), or millions-of-vehicles (MV), depending upon individual state records. Kentucky and Missouri crash rates are maintained in the HMVM format, while Illinois maintains rates in the MV format.

The individual states provided their statewide average crash rates by roadway classifications. Critical crash rates for area roadways was found using the following formula:

$$A_c = A_a + K\sqrt{\frac{A_a}{M}} + \frac{1}{2M}$$

Where:

A_c = Critical Crash Rate
A_a = Statewide Average Crash Rate
K = Constant related to level of statistical significance selected (a probability of 0.995 was used wherein K=2.576), and
M = Exposure (for Kentucky/Missouri, M was in terms of 100 million vehicle-miles; for Illinois, M was in terms of million vehicles).

The critical crash rate factor is defined as the ratio of the roadway crash rate to the critical crash rate. If the ratio is greater than 1, meaning that the roadway crash rate is greater than the critical crash rate, than the roadway is can be labeled as being a high crash location.

The analysis determined that there are nine roadway segments (highlighted in yellow) with a high crash location.

3.5 Intermodal Transportation Options

Intermodal transportation refers to modes of transportation within the study area in addition to roadways and highways. It includes considerations such as: public use airports, freight and passenger railroad services, bus services, marine terminals and other water ports, transfer facilities, trucking facilities, industrial parks, bicycle and pedestrian facilities.

Table 3.6
High Crash Locations

Route	County, State	Segment Length (miles)	Crashes				ADT	HMVM[2]	MV[3]	Crash Rate[4]	Injury Rate	Fatal Rate	Statewide Crash Rate	Critical Rate	Critical Rate Factor[5]	Statewide Fatal Rate	Critical Fatal Rate	Fatal Rate Factor[6]
			PDO[1]	Injury	Fatal	Total												
I-24	Marshall, KY	12.1	166	99	2	267	27,300	6.034		44	16	0.33	49	56	0.78	0.6	1.492	0.22
	McCracken, KY	16.9	813	318	2	1133	36,000	11.090		102	29	0.18	92	99	1.03	0.6	1.242	0.15
	Massac, IL	15.1	53	4	0	57	17,500		96.387	0.591	0	0.00	4.172	4.711	0.13	0.6	0.808	0.00
I-55	Scott, MO	26.1	569	210	13	792	20,000	9.534		83	22	1.36	194	206	0.40	1.31	2.314	0.59
	Cape Girardeau, MO	27.3	407	131	5	543	31,800	15.826		34	8	0.32	194	203	0.17	1.31	2.080	0.15
I-57	Scott, MO	20.1	26	7	0	33	8,000	2.930		11	2	0.00	194	215	0.05	1.31	3.197	0.00
	Mississippi, MO	20.0	215	65	6	286	13,000	4.750		60	14	1.26	194	211	0.29	1.31	2.763	0.46
	Alexander, IL	4.3	11	2	0	13	10,700		16.755	0.776	0	0.00	4.172	5.483	0.14	0.6	1.116	0.00
	Pulaski, IL	17.7	40	8	0	48	9,800		63.384	0.757	0	0.00	4.172	4.838	0.16	0.6	0.858	0.00
US 45	McCracken, KY	13.5	1040	637	7	1684	14,000	3.449		488	185	2.03	501	532	0.92	1.5	3.338	0.61
	Massac, IL	22.9	129	41	0	170	9,700		81.042	2.098	1	0.00	1.651	2	1.04	1.3	1.631	0.00
US 51	Ballard, KY	8.3	98	64	1	163	5,000	0.757		215	85	1.32	248	295	0.73	3	8.770	0.15
	Alexander, IL	7.8	26	10	0	36	6,000		17.082	2.107	1	0.00	1.651	2.478	0.85	1.3	2.037	0.00
US 60	McCracken, KY	19.8	1078	763	10	1851	17,500	6.324		293	121	1.58	120	131	2.23	1.3	2.543	0.62
	Ballard, KY	16.8	195	170	6	371	5,700	1.748		212	97	3.43	248	279	0.76	3	6.649	0.52
	Mississippi, MO	22.3	213	96	4	313	5,500	2.240		140	43	1.79	232	258	0.54	2.24	5.030	0.35
	Scott, MO	0.6	10	5	0	15	9,000	0.096		156	52	0.00	232	363	0.43	2.24	19.857	0.00
	Alexander, IL	0.7	3	0	0	3	6,200		1.629	1.841	0	0.00	1.651	4.542	0.41	3	6.790	0.00
US 61	Scott, MO	26.0	507	147	1	655	3,200	1.521		431	97	0.66	232	264	1.63	2.24	5.684	0.12
US 62	Marshall, KY	12.1	155	110	4	269	7,000	1.550		174	71	2.58	248	281	0.62	3	6.894	0.37
	McCracken, KY	16.9	464	311	5	780	3,400	1.048		744	297	4.77	248	288	2.58	3	7.819	0.61
	Scott, MO	7.9	568	238	4	810	19,600	2.808		288	85	1.42	232	256	1.13	2.24	4.711	0.30
US 68	Marshall, KY	28.4	166	124	4	294	6,000	3.114		94	40	1.28	248	271	0.35	3	5.680	0.23
	McCracken, KY	2.7	78	104	3	185	7,000	0.341		543	305	8.81	248	319	1.70	3	12.085	0.73
US 641	Marshall, KY	6.4	83	58	2	143	5,800	0.676		211	86	2.96	248	298	0.71	3	9.145	0.32
IL 3	Alexander, IL	30.6	43	10	2	55	4,500		50.178	1.096	0	0.04	1.078	1.464	0.75	3	3.638	0.01
IL 37	Pulaski, IL	19.9	26	2	0	28	2,600		18.866	1.484	0	0.00	1.078	1.718	0.86	3	4.050	0.00
IL 127	Alexander, IL	14.8	14	6	0	20	1,150		6.225	3.213	1	0.00	1.078	2.227	1.44	3	4.862	0.00
IL 145	Massac, IL	10.1	19	2	0	21	2,500		9.244	2.272	0	0.00	1.078	2.009	1.13	3	4.516	0.00
IL 146	Alexander, IL	3.8	16	6	0	22	10,900		14.999	1.467	0	0.00	1.078	1.800	0.82	3	4.181	0.00
IL 169	Pulaski, IL	5.3	4	1	0	5	2,200		4.224	1.184	0	0.00	1.078	2.493	0.47	3	5.282	0.00
KY 286	McCracken, KY	2.3	19	22	0	41	3,400	0.141		290	156	0.00	248	359	0.81	3	18.355	0.00
	Ballard, KY	14.3	89	83	2	174	2,700	0.705		247	118	2.84	248	297	0.83	3	9.006	0.32

Sources: Kentucky Transportation Cabinet (KYTC) Highway Information System (HIS), Illinois Department of Transportation (IDOT), Missouri Department of Transportation (MoDOT)

[1] PDO (Property Damage Only)

[2] HMVM (Hundred Million Vehicle Miles Traveled) exposure for roadway sections (greater than 0.30 miles): (length of roadway x ADT x 365 x # of years) / (100,000,000)

[3] MV (Million Vehicles) exposure for roadway spots (0.30 miles): (ADT x 365 x # years) / (1,000,000)

[4] Kentucky and Missouri rates are calculated per hundred million vehicle miles based on data from 1996 through 2000. Illinois rates are calculated per million vehicles based on 2000 data.

[5] Crash rates greater than 1.00 are high crash rate locations with crashes occurring at statistically significant amounts that cannot be explained by other factors, and are indicated by shading.

[6] Fatal Rate Factor rates greater than 1.00 are high fatality rate locations with fatalities occurring at statistically significant amounts that cannot be explained by other factors, and are indicated by shading.

4.0 ENVIRONMENTAL OVERVIEW

4.1 Introduction

An environmental overview was conducted to determine the general characteristics of the study area. This environmental overview is based on secondary sources, and very limited field verifications. Resources addressed in this section include; National Register of Historic Places (NRHP) sites, threatened and endangered species; national wetland inventory areas, conservation lands, 100-year floodplains and sites with potential hazardous materials concerns.

4.2 Environmental Constraints

In an effort to identify major environmental constraints, a study was completed to consider documented environmental features in the selection of the project corridors. These features included natural environmental features such as wetlands, wildlife areas, conservation lands and floodplains as well as human environmental features such as designated agricultural districts, National Register of Historic Places (NRHP) sites, and Superfund hazardous waste sites. All of the data collected was extracted from sources via correspondence with a variety of resource agencies and from their databases and/or websites.

The position of the environmental features was placed in a geographic information system database and processed to determine the relative abundance of features within each corridor. This study was designed to locate documented features for consideration, but it should be noted that highly sensitive undocumented features are present in the project area that were not located in this effort; such features will be identified in future project phases.

4.2.1 Natural Environment

Wetland areas are one of the more prominent features noted in the project area, particularly in western Ballard County, Kentucky and Alexander County, Illinois. Large areas of wetlands are concentrated in the bottomlands along much of the Ohio and Mississippi Rivers. These areas also commonly have associated wildlife management area (WMA) or conservation area (CA) designations. Designations include large areas such as the Barlow Bottoms WMA (6,900 acres) and Ballard WMA (8,100 acres) in Kentucky and Horseshoe Lake Conservation Area (8,200 acres) in Illinois. Other large features include West Kentucky WMA and Clarks River National Wildlife Reserve in Kentucky. Large areas that would be considered sensitive in Illinois such as Bumgard Island, Burnham Island, and Brown's Bar, are designated Illinois natural areas located

Table 4.1
Threatened and Endangered Species by County

State	County	Taxonomic Group	Scientific Name	Common Name	Statuses	Habitat
Kentucky	Ballard	Birds	*Haliaeetus leucocephalus*	Bald eagle	T	Along open bodies of water in large trees
			Sterna antillarum athalassos	Interior least tern	E	Sandbars and shallow water in large rivers.
		Bivalves	*Obovaria retusa*	Ring pink	E	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
		Fishes	*Scaphirhynchus albus*	Pallid sturgeon	E	Muddy or silty waters of large rivers with moderate currrents
			Etheostoma chienense	Relict darter	E	Known only from the Bayou du Chien - a small sand and mud bottomed stream
		Mammals	*Myotis sodalis*	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Graves	Fishes	*Etheostoma chienense*	Relict darter	E	Known only from the Bayou du Chien - a small sand and mud bottomed stream
	Marshall	Bivalves	*Lampsilis abrupta*	Pink mucket	E	Medium to large rivers with moderate to fast flowing currents
			Obovaria retusa	Ring pink	E	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
			Pleurobema clava	Clubshell	E	Big rivers burrowed in 2-4 inches of sand or gravel
		Birds	*Haliaeetus leucocephalus*	Bald eagle	T	Along open bodies of water in large trees
	McCracken	Bivalves	*Lampsilis abrupta*	Pink mucket	E	Medium to large rivers with moderate to fast flowing currents
			Obovaria retusa	Ring pink	E	Large rivers on gravel bars in swift water
			Plethobasus cooperianus	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
			Potamilus capax	Fat pocketbook	E	Backwater areas of large rivers in muddy or silty substrates
		Mammals	*Myotis sodalis*	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Carlisle	Bivalves	*Potamilus capax*	Fat pocketbook	E	Backwater areas of large rivers in muddy or silty substrates
		Birds	*Haliaeetus leucocephalus*	Bald eagle	T	Along open bodies of water in large trees
			Sterna antillarum athalassos	Interior least tern	E	Sandbars and shallow water in large rivers.
		Mammals	*Myotis sodalis*	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)

Table 4.1continued
Threatened and Endangered Species by County

State	County	Taxonomic Group	Scientific Name	Common Name	Statuses	Habitat
Illinois	Alexander	Birds	*Sterna antillarum*	Least tern	E	Bare alluvial and dredged spoil islands, Mississippi & Ohio Riv.
		Mammals	*Myotis grisescens*	Gray bat	E	Caves/abandoned mines
			Myotis sodalis	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Fish	*Scaphirynchus albus*	Pallid Sturgeon	E	Muddy or silty waters of large rivers with moderate currrents
	PULASKI	Mammals	*Myotis grisescens*	Gray bat	E	Caves/abandoned mines
			Myotis sodalis	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Bivalve	*Plethobasis cooperianus striatus*	Orange-footed pearly mussel	E	Ohio River
			Lampsilis orbiculata abrupta	Pink mucket pearly mussel	E	Ohio River
	MASSAC	Bivalve	*Potamilis capax*	Fat pocketbook pearly mussel	E	Wabash River
		Birds	*Sterna antillarum*	Least tern	E	Sandbars and shallow water in large rivers.

along the banks of the Mississippi River. The single largest feature in the project area is the Shawnee National Forest, located primarily in Alexander County, Illinois.

The locations of federal threatened or endangered species were not identified for this analysis. However, according to the United States Fish and Wildlife Service, there are 14 species of federal threatened or endangered animal species that may occur in the study area. A listing of the species and a brief description of their habitat is included in Table 4.1. The habitat for some species, such as the Indiana bat (Myotis sodalis) consisting of certain forest types, is common. Other species habitat, such as endangered freshwater mussel species, is limited to streams and rivers.

4.2.2 Human Environment

Human environmental features considered for this phase of the project were landfills, Superfund sites, and NRHP sites. The geographic size of these features varies widely from single historic structures to the Paducah Gaseous Diffusion Plant's 3,500-acre Superfund site. The Trail of Tears is a long linear feature that is present in the study area and is a sensitive Native American cultural historic feature.

Many of the communities in the project area have historic districts that will vary in size from a single block to entire neighborhoods. There are 68 previously recorded cultural historic or archaeological NRHP sites located within the study area. These resources include prehistoric archaeological sites or districts and historic districts. NRHP sites require consideration; however sites eligible for listing require the same consideration. The number of sites eligible for NRHP listing is unknown but can be expected to significantly exceed the number of recorded sites.

Landfills are also a common feature in the study area. Many of these facilities are not currently active and can be difficult to identify in the field. The presence of a landfill in a project corridor requires significant consideration as a potential liability and can require substantial mitigation. The databases available that identify such features are incomplete and do not always identify all landfills.

The Birds Point-New Madrid Floodway, a component of the comprehensive Mississippi River and Tributaries Project, is located in southeast Missouri on the right descending bank of the Mississippi River in New Madrid and Mississippi Counties. The purpose of the Floodway is to prevent an increase in river stages upstream and adjacent to the Floodway during major flood events which require its use.

The current plan of operation for the Birds Point-New Madrid Floodway provides that 550,000 cubic feet per second of the total MRPF discharge of 2,360,000 cubic feet per second will pass through the Floodway. The current plan of operation (October 1986) is designed to accomplish this by artificially crevassing sections of the frontline levee.

5.0 GEOTECHNICAL OVERVIEW

5.1 Topography and Drainage

Figure 5-1. Mississippi River and Adjacent Flood Plains

The proposed corridors are primarily located in Western Kentucky and Southeastern Missouri, and lie within the Mississippi Embayment physiographic region which is part of the Coastal Plain physiographic province. In Kentucky, these corridors are situated on portions of seven USGS 7.5-minute topographic quadrangle maps. They are the Barlow (1977), Wickliffe (1983), La Center (1975), Blandville (1977), Heath (1978), Lovelaceville (1978), and Paducah West (1982) Quadrangles. In Missouri, the corridors are situated on the Wyatt (1979) and Charleston (1979) Quadrangles. The surface topography varies within the project corridors from well dissected uplands in the northern and eastern portions of the areas in Kentucky, to large areas of nearly level flood plain in the vicinity of the Ohio and Mississippi Rivers in both Kentucky and Missouri. Figure 5-1 is a typical view of the topography of the flood plains adjacent to the Ohio and Mississippi Rivers. The upland areas are composed of rolling hills, locally flat-topped ridges, and broad valleys. Bottom lands adjacent to the Ohio and Mississippi Rivers are relatively flat, and marked by north-south oriented lakes, ponds, sloughs, chutes, and swamps, all former routes of these rivers in normal or flood-flow conditions. Additionally, loessal silt bluffs rise as much as 150 feet above the Mississippi River flood plain near Wickliffe, Kentucky. The bedrock surface is deep within both Kentucky and Missouri in this study area (generally in excess of two hundred feet). Therefore fluvio-lacustrine soil deposits dominate the area physiology.

Surface drainage within these area of Kentucky and Missouri is directed towards numerous swales, ditches, creeks and streams, and ultimately to the Ohio and Mississippi Rivers. Backwater sloughs are present within the project vicinity at lower elevations and retain water depending on the elevation stage of the adjacent river.

5.2 Stratigraphy

Corresponding USGS geologic quadrangles are available for Barlow (1971), Wickliffe (1974), La Center (1978), Blandville (1971), Heath (1966), Lovelaceville (1968), and Paducah West (1966). The 1979 Geologic Map of Missouri, published by the State of Missouri, the Department of Natural Resources, and the Missouri Geological Survey

was used to describe geologic conditions relevant to the Missouri portion of the corridors and Mississippi River crossings. Based on the various geologic mapping and literature reviewed, the proposed corridors are primarily underlain by deeply buried Paleozoic era bedrock. Thick Tertiary sediments lie under a mostly complete covering of Ice Age deposits of sand. Alluvial deposits of gravel, silt, clay, and loess from the meltwater swollen Ice Age Mississippi River and its tributaries are also present.

Specifically, the eastern (Kentucky) portions of the corridors will cross over well dissected, Quartenary age Peoria Loess silt as well as Tertiary and Quartenary Continental deposits comprised of sandy chert gravel and gravelly sand. Within creek bottoms the surface materials are Quaternary age alluvial silt, sand, and clay deposits. In the study areas of Kentucky and Missouri adjacent to the Mississippi and Ohio river bottoms, surface materials are composed of Quaternary age fluvio-lacustrine silt, sand, and clay deposits. Throughout the project corridors, these deposits are underlain by Tertiary age silts, sands, and clays of the Clairborne and Wilcox Formations. Underlying these deposits is the Lower Tertiary Porters Creek Clay. This Paleocene formation of the Midway Group is comprised of over-consolidated, montmorillinitic clay with interlensed fine sand. Below these deposits are Upper Cretaceous and Tertiary clays and sands of the McNairy and Clayton Formation. The Paleozoic age bedrock (including Mississippian limestone and sandstone) is indicated to be at depths in excess of several hundred feet below the ground surface throughout the study limits.

5.3 Soils and Unconsolidated Materials

A thin mantle of wind blown silt material (loess) covers a large portion of the study area. Loess thicknesses are shown on the referenced geologic mapping to be up to 30 feet along the Mississippi River bluffs near Wickliffe, Kentucky. This material is described as yellowish-brown to medium-gray silt, unstratified, and containing minor amounts of clay and sand. Loess deposits are generally highly erodible and flatter cut slopes should be anticipated in these areas. Wetlands, such as marshes, natural ponds, and floodplains are common in low lying areas in both Kentucky and Missouri. These situations often contain organic material and soft, unconsolidated soils that may require stabilization prior to constructing roadway improvements.

Alluvial materials comprised of sands, silts and gravels cover the floodplains of the Mississippi and Ohio Rivers, as well as major tributaries in the study area. The referenced mapping indicates the alluvium has been encountered in thicknesses up to 73 feet beneath the Mississippi River floodplain. These alluvial deposits overlay the fluvio-lacustrine silts, clay and sand deposits noted in Section 5.2.

5.4 Groundwater

The project corridors addressed in this overview lie within relatively flat areas of Western Kentucky and Southeastern Missouri in proximity to the Tennessee, Ohio, and Mississippi Rivers watersheds. Because of the permeable nature of the subsurface

stratum, the groundwater table is close to the ground surface in floodplain or backwater areas. During design of the project roadways and associated structures, the effects of groundwater on soil strengths and stability will need to be taken into account.

5.5 Regional Seismicity

Review of available geologic mapping indicates that the roadway corridors and potential bridge sites are within the New Madrid Seismic Zone (NMSZ). The NMSZ lies within the central Mississippi Valley, extending from northeast Arkansas, through southeast Missouri, western Tennessee, western Kentucky to southern Illinois. The NMSZ is a series of faults associated with the Reelfoot Rift, and is the most seismically active region in the United States east of the Rocky Mountains. Historically, this area has been the site of some of the largest earthquakes in North America. Between 1811 and 1812, four catastrophic earthquakes, with magnitudes estimated to be greater than 8.0 on the Richter Scale, occurred during a 3-month period. Hundreds of aftershocks followed over a period of several years. The largest earthquakes to have occurred since then were on January 4, 1843 and October 31, 1895. Instruments were installed in and around this area in 1974 to closely monitor seismic activity. Since then, more than 4000 earthquakes have been detected, most of which are too small to be felt by human senses. On average one earthquake per year will be large enough to be felt by communities in the area.

On the basis of the large area of damage (230,000 square miles), the widespread area of perceptibility (1,930,000 square miles), and the complex physiographic changes that occurred, the Mississippi River valley earthquakes of 1811-1812 rank as some of the largest in the United States since its settlement by Europeans. The area of strong shaking associated with these shocks is two to three times larger than that of the 1964 Alaska earthquake and 10 times larger than that of the 1906 San Francisco earthquake.

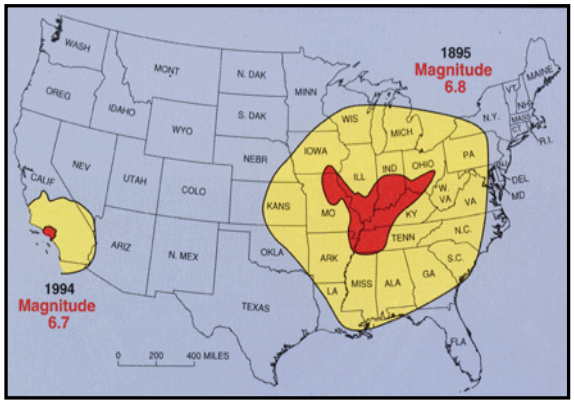

Figure 5-2 Relative Size of Affected Areas

Although earthquakes in the central and eastern United States are less frequent than in the western United States, they affect much larger areas. Figure 5-2 (Source: http://quake.wr.usgs.gov/) shows two areas affected by earthquakes of similar magnitude- the 1895 Charleston, Missouri, earthquake in the New Madrid seismic zone and the 1994 Northridge, California, earthquake. Red indicates minor to major damage to buildings and their contents. Yellow indicates shaking felt, but little or no damage to objects.

Earthquake epicenters and magnitudes for the Central and Eastern United States are presented in Figure 5-3. This figure indicates all of the corridors within this study are in areas of significant seismic potential.

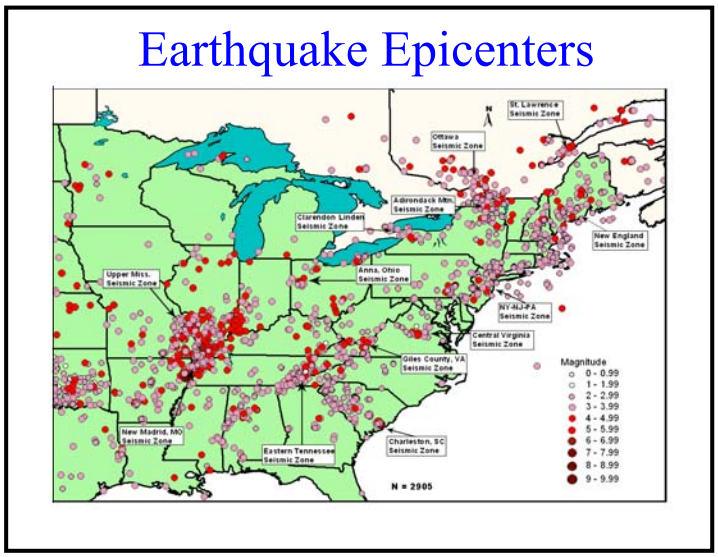

Figure 5-3 Earthquake Epicenters and Magnitudes in the Central and Eastern United States

5.6 Existing Corridor Features

The primary land uses within the project corridors are farmland cultivated for crops; undeveloped forest, grasslands and wetlands; single family dwellings; and commercial entities commonly associated with small towns. The area is extensively farmed both within and outside the flood plains of the Ohio and Mississippi Rivers. Levee systems, both privately and publicly owned, are located adjacent to the Ohio and Mississippi Rivers and function as flood control structures during high water events. Additionally, sand and gravel has been quarried and timber logging has occurred throughout the region.

5.6.1 Domestic and Public Areas

McCracken, Ballard, and Carlisle counties Kentucky are within a predominantly rural farm community setting. Likewise, Mississippi County Missouri is also heavily agricultural in land use. Small towns are usually situated at the intersection of county and state routes or historic railroad depots. Numerous schools and churches are located within the proposed corridors presented herein. Gas stations, stores, small commercial businesses and residences are common within these communities. Many of the stores sell gas and diesel fuel. Existing gas stations and stores that handle petroleum products and chemicals often have numerous storage tanks for their

products. Small businesses such as auto body and repair shops, farm equipment and supply stores, construction companies and equipment rental companies have tanks and other environmentally sensitive concerns that need to be considered when evaluating a corridor. Locations of former gas stations, stores and other businesses may have abandoned storage tanks, unstable refuse storage areas, or debris dump sites.

The rural areas generally have various homestead and farm situations that exist within subwatersheds off a primary watershed. These properties are often owned by families that have been in the area for many decades. Lumber yards, farm equipment stores, and community groceries are commonplace in rural areas. Family and community cemeteries are common throughout the region. The field reconnaissance of July 3, 2003 noted that the corridor which follows US 60 to be the more heavily populated of the corridors. Also, US 60 is the primary arterial road between the major communities in this area, and is therefore much more heavily traveled than the roads associated within other corridors.

6.0 REVIEW OF RELATED STUDIES

Numerous documents, including transportation planning studies, county plans and other related reports have been developed to plan for, design, and implement various transportation-related improvements in the study area. Before proceeding with the I-66 study, a clear understanding of these other documents is necessary in order to fully understand the realm of problems and possible solutions that have been previously identified or studied.

Documents were examined for: (1) their relevance to the I-66 study and (2) their mention or description of transportation improvements that would have an impact to the transportation system in the study area. Studies or documents analyzed included those summarized below:

6.1 Southern Kentucky Corridor (I-66): Economic Justification and Financial Feasibility –

Prepared by the Kentucky Transportation Center for the Kentucky Transportation Cabinet (KYTC), May 1997

The purpose of the study was to determine the economic feasibility of the Kentucky segment of I-66. The study was initiated following several legislative actions; the 1991 Appropriation Act of the U.S. Department of Transportation (USDOT) and H.R. 4385 passed by the US House of Representatives on May 25, 1994 to amend section 1105 (c) (3) of the Intermodal Surface Transportation Efficiency Act ISTEA) of 1991.

The 1991 Appropriations Act provided funding for an “Interstate 66 Feasibility Study” which is also referred to as the Transamerica Transportation Corridor (TTC). The TTC was defined as a transcontinental route extending from the East Coast to the West Coast. It was further defined in the National Highway System Legislation in 1996 as generally located between I-70 and I-40. In Kentucky, the corridor was centered on the cities of Bowling Green, Columbia, Somerset, London, Hazard, Jenkins, and Pikeville. H.R. 4385 amended the Kentucky section to include Paducah, Benton and Hopkinsville. The equivalent of HR 4385 did not pass in the senate. However, despite the defeat of the measure, it set a precedent to examine a more specific corridor in Kentucky. Wilbur Smith Associates (WSA) and Howard, Needles, Tammen, and Bergendoff (HNTB) conducted the national TTC feasibility study. The study analysis and observations are documented in the “Final Report dated September 8, 1994”. The national study concluded that the “TTC does not meet economic feasibility criteria, generally because of its high cost and low travel demands in some segments”. More importantly, however, the study concluded that additional analysis of individual segments providing linkages to the National Highway System (NHS) or key elements of a state’s transportation system could prove some of the segments to be economically feasible.

For analysis purposes the Southern Kentucky Corridor was divided into four sub-segments; (a) Kentucky/Missouri State Line to I-24, (b) I-24 to I-65, (c) I-65 to I-75, and (d) I-75 to Kentucky, West Virginia or Virginia State Line.

The Economic Justification and Financial Feasibility Study analyzed each of the four segments by examining the travel demand, socio-economic conditions, cost benefit analysis and a financial feasibility analysis. The study found that the construction of a new interstate along the Southern Kentucky corridor would provide positive benefits to the surrounding communities with a cost benefit ratio of more than 4.0 in some areas.

The financial analysis reviewed the existing funding commitments of the KYTC and determined that it would be challenging to construct a new interstate on new right of way. To finance a project of this magnitude, it would be necessary to receive designated funds from the federal government and/or raise additional revenues for the Kentucky Road Fund. The report found that it would be more feasible to construct the Southern Kentucky Corridor in smaller segments connecting major existing highways in separate priorities. The first priority would be to construct a segment linking I-75 and I-65. The second would improve access between the Daniel Boone Parkway and the eastern State line. The third priority would be a segment from I-24 in Paducah to Wickliffe, with a short segment connecting to I-55 in Missouri. The final priority would be to upgrade existing parkways to interstate standards.

6.2 Project Cost Estimate: Southern Kentucky Corridor (I-66) Project

Prepared for the Kentucky Transportation Cabinet by the University of Kentucky, March 10, 1997

This study was undertaken to determine planning level cost estimates for a new I-66 highway facility within Kentucky. While I-66 is defined as a new interstate from I-55/57 in Missouri to I-81 in Virginia, this study only evaluated the 420-mile segment in Kentucky. The specific objectives of the study are as follows:

- To determine the general route locations for three alternative highway designs.
- To develop conceptual cost estimates for the alternative route locations, including construction, design, right of way, utilities, preliminary engineering, maintenance and possible toll operation.

It is important to note that the corridors selected for cost estimate evaluation are for the development of reasonable cost estimates only and should not be considered when determining a preferred location.

Four alternative routes were evaluated with 3 alternative design speeds (100km/h / 60 mph, 110km/hr / 70 mph, 130km/h / 80 mph). The alternatives were all largely in the southern 1/3 of Kentucky and had common routes from Pikeville to Hopkinsville. From

Hopkinsville, the routes could go either north or south of Benton, Kentucky with an option to either exit Kentucky over the Ohio River / I-24 (Option A) or over the Mississippi River (Options B, C and D). Summaries of the costs for the four alternatives are presented below.

Table 6.1 - I-66 Corridor Costs Per Km

Alignments	Design Speed 100km/h (60mph)	110km/h (70mph)	130km/h (80mph)
Alternative A	$4,757,580	$6,794,757	$9,728,629
Alternative B	$5,239,960	$7,293,989	$9,969,733
Alternative C	$4,890,642	$7,268,718	$9,852,780
Alternative D	$5,495,143	$8,492,932	$10,921,423

Source: University of Kentucky

6.3 Economic Impact Assessment of a Southern Kentucky Corridor (I-66)

Prepared for the Kentucky Transportation Cabinet by the University of Kentucky, April 1997

The University of Kentucky conducted an Economic Impact Assessment of the Southern Kentucky Corridor. The assessment analyzed 12 different design options consisting of four alternative routes with three different design speeds. The alternatives are identical to those analyzed in the Project Cost Estimate study summarized above.

Using a discount rate of 4%, the study found that there was economic justification for a new I-66 through Kentucky. While the construction would be expensive, the economic development and quality of life benefits outweigh the costs. In conclusion the study found that the construction of alternative A or B with a 70mph design speed would be preferred from an economic development and financial feasibility perspective.

6.4 I-66 Southern Kentucky Corridor between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways: Pulaski and Laurel Counties

Prepared for the Kentucky Transportation Cabinet by Wilbur Smith Associates, June 2000

The purpose of the study was to identify areas of concern, benefits of the project, solicit public input, and develop an environmental footprint from known data sources. Its purpose was also to evaluate corridor alternatives; and to provide recommendations

and more specific evaluation criteria for future project development activities for the I-66 corridor project from Somerset to London, Kentucky. The study provided information regarding the existing conditions of the area including, traffic patterns and operations, socioeconomic conditions and environmental considerations. Several alternative corridors were defined and evaluated based on specific criteria. The evaluation criteria included, environmental issues, cultural/historic sites, engineering and construction issues, public input, resource agency input and costs.

The study recommended a preferred corridor that was divided into five priority segments.

- Priority 1: Somerset Northern Bypass, Louie B. Nunn (Cumberland) Parkway to KY 80
- Priority 2: London Bypass, I-75 to the Daniel Boone Parkway
- Priority 3: Eastern approach to the Rockcastle River Bridge to I-75
- Priority 4: Rockcastle River Bridge and approaches
- Priority 5: KY 80 to the western approaches of the Rockcastle River Bridge

The costs of the preferred alternative would be approximately $949.4 million and $22.0 million per mile.

6.5 Scoping Study: US 60 Paducah, Kentucky to Cairo Illinois

Prepared by the Kentucky Transportation Cabinet, Department of Highways, Division of Planning, July 1993

The purpose of the scoping study was to document the need, determine the type and extent of the US 60 improvement(s) required and to identify any know environmentally sensitive areas associated with the improvement of US 60 from I-57 near Cairo, Illinois to I-24 west of Paducah, Kentucky.

The project area was located in Ballard and McCracken counties and was approximately 31 miles. The study evaluated the “No-Build” alternative and three build alternatives.

- No Build Alternative – Includes existing and committed projects for US 60 but not a replacement of the existing river crossing over the Ohio and Missouri rivers or a direct connection to I-57.
- Build Alternative 1 – This alternative would replace the existing river crossing with a new structure just upstream. It travels on both existing US 60 and some new right of way. The new alignment would bypass Kevil, possibly La Center, and Barlow.

- Build Alternative 2 – Alternative 2 is almost identical to Alternative 1 until Barlow where there may be a bypass. It leaves the existing US 60 alignment and proceeds directly west across Barlow Bottoms to the Ohio River.
- Build Alternative 3 – It is identical to Alternative 1 until a point approximately 1.5 miles north of Wickliffe. At this point the alignment proceeds southeast and crosses the Mississippi River approximately 1 mile south of Wickliffe at US 51.

The study concluded that any of the build alternatives would provide adequate levels of service in the future year based on anticipated traffic demand. Alternative 1 was preferred; Alternative 2 would provide the most direct connection to I-57 in Illinois and I-24 in Paducah, but would likely require the continued maintenance of the existing river crossing at Cairo.

7.0 FUTURE TRANSPORTATION PROJECTS

7.1 Introduction

An understanding of the region's past transportation projects and future transportation plans is important for study context as well as study decision-making. Transportation Plans analyzed for this study include:

- KYTC Six Year Highway Plan FY 2002 – FY 2008 (August 2002)
- KYTC Statewide Transportation Plan FY 1999 – FY 2018 (December 1999)
- KYTC District 1 Unscheduled State Highway Plan Needs (May 2002)
- MoDOT Statewide Transportation Improvement Program 2002 – 2006 District 10

7.2 History of Transportation Projects in the Study Area

A number of transportation projects have been completed in or near the study area during the past several decades, with a few more currently under design or construction. These projects consist mainly of improvements to bridges and culverts (such as rehabilitation or replacement projects) and some improvements to highway segments (such as repaving, grading, drainage, etc.)

Significant ongoing projects in the area include the Paducah Area Outer Loop project directly west of the Paducah area, the purpose of which is to create an outer "beltway" type highway facility, and the US 60 improvement project that will eventually add capacity and make safety improvements to US 60 from the Paducah area westward to Wickliffe. These two projects represent a significant investment in the transportation infrastructure in the region. Other on-going projects will continually make operational and/or safety improvements in the area.

7.3 Summary of Future Transportation Projects

7.3.1 Recommended KYTC Six-Year Highway Plan – FY 2002 – FY 2008

The Six Year Highway Plan is a bi-annually developed document that serves as a statewide capital improvements list for transportation projects throughout Kentucky. The first two years of the plan are funded and the rest of the years are not yet funded. In the western Kentucky region, the Purchase Area Development District (PADD) helps facilitate discussion and decision making with regard to input for the plan.

The PADD is a partnership organization that offers support to city and county governments in the eight-county western Kentucky region of Fulton, Hickman, Carlisle, Ballard, Graves, McCracken, Calloway and Marshall counties. The PADD provides

assistance in the planning, coordination and implementation of services provided through federal, state and local funding sources, including those for transportation. In the current Six-Year Plan for Kentucky, there are ten (10) projects in the study area that could have either an impact on or a relation to the Western Kentucky I-66 project. Those current projects are summarized in Table 7.1.

7.3.2 Recommended Missouri Statewide Transportation Improvement Program

MoDOT developed a Statewide Transportation Improvement Program (STIP) for state fiscal years 2002 through 2006. This annually prepared document includes all projects proposed for funding under various state and federal sources. The plan covers all modes of transportation and sets forth the projects MoDOT will fund under the five years that the plan covers. For the study area, MoDOT primarily has projects that are either rehabilitation or reconstruction, safety projects, and/or preventative maintenance projects. There currently are no projects that would add capacity or expand the existing system. However, there are projects that would rehabilitate and/or reconstruct, or provide needed preventative maintenance on the highways in the study area for Missouri. Roadways slated for these types of investment include I-55 and I-57.

MoDOT is also constructing a new bridge at Cape Girardeau, Missouri and East Cape Girardeau, Illinois. The new bridge, the Bill Emerson Memorial Bridge, is named for the eight-term Southeast Missouri congressman who helped lead efforts to secure funding for its construction.

The Bill Emerson Memorial Bridge is anticipated for completion in 2003. The estimated cost of the bridge is $100 million. The structure will be a 100-foot wide, 4,000-foot long cable stay bridge. The new structure is needed to safely and efficiently accommodate the many motorists who use the current Mississippi River Bridge each day. Traffic on the structure is continually increasing and future projections indicate this trend will continue. Currently, 14,000 vehicles utilize the structure daily and by the year 2015, the volume is expected to increase to 26,000 vehicles per day.

Table 7.1 - Current KYTC Six-Year Plan Projects in Study Area

County	Item Number	Project	Year of Implementation
Ballard/ McCracken	01-115.00	Widen US 60 to 4 lanes from 1 mile east of Denis Jones Road to Bethel Church Road (includes the Kevil Bypass)	2003 – Design 2006 – Right-of-way
Ballard	01-118.00	Widen US 60 to 4 lanes from the proposed southern bypass of La Center to 1.0 miles east of Denis Jones Road	2004 – Design
Ballard	01-700.00	Straighten two cures on KY 286, 5 miles east of Wickliffe	2002 – Right-of-way 2002 – Utilities 2003 – Construction
Carlisle	01-1002.00	Replace Bridge and approaches at IC (Sou) Railroad 0.4 miles west of KY 51	2002 – Right-of-way 2002 – Utilities 2003 – Construction
Carlisle	01-1017.00	Replace bridge over Truman Creek 1.0 mile west of junction of US 51	2003 – Design 2005 – Right-of-way 2005 – Utilities 2006 – Construction
McCracken	01-115.10	4 lane US 60 from Bethel Church Road to KY 1154	2003 – Construction 2004 – Utilities 2005 – Construction
McCracken	01-310.01	Paducah Outer Loop; New connector from US 45 to US 60 West of I-24	2003 – Right-of-way 2004 – Utilities
McCracken	01-954.00	Construct Left-turn lanes (each approach US 60) at Brown Street	2003 – Construction
McCracken	01-966.00	Construct left-turn lanes at each approach on US 45 at 16th Street	2002 – Right-of-way 2002 – Utilities 2003 – Construction
McCracken	01-115.10	Relocation and minor widening of US 60 from Clarks River to US 62 Junction	2003 – Design 2005 – Right-of-way 2006 – Utilities
McCracken	01-115.20	Relocation of US 62 from US 60 departure to KY 1887 (Park Road)	2006 – Design 2008 – Right-of-way 2008 – Utilities
McCracken	01-8003.00	I-24; Construct new interchange at KY994 (Old Mayfield Road) southeast of Paducah	2004 – Right-of-way 2004 – Utilities 2005 – Construction

7.3.3 Kentucky Statewide Transportation Plan

The Statewide Transportation Plan is a long-range 20-year plan for all modes of transportation. The plan includes listings of projects in two phases: (1) a short-range element (years one to six) which corresponds to the Six Year Highway Plan, elements of which are discussed above; and (2) a long-range element extending fourteen years beyond the short range element. The projects that are in the I-66 project area are listed below.

- *Paducah Outer Loop*
  - New Construction from US 62 to new US 60 west of I-24 in Paducah. Includes new interchanges at US 62 and new US 60.
  - New construction of KY 1322 to US 62 west of I-24 in Paducah. Includes new interchanges at KY 1322 and US 62.
  - New construction from US 45 to KY 1322 west of I-24 in Paducah. Includes new interchanges at US 45, KY339 and KY 1322.
- *I-24*
  - Upgrade existing facility from Paducah to Cadiz to accommodate future I-66 concurrent routing.

- *I-66*
  - New interstate facility from the Missouri State line to I-24 at Paducah.

    Note: The project above is the current study.

- *US 60*
  - New La Center Southern Bypass
  - Major widening to 4 lanes from proposed Barlow Eastern Bypass to proposed La Center Southern Bypass.
  - New Barlow Eastern Bypass
  - Major widening to 4 lanes from US 51 to KY 1280
  - Major widening to 4 lanes from KY 1280 to proposed Barlow Eastern Bypass
  - Major widening and relocation from approximately 1.0 mile north of Wickliffe to the Ohio River Bridge near Cairo, Illinois.
  - New Ohio River Bridge near Cairo, Illinois.

7.3.4 KYTC District 1 Plans / Needs

Each KYTC District maintains a list of projects that are needed but are currently financially constrained. That is to say that current funds are unavailable to implement these projects. Several of the projects from District 1 that are on the Unscheduled Needs List affect the I-66 study area. These projects are listed below.

US 51 – Ballard County
Reconstruct intersection at KY 121 in Wickliffe

US 62 – Ballard and McCracken Counties
Construct a new Lovelaceville Bypass

KY 121 – Ballard County
Reconstruct intersection with KY 286
Relocation from Carlisle County Line to KY 802.
Relocation from KY 802 to Wickliffe-Blandville Road.
Relocation from Wickliffe-Blandville Road to KY 286
Relocation from KY 286 to US 51 North of Wickliffe

I-24 – McCracken and Marshall County
Widening to 6 lanes from US 60 to US 68 in Paducah
Construct new Welcome Center on eastbound I-24 between Illinois state line and Paducah
Reconstruct US 60 to an urban interchange in Paducah
Add slip ramps between US 62 and US 45 in Paducah
Reconstruct interchange at Purchase Parkway
Construct new interchange at KY 282

US 45 – McCracken County
Widening US 45 from KY 1322 to US 62

US 60 – McCracken County
Widening US 60 from Old US 60 to Friedman Lane in Paducah

US 62 – McCracken County
Reconstruction from Lovelaceville Road at Ballard County Line to Paducah Information Age Park
Widening US 62 from Paducah Information Age Park to KY 998.
Reconstruct Intersection with KY 1322
Reconstruction from KY 284 to the Purchase Parkway

Paducah Outer Loop – McCracken County
New construction from US 60 to I-24/KY 305 interchange. Includes new interchange at US 60
New construction from KY 994 to US 45 west of I-24. Includes new interchanges at KY 994 and US 45.
New construction from I-24/KY 1954 interchange to KY 994. Includes new interchange at KY 994.
Widen KY 305 to 5 lanes with urban section from I-24 to US 45 in Paducah. Includes new connector to the US 45 Ohio River bridge.

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BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 3 - ENVIRONMENTAL JUSTICE ANALYSIS

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

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In Association With:

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Fuller, Mossbarger, Scott & May

FEBRUARY 2005

1.0 INTRODUCTION

This report presents an overview of specific community characteristics relating to Environmental Justice (EJ) for the I-66 Corridor Study – Western Kentucky to Missouri Project area. The data used in the report comes primarily from the U.S. Census Bureau, but also from field and mapping observations. The information and results are intended to assist the Kentucky Transportation Cabinet in making informed and prudent transportation decisions in the study area about the likelihood of encountering potential disproportionate consequences on one or more Environmental Justice communities and/or groups of communities as a result of the proposed new I-66 corridor.

This analysis specifically addresses the requirements of *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (signed on February 11, 1994). Executive Order 12898 states:

> *"…each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…"*

This report outlines the portions of the study area in Kentucky, Missouri and Illinois that may be considered under the guidelines for addressing Environmental Justice.

2.0 WHAT IS ENVIRONMENTAL JUSTICE?

The Executive Order directed all agencies, including the U.S. Department of Transportation (USDOT), with addressing concerns for EJ populations (minorities and the low-income) in all transportation decision making. Increasingly, elderly or aged communities are also becoming part of the EJ analysis as well. In fact, KYTC has policies that specify inclusion of elderly or aged populations in the EJ analysis.

EJ however was not a new concern that emerged in 1994. The principles EJ embodies have their roots in the Title VI of the Civil Rights Act of 1964 and prior civil rights legislation. Today, because of the increased importance and evolution of full and equitable analysis and treatment in the transportation planning process, EJ is perhaps best described as a matter of increased awareness of the full effects and impacts of transportation decisions on the human environment. The three fundamental EJ principles that the U.S. Department of Transportation (DOT) outline in its process when it put EJ regulations into place include:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.

2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

3.0 METHODOLOGY and DEFINITIONS

3.1 Methodology

Data for this analysis was collected from one primary source, the 2000 U.S. Census Data. Other information such as field surveys / observations and mapping were also used. The 2000 U.S. Census Data used in the analysis includes data available from the Census Bureau's American Fact Finder internet data query program - http://factfinder.census.gov/servlet/BasicFactsServlet?_lang=en.

All primary information comes from 2000 Summary Files 3 (SF 3) and includes the following specific data items:

- P1 - Total Population
- P6 - Race
- P8 - Sex by Age, and
- P87 - Poverty Status data for 1999 (the latest year available for this data)

Additional information used to refine minority, low-income and elderly populations comes from 2000 Summary Files 1 (SF 1) and includes the following specific data items:

- P7 – Race (Total Population)
- P12 - Sex by Age (Total Population)

U.S. Census data is arranged according to geographic unit. For this study, data for the entire study area is presented at the national, state, county, and census tract levels. Because the area of analysis is over 50 miles in length, spans three states, numerous counties and takes into account a corridor that is ½ mile in length, the Census Tract level was determined to be the most appropriate unit for analysis. For tracts identified as being affected by an alternative corridor under consideration and as having a minority, low-income, or elderly population greater that the statewide average, additional data was collected to the block group and block level (excluding low-income populations since data is only available to the block group level).

According to the U.S. Census Bureau, the definition of census tracts, block groups, and census blocks is as follows:

Census Tract – "A small, relatively permanent statistical subdivision of a county or statistically equivalent entity, delineated for data presentation purposes by a local group of census data users or the geographic staff of a regional census center in accordance with Census Bureau guidelines. Census tracts generally contain between 1,000 and 8,000 people. Census tract boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features. However, they may follow governmental unit boundaries and other invisible features in some instances; the boundary of a state or county is always a census tract boundary."

Block Group (BG) – "A statistical subdivision of a census tract. A BG consists of all tabulation blocks whose numbers begin with the same digit in a census tract. BGs generally contain between 300 and 3,000 people, with an optimum size of 1,500 people."

Census Block (or referred to as simply block) **– "**An area bounded on all sides by visible and/or nonvisible features shown on a map prepared by the Census Bureau. A block is the smallest geographic entity for which the Census Bureau tabulates decennial census data."

The data was compiled into spreadsheets by Census Tract, stratified by County and by State and checked with corresponding maps of the various alternative corridors to determine likely area areas of impact(s) in the study area.

3.2 Definitions

For the analysis, definitions compatible with guidelines from various sources including the U.S. DOT's Federal Highway Administration (FHWA), the Kentucky Transportation Cabinet (KYTC) (and other similar KYTC projects), the Census Bureau and standard transportation planning practices were all used.

The 2000 Census data on race, which was asked of all people, were derived from answers to long-form questionnaire Item 6, and short-form questionnaire Item 8. The concept of race, as used by the Census Bureau, reflects self-identification by people according to the race or races with which they most closely identify.

Minority (non White / Caucasian) individuals were defined themselves as those being Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, some other race, or a mixture of minority races. Some other race included all other responses not included in the defined race categories. Respondents providing write-in entries such as multiracial, mixed, interracial, or a Hispanic/Latino group (for example, Mexican, Puerto Rican, or Cuban) in the "Some other race" write-in space are included in this category.

Since race information is self-reported, there is an element of error and perhaps under reporting that may be introduced into the data, especially by persons of mixed race.

Therefore, to be more inclusive of minorities in the analysis, the definition of “Minority” for this analysis will be all persons other than those who self identified as White or Caucasian. Although this may overestimate slightly the actual number and percentages of “minorities” if applied on a statewide basis, the overestimation on a tract basis and for only a few tracts in question is rather insignificant.

Low-income is defined in U.S. DOT Order (5610.2) as “a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines”. A low-income population is “any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons …”

Specifically, the 1999 poverty data were used to derive answers to long-form Census questionnaire Items 31 and 32, the same questions used to derive income data. The Census Bureau uses the federal government's official poverty definition, which is an offshoot of the Social Security Administration (SSA) original poverty definition of 1964, which federal interagency committees subsequently revised in 1969 and 1980. The Office of Management and Budget's (OMB's) Directive 14 prescribes this definition as the official poverty measure for federal agencies to use in their statistical work.

The specific poverty thresholds are revised annually to allow for changes in the cost of living as reflected in the Consumer Price Index (CPI-U). The poverty thresholds are the same for all parts of the country -- they are not adjusted for regional, state, or local variations in the cost of living. The poverty status of families and unrelated individuals in 1999 was determined using 48 thresholds (income cutoffs) arranged in a two dimensional matrix. The matrix consists of family size (from 1 person to 9 or more people) cross-classified by presence and number of family members under 18 years old (from no children present to 8 or more children present). Unrelated individuals and 2-person families were further differentiated by the age of the reference person (RP) (under 65 years old and 65 years old and over).

To determine a person's poverty status, one compares the person's total family income with the poverty threshold appropriate for that person's family size and composition. If the total income of that person's family is less than the threshold appropriate for that family, then the person is considered poor, together with every member of his or her family. If a person is not living with anyone related by birth, marriage, or adoption, then the person's own income is compared with his or her poverty threshold.

Populations by Age (Elderly) Elderly populations (age 62 or above in this analysis) are not specifically recognized under the definition of an Environmental Justice community. However, the U.S. DOT specifically encourages the early examination of potential populations of the elderly, children, disabled, and other populations protected by Title VI of the Civil Rights Act of 1964 and related nondiscrimination statutes.

The data on age, which was asked of all people, were derived from answers to the long-form questionnaire Item 4 and short-form questionnaire Item 6. The age classification is based on the age of the person in complete years as of April 1, 2000. The age of the person usually was derived from their date of birth information. Their reported age was used only when date of birth information was unavailable. For the analysis, aged was defined as all individuals who were age 62 years or older.

4.0 CENSUS DATA

The I-66 Corridor Study – Western Kentucky to Missouri project study area is over 50 miles long and spans three states and multiple counties. It includes Ballard, Carlisle, Graves, and McCracken counties in Kentucky, Cape Girardeau, and Mississippi County in Missouri, and Alexander, Massac and Pulaski counties in Illinois. In Kentucky, there are three affected census tracts in Ballard County, two each in Carlisle and Graves County, and five in McCracken County for a total of twelve tracts. In Missouri there are five affected tracts in Cape Girardeau County and one in Mississippi County for a total of six tracts. In Illinois, there are two affected tracts each in Alexander and Pulaski County respectively and one in Massac County for a total of five tracts.

The following map displays the affected tracts and the alternative corridors that cut across or near each tract.

N

CAPE GIRARDEAU CO.

ILLINOIS

KENTUCKY

MISSOURI

SCOTT CO.

ALEXANDER CO.

PULASKI CO.

MASSAC CO.

BALLARD CO.

MCCRACKEN CO.

MARSHALL CO.

MISSISSIPPI CO.

CARLISLE CO.

GRAVES CO.

9808
9809
9811
9816
9810
9814
9576
9711
9710
9701
9703
9578
9502
9501
315
314
308
306
309
313
310
9579
9501
316
312
9503
9502
208
207
9602
9601

Corridor 5
Corridor 6/7
Corridor 8
Corridor 9/10
Corridor 11/12/13/14/15/21
Corridor 19
Corridor 20
Study Area
Census Tract (2000)
Tract ID

25000 0 25000 Feet

Census Tracts and
Proposed Corridors
Interstate 66 Corridor Study
Illinois, Kentucky and Missouri

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- Filename: p:\2000\0396-pbqd-ballard-i66\mapping\gis\census_map.apr Layout: census_tracts-Map By: las On: March 7, 2003

5.0 ENVIRONMENTAL JUSTICE SUMMARY

The data was compiled into spreadsheets by census tract, stratified by county and by state and checked with corresponding maps of the various alternative corridors to determine likely area areas of impact(s) in the study area. The following sections summarize the potential impacts to minority populations, low-income populations, and elderly populations for Kentucky, Missouri, and Illinois.

5.1.1 Minority Population Analysis

To determine areas of high minority populations, the percentage of minorities in a census tract was compared to the statewide average minority percentage. Census tracts that were higher than the statewide average were then analyzed at the block group and block level to locate the minority populations in relation to the proposed corridors. Table 1 lists the potential minority concentrations and the corridors that could impact these populations. Some census tracts had higher than the statewide average of minorities, but there was no specific concentration within the census tract. These census tracts are listed in the table, but do not show a specific concentration. Also, data for Kentucky is not shown in this table since there are no census tracts in the study area in Kentucky that contain percentages of minorities that are above the Kentucky statewide average of nine percent.

Table 1: Minority Population Analysis Summary

Location			Statewide Average Minority %	Census Tract Minority %	Specific Minority Population Concentration	Specific Minority Population %	Corridor Impacts
Missouri	Cape Girardeau County	Tract 9810	13	14	-	-	Corridor 20
		Tract 9814		41	900	17	Corridor 20
		Tract 9816		21			Corridor 20
	Mississippi County	Tract 9501		15	160 (Wilson City)	45	Corridors 5, 6/7, 9/10, 11/12/13/14/15/21 and 19
Illinois	Alexander County	Tract 9578	25	54	In and near Cairo, Illinois	-	-
	Pulaski County	Tract 9711		44	58 (Ullin, Illinois)	32	Corridor 20

From the data available for minority populations, the greatest potential for impact appears to be in Cape Girardeau County, where Alternative 20 ends and near Wilson City where several of the corridors terminate.

5.1.2 Low-Income Population Analysis

The procedure for identifying low-income populations is similar to that for the minority analysis. The percentage of persons below the poverty level for each census tract

affected was compared to the statewide average. Census tracts higher than the statewide average were analyzed in more detail to determine specific locations of low-income populations. Table 2 lists the census tracts with percentages of persons living below the poverty level that are greater than the statewide averages. For some census tracts, it was possible to identify specific low-income populations. These populations and the corridors they affect are also shown on the table.

According to Table 2, Corridor 20 may impact some low-income populations where it ends in Cape Girardeau County. Also, there appear to be specific low-income populations in Wyatt, Union City, and Mound City which could all be potentially impacted by Corridor 20.

Table 2: Low-Income Population Analysis Summary

Location			Statewide Average % Below Poverty Level	Census Tract % Below Poverty Level	Specific Low-Income Population Concentration	Specific Low-Income Population %	Corridor Impacts
Kentucky	Ballard County	Tract 9503	16	16	-	-	Corridors 5, 6/7, 9/10, 11/12/13/14/15/21
	Carlisle County	Tract 9602		19	-	-	Corridor 19
Missouri	Cape Girardeau	Tract 9808	12	28	155 and 254	51 and 40	Corridor 20
		Tract 9810		33	365	41	Corridor 20
		Tract 9814		36	407	48	Corridor 20
		Tract 9816		24	403	32	Corridor 20
	Mississippi County	Tract 9501		15	178 (Wyatt and Wilson City)	21	Corridors 5 and 19
Illinois	Alexander County	Tract 9576	11	23	-	-	Corridor 20
		Tract 9578		29	-	-	Corridor 8
	Pulaski County	Tract 9710		24	291 (Mound City)	41	Corridor 20
		Tract 9711		26	-	-	Corridor 20

5.1.3 Population by Age Analysis

Elderly populations (age 62 or above in this analysis) are not specifically recognized as an Environmental Justice community based on the legal definition. However, the U.S. DOT specifically encourages the early examination of potential elderly populations. For this analysis, the identification of elderly populations was determined by comparing statewide elderly population percentages to elderly population percentages at the

census tract level. Census tracts with elderly population percentages higher than the statewide average are listed in Table 3. Also, when possible, specific locations of elderly populations within the census tracts were identified and are listed in Table 3 along with the corridors that could potentially impact these populations.

Based on the data shown in Table 3, both Kentucky and Missouri have several locations of high elderly populations. In Kentucky, these populations are located in La Center, Wickliffe, the northeast section of Carlisle County, and Paducah. In Missouri, Corridor 20 could impact elderly populations near the end of the corridor in Cape Girardeau.

Table 3: Population by Age Analysis Summary

Location			Statewide Average Elderly (Age 62+) %	Census Tract Elderly %	Specific Elderly Population Concentration	Specific Elderly Population %	Corridor Impacts
Kentucky	Ballard County	Tract 9501	15	20	78 (La Center)	96	Corridor 5
		Tract 9502		18	-	-	Corridors 5, 8, and 6/7
		Tract 9503		18	34 (Wickliffe)	24	Corridors 5, 6/7, 9/10, and 11/12/13/14/15/21
	Carlisle County	Tract 9601		21	75	53	Corridor 19
		Tract 9602		22	-	-	Corridor 19
	Graves County	Tract 207		15	-	-	Corridor 19
		Tract 208		18	-	-	Corridor 19
	McCracken County	Tract 313		16	60	17	Corridor 11/12/13/14/15/21
		Tract 314		19	36 and 82	61 and 91	Corridors 5 and 9/10
		Tract 315		16	-	-	Corridors 5 and 9/10
Missouri	Cape Girardeau	Tract 9811	14	21	125	24	Corridor 20
		Tract 9814		14	73	19	Corridor 20
		Tract 9816		19	179	24	Corridor 20
	Mississippi County	Tract 9501		21	-	-	Corridors 5 and 19
Illinois	Alexander County	Tract 9576	14	17	-	-	Corridor 20
		Tract 9578		19	-	-	Corridor 8
	Massac County	Tract 9701		15	-	-	Corridor 20
	Pulaski County	Tract 9710		21	-	-	Corridor 20
		Tract 9711		19	-	-	Corridor 20

5.2 Conclusions

In order to determine which corridor is the most desirable from an Environmental Justice standpoint, a summary table of impacts by corridor (Table 4) was compiled from the previous analysis. The populations identified in Table 4 were determined based on additional analysis for census tracts with percentages of minorities, low-income, or elderly residents greater than the statewide averages.

Table 4: Summary of Minority, Low-Income, and Elderly Population Impacts by Corridor

Corridor	No. of Specific Minority Populations Potentially Affected	No. of Specific Low-Income Populations Potentially Affected	No. of Specific Elderly Populations Potentially Affected	Total Number of EJ Populations Potentially Affected*
Corridor 5	None Found	1	4	5
Corridor 6/7	None Found	1	3	4
Corridor 8	None Found	1	3	4
Corridor 9/10	None Found	1	3	4
Corridor 11/12/13/14/15/21	None Found	1	2	3
Corridor 19	1	1	2	4
Corridor 20	2	5	4	11

*EJ populations in this analysis include minority, low-income, and the elderly (age 62+)

On a corridor basis, the most concern seems to be for Alternative Corridor 20, as it cuts across tracts in Cape Girardeau, Alexander, Pulaski and Massac counties respectively. In terms of EJ analysis this corridor has the most potential for adverse impacts on minority, low-income, and elderly populations when compared to the other corridors under consideration. Most of the minority, low-income and elderly populations that Corridor 20 would potentially adversely impact are limited to the termination point of Corridor 20 in Cape Girardeau.

All other corridors rank low in their likely respective impacts. However, since all corridors utilizing the river crossing south of Wickliffe, Kentucky pass through Mississippi County, Missouri there is potential for some adverse impacts across the county, especially in Census Tract 9501.

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BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 4 – TRAFFIC FORECASTING

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

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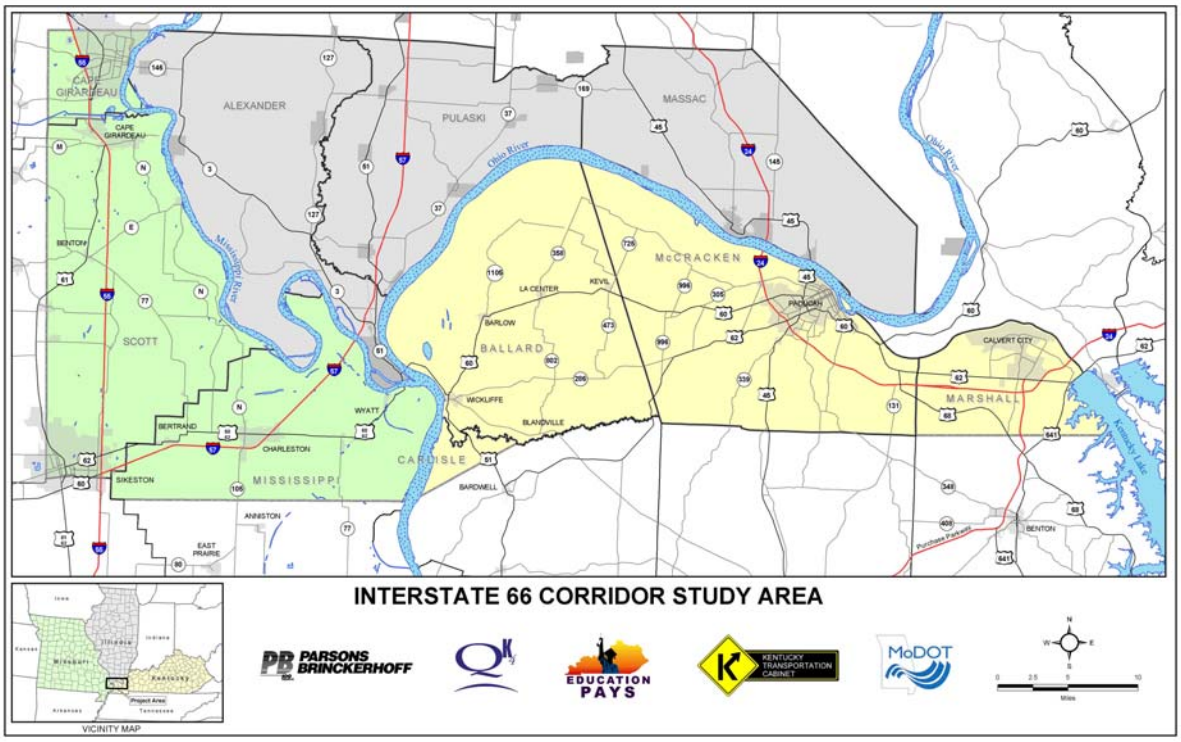
FEBRUARY 2005

1.0 INTRODUCTION

1.1 Study Purpose and Study Area

The Kentucky Transportation Cabinet (KYTC), Missouri Department of Transportation (MoDOT), and Federal Highway Administration (FHWA) initiated the I-66 Western Kentucky Corridor Planning Study to assess the need, feasibility, and possible corridors for a new limited access highway between Western Kentucky and Southeastern Missouri. The study area includes portions of McCracken, Ballard, and Carlisle Counties in Kentucky and Scott, Mississippi, and Cape Girardeau Counties in Missouri. A section of Southern Illinois is also included. The study area is shown in Figure 1.

Figure 1: Study Area



1.2 Project Goals

A set of primary project goals were defined for this study. They were used as the basic criteria for evaluating each of the potential alternative corridors as well as the No-Build alternative. The goals include:

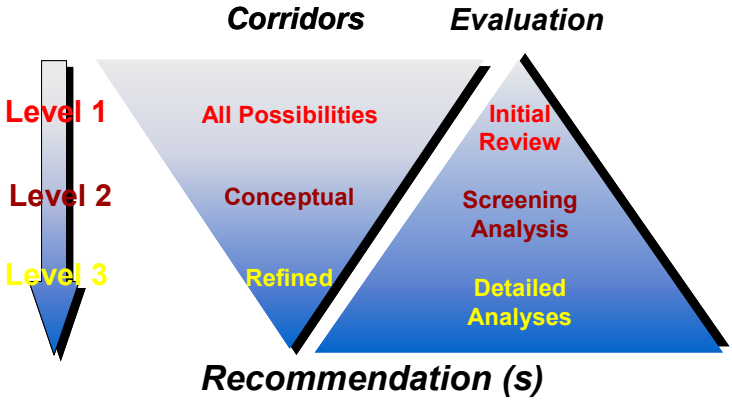
1. *Support Completion of I-66 Across Southern Kentucky, Providing System Continuity from West Virginia to Missouri*
2. ***Reduce Traffic Congestion***
3. ***Improve Accessibility and Connectivity***
4. ***Enhance Roadway Safety***
5. *Support Economic Development and Community Growth*
6. *Capitalize on Existing and Planned Investments*
7. *Improve Community Character / Quality of Life*

Traffic forecasting and related analyses are essential to assessing Goals 2 through 4 above. They play an important role in considering the other goals as well.

1.3 Corridor Analysis Procedures

The corridor analysis was a three-tiered evaluation process as shown in Figure 2. Level 1 screening was qualitative and recommended 14 of the original 22 corridors for further evaluation in Level 2. Many of the remaining 14 corridors were similar; therefore, they were combined into a total of seven corridors for the Level 2 screening. During the Level 2 screening, the seven corridors were evaluated using a combination of qualitative and quantitative methods. The Level 2 quantitative evaluation focused on: transportation operations (traffic), documented support for/against an alternative, environmental and community impacts, and capital costs. Based on the Level 2 analyses, five alternatives (including the No-Build) were advanced to Level 3.

Figure 2: Corridor Analysis Procedure



1.4 Traffic Forecasting and Analysis Goals

The traffic forecasting and traffic operations analyses efforts were conducted in support of the Level 2 and Level 3 evaluations discussed above. They provided important inputs to estimate the use of the proposed new highways and to compare the alternatives to each other. The specific goals of these efforts, and therefore the focus of this report, are given below.

Traffic Forecasting and Analysis Goals:

1. Estimate 2030 daily traffic volumes for proposed new highways and key existing highways in the study area;
2. Evaluate traffic patterns in the study area;
3. Estimate and compare travel distances and travel times;
4. Consider systemwide operations measures such as vehicle miles of travel and vehicle hours of travel;
5. Evaluate levels of service on proposed new interstate highways; and
6. Explore possible traffic impacts to the existing interstate system.

1.5 Report Organization

The remainder of the report is divided into four sections as follows:

2.0 Methodology
3.0 No-Build Traffic Forecasts
4.0 Level 2 – Build Traffic Forecasts
5.0 Level 3 – Build Traffic Forecasts

2.0 METHODOLOGY

The methodology for this study is divided into two elements: 1) traffic forecasting methods and 2) traffic operations analysis methods.

2.1 Traffic Forecasting Methodology

The recently updated version of the Kentucky Statewide Traffic Model (KYSTM) was selected as the model platform for developing the future forecasts. Specifically, the three model versions used included:

- KYSTM Update Version 2 (Recalibrated to I-66 Corridor)
- KYSTM Update Version 2 (I-66 Existing + Committed Model Network)
- KYSTM Update Version 2 (I-66 Project Network)

The base model was then modified as necessary to reasonably consider the proposed 2030 No-Build and Build Scenarios. This mainly consisted of changes to the model network and assumed zonal factors as discussed below. As this was a long-range corridor planning study, future forecasts were only developed for 2030. This provided an adequate and appropriate horizon year for comparing the proposed alternatives.

2.1.1 Model Validity Check

While no formal calibration was included as part of this traffic forecast process, the baseline model numbers for the 1999 KYSTM Update Version 2 (Recalibrated to I-66 Corridor) were compared to recent volume estimates at eight screenline locations in the study area. The purpose of the comparison was to evaluate whether the model could be expected to predict the I-66 Corridor and general study area traffic flows reasonably well at a corridor planning level. Figure 3 shows the screenline locations and Table 1 presents a summary of the volume comparisons. A detailed comparison showing the volumes for each link crossing the screenlines is provided as Exhibit A.

For all of the screen lines, the 1999 KYSTM predicted volumes within 15% of the count values.[1] Overall, the total volume estimate for all screenlines is within 1% of the count total. When the absolute values of the differences are used, the forecasts are within 6% of the count total. For specific links, the differences are larger, with some of the greatest variability showing up on Missouri and Illinois.

Overall, however, it is expected that the model provides a sufficiently accurate tool for use in this planning level corridor study. It will facilitate comparisons between competing alternatives and will provide reasonable order of magnitude traffic estimates for a proposed new I-66 highway through the study area.

[1] While the model predicts 1999 average daily volumes and the daily volume estimates were for 2001 through 2003, it was decided that the unadjusted data comparison provided a reasonable basis for assessing the general validity of the model in the region.

Figure 3: Model Volume Comparison Screenlines

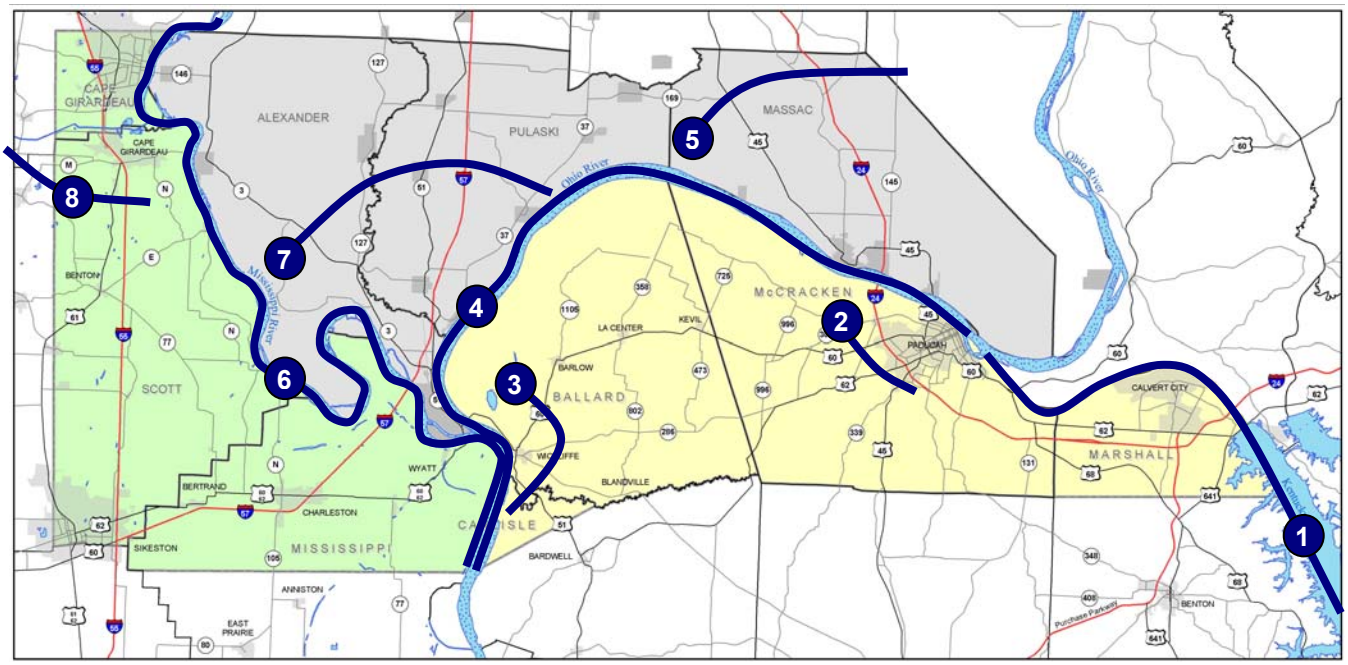


Table 1: Model Volume Comparison Summary

Screenline	Recent Counts*	1999 KYSTM Model Volumes**	Difference from Counts	Percent Difference from Counts
1- Tennesee River	48,350	46,860	-1,490	-3%
2 - West of Paducah	13,240	12,860	-380	-3%
3 - East of Wickliffe	11,090	12,740	1,650	15%
4 - Ohio River	37,860	37,280	-580	-2%
5 - North of Paducah	22,350	21,470	-880	-4%
6 - Mississippi River	24,840	26,130	1,290	5%
7 - North of Cairo	18,200	16,380	-1,820	-10%
8 - North of Sikeston	28,652	32,400	3,748	13%

* Count data was obtained from Kentucky, Missouri, and Illinois web sites and if for 2001-2003.
** The 2002 version of the 1999 KYSTM (calibrated for the I-66 corridor) was used for the comparison

2.1.2 No-Build Scenario

The 2030 No-Build Scenario forecasts were based on the 2030 KYSTM Update Version 2 (I-66 Existing + Committed Model Network), which included two major new highways: Corridor 18 (I-69) and Corridor 5 (I-73/I-74) as presented in the *Traffic Model Coordination for the I-66 (Southern Kentucky) Corridor – Final Report* prepared by Wilbur Smith Associates in 2002. The model network was also upgraded for this current study to include key existing and committed projects in the study area (i.e. those with at least one phase in the KYTC Six Year Plan). The projects that were added included improvements to US 60 from near Kevil to LaCenter as well as the Paducah Outer Loop project. Data characteristics for a small number of facilities were also updated to match current conditions (such as numbers of lanes or speed classifications). The model was then re-run with these network modifications to provide the 2030 No-Build forecasts. The results remained similar to the unadjusted Existing + Committed model output.

2.1.3 Level 2 Build Scenarios

There were two sets of build forecasts completed for this project. The first set was completed for the Level 2 Screening. It was general in nature and was intended to give order of magnitude traffic volume comparisons between alternative corridors. As some of the corridors followed similar alignments, certain model runs were used to estimate traffic volumes for multiple corridors. The build alternatives considered in the Level 2 analysis are summarized in Table 2 and illustrated in Figure 4. The Level 2 modeling scenarios included:

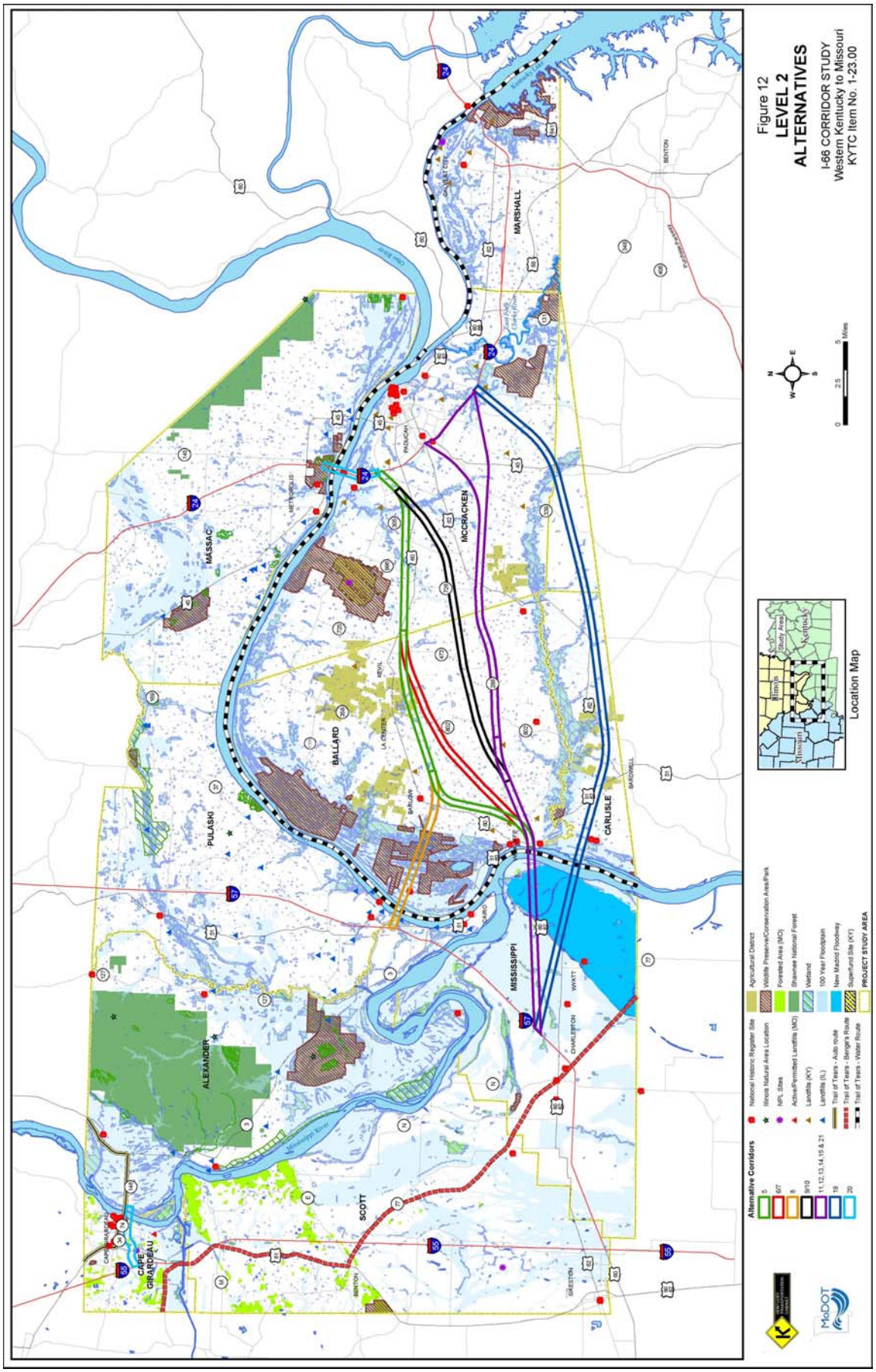
- Scenario 1 - No-Build (existing and committed projects only)
- Scenario 2 - Alternatives 5
- Scenario 3 - Alternatives 6 and 7
- Scenario 4 - Alternative 8
- Scenario 5 - Alternative 8A
- Scenario 6 - Alternative 8B
- Scenario 7 - Alternatives 9 and 10
- Scenario 8 - Alternatives 11-15 & 21
- Scenario 9 - Alternative 19
- Scenario 10 - Alternative 20 (with generic assumptions for model coding)

At the conclusion of the Level 2 evaluation, a subset of the build alternatives was selected for further analysis in Level 3. The model runs were then refined to produce a second set of more detailed volumes for a smaller number of alternatives.

Table 2: Level 2 Alternatives

Alt.	Route Description
0	No-Build Scenario. Assumes only existing and committed projects are constructed.
5	Begins at I-24 near Paducah. Follows the US 60 corridor to Wickliffe. Crosses the Mississippi River south of Wickliffe. Connects to US 60 east of Charleston. Follows I-57 to Sikeston.
6, 7	Similar to Alt. 5, except it follows a new alignment from US 60 near Kevil to south of Wickliffe.
8	Begins at I-24 south of Paducah. Follows the US 62/KY 286 corridor to east of Wickliffe. Runs northwest on a new alignment to cross the Ohio River and connect to I-57 north of Cairo.
8A	*Does not include a new interstate.* Widen US 60 to 4-lanes from Kevil to Wickliffe. Bypass Kevil, LaCenter, and Barlow. Includes new highway and bridge over the Ohio River north of Wickliffe, connecting with I-57 north of Cairo. (Alt. 8 alignment)
8B	*Does not include a new interstate.* Widen US 60 to 4-lanes from Kevil to Wickliffe. Bypass Kevil, LaCenter, and Barlow. Includes new highway and bridge over the Mississippi River south of Wickliffe connecting to US 60 in Missouri.
9, 10	Begins at I-24 near Paducah. Follows a new route southwest to Wickliffe (parallel to US 62/KY 286). Crosses the Mississippi River south of Wickliffe to connect with to I-57 near Charleston.
11-15, 21	Begins at I-24 south of Paducah. Follows a new route (parallel to KY 286) to south of Wickliffe. Crosses the Mississippi River south of Wickliffe. Connects with I-57 near Charleston.
19	Begins at I-24 near KY 1954 or KY 450. Follow a new route southwest to cross KY 45 near the McCracken County line. Run west on a new route to south of Wickliffe. Cross the Mississippi River south of Mayfield Creek. Connect to I-57 near Charleston.
20	Re-sign the existing I-24 as I-24 and I-66 in KY. Begin new corridor in Southern IL (Massac Co.). Run west on a new route across Southern IL to connect with I-55 near Cape Girardeau, MO.

Figure 4: Level 2 Alternatives



2.1.4 Level 3 Build Scenarios

In Level 3, the build alternatives remaining for further evaluation were 8, 8B, 11-15/21, and 20. The other alternatives were set aside in Level 2. Subsequently, Alternative 8 was also removed from consideration due to significant environmental impacts and is not addressed further in this report. Therefore the remaining model scenarios for Level 3 included:

- Scenario 1 - No-Build (existing and committed projects only)
- Scenario 2 - Alternatives 11-15 and 21
- Scenario 3 - Alternative 8B
- Scenario 4 - Alternative 20 (with generic assumptions for model coding)

2.1.5 Build Scenario Model Development

2.1.5.1 Model Networks

The 2030 KYSTM Update Version 2 (I-66 Project Network) was used as the basis for all of the Build Scenario model runs (including the new bridge only alternatives). This provided a consistent and comparable model network outside of the study area. New 2030 build networks were created for each of the proposed Build Scenarios. The network modifications included:

1. Adding new links for proposed new highways and bridges
2. Adding connection points (denoting interchange locations)
3. Adding access highways as necessary
4. Adding other existing highways that may have a bearing on traffic circulation and flows relative to the new highways in the study area
5. Modifying numbers of lanes for build options that improve existing highways.
6. Deleting the old I-66 highway links in the study area.

For all of the alternatives except 20, specific corridors were proposed in the planning study. These corridor proposals were more than adequate for defining the model network. To model Alternative 20 (in Illinois) the project team decided to assume a direct east-west corridor from Cape Girardeau to I-24 with only minor shifts to avoid population centers.

2.1.5.2 Zone System

The zone system was not changed as part of the modeling effort. It was agreed that the zone system, while aggregate in nature was sufficient for this planning level study.

2.1.5.3 Trip Tables and Zonal Factor Adjustments

The trip tables from the 2030 KYSTM Update Version 2 (I-66 Build) were used for all of the Build Scenario model runs (including the new bridge only alternatives). Similar to the network discussion, this provided a consistent and comparable basis for examining all of the build scenarios.

The build trip tables were however modified to better reflect the location of the corridor being examined. This was done by examining and adjusting the original I-66 model

zonal factors. According to documentation for the KYSTM (I-66 Corridor), the zonal factors were used

> *"to account for the redistribution or population, employment, and trips as a result of the construction of I-66. Furthermore, an important premise of the economic analysis was that traffic on a major new roadway within the I-66 Corridor would increase population and employment within the corridor. This new traffic-induced increase in population and employment will, in turn, generate more traffic on the new roadway." (Traffic Model Coordination for the I-66 (Southern Kentucky) Corridor, Wilbur Smith Associates, May 2002.)*

Therefore, new zonal factors were developed for the different corridors to account for traffic shifts resulting from the reallocation of future economic activity to each corridor. Similar corridors were assumed to have similar economic impacts and therefore similar zonal factors. Zones located close to a particular corridor were given zonal factors greater than one. As the distance between the corridor and the zones increased, the zonal factors were decreased approximately linearly, until at a certain point they became less than one. The zonal factors were also adjusted, such that the cumulative effect resulted in little change to the total number of trips generated within the study area.

The original I-66 model generally applied zonal factors only within Kentucky, leaving those outside the state at one. In part this may have been due to a lack of economic impact data for areas outside Kentucky. For this current study zonal factors outside the state were left alone. This was deemed reasonable due to the modest length of new interstate construction outside of Kentucky (just enough to reach I-57) and the relatively low population and employment density along the corridors. The alternative with the longest highway corridor outside of Kentucky is Alternative 20. However, the exact location of this corridor was not defined in the alternatives analysis (only a general corridor for modeling purposes) and again the density of economic activity and zones was low. Therefore, the zonal factors in Illinois were left alone for this alternative as well.

While the zonal factors were adjusted to better reflect the local economic impact of the I-66 corridor, the sum of the trips originating and terminating in the study area were maintained as a constant in the readjustment. Thus the adjustment did not increase the total number of trips over what was projected by the I-66 statewide model forecasts, which already took into account an increase in economic activity due to the highway through the state.

2.1.5.4 Model Assignments

The revised trip tables were used to complete assignment runs for both trucks and cars for each of the build scenarios. The output from these runs were then examined to determine if they were reasonable and to assess whether any further network refinement was needed. The final resulting data was then used to compare and evaluate the alternatives. It was also used to examine where traffic was going to and from, how traffic was being reallocated with the presence of I-66, and what the estimated operating conditions were on the new facilities.

3.0 NO-BUILD TRAFFIC FORECAST

To provide a baseline for the future No-Build Scenario (2030 E+C model) as well as the future Build Scenarios, the existing daily traffic volumes at six key screenlines are shown in Table 3. (The screenline locations are shown in Figure 12 in Chapter 5.0.) The existing traffic patterns are also shown on Exhibit B at the back of this forecasting report. Overall, the major traffic flows through the study area are on I-24 in the east and I-55 and I-57 in the west. Smaller volumes are found on the arterials in the central portion of the study area. It is important to note that the volumes shown on Exhibit B differ from the screenline analysis volumes included in this report. The Exhibit B volumes were collected in 2002. The screenline volumes were taken from state websites in early 2004 and are therefore more recent volume estimates.

Based on the recent count data shown in Table 3, the amount of traffic entering the study area from the east is approximately 48,000 vehicles per day (vpd). The flow over the Ohio River (all three Ohio River bridges) is nearly 38,000 vpd and the flow over the Mississippi River is 25,000 vpd. An examination of individual bridges indicates that approximately 5,500 vpd cross the Ohio River at Cairo on US 51; 4,000 vpd cross the Mississippi River south of Cairo on US 60; and 9,800 vpd cross the Mississippi on I-57.

The 2030 Existing Plus Committed (E+C) Scenario volumes shown in Table 3 show significant growth over the existing traffic volumes at nearly all locations examined. (New highways assumed to be in place in the 2030 E+C Scenario are discussed at the end of this section.) The total traffic entering the study area from the east over the Tennessee River more than doubled from 48,000 to 104,000 vpd. Most of this increase is on I-24. (Approximately half of the I-24 traffic is flowing northeast / southwest on I-24 and the Purchase Parkway, which is assumed to be I-69 in the 2030 E+C Scenario.)

The total screen line flow over the Ohio River (between Kentucky and Illinois) also increased considerably from 38,000 to 65,000 vehicles per day. The volume over the Ohio River by Cairo doubled to 11,000 vpd. Exhibit C (at the back of this forecasting report) shows a flow map for the E+C Scenario.

Table 3: Existing and 2030 E+C Volumes

Screenline	Highway	Recent Counts	E+C
1	US 60	9880	15000
Tennesee River	I-24	29500	66000
	US 62	6340	16000
	US 68	2630	7000
		48350	**104000**
2	US 60	27800	43000
W. of I-24	US 62	8780	19000
	US 45	28500	43000
	I-66	0	0
		65080	**105000**
3	US 60	6690	11000
Near the County Line	KY 286	2990	6000
	US 62	3560	4000
	I-66	0	0
		13240	**21000**
4	US 60	4820	10000
East of Wickliffe	KY 286	2340	2000
	KY 121	1500	2000
	US 51	2430	6000
	I-66	0	0
		11090	**20000**
5	US 45	5530	5000
Miss./Ohio River	I-24 (I-66)	26850	49000
	US 51 (Cairo Bridge)	5480	11000
	New Bridge / I-66	0	0
		37860	**65000**
6	US 60	3990	4000
Mississippi River	I-57	9750	17000
	MO 74 (I-66)	11100	15000
	New Bridge / I-66	0	0
		24840	**36000**

A comparison of Exhibits B and C (at the back of this forecasting report) shows that traffic on I-24 between US 60 and US 62 is projected to increase by over 50% to approximately 66,000 vpd. South of US 45, the increase on I-24 is even more substantial, with a projected volume of 75,000 vpd. These E+C volumes are large enough to require additional lanes on I-24 through the Paducah area. The heaviest traveled section requires 8 lanes to maintain LOS C or better in 2030. The volume increases on US 60, US 62, and US 45 west of I-24 are also considerable.

As outlined in Section 2.1.2, the 2030 E+C Scenario forecasts were based on the 2030 KYSTM Update Version 2 (I-66 Existing + Committed Model Network), which included two major new highways: Corridor 18 (I-69) and Corridor 5 (I-73/I-74) as presented in the *Traffic Model Coordination for the I-66 (Southern Kentucky) Corridor – Final Report* prepared by Wilbur Smith Associates in 2002. The model network was further upgraded for this current study to include key existing and committed projects in the study area (i.e. those with at least one phase in the KYTC Six Year Plan). Two projects were determined to be significant enough that they could affect travel flow patterns. The first was widening US 60 to four lanes from near Kevil to LaCenter and the second was the Paducah Outer Loop project. (Data characteristics for a small number of facilities were also updated to match current conditions, such as numbers of lanes or speed classifications.) The model was then re-run with these network modifications to provide the 2030 E+C Scenario forecasts. The results remained similar to the unadjusted Existing + Committed model output.

(Note that the 2030 No-Build volumes used in the Level 2 Screening differ slightly from the volumes used for Level 3 due to model improvements. The values presented in this section are the Level 3 values.)

4.0 LEVEL 2 - BUILD TRAFFIC FORECASTS

The Level 2 forecasts were conducted to give an early indication regarding the order of magnitude of traffic volumes for each alternative and to give a reasonable basis for comparing the alternatives. Therefore, the focus of the Level 2 work was on how much traffic, including the percent truck traffic, would be attracted to each of the proposed alternative corridors. The travel time savings between Paducah and Sikeston and between Paducah and Cape Girardeau were also estimated for each of the alternative corridors. The results of the Level 2 travel time analysis are summarized in Table 4 and the estimated I-66 average daily traffic volumes and levels of service are presented on Figures 5 through 11 on the following pages. (Note that figures were not prepared for Alternatives 8A and 8B.) The Level 2 traffic operations matrix is also provided as Exhibit D for reference.

Table 4: Estimated Travel Time by Alternatives

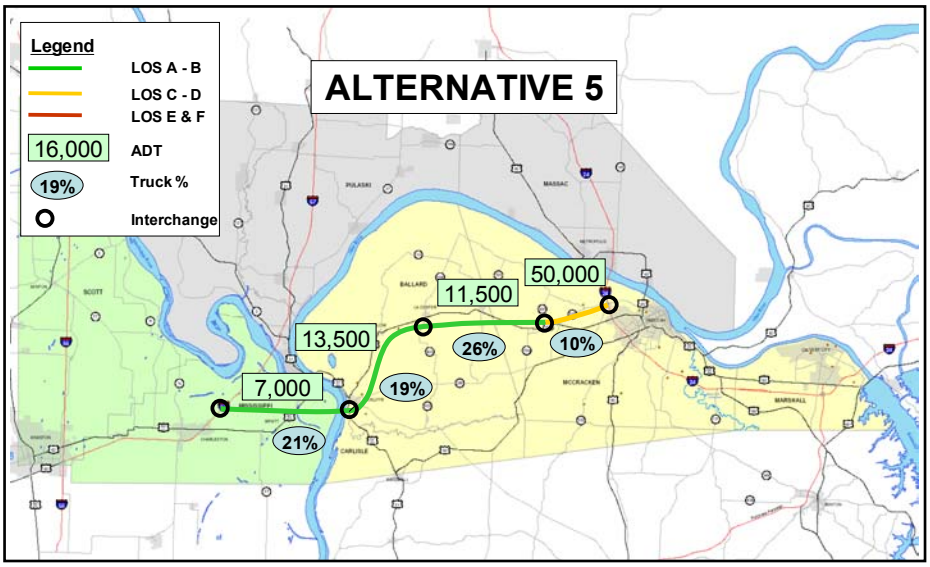
	Estimated Travel Time by Alternative (Minutes)									
	E+C	Alt. 5	Alt. 6-7	Alt. 8	Alt. 8A	Alt. 8B	Alt. 9-10	Alt. 11-15,21	Alt. 19	Alt. 20
Paducah to Sikeston	76	63	62	66	74	74	61	58	60	74
Savings Compared to E+C		13	14	10	2	2	15	18	16	2
Paducah to Cape Girardeau	98	89	89	83	91	98	87	84	88	67
Savings Compared to E+C		9	9	15	7	0	11	14	10	31

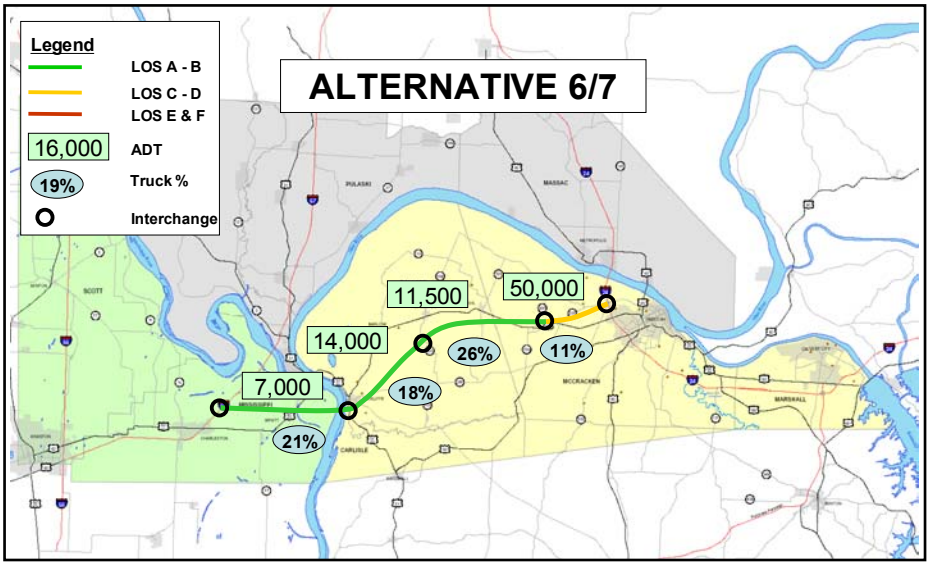
The volume of traffic projected to use the new I-66 highway was highest near Paducah and lowest at the western terminus. The high volumes shown adjacent to I-24 are aggregate numbers that include some local traffic that may actually use parallel facilities. Levels of service on I-66 were not deemed to be a critical issue. However, the largest volumes would be expected near I-24 and traffic volumes and levels of service on I-24 were identified as an issue worth more study in Level 3.

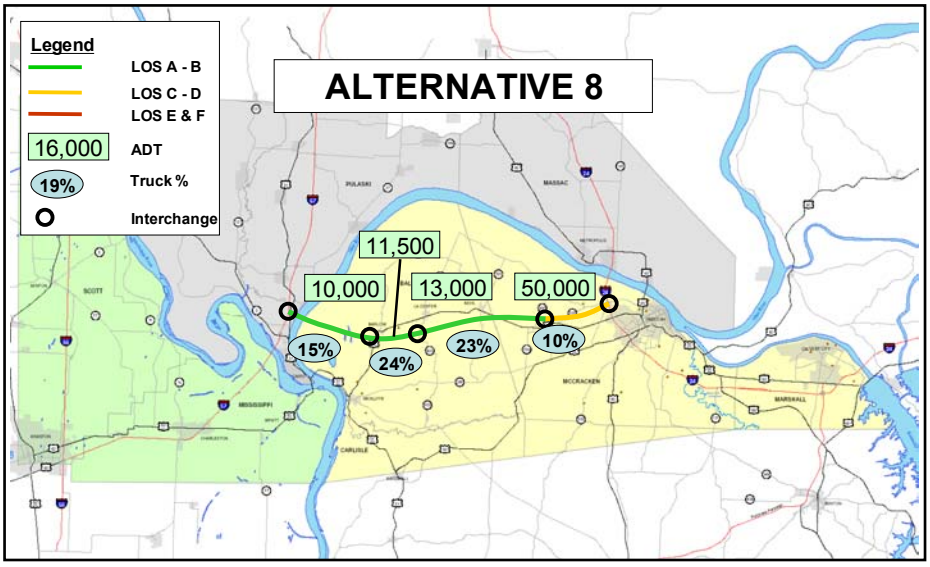
The volume of traffic crossing the Mississippi River for Alternatives 5-7, 9-15, 19, and 21 was 7,000 to 8,000 vehicles per day with approximately 20% trucks. The Ohio River crossing (Alternative 8) showed a volume of approximately 10,000 vehicles per day. This increased volume is in part due to a general northwest/southeast travel pattern through the region. This issue was explored in more detail in the Level 3 analysis.

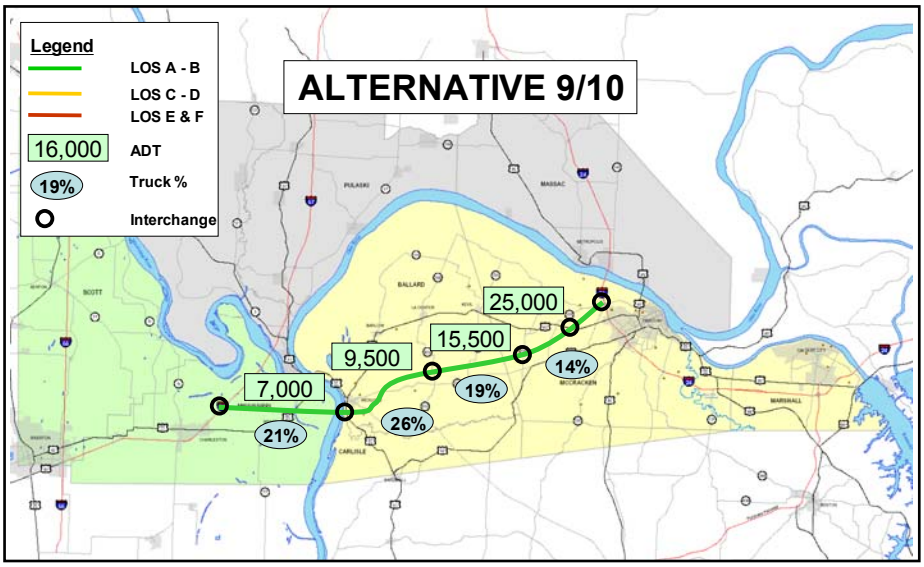
Based on the Level 2 evaluation (see the full Level 2 report for details) Alternatives 5-7, 8A, 9-10, and 19 were set aside from further consideration. Alternative 8 was also set aside at the conclusion of Level 2, but was put back in during the Level 3 process. The remaining alternatives were studied in Level 3.

Figures 5 through 11: Level 2 Volume Estimates





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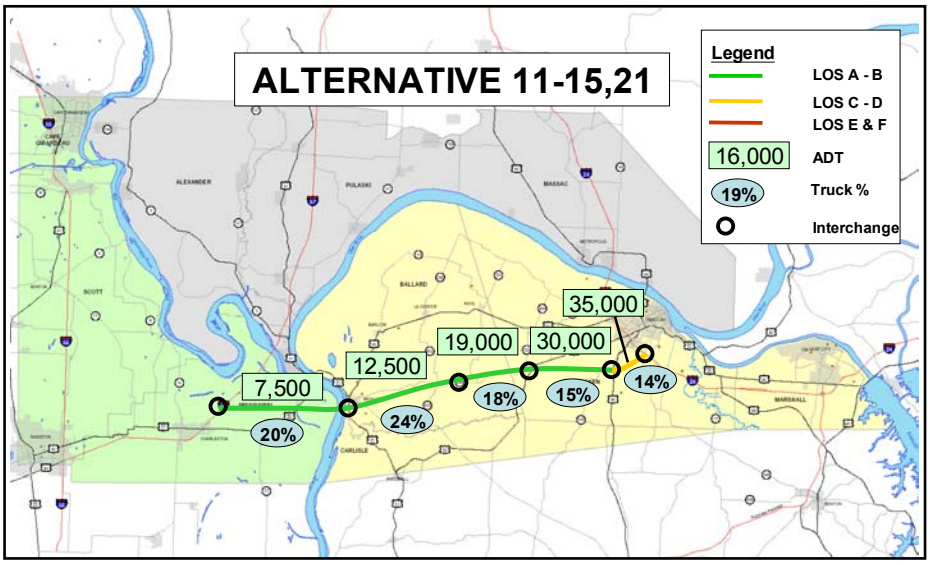
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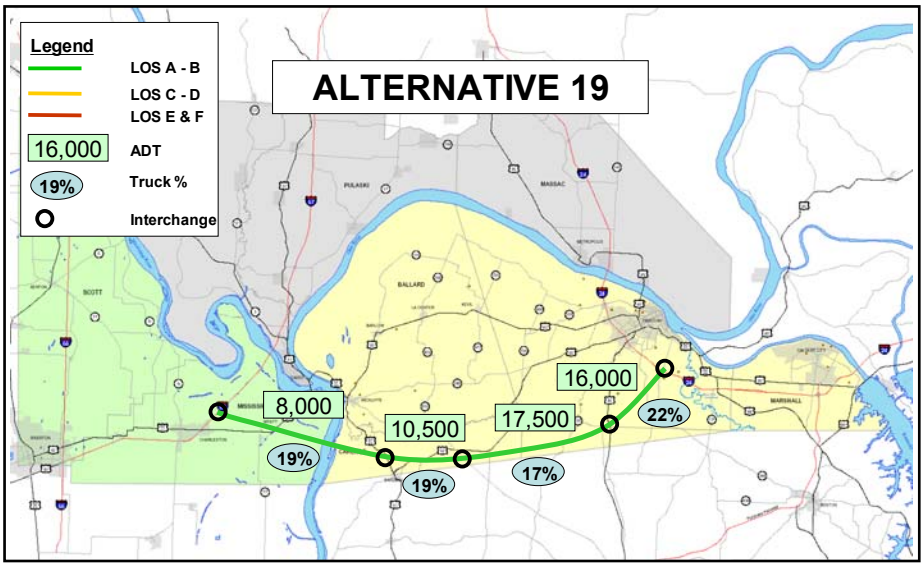
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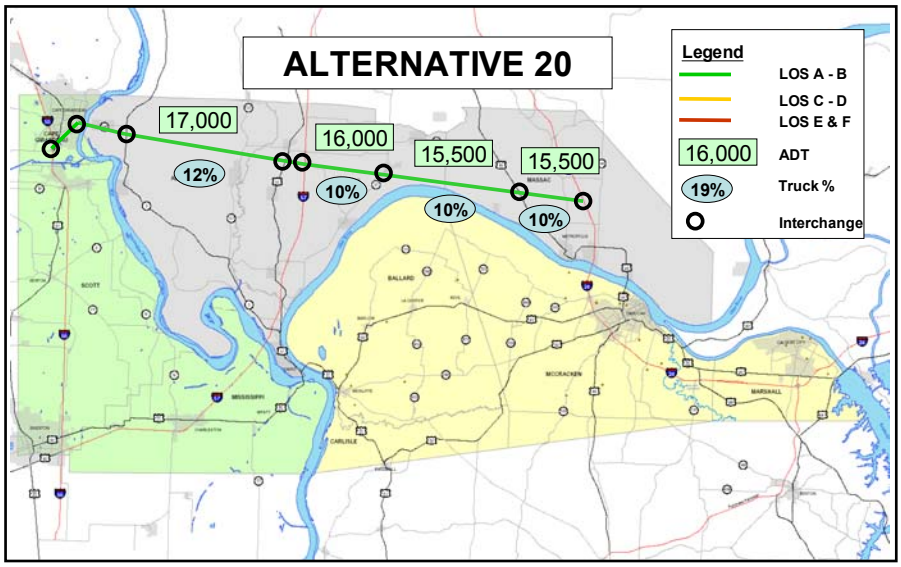
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5.0 LEVEL 3 BUILD TRAFFIC FORECASTS

The forecasts prepared for Level 2 were refined to produce the Level 3 forecasts. During the process, additional information was gained relative to travel patterns, estimated volumes, system travel measures, and other critical traffic indicators. For reference, the final alternatives considered in Level 3 were:

1. **Alternative 0** – (No Build) – Only existing and committed projects in KYTC Six Year Plan and MoDOT improvement program.
2. **Alternative 8** – Essentially Corridor 11 in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceeding northwest on new route across the Ohio River on a new bridge to I-57 in Illinois. *[Alternative 8 was re-examined in Level 3 after being designated in Level 1 for no further analysis. However, resource agency discussions (KY Nature Preserves Commission and KY Dept. of Fish and Wildlife) revealed that it was fatally flawed from an environmental standpoint. Therefore, limited additional traffic analysis is included for this alternative.]*
3. **Alternative 8B** – US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing.
4. **Alternative 11/12/13/14/15 & 2**1 – New interstate corridor parallel to US 62 and KY 286 with a new Mississippi River crossing
5. **Alternative 20** – Unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

5.1.1 Average Daily Traffic Volumes

The principal result of the Level 3 modeling effort was a set of daily traffic estimates for the alternative corridors. A summary of these volumes is presented in Table 5, which provides volumes at the six key screenline locations shown in Figure 12. The volumes are also shown in Exhibits E through G. There are slight differences between the Draft Level 3 matrix and these final volumes, but the volumes match the final project matrix.

Figure 12: Level 3 Traffic Forecast Screenlines

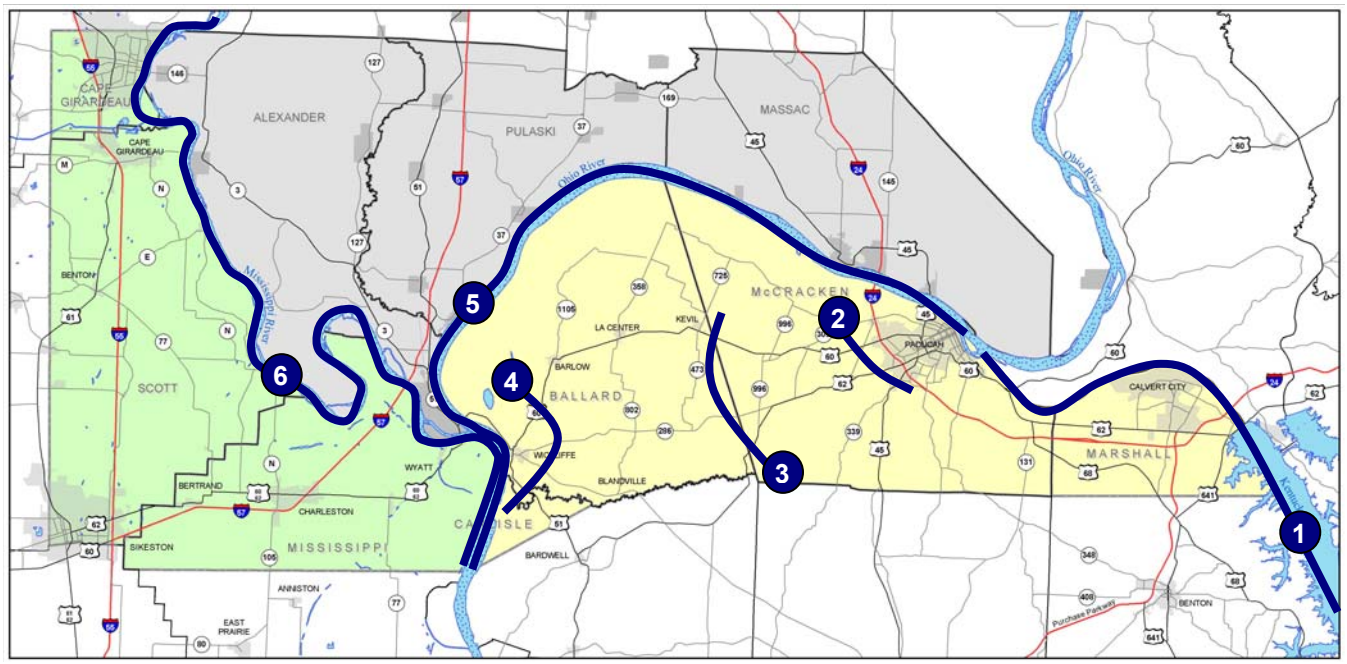


Table 5: Level 3 2030 Screenline Volume Comparisons

Screenline	Highway	Recent Counts	E+C	Alt. 8B	Alt. 11	Alt. 20
1	US 60	9880	15000	16000	16000	16000
Tennesee River	I-24	29500	66000	82000	84000	83000
	US 62	6340	16000	6000	6000	6000
	US 68	2630	7000	6000	6000	6000
		48350	**104000**	**110000**	**112000**	**111000**
2	US 60	27800	43000	41000	40000	45000
W. of I-24	US 62	8780	19000	25000	9000	21000
	US 45	28500	43000	48000	36000	48000
	I-66	0	0	0	33000	0
		65080	**105000**	**114000**	**118000**	**114000**
3	US 60	6690	11000	6000	6000	10000
Near the County Line	KY 286	2990	6000	10000	2000	6000
	US 62	3560	4000	4000	3000	4000
	I-66	0	0	0	15000	0
		13240	**21000**	**20000**	**26000**	**20000**
4	US 60	4820	10000	5000	4000	9000
East of Wickliffe	KY 286	2340	2000	7000	2000	2000
	KY 121	1500	2000	2000	1000	1000
	US 51	2430	6000	6000	7000	5000
	I-66	0	0	0	11000	0
		11090	**20000**	**20000**	**25000**	**17000**
5	US 45	5530	5000	5000	5000	4000
Miss./Ohio River	I-24 (I-66)	26850	49000	54000	51000	56000
	US 51 (Cairo Bridge)	5480	11000	3000	6000	8000
	New Bridge / I-66	0	0	7000	9000	0
		37860	**65000**	**69000**	**71000**	**68000**
6	US 60	3990	4000	2000	2000	6000
Mississippi River	I-57	9750	17000	17000	17000	16000
	MO 74 (I-66)	11100	15000	14000	14000	27000
	New Bridge / I-66	0	0	7000	9000	0
		24840	**36000**	**40000**	**42000**	**49000**

Note: All of the Build Scenarios include I-66 in the central and eastern portions of Kentucky.

Overall, screenline volumes in the build scenarios are generally higher than in the E+C Scenario due to the added traffic due to the I-66 Corridor and the statewide land use changes assumed to accompany that highway. All of the Build Scenarios have approximately 144,000 additional trips system wide compared to the E+C Scenario. Within the study area, this means higher volumes at most, but not all screenlines, depending on the alternative.

Total traffic entering the study area from the east (screenline 1) is expected to increase approximately 6-8,000 over the E+C scenario. The largest increase is for Alternative 11. This alternative draws slightly more new northeast-southwest traffic through the study area compared to the other alternatives. Alternative 11 also has the highest volumes at screenlines 2 through 4 because it runs west across the study area. It also has the highest count at screenline 5 the Mississippi / Ohio River line (Kentucky border) because it attracts northeast-southwest traffic that uses both the I-24 and I-66 bridges. Alternative 20 has the highest volume crossing the Mississippi River due to the added I-66 traffic crossing at Cape Girardeau. A brief discussion of the volumes for each alternative is given below.

Alternative 8B

Alternative 8B has average daily traffic (ADT) volumes that are higher than the E+C Scenario at the river screenlines and in the vicinity of I-24 (Screenlines 1, 2, 5, and 6). This is due to the added development assumed to occur along I-24, as well as I-66 traffic from Eastern Kentucky using I-24 through the area. It is important to note for Alternative 8B, I-66 is still assumed to be in place in Eastern Kentucky, along with the associated land use growth. I-66 is not present in Western Kentucky, therefore the land use growth was shifted to the I-24 corridor. In the E+C Scenario, no portion of I-66 is assumed to be constructed and consequently there is no I-66 related land use growth.

For Alternative 8B, traffic volumes are lower or the same across Screenlines 3 and 4 (McCracken / Ballard County Line and near Wickliffe). This is likely due to macro scale traffic pattern shifts due to the presence of I-66 in Eastern and Central Kentucky. The new I-66 in these areas provides better access to other interstates, allowing some longer distance traffic that might have crossed near Wickliffe to choose new routes and bypass far Western Kentucky. However, overall volumes across Screenline 5, Mississippi / Ohio Rivers, increases by 4,000 ADT because of the land use growth assumptions inherent in the I-66 Build model scenarios and because of I-66 / I-24 through traffic. Alternative 8B also causes the volumes on US 60 and KY 286 to “flip” with traffic attracted to KY 286 because it is the more direct route to the new Wickliffe bypass and the bridge south of Wickliffe.

Alternative 8

Alternative 8 was brought back to Level 3 for further study, but then it was set aside again due to environmental resource constraints.

Alternatives 11-15, 21

Alternative 11 carries approximately 33,000 vehicles west of I-24. This volume declines to 11,000 east of Wickliffe, and then to 9,000 as it passes over the Mississippi River.

Alternative 20

Alternative 20 leaves traffic on I-24 through Kentucky. This results in additional traffic growth on I-24 in the study area. The peak volume is approximately 84,000 vehicles just south of Paducah, an increase around 8,000 (or 11%) over the projected 2030 E+C volume. In Illinois, the volume on I-66 between I-24 and Cape Girardeau is around 16,000 vpd. The volume over the Mississippi River (when combined with other background traffic) reaches approximately 27,000. Alternative 20 also removes traffic from US 51 and the bridge at Cairo.

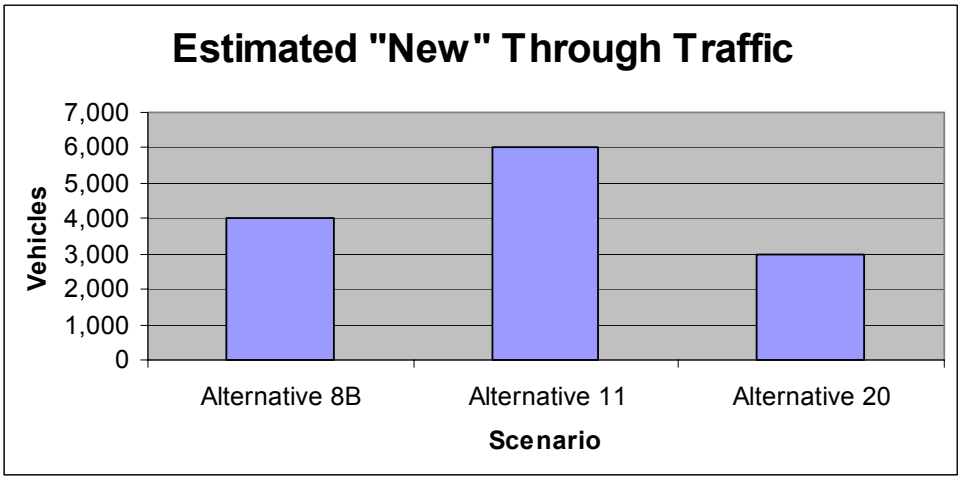
5.1.2 New Through Traffic Estimates

Based on the screenline analysis for the Kentucky Border (Mississippi River / Ohio River) estimates were prepared for how much new through traffic is added to the Western Kentucky highway system for each alternative. A summary of this evaluation is shown in Table 6 and Figure 13. The analysis indicates that the I-66 Build alternatives draw approximately 3,000 to 6,000 additional trips across Kentucky's western border, with Alternative 11 drawing the largest amount. Some of this traffic for Alternative 11 may actually cross both the I-24 Bridge as well as the new I-66 Mississippi River Bridge, flowing northeast-southwest across the region.

Table 6: New Through Traffic Summary

2030 Scenarios	Traffic Crossing Mississippi and Ohio Rivers (screenline count)	Estimated New Through Traffic Due to Improvments
No-Build (E+C)	65,000	NA
Alternative 8B	69,000	4,000
Alternative 11	71,000	6,000
Alternative 20	68,000	3,000

Figure 13: New Through Traffic Summary



5.1.3 Level 3 Travel Time Analysis

The travel times between Paducah and Sikeston and between Paducah and Cape Girardeau were examined for each of the Level 3 alternatives. The results of this analysis are shown in Table 7 and Figures 14 and 15. The No-Build travel times are approximately 77 and 94 minutes respectively.

Table 7: Travel Time Summary

	East of Paducah to Sikeston			East of Paducah to Cape Girardeau		
2030 Scenarios	**Travel Time (minutes)**	**Travel Time Savings (minutes)**	**Percent Travel Time Savings**	**Travel Time (minutes)**	**Travel Time Savings (minutes)**	**Percent Travel Time Savings**
No-Build (E+C)	76.5	NA		93.6	NA	
Alternative 11	57.9	18.6	24%	84	9.6	10%
Alternative 20	76.1	0.4	1%	68.1	25.5	27%
Alternative 8B	72.7	3.8	5%	94.8	NA*	NA*

* The penalty applied to the existing bridge increased the modeled travel time to Cape Girardeau in this scenario.

Figure 14: Travel Time Savings

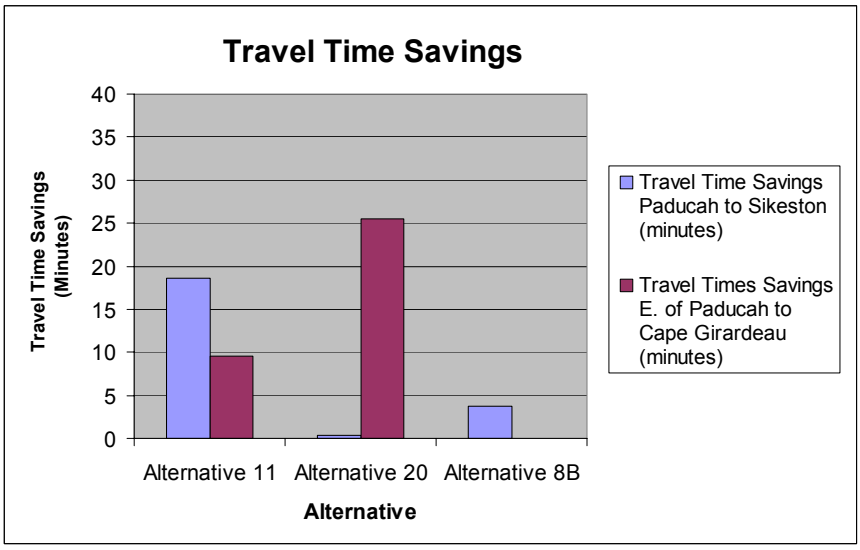
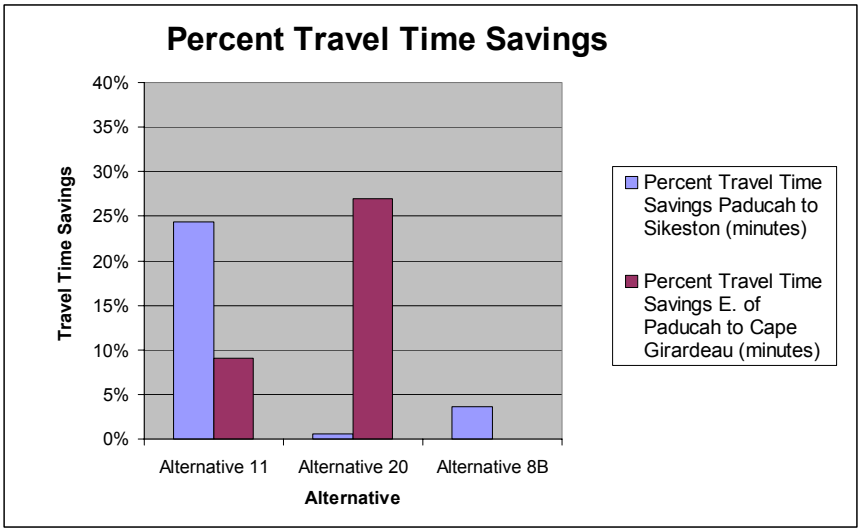


Figure 15: Percent Travel Time Savings



Alternative 11 provides a travel time savings of over 18 minutes (25%) for the Paducah to Sikeston trip. It provides a smaller savings of about 10 minutes for the Paducah for Cape Girardeau trip. Alternative 20 provides an over 25 minute savings for the Paducah to Cape Girardeau trip, a reduction of over 25%. However, it provides a negligible benefit for the Paducah to Sikeston trip. Alternative 8B provides no reduction to the Paducah – Cape Girardeau trip and a small 4 minute savings for the trip to or from Sikeston.

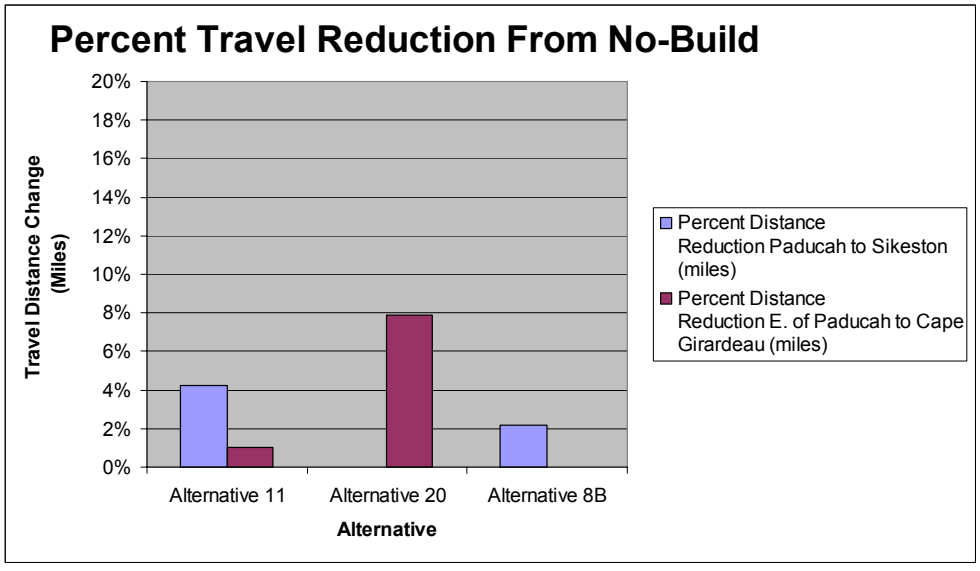
5.1.4 Travel Distance Analysis

A similar analysis was prepared for travel distances. The results were similar, but with smaller percentage reductions as shown in Table 8 and Figure 16. The larger travel time reductions indicate that the alternatives are shifting traffic to higher speed facilities. As was expected, Alternative 11 provides a greater reduction to Sikeston and a lesser reduction to Cape Girardeau. Alternative 20 provides a larger reduction to Cape Girardeau and no reduction to Sikeston. Alternative 8B provides a small reduction to Sikeston only.

Table 8: Travel Distance Reduction Summary

	East of Paducah to Sikeston			East of Paducah to Cape Girardeau		
2030 Scenarios	**Travel Distance (miles)**	**Travel Distance Change (miles)**	**Percent Distance Reduction**	**Travel Distance (miles)**	**Travel Distance Change (miles)**	**Percent Distance Reduction**
No-Build (E+C)	68.6	NA		78.7	NA	
Alternative 11	65.7	2.9	4%	77.9	0.8	1%
Alternative 20	68.6	0	0%	72.5	6.2	8%
Alternative 8B	67.1	1.5	2%	78.7	0	0%

Figure 16: Percent Travel Distance Reduction



5.1.5 System Travel Measures

Two system measures were examined as part of this study: vehicle miles of travel (VMT) and vehicle hours of travel (VHT). The build alternatives were compared to the No-Build (E+C) alternative, but they were also compared to Alternative 8B because this is a form of limited build with most other elements (such as the number of trips and the model network outside the study area) held constant.

For VMT, the build alternatives add approximately four million VMT over the No-Build Scenario. This is due to the I-66 corridor and associated growth across the entire model network. However, when Alternatives 11 and 20 are compared to Alternative 8B, Alternative 20 reduces the VMT, while Alternative 11 increases it slightly as shown in Table 9. This appears to indicate that Alternative 20 is providing more direct links for more travelers. These findings are consistent with the travel time reduction and traffic volume data presented previously.

Table 9: 2030 Vehicle Miles of Travel Summary

2030 Scenarios	Total Assigned Trips	Total Vehicle Miles Traveled (VMT)	Change in VMT from E+C Scenario	Change in VMT from US 60 Scenario	Average VMT per Trip
No-Build	27,532,650	938,502,600	NA	NA	34.09
Alternative 8B	27,677,030	942,535,300	4,032,700	NA	34.06
Alternative 11	27,676,640	942,558,200	4,055,600	22,900	34.06
Alternative 20	27,677,030	942,407,600	3,905,000	-127,700	34.05

Regarding VHT, the build alternatives add between 24,000 and 40,000 VHT to the 2030 No-Build (E+C) Scenario. When compared to the Alternative 8B "limited build" option, Alternative 20 decreases system wide VHT by 15,000 and Alternative 11 decreases VHT by 4,000 as shown in Table 10. Again, these numbers appear reasonable given the volumes and time savings discussed previously.

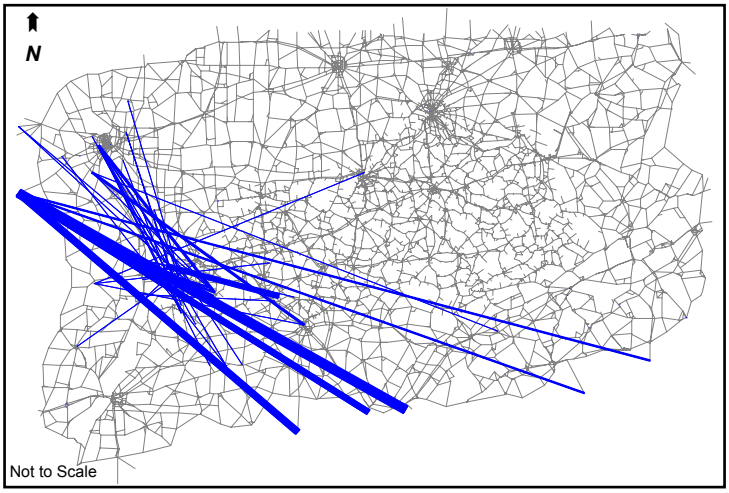
Table 10: Vehicle Hours of Travel Summary

2030 Scenarios	Total Assigned Trips	Total Vehicle Hours Traveled (VHT)	Change in VHT from E+C Scenario	Change in VHT from US 60 Scenario	Averare VHT per Trip	Ave Trip Speed (mph)
No-Build	27,532,650	18,723,100	NA	NA	0.68	50.1
Alternative 8B	27,677,030	18,762,500	39,400	NA	0.678	50.2
Alternative 11	27,676,640	18,758,300	35,200	-4,200	0.678	50.2
Alternative 20	27,677,030	18,747,400	24,300	-15,100	0.677	50.3

5.1.6 Travel Patterns

One item of interest was to examine who is using the existing Cairo Bridge (US 51). A select link analysis was performed on the bridge to create a set of desire lines for travelers on this bridge as illustrated in Figure 17. It showed that many of the current users of the bridge are traveling northwest/southeast through the study area. The largest number travel between St. Louis and points west and Tennessee and points south as shown in the figure. These trips are looking for the fastest route between these points. A relatively small amount of the traffic is flowing directly east-west or northeast-southwest through the study area. (It is important to note that this is without the I-66 corridor in place.)

Figure 17: Existing Desire Lines for Cairo Bridge



When a new bridge is placed across the Mississippi River south of Wickliffe as part of the I-66 Corridor, it carries the east-west I-66 flow (large band across Figure 18). It also attracts modest east-west and northeast-southwest flows. Much of the southeast-northwest flowing traffic remains on the old bridge (as shown in Figure 19) which lies along the path to St. Louis and points west (via I-57, Route 3, and I-55). It is useful to note that while Figures 17-19 are not to a specific scale, the line weights are roughly comparable between the figures (i.e. they are approximately to the same scale).

Figure 18: Desire Lines for New I-66 Bridge

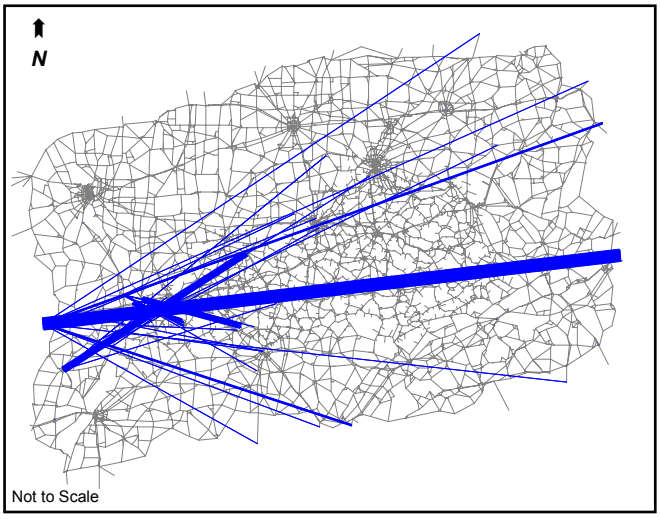
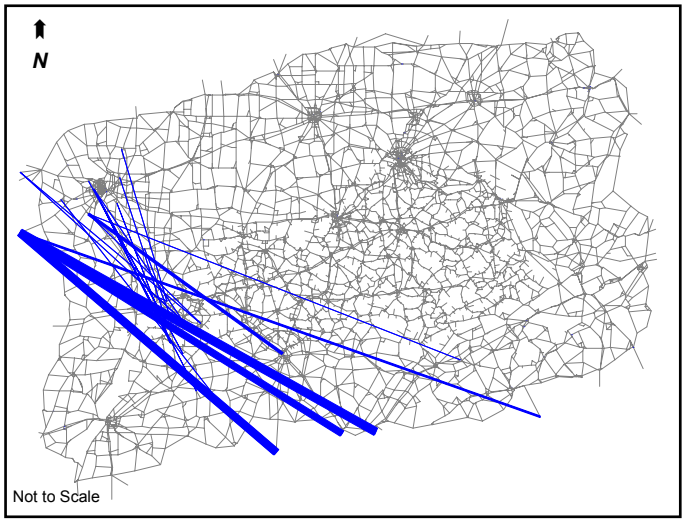


Figure 19: Desire Lines for Cairo Bridge With I-66 in Place



Given these desire lines and the model's propensity to leave a large portion of the traffic on the old bridge, an adjustment became necessary to shift some traffic to the new bridge. This was deemed both necessary and appropriate given the poor geometrics and safety features of the old bridge. Local perception is that the bridge is unsafe, especially at night and in poor weather due to the narrow lanes and no shoulders. It is expected that most trucks, older drivers, and unfamiliar through travelers would use the new bridge. With the appropriate adjustments in place, the volumes on the two bridges appeared reasonable.

Given the model parameters, some through traffic continued to use the old bridge because it provided the shortest travel times for certain southeast – northwest travel flows. The southern bridge location, combined with the longer route through Sikeston increased travel times such that travel on the existing bridge (at lower speeds) was still shorter for these trips.

Other travel patterns of importance include the decrease in traffic over the Cairo and new Wickliffe bridges in the Alternative 8B Scenario (traffic from Kentucky to the west decreases from 11,000 in the E+C to 10,000 with 8B. This is due to the assumed completion of I-66 through the eastern and central portions of Kentucky, which affects the macro travel patterns across the state. Vehicles that previously would have crossed the river near Wickliffe use I-66 to access I-64 and other interstate facilities and no longer travel through western Kentucky.

Traffic Forecasting Methodology Report
Exhibits

Exhibit A

Detailed Model Volume Comparison

Screenline	Highway	Recent Counts*	1999 KYSTM Model Volumes**	Difference from Counts	% Difference from Counts
1	US 60	9880	9050	-830	-8%
Tennesee River	I-24	29500	25910	-3590	-12%
	US 62	6340	8360	2020	32%
	US 68	2630	3540	910	35%
		48350	**46860**	**-1490**	**-3%**
2	US 60	6690	6790	100	1%
West of Paducah	KY 286	2990	3310	320	11%
	US 62	3560	2760	-800	-22%
		13240	**12860**	**-380**	**-3%**
3	US 60	4820	6210	1390	29%
East of Wickliffe	KY 286	2340	1580	-760	-32%
	KY 121	1500	1280	-220	-15%
	US 51	2430	3670	1240	51%
		11090	**12740**	**1650**	**15%**
4	US 45	5530	3900	-1630	-29%
Ohio River	I-24	26850	26340	-510	-2%
	US 51	5480	7040	1560	28%
		37860	**37280**	**-580**	**-2%**
5	US 45	4700	1680	-3020	-64%
North of Paducah	I-24	15600	18870	3270	21%
	IL 145	2050	920	-1130	-55%
		22350	**21470**	**-880**	**-4%**
6	US 60	3990	2280	-1710	-43%
Mississippi River	I-57	9750	14290	4540	47%
	MO 74	11100	9560	-1540	-14%
		24840	**26130**	**1290**	**5%**
7	IL 3	4150	6020	1870	45%
North of Cairo	US 51	1450	820	-630	-43%
	I-57	9900	9230	-670	-7%
	IL 37	2700	310	-2390	-89%
		18200	**16380**	**-1820**	**-10%**
8	MO 25	4131	3170	-961	-23%
North of Sikeston	MO 77	3147	0	-3147	-100%
	US 61	2374	11670	9296	392%
	I-55	19000	17560	-1440	-8%
		28652	**32400**	**3748**	**13%**

* Count data was obtained from Kentucky, Missouri, and Illinois web sites and if for 2001-2003.

** The 2002 version of the 1999 KYSTM (calibrated for the I-66 corridor) was used for the comparison

Exhibit B

CAPE GIRARDEAU
CAPE GIRARDEAU
ADT-31,800 Trucks-27.6%
ADT-10,900 Trucks-11.7%
ADT-5,530 Trucks-16.3%
ADT-41,600 Trucks-27.6%
ADT-2,660 Trucks-7.1%
ADT-19,000 Trucks-27.6%
ALEXANDER
ADT-3,980 Trucks-7.5%
ADT-1,150 Trucks-9.6%
ADT-9,800 Trucks-36.7%
ADT-1,600 Trucks-18.8%
ADT-2,180 Trucks-10.8%
PULASKI
ADT-2,600 Trucks-12.5%
ADT-9,730 Trucks-6.5%
ADT-15,700 Trucks-31.2%
MASSAC
ADT-2,490 Trucks-11.3%
METROPOLIS
ADT-5,900 Trucks-5.1%
ADT-28,500 Trucks-20.7%
ADT-29,040 Trucks-20.7%
ADT-8,510 Trucks-36.0%
ADT-25,400 Trucks-2.6%
ADT-17,900 Trucks-4.1%
ADT-16,000 Trucks-18.9%
PADUCAH
ADT-42,000 Trucks-21.4%
ADT-13,600 Trucks-18.9%
ADT-19,900 Trucks-4.1%
ADT-19,900 Trucks-6.1%
ADT-42,000 Trucks-22.2%
ADT-8,800 Trucks-7.6%
ADT-10,940 Trucks-7.7-11.9%
ADT-6,710 Trucks-10.7%
ADT-5,760 Trucks-11.3%
LA CENTER
KEVIL
BARLOW
BALLARD
ADT-2,800 Trucks-11.4%
ADT-10,700 Trucks-32.4%
ADT-5,500 Trucks-12.7%
ADT-5,980 Trucks-12.6%
ADT-6,200 Trucks-23.4%
ADT-6,800 Trucks-20.6%
ADT-4,600 Trucks-14.9%
ADT-2,540 Trucks-13.0%
ADT-3,440 Trucks-13.0%
ADT-2,700 Trucks-13.0%
ADT-3,125 Trucks-7.6%
MCCRACKEN
ADT-32,500 Trucks-22.9%
ADT-15,140 Trucks-5.12%
ADT-9,000 Trucks-4.5%
ADT-10,700 Trucks-18.9%
MARSHALL
CALVERT CITY
ADT-26,900 Trucks-33.6%
ADT-7,280 Trucks-18.9%
ADT-6,780 Trucks-18.9%
ADT-6,700 Trucks-18.9%
ADT-6,280 Trucks-18.9%
ADT-27,900 Trucks-33.6%
ADT-5,340 Trucks-5.9%
ADT-26,900 Trucks-21.8%
ADT-7,000 Trucks-4.5%
ADT-6,000 Trucks-5.1%
ADT-26,900 Trucks-21.8%
ADT-10,400 Trucks-27.6%
ADT-3,090 Trucks-20.6%
ADT-4,190 Trucks-20.6%
ADT-3,400 Trucks-7.6%
WICKLIFFE
CARLISLE
MISSISSIPPI
ADT-5,840 Trucks-8.3%
WYATT
ADT-5,330 Trucks-8.3%
CHARLESTON
ADT-15,500 Trucks-27.6%
ADT-9,870 Trucks-7.1%
ADT-19,600 Trucks-8.3%
ADT-18,200 Trucks-8.3%
ADT-20,500 Trucks-27.6%
SIKESTON
ADT-8,209 Trucks-27.6%
ADT-16,400 Trucks-27.6%
ADT-4,300 Trucks-7.1%
ADT-8,980 Trucks-15.7%
ADT-19,100 Trucks-27.6%
SCOTT
BENTON
BARDWELL
ARLINGTON
EAST PRAIRIE
Mississippi River
Ohio River
Kentucky Lake
Purchase Parkway

KENTUCKY TRANSPORTATION CABINET
EDUCATION PAYS
MoDOT

PROJECT STUDY AREA

LOCATION MAP
Illinois
Missouri
Kentucky
Study Area

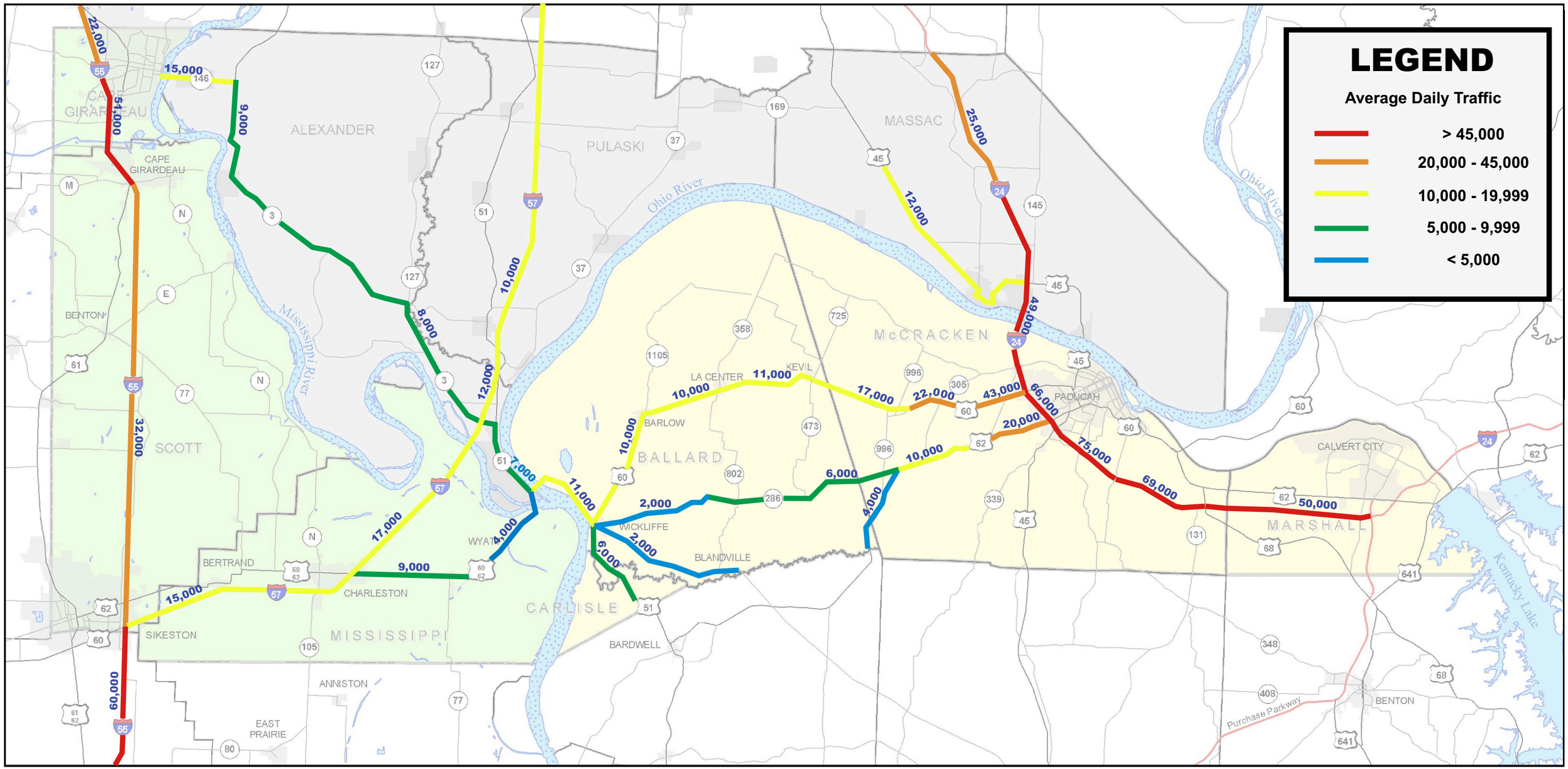
0 2.5 5 10 Miles

Figure 3 Sheet 1 of 1

N W E S

AVERAGE DAILY TRAFFIC AND TRUCK PERCENTAGES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00



VICINITY MAP

2030 EXISTING AND COMMITTED PROJECTS SCENARIO

PB PARSONS BRINCKERHOFF

QK4

EDUCATION PAYS

KENTUCKY TRANSPORTATION CABINET

MoDOT

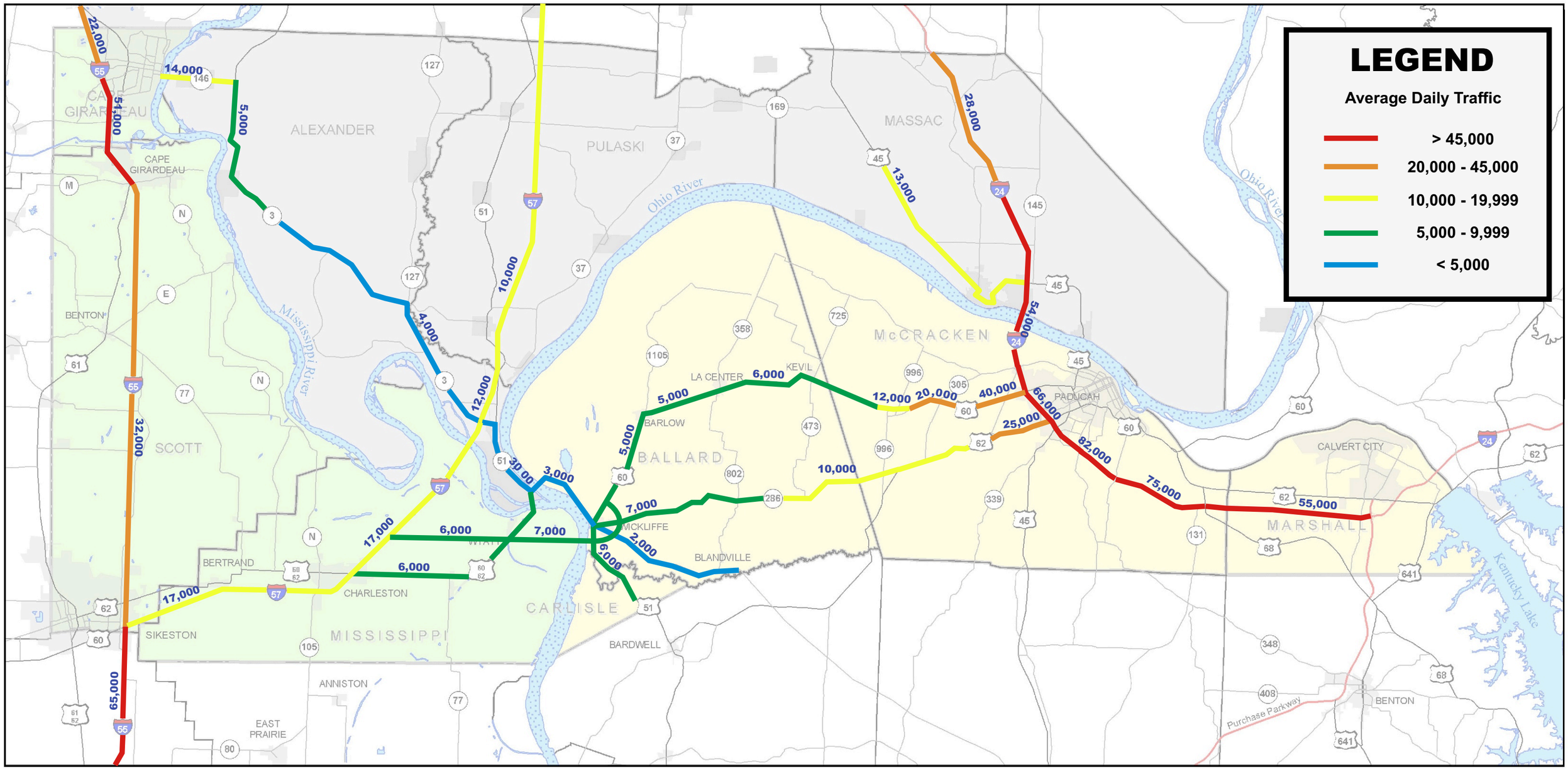
N W E S

0 2.5 5 10

Miles

Exhibit D

Alt. / Corridor No.	Description	Traffic Operations*											
		Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River (Ohio River for 8 & 8A)		
		Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	45,000 (US 60)	3,500 (7%)	E (4 lanes)	11,000 (US 60)	1,500 (14%)	A (4 lanes)	10,000 (US 60)	1,000 (10%)	E (2 lanes)	11,500 (Bridge Over Ohio River)	2,000 (17%)	E (2 lanes)
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,000 (10%)	D	11,500	3,000 (26%)	A	13,500	2,500 (19%)	A	7,000	1,500 (21%)	A
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,500 (11%)	D	11,500	3,000 (26%)	A	14,000	2,500 (18%)	A	7,000	1500 (21%)	A
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	50,000	5,000 (10%)	D	13,000	3,000 (23%)	A	11,500	2,500 (24%)	A	10,000 (Bridge Over Ohio River)	1,500 (15%)	A
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	51,500 (US 60)	4,000 (8%)	F (4 lanes)	14,000 (US 60)	2,000 (14%)	B (4 lanes)	12,500 (US 60)	1,500 (12%)	A (4 lanes)	7,000 (Bridge Over Ohio River)	500 (7%)	A (4 lanes)
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	44,500 (US 60)	3,500 (8%)	E (4 lanes)	7,000 (US 60)	1,500 (21%)	A (4 lanes)	6,000 (US 60)	500 (8%)	A (4 lanes)	5,500	500 (9%)	A (4 lanes)
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	25,000	3,500 (14%)	B	15,500	3,000 (19%)	A	9,500	2,500 (26%)	A	7,000	1,500 (21%)	A
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	35,000	5,000 (14%)	C	19,000 - 30,000	3,500-4,500 (15-18%)	A-B	12,500	3,000 (24%)	A	7,500	1,500 (20%)	A
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	16,000	3,500 (22%)	A	17,500	3,000 (17%)	A	10,500	2,000 (19%)	A	8,000	1,500 (19%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	15,500	1,500 (10%)	A	15,500	1,500 (10%)	A	16,000	1,500 (10%)	A	17,000	2,000 (12%)	A



VICINITY MAP

ALT. 8B - 2030 US 60 AND NEW BRIDGE SCENARIO

PB PARSONS BRINCKERHOFF 100 YEARS

QK4

EDUCATION PAYS

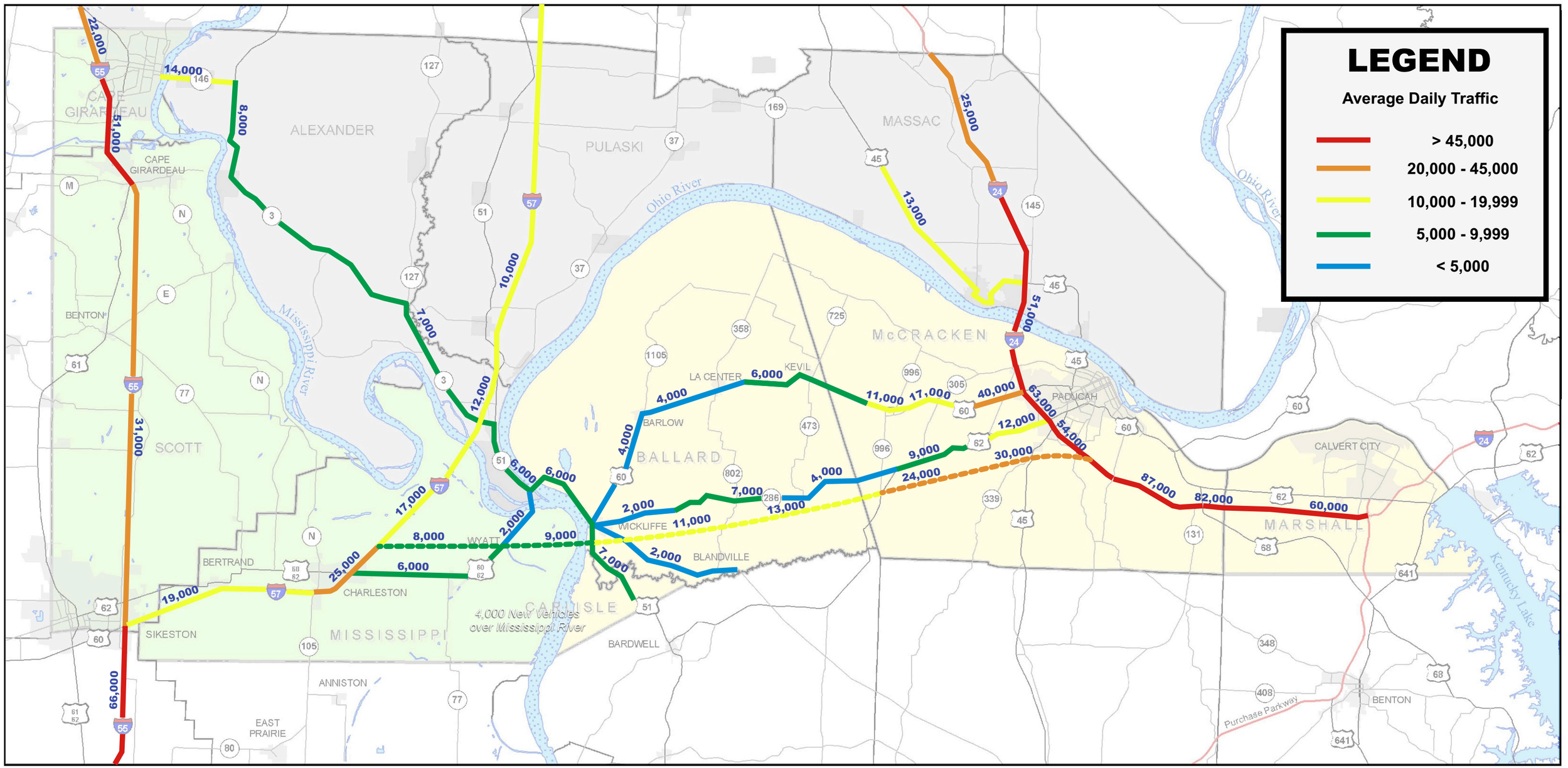
KENTUCKY TRANSPORTATION CABINET

MoDOT

N W E S

0 2.5 5 10

Miles



VICINITY MAP

2030 ALTERNATIVE 11 SCENARIO

PB PARSONS BRINCKERHOFF

QK4

EDUCATION PAYS

KENTUCKY TRANSPORTATION CABINET

MoDOT

N W E S

0 2.5 5 10

Miles

LEGEND

Average Daily Traffic

- > 45,000
- 20,000 - 45,000
- 10,000 - 19,999
- 5,000 - 9,999
- < 5,000

2030 ALTERNATIVE 20 SCENARIO

VICINITY MAP

PB PARSONS BRINCKERHOFF

QK4

EDUCATION PAYS

KENTUCKY TRANSPORTATION CABINET

MoDOT

N W E S

0 2.5 5 10

Miles

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 5 – GEOTECHNICAL OVERVIEW

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

Qk4
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FEBRUARY 2005

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1. Project Description

The Kentucky Transportation Cabinet (KYTC) is evaluating potential roadway corridors for the construction of Interstate Route I-66 through portions of Marshall, Graves, Ballard, Carlisle, and McCracken Counties, Kentucky; Mississippi, Scott and Cape Girardeau Counties, Missouri; and Alexander, Pulaski, and Massac Counties in Illinois. Also under review are two potential Ohio River crossings and three Mississippi River crossings. These corridors were initially developed through public input and have been processed through three levels of evaluation designated Levels 1, 2 and 3, respectively. Maps presenting the various corridors studied during each level of evaluation are presented throughout the full project report. Level 1 Alternatives were the initial compilation of corridors suggested by the public, and included 22 potential roadway corridors crossing various portions of Missouri, Illinois, and Kentucky. The ensuing Level 2 Alternatives consisted of seven corridors primarily in Kentucky and Missouri with various bridge options, as well as one unspecified corridor in Illinois. The Level 3 Alternatives focused primarily on three corridors in Kentucky, a single corridor in Missouri and bridge options across the Mississippi River.

For the purpose of this geotechnical overview, three composite roadway corridors and three bridge crossing locations were selected by the Project Team for geotechnical review. A preliminary geotechnical overview was performed on combined corridor 11, 12, 13, 14, 15 and 21 as presented in the Level 2 Alternatives; Corridor 8 as presented in the Level 2 Alternatives; and Corridor 8B as presented in the Level 3 Alternatives.

The composite of roadway corridor 11, 12, 13, 14, 15 and 21 as presented in the Level 2 Alternatives begins on the west side of I –24 between the interchanges with US 68 and US 62 immediately southwest of the city of Paducah. The corridor roughly follows US 45 in a southwesterly direction to the intersection with KY Route 1322 (Lovelaceville Road). The corridor then follows KY 1322 west to the intersection with KY Route 726. Immediately north of this intersection, KY Route 286 is encountered which leads the corridor to the west near the city of Wickliffe. The corridor progresses over the Mississippi River at mile point 951, just south of the Fort Jefferson Historic Memorial and below the confluence of the Mississippi and Ohio Rivers. Upon crossing the Mississippi River, the corridor traverses the Birds Point-New Madrid Floodway, and continues west to a terminus at a common intersection with existing I-57 near the community of Charleston, in Mississippi County, Missouri.

Corridor 8 – Level 2 Alternatives begins near US 60 south of the community of Barlow and proceeds west-northwest through the Barlow Bottoms to the Ohio River. This corridor crosses the Ohio River at approximate River Mile point 975 near the mouth of the Cache River, and into Pulaski County, Illinois.

Corridor 8B – Level 3 Alternatives begins in Kentucky at the intersection of US 60 and I-24 and proceeds to the west along the existing US 60 alignment to a location just south of the community of Barlow, Kentucky. From the location south of Barlow, the alternate leaves US 60 and proceeds southwesterly until it crosses Mayfield Creek. The corridor then turns to the west and encounters the Mississippi River near Mississippi River mile point 948. Upon crossing of the Mississippi River, the corridor traverses the Birds Point-New Madrid Floodway, and

continues west to a terminus at a common intersection with existing I-57 near the community of Charleston, in Mississippi County, Missouri.

2. Scope of Work

The scope of work for this study consists of performing a geotechnical overview for the proposed roadway corridors previously discussed based upon research of available published data; FMSM's experience with highway design and construction within the Mississippi Embayment physiographic region; and field reconnaissance of the preliminary corridors. General geotechnical/geologic characteristics of the study area have been identified with special attention given to the potential Mississippi and/or Ohio River crossings. A literature search was performed by FMSM personnel using a variety of sources. Tasks performed by FMSM included reviews of the following items:

- Available topographic and geologic mapping of the project area published by the United States Geological Survey (USGS) and the Kentucky Geological Survey (KGS);
- The Geologic Map of Missouri, published by the State of Missouri, the Department of Natural Resources, and the Missouri Geological Survey;
- KGS Oil and Gas Development Activity mapping;
- National Wetlands and Wildlife Management Areas as recognized by the U.S. Department of the Interior, Fish and Wildlife Service;
- KYTC data from geotechnical explorations for roadway bridges in the vicinity of Wickliffe, Kentucky;
- Letter from Memphis District, United States Army Corps of Engineers (USACE) to Kentucky Transportation Cabinet, dated July 3, 2003, regarding issues of proposed corridors crossing the Birds Point-New Madrid Floodway;
- Resource Agency Coordination Memo dated February 2004; and
- Websites of various bridge projects of Mississippi River crossings.

FMSM also participated in a conference call on June 25, 2003 between the project team, the U.S. Army Corps of Engineers, the U.S. Coast Guard, and the Kentucky Transportation Cabinet. Some issues discussed during that conference are addressed within this report.

A field reconnaissance of the proposed roadway corridors was performed by FMSM personnel on July 3, 2003. Based upon the results of the field reconnaissance and reviews of the noted information, the general site physiology has been summarized, and corridor features of geotechnical significance that may influence alignment and grade selection have been identified. The following sections present the results of this overview.

3. Physiographic and Stratigraphic Setting

3.1. Topography and Drainage

Figure 1. Mississippi River and Adjacent Flood Plains

The proposed roadway corridors are primarily located in Western Kentucky and Southeastern Missouri, and lie within the Mississippi Embayment physiographic region which is part of the Coastal Plain physiographic province. In Kentucky, these corridors are situated on portions of seven USGS 7.5-minute topographic quadrangle maps. They are the Barlow (1977), Wickliffe (1983), La Center (1975), Blandville (1977), Heath (1978), Lovelaceville (1978), and Paducah West (1982) Quadrangles. In Missouri, the corridors are situated on the Wyatt (1979) and Charleston (1979) Quadrangles. The surface topography varies within the project corridors from well dissected uplands in the northern and eastern portions of the areas in Kentucky, to large areas of nearly level flood plain in the vicinity of the Ohio and Mississippi Rivers in both Kentucky and Missouri. Figure 1 is a typical view of the topography of the flood plains adjacent to the Ohio and Mississippi Rivers. The upland areas are composed of rolling hills, locally flat-topped ridges, and broad valleys. Bottom lands adjacent to the Ohio and Mississippi Rivers are relatively flat, and marked by north-south oriented lakes, ponds, sloughs, chutes, and swamps, all former routes of these rivers in normal or flood-flow conditions. Additionally, loessal silt bluffs rise as much as 150 feet above the Mississippi River flood plain near Wickliffe, Kentucky. The bedrock surface is deep within both Kentucky and Missouri in this study area (generally in excess of two hundred feet). Therefore fluvio-lacustrine soil deposits dominate the area physiology.

Surface drainage within these area of Kentucky and Missouri is directed towards numerous swales, ditches, creeks and streams, and ultimately to the Ohio and Mississippi Rivers. Backwater sloughs are present within the project vicinity at lower elevations and retain water depending on the elevation stage of the adjacent river.

3.2. Stratigraphy

Corresponding USGS geologic quadrangles are available for Barlow (1971), Wickliffe (1974), La Center (1978), Blandville (1971), Heath (1966), Lovelaceville (1968), and Paducah West (1966). The 1979 Geologic Map of Missouri, published by the State of Missouri, the Department of Natural Resources, and the Missouri Geological Survey was used to describe geologic conditions relevant to the Missouri portion of the corridors and Mississippi River crossings. Based on the various geologic mapping and literature reviewed, the proposed corridors are primarily underlain by deeply buried Paleozoic era bedrock. Thick Tertiary sediments lie under a mostly complete covering of Ice Age deposits of sand. Alluvial deposits of

gravel, silt, clay, and loess from the meltwater swollen Ice Age Mississippi River and its tributaries are also present.

Specifically, the eastern (Kentucky) portions of the corridors will cross over well dissected, Quartenary age Peoria Loess silt as well as Tertiary and Quartenary Continental deposits comprised of sandy chert gravel and gravelly sand. Within creek bottoms the surface materials are Quaternary age alluvial silt, sand, and clay deposits. In the study areas of Kentucky and Missouri adjacent to the Mississippi and Ohio river bottoms, surface materials are composed of Quaternary age fluvio-lacustrine silt, sand, and clay deposits. Throughout the project corridors, these deposits are underlain by Tertiary age silts, sands, and clays of the Clairborne and Wilcox Formations. Underlying these deposits is the Lower Tertiary Porters Creek Clay. This Paleocene formation of the Midway Group is comprised of over-consolidated, montmorillinitic clay with interlensed fine sand. Below these deposits are Upper Cretaceous and Tertiary clays and sands of the McNairy and Clayton Formation. The Paleozoic age bedrock (including Mississippian limestone and sandstone) is indicated to be at depths in excess of several hundred feet below the ground surface throughout the study limits.

3.3. Soils and Unconsolidated Materials

A thin mantle of wind blown silt material (loess) covers a large portion of the study area. Loess thicknesses are shown on the referenced geologic mapping to be up to 30 feet along the Mississippi River bluffs near Wickliffe, Kentucky. This material is described as yellowish-brown to medium-gray silt, unstratified, and containing minor amounts of clay and sand. Loess deposits are generally highly erodible and flatter cut slopes should be anticipated in these areas. Wetlands, such as marshes, natural ponds, and floodplains are common in low lying areas in both Kentucky and Missouri. These situations often contain organic material and soft, unconsolidated soils that may require stabilization prior to constructing roadway improvements.

Alluvial materials comprised of sands, silts and gravels cover the floodplains of the Mississippi and Ohio Rivers, as well as major tributaries in the study area. The referenced mapping indicates the alluvium has been encountered in thicknesses up to 73 feet beneath the Mississippi River floodplain. These alluvial deposits overlay the fluvio-lacustrine silts, clay and sand deposits noted in Section 3.2.

3.4. Groundwater

The project corridors addressed in this overview lie within relatively flat areas of Western Kentucky and Southeastern Missouri in proximity to the Tennessee, Ohio, and Mississippi Rivers watersheds. Because of the permeable nature of the subsurface stratum, the groundwater table is close to the ground surface in floodplain or backwater areas. During design of the project roadways and associated structures, the effects of groundwater on soil strengths and stability will need to be taken into account.

3.5. Regional Seismicity

Review of available geologic mapping indicates that the roadway corridors and potential bridge sites are within the New Madrid Seismic Zone (NMSZ). The NMSZ lies within the central Mississippi Valley, extending from northeast Arkansas, through southeast Missouri, western Tennessee, western Kentucky to southern Illinois. The NMSZ is a series of faults associated with the Reelfoot Rift, and is the most seismically active region in the United States east of the Rocky Mountains. Historically, this area has been the site of some of the largest earthquakes in North America. Between 1811 and 1812, four catastrophic earthquakes, with magnitudes estimated to be greater than 8.0 on the Richter Scale, occurred during a 3-month period. Hundreds of aftershocks followed over a period of several years. The largest earthquakes to have occurred since then were on January 4, 1843 and October 31, 1895. Instruments were installed in and around this area in 1974 to closely monitor seismic activity. Since then, more than 4000 earthquakes have been detected, most of which are too small to be felt by human senses. On average one earthquake per year will be large enough to be felt by communities in the area.

On the basis of the large area of damage (230,000 square miles), the widespread area of perceptibility (1,930,000 square miles), and the complex physiographic changes that occurred, the Mississippi River valley earthquakes of 1811-1812 rank as some of the largest in the United States since its settlement by Europeans. The area of strong shaking associated with these shocks is two to three times larger than that of the 1964 Alaska earthquake and 10 times larger than that of the 1906 San Francisco earthquake.

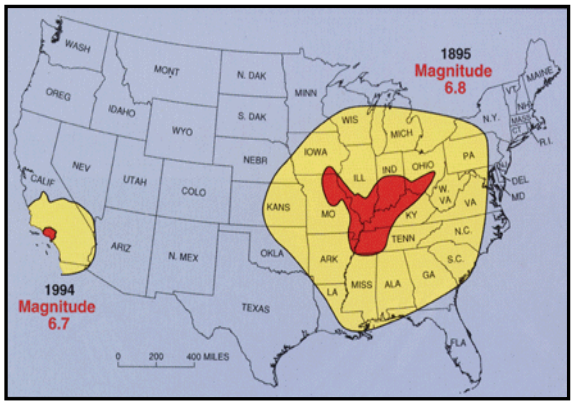

Figure 2. Relative Size of Affected Areas

Although earthquakes in the central and eastern United States are less frequent than in the western United States, they affect much larger areas. Figure 2 (Source: http://quake.wr.usgs.gov/) shows two areas affected by earthquakes of similar magnitude-the 1895 Charleston, Missouri, earthquake in the New Madrid seismic zone and the 1994 Northridge, California, earthquake. Red indicates minor to major damage to buildings and their contents. Yellow indicates shaking felt, but little or no damage to objects.

Earthquake epicenters and magnitudes for the Central and Eastern United States are presented in Figure 3. This figure indicates all of the corridors within this study are in areas of significant seismic potential.

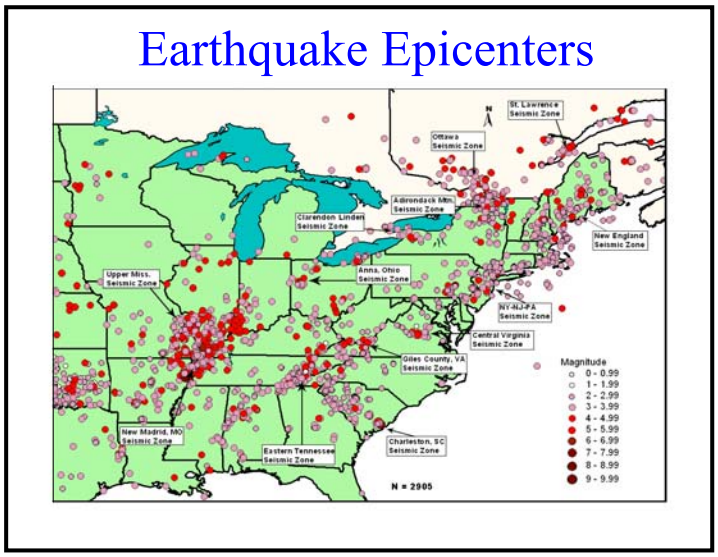

Figure 3. Earthquake Epicenters and Magnitudes in the Central and Eastern United States

4. Existing Corridor Features

4.1. General

The primary land uses within the project corridors are farmland cultivated for crops; undeveloped forest, grasslands and wetlands; single family dwellings; and commercial entities commonly associated with small towns. The area is extensively farmed both within and outside the flood plains of the Ohio and Mississippi Rivers. Levee systems, both privately and publicly owned, are located adjacent to the Ohio and Mississippi Rivers and function as flood control structures during high water events. Additionally, sand and gravel has been quarried and timber logging has occurred throughout the region.

4.2. Domestic and Public Areas

McCracken, Ballard, and Carlisle counties Kentucky are within a predominantly rural farm community setting. Likewise, Mississippi County Missouri is also heavily agricultural in land use. Small towns are usually situated at the intersection of county and state routes or historic railroad depots. Numerous schools and churches are located within the proposed corridors presented herein. Gas stations, stores, small commercial businesses and residences are common within these communities. Many of the stores sell gas and diesel fuel. Existing gas stations and stores that handle petroleum products and chemicals often have numerous storage tanks for their products. Small businesses such as auto body and repair shops, farm equipment and supply stores, construction companies and equipment rental companies have tanks and other environmentally sensitive concerns that need to be considered when evaluating a corridor.

Locations of former gas stations, stores and other businesses may have abandoned storage tanks, unstable refuse storage areas, or debris dump sites.

The rural areas generally have various homestead and farm situations that exist within subwatersheds off a primary watershed. These properties are often owned by families that have been in the area for many decades. Lumber yards, farm equipment stores, and community groceries are commonplace in rural areas. Family and community cemeteries are common throughout the region. The field reconnaissance of July 3, 2003 noted that the corridor which follows US 60 to be the more heavily populated of the corridors. Also, US 60 is the primary arterial road between the major communities in this area, and is therefore much more heavily traveled than the roads associated within other corridors.

4.3. Other Features

The Peal and Swan Lake Wildlife Management Areas (WMA's) are located approximately two miles west of the community of Barlow, Kentucky and could be impacted by corridor 8- Level 2 Alternatives. The Winford WMA is located nearly 2.5 miles southeast of Wickliffe, KY, and could be impacted by the approach to bridge crossing Corridor 8B – Level 3 Alternatives over the Mississippi River in the vicinity of Mayfield Creek.

Corridor 8 – Level 2 Alternatives will likely have to traverse approximately three miles of wetlands, lakes and streams in the Barlow Bottoms area on the Ohio River floodplain. This area consists primarily of north-south oriented ancient river channels of the Ohio River which were abandoned during channel migration and have been filled in over time by alluvial sediments. Geotechnically, each trough may present its own individual subsurface profile and strength characteristics. Also, these wetlands typically present high water tables as well as soft and/or unconsolidated soils which present issues regarding foundation stability, settlement and sensitivity to seismic events.

Corridor 8B – Level 3 Alternatives and the approach to the Mississippi River crossing will traverse Mayfield Creek and approximately 1.0 – 1.5 miles of wetlands and streams associated with the corresponding floodplain. Mayfield Creek is a low gradient stream which is prone to flooding by backwaters of the Mississippi River. A bridge will be required to cross this stream, and the substructure elements will be required to resist alternating flow directions and forces from debris/drift.

The Birds Point – New Madrid Floodway is located on the Mississippi River Floodplain in Southeastern Missouri, south of the confluence of the Mississippi and Ohio Rivers. Corridors 8B – Level 3 Alternatives and 11, 12, 13, 14, 15 and 21 – Level 2 Alternatives will traverse the levee and associated floodway. The central purpose of the floodway is to provide additional flood water storage in this part of the river to prevent the Project Design Flood from exceeding its design elevation at and above Cairo, Illinois. Therefore, it is anticipated that any roadway crossing the floodway will be elevated in the form of a bridge to reduce the impact upon the floodway capacity. Substructure elements of these bridges should be designed to resist extreme flow conditions and scour events resulting from levee breaches and inundation during the operation of the flood way. In order to cross the floodway at the proposed locations, bridge

lengths must be on the order of 2.8 and 4.2 miles, respectively. Such bridge crossings would necessitate the construction of large numbers of deep foundations.

It should be noted that in a July 3, 2003 letter to the KYTC, the Memphis District – USACE expressed strong opposition to any proposed corridor that crosses the Birds Point – New Madrid Floodway. The letter expressed operational, engineering, real estate, and regulatory concerns regarding construction across the floodway. The 1965 Flood Control Act provides for operation of the floodway in the event floods reach a height of 58 feet, and are projected to exceed 60 feet on the Cairo, Illinois gauge. The current operation plans entail artificially crevassing sections of the levee at the upper and lower "fuse plugs" using explosives having a cratering effect 1.5 times greater than TNT. The Upper Fuse Plug section is approximately 11.3 miles long and includes an area to be breached (the inflow crevasse) approximately 11,000 feet in length. Figures presented in the USACE letter indicate that only crossing 11, 12, 13, 14, 15 and 21 will be within the inflow crevasse area. A safety zone for liquefaction potential, airblast, and ground motion has been established to be one half mile from any of the detonation sites. Additionally, a one-half mile strip along the length of the Upper Fuse Plug was purchased by the USACE and quit claimed to the local levee district. The quit-claim deed(s) reportedly contain a clause stipulating that no permanent structures may be built on this property because of anticipated damage from blueholing (deep scour) and sanding (sandbar deposition) resulting from floodway operations. The USACE operation of the floodway would require that all roadways entering the area be closed until recession of floodwaters and safety inspections of the floodway area have been performed.

Flood control levees were noted to border other portions of the flood plains of the Ohio and Mississippi Rivers, as well as smaller tributaries. These earthen levees were placed to protect both developed and agricultural areas during high water events. Also, structures comprised of large cyclopean stone dikes were noted along the banks of the Mississippi and Ohio Rivers jutting into the river channels in the study area. These structures are typically under the jurisdiction of local levee districts or the United States Army Corps of Engineers and are used to control or channel flow within the river. Close interaction with these entities will be required because these levees and dikes will have to be accounted for in evaluation of any corridors to reduce the potential of the I-66 roadway jeopardizing their effectiveness.

5. Geotechnical Concerns

5.1. Roadway

Existing roadways within the proposed corridors typically follow existing topography with little excavation or fill placement. In areas of Kentucky and Missouri crossing significant floodplains and streams, planned roadways are often elevated atop existing earthen levees or in the form of bridges. As previously noted, local soils are primarily loessal in nature, and are highly erodible. Soil embankments should be designed with as flat an outslope as practical (maximum of 3 horizontal to 1 vertical) to reduce erosion and promote revegetation. Embankments crossing areas subject to inundation by flooding may require the application of slope protection, and/or require construction using freely draining materials up to the high water elevation, in order to reduce the loss of embankment material and improve stability during floodwater recession.

Soil cuts may occur in upland loess soils, and should also be designed with as flat an outslope as possible to reduce erosion and promote revegetation. Additionally, intercept ditching may be required above the daylight points of soil cuts to direct surface runoff away from soil cut faces.

In addition to being highly erodible, the referenced loessal soils are extremely moisture sensitive, and this characteristic should be considered in all aspects of design. Dry loess deposits subjected to moisture intrusion may lose interparticle bonds and therefore experience a loss of strength and an increase in compressibility. Also, the saturation of a loess soil and the subsequent loading/unloading can fluctuate pore water pressures within the soil and create quick (free flowing) conditions. Because these loess soils are highly moisture sensitive, the KYTC typically avoids the use of these soils as roadway subgrade.

Figure 4. View of Illinois Approach, Cape Girardeau, IL

5.2. Structures

Bridges will be required in each of the corridors to carry the roadways over small streams, backwater sloughs, major rivers, and possibly over sensitive wetland areas. Crossing 8 – Level 2 Alternatives will require a bridge over the Ohio River into Illinois. At this location, the Ohio River is approximately 4,000 feet wide. Other corridors will require bridges over the Mississippi River into the state of Missouri. At these crossings, the Mississippi River is on the order of 4,000 to 5,000 feet wide. Currently, there are two major bridge projects under construction over the Mississippi River which are similar to this project. The first, as shown in Figure 4 (Source: http://www.modot.state.mo.us/) is a cable-stayed structure connecting Cape Girardeau, Missouri and East Cape Girardeau, Illinois. This structure has a main span length of approximately 1,150 feet. The second structure carries US Highway 82 between Greenville, Mississippi and Lake Village, Arkansas. The main span length of the Greenville bridge is to be approximately 1,370 feet and when completed, will have the longest cable-stayed span over the Mississippi River.

Figure 5. Greenville Bridge Pier 37

Figure 5 (Source: http://www.greenvillebridge.com/), shows the construction of a dredged caisson main span pier for the Greenville Bridge.

Approach embankments to structures in upland areas away from major streams will likely be designed using traditional soil fill placement techniques. Structures over floodplains subject to frequent or severe flooding may require elevated approach spans. Existing bridges within the corridors over low or 'backwater' areas such as Mayfield Creek and Minor Slough were noted during the field reconnaissance to be comprised

of multiple short spans with reduced intrusion of approach embankment construction within the floodway.

Because of the depth to bedrock in each of the corridors, it is probable that all foundation systems for the bridges will be soil-bearing deep foundations. Typical foundation types for bridges with similar subsurface conditions include: driven piles, drilled shafts, and dredged caissons. Conversations with Kentucky Transportation Cabinet (KYTC) personnel indicate that the most widely used foundation type for short span bridges in the area is driven piles. It is FMSM's understanding that the bridge crossings over the Ohio and Mississippi Rivers will require main span lengths on the order of 1500 feet to meet navigation requirements. With increasing span length, increased foundation capacity is required. Therefore, each type of foundation system should be evaluated to determine which is the most efficient and cost effective. Both driven piles and drilled shafts are considered slender foundations, and will develop axial capacity from the friction between the pile/shaft perimeter and the surrounding soils. Resistance to lateral movement of the slender deep foundations will be derived from the surrounding soils and is dependent upon the embedment lengths, diameters and material properties of the piles or shafts. Dredged caisson foundations follow a spread footing concept which derives bearing capacity at the bearing surface under the caisson. This type of foundation is typically massive, and can withstand significant lateral loads. Because of the significant regional seismicity described in Section 3.5, the ability of a particular foundation type to withstand seismically induced forces will likely govern foundation selection.

5.3. Seismic Concerns

Regardless of which roadway corridor and bridge crossing are selected for final design, seismic considerations will play a significant role in design and construction. As noted in Section 3.5, the proposed corridors lie within the New Madrid Seismic Zone. A seismic event could create several geotechnical problems. One of which could be a seismic event inducing liquefaction of foundation soils beneath embankments and substructure locations. Liquefaction induces a reduction of the load bearing capacity of the soils in the affected areas. This loss of strength could cause embankment settlement/failures, or the loss of frictional soil resistance to bridge substructure foundations. The loss of frictional strength could leave the foundations laterally unsupported, and in the case of friction piles or drilled shafts bearing in soil, axially unsupported. A second potential geotechnical concern could be a seismic event introducing lateral movements and therefore loads into the foundation systems of structures. Introducing lateral loads while there is a loss of soil strength would require the foundation system to carry all structural and induced loads internally. Additionally, the proposed bridge site should be characterized seismically in order to provide spectra response to the bridge design team.

It is recommended that seismic analyses be performed using data collected from sample borings along the proposed centerlines of any bridge structures. Analyses may include simplified seismic site response, equivalent one-dimensional site response, liquefaction and post-liquefaction settlement. In addition, static slope stability, pseudo-static slope stability, and permanent seismic deformation analyses should be performed for all approach embankment locations.

5.4. Scour Concerns

Because of the previously described loess, clay, sand, and gravel soil types present throughout the corridors, scour will be of concern in areas surrounding bridge foundations, and embankments adjacent to streams. Both local and contraction scour potential should be estimated for each potential corridor prior to selection. Contraction scour is initiated because of increased flow velocities through the bridge openings, changes in local base-level elevations, or flow around a bend. The most common cause of contraction scour is the contraction of flow by bridge approach embankments that encroach on the floodplain or the main channel, or both. Local scour is the removal of material around piers, abutments, spur dikes, and embankments caused by flow acceleration and turbulence near bridge sub-structure elements and embankments. Local scour can be increased as the result of accumulation of debris in a bridge opening. Figure 6 (Source: http://www.missouri.usgs.gov/) illustrates the potential of local scour on a typical bridge pier location.

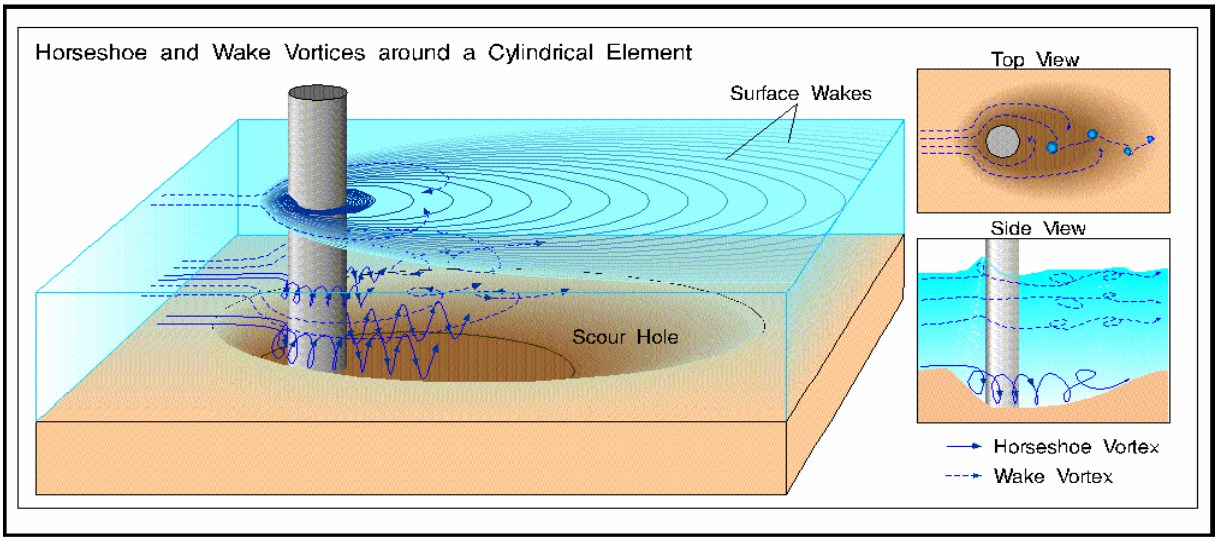

Figure 6. Local

A final scour study should be performed in conjunction with hydrological and hydraulic modeling during the design of the selected bridge structure. Major floods on the Mississippi and Ohio Rivers can create very high flow conditions. Local scour depths greater than 10 feet were reported, (on the above referenced website), after the 1993 Upper Mississippi/Missouri River floods. All bridge foundation designs in the study area will require that the results of detailed scour analyses be incorporated into establishing the embedment depth of individual substructure foundations. Typically, the KYTC requires that the tops of all spread footings and the bases of all shaft/pile caps be constructed below the anticipated maximum scour elevation.

6. Conclusions and Recommendations

6.1. General

6.1.1. The purpose of this overview was to provide a general summary of the soil and stratigraphic features likely to be encountered within the proposed roadway corridors, and to identify geotechnical features which could have adverse impacts on design and construction.

6.1.2. Based on this study, each of the proposed corridors are geotechnically feasible. All of the proposed corridors will encounter features associated with loessal deposits, deep soils and a major stream crossing. Moisture-sensitive loessal deposits present erosion problems as well as stability issues. Deep subsurface soils typically increase the foundation costs of bridges, and can be more sensitive to seismic events. Because of the substantial length of the main span and approaches as well as the seismic, scour, and deep foundation aspects of design, the Mississippi/Ohio River crossing will require the largest portion of the design effort for each of the study corridors.

6.1.3. It is recommended that a geotechnical exploration of the selected corridor be performed to determine the soil stratigraphy to establish foundation soil characteristics for evaluation of embankment slope stability and settlement, bridge foundation design, scour susceptibility, liquefaction potential and seismic response. Engineering analyses should be performed at each substructure location of each multi-span bridge in order to develop appropriate geotechnical information for design and identify potential areas of concern. Such analyses should include: slope stability at bridge abutment locations; bearing capacity of spread footings and dredged caissons; axial and lateral capacity of drilled shafts and/or pile groups; negative skin friction/uplift capacity of piles and/or shafts, and wave equation/drivability analyses for piles.

6.1.4. It is recommended that a seismic evaluation be performed at the bridge site selected for final design. Testing in the form of cross-hole logging, seismic reflection/refraction profiling, and seismic cone penetration testing should be evaluated for use in data acquisition. The purposes of a seismic evaluation would be to: identify soils along the proposed bridge alignment that may be susceptible to liquefaction, estimate the potential induced settlements, assess the stability of the approach embankments and quantify possible deformation under seismic loading, and develop representative foundation response spectra for use in structural design.

6.1.5. It is recommended that a hydrographic survey and detailed scour analysis be performed for all stream crossings within the corridor selected for final design. The results of the analyses should be used to determine foundation embedment lengths, and span arrangements.

6.2. Roadway Corridors

6.2.1. Roadway aspects to be addressed as design continues are associated with use of flatter cut and embankment slopes to reduce soil erodibility, stabilization of soft/wet areas prior to embankment construction, and the construction of roadway embankments subject to floodwater inundation using free draining and/or scour resistant materials.

6.2.2. Geotechnically, the roadway corridors in this study present very similar characteristics. However, the corridor along existing US 60, 8 – Level 2 Alternatives, must cross approximately three miles of native wetlands, lakes and streams as the corridor leaves the community of Barlow, as well as the existing roadway, and traverses the Barlow Bottoms area for the approach to proposed crossing over the Ohio River. Corridor 8B – Level 3 Alternatives crosses substantially less wetlands, with only the Mayfield Creek area shown by the referenced mapping or noted during the field reconnaissance. However, if either Corridor 8B – Level 3 Alternatives or Corridors 11, 12, 13, 14, 15, and 21 – Level 2 Alternatives is selected, the approach to the bridge from the Missouri side will cross the Birds Point-New Madrid Floodway in the form of a bridge. The upper corridor will require approximately 2.8 miles of bridge to cross the floodway in Missouri, and crossing 8B will require approximately 4.2 miles of bridge.

6.2.3. A comparison of the roadway corridors during the field reconnaissance showed US 60 to be a densely populated and heavily traveled route. Therefore, impacts to the community would likely be more prevalent along the 8B corridor (US 60) than along the Corridor 11, 12, 13, 14, 15 and 21 (KY 286).

6.3. Major River Crossings

6.3.1. At the location of crossing 8, the Ohio River is roughly 4,000 feet wide. Approach spans in the Barlow Bottoms area of Kentucky, and in the areas of the Cache River and Cottonwood Slough in Illinois would greatly increase the length of the bridge. It is estimated that the cumulative length of the approach and main bridge spans for this crossing will be nearly four miles.

6.3.2. Crossing 11, 12, 13, 14, 15, and 21 will intersect the Mississippi River at mile point 951, just south of the confluence of the Mississippi and Ohio rivers. The river at this location is roughly 4,000 feet wide. In the conference call of June 25, 2003, the Unites States Coast Guard (USCG) stated that this location is unacceptable from a navigation standpoint, and that no bridge would be considered unless it is south (downriver) of mile point 949.5. The USACE also stated that a bridge crossing would not be acceptable north of mile point 949.5, and that this location at mile point 951 is further unacceptable from their viewpoint because the bridge may land in Missouri on a fuse plug of the Birds Point Levee which will be removed by explosives during extreme flood events.

6.3.3. Crossing 8B for the study would cross the Mississippi River at mile point 948. In this area, the river varies between 4,000 and 6,000 feet in width because of the presence of an island/sand bar called Island No. 1. In order to cross the river at this location, a bridge length on the order of 6,000 feet would likely be required. This bridge length would be greatly increased by approach spans on both the Kentucky and Missouri sides of the river. Rough estimates of lengths required to carry traffic over Mayfield Creek, the Mississippi River, and the Birds Point Floodway result in a cumulative length of over 6.5 miles of bridges. Based on USCG criteria, this crossing is enough south (below mile point 949.5) to be acceptable. However, USACE criteria pertaining to the operation of the floodway would have to be satisfied prior to alignment selection.

6.4. Closing

6.4.1. Based on the information obtained during research and the field reconnaissance, neither of the Ohio or Mississippi River crossings present any 'fatal' geotechnical flaws. Any crossings will require extensive amounts of bridging. Each corridor would involve the extensive use of deep foundations for the bridges, and will have to address roadway construction in loessal deposits. In this cursory overview it appears that crossing 8B may require as much as 2.5 miles more bridge length than crossing 8. The majority of the bridge length for the southern crossing will be associated with the Birds Point-New Madrid Floodway. Bridge substructure elements and foundations in this area would be required to meet much more stringent (USACE) criteria than traditional bridging over non-floodway lands in the area. These increased requirements within the floodway would likely require substantial supplemental geotechnical investigations and analyses.

6.4.2. The information presented in this report should be viewed in the general nature in which it was intended. A more detailed study, which was beyond the scope of this work, would be required to more specifically define potential problem areas within the proposed corridors. A thorough geotechnical exploration and seismic evaluation of the selected alignment and grade will be required to help the design team anticipate and plan for special requirements necessary for design and construction of a roadway and major river bridge.

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 6 – LEVEL 1 SCREENING

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

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FEBRUARY 2005

1.0 PRELIMINARY ALTERNATIVE CORRIDORS

This paper presents the alternative corridor development process used for the I-66 Corridor Study Western Kentucky to Missouri section. It included here are a description of (1) how the alternative corridors were developed, (2) and how they were grouped or classified for further analysis and screening. This chapter also provides a comprehensive list and description of the initial alternative corridors developed for the study, the evaluation criteria and methods for Level 1, 2 and 3 screening. The screening analysis and results for the Level 1 / initial evaluation are also included.

1.1 Development Process

A wide-range of alternative corridors were developed in response to the study's goals, objectives and identified issues. The alternative corridors development process was interactive and took into account suggestions and input from a wide variety of sources, including:

- Stakeholder / Public
- Project Work Group
- Project Team
- Previous studies
- Existing transportation plans

Specific activities to solicit input for the alternative corridors development process included:

- Project Work Group input in a workshop style meeting where numerous alternative corridors were developed. This meeting was held in Charleston, Missouri on July 25, 2002.
- A set of two (2) public meetings also held in workshop format, specifically designed to receive public comment on three initial corridors and to receive suggestions for other potential alternative corridors developed by participants at the workshops. The workshops were held in Sikeston Missouri and in Barlow Kentucky respectively on August 19 and 20, 2002.

1.2 Issues Addressed

The initial alternative corridors were designed to address many observed transportation system deficiencies, problems and other issues in the study area including:

- Identify a viable corridor(s) from I-24 in Western Kentucky to Missouri consistent with national and / or Kentucky legislation, previous national and Kentucky

studies, and the goals of the Delta Commission, including improved access and mobility in depressed or impoverished regions
- Maximize connectivity between Kentucky and Missouri
- Stimulate the economic development potential in Western Kentucky and Southeastern Missouri
- Accommodate increasing automobile and truck traffic
- Improve traveler safety
- Support Completion of I-66 Across Southern Kentucky, Providing System Continuity from West Virginia to Missouri

Although not all encompassing, the list provides a good indication of the types of problems and issues that were of consequence or had an impact on the development of the preliminary alternative corridors.

1.3 Corridor Descriptions

To date, public stakeholders, the Project Work Group, and the Project Team have identified over 22 preliminary alternative corridors – including combinations and hybrids. The descriptions below and the map on the following page depict these corridors. Note that for ease of description, some geographically similar alternative corridors have been combined.

Corridor 1 - From existing I-24 alignment in Illinois due westward on new right-of-way through Shawnee National Forest in southern Illinois to Missouri 146 near Cape Girardeau via existing bridge to I-55

Corridor 2 - From existing I-24 alignment in Illinois due southwestward on new right-of-way avoiding major environmental areas in Illinois and Missouri around the Shawnee National Forest in southern Illinois to Missouri 146 near Cape Girardeau over existing bridge to I-55

Corridor 3 - From I-24 north of Metropolis, Illinois follow US 45 in Illinois northwest then following alternative 2 as described above to I-55

Corridor 4 - From existing I-24 alignment in Illinois due southwestward on new right-of-way avoiding major environmental areas in Illinois and Missouri around Shawnee National Forest to new bridge over Mississippi River south of Cape Girardeau to I-55

Corridor 5 - From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe, Kentucky over the Mississippi River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57

Corridors 6 / 7 - From existing US 60 east of Kevil, Kentucky go southwest on a new alignment towards Wickliffe over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57

Kentucky Natural Resources and Environmental Protection Cabinet.

http://maps.cares.missouri.edu/maproom/download.html

http://www.isgs.uiuc.edu/nsdihome/webdocs/browse.html

http://www.epa.gov/enviro/html/cerclis/cerclis_query.html

http://msdis.missouri.edu/

KY floodplain data used was from the FEMA Q3 Flood data, dated 9/98, was obtained from the Federal Emergency Management Agency.

http://www.gisdatadepot.com

http://www.kfwis.state.ky.us/

Special Designated Areas (SDAs)/National Forest Boundaries/National Inventoried Roadless Areas (IRAs) obtained from the USDA Forest Service, Geospatial Service and Technology Center (GSTC), dated 9-15-00

CONSTRAINTS KEY

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route
- Illinois Natural Area
- Wildlife Preserve/Conservation Area/Park
- Wetland
- 100 Year Floodplain
- Forested Area (MO)
- Agricultural District
- Superfund Site (KY)
- Shawnee National Forest

CAPE GIRARDEAU

ALEXANDER

PULASKI

MASSAC

ALTERNATIVE 3

METROPOLIS

BENTON

SCOTT

BALLARD

LA CENTER

KEVIL

BARLOW

PADUCAH

CALVERT CITY

MISSISSIPPI

CAIRO

WYATT

MCCRACKEN

MARSHALL

SIKESTON

CHARLESTON

CARLISLE

ALTERNATIVE 1

CORRIDOR COMMON TO ALTERNATIVES 1 AND 2

BARDWELL

Mississippi River

Ohio River

Kentucky Lake

Purchase Parkway

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

PB PARSONS BRINCKERHOFF

QK4 Architecture Engineering Construction

INTERSTATE 66 CORRIDOR

PRELMINARY ALTERNATIVE CORRIDORS

KENTUCKY TRANSPORTATION CABINET

EDUCATION PAYS

MoDOT

N W E S

1.75 0 1.75

Corridor 8 - From I-24 at Paducah, Kentucky along existing KY 286, US 60 or US 62 corridor to a point east of Wickliffe, proceed northwest on new route across the Ohio River on a new bridge to I-57 in Illinois

Corridors 9 / 10 - From I-24 near Paducah, Kentucky follow new route southwesterly to Wickliffe (parallel to US 62 KY 286) across the Mississippi River on a new bridge to I-57

Corridors 11 / 12 / 13 / 14 / 15 / and 21 - From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to I-57

Corridor 16 - From I-24 in Marshall County Kentucky proceed west along new route to McCracken County then follow parallel route to option 14 above

Corridor 17 - From I-24 near US 68 in Marshall County Kentucky proceed west to McCracken County along new route parallel to 16 above to similar route as 14 west and south of Paducah

Corridor 18 - From I-24 / US 60 / US 68 location in Marshall County Kentucky proceed west along new route to McCracken County with 17 then follow parallel route to option 14 above

Corridor 19 - From existing US 60 bridge across Tennessee River in Kentucky proceed south west across I-24 to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston

Corridor 20 - Re-badge existing interstate I-24 in Kentucky as I-66

Corridor 22 - From existing I-24 alignment proceed due southwest on new right-of-way avoiding major environmental area(s) in Illinois to existing I-57

2.0 ALTERNATIVES EVALUATION METHODOLOGY

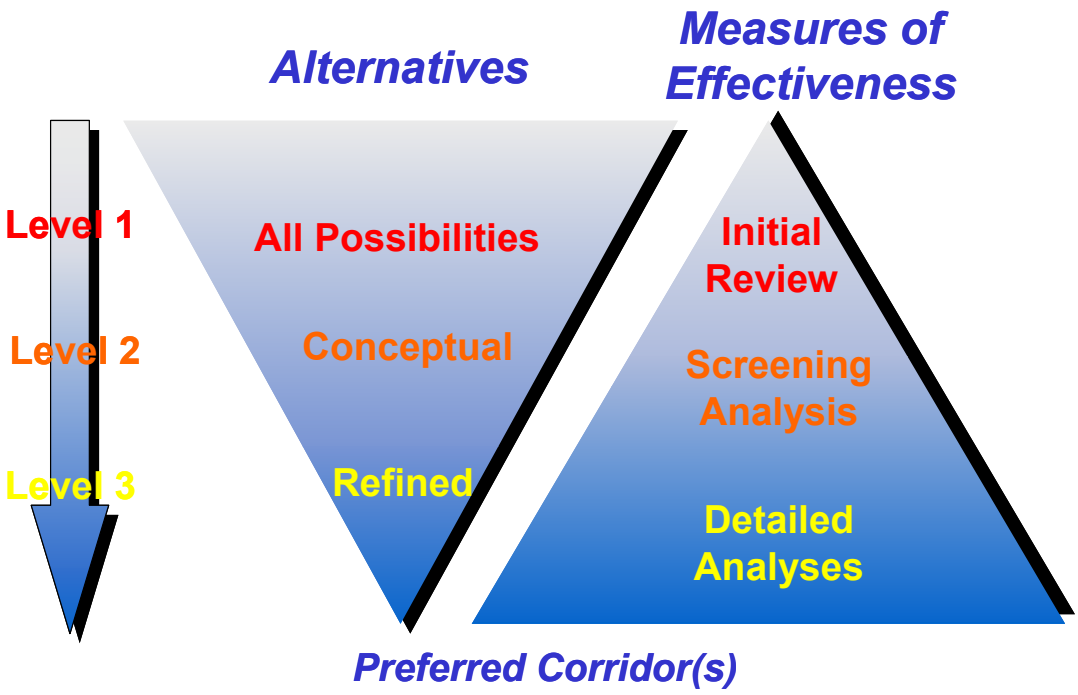
2.1 Introduction

This section describes a screening process and measures of effectiveness (MOEs) that will be / are being applied to the alternative corridors developed and analysis for the I-66 Corridor Study Western Kentucky to Missouri section. The purpose of the screening process is to refine the list of possible alternative corridors from a long list of many / all possible alternative corridors (universe) to a shorter list of recommended one(s) at the conclusion of the study.

This screening process is obviously necessary to identify and further screen those corridors that more completely meet the project's Goals, Objectives and issues and to eliminate from further consideration those that do not.

Initially, a few pertinent, qualitative details will be identified for the initial group of alternative corridors. As progression is made through the three proposed levels of screening, the amount of information grows and becomes more quantitative as the number of corridors decreases. Figure 2.1 below depicts the levels of screening and the depths of information that will be developed as the number of alternatives narrows.

Figure 2.1



The first phase of analysis, the Level 1 screening, focuses on more qualitative, rather than quantitative analysis. This first level is an initial analysis of the general feasibility of the corridors. As the screening process progresses, more detailed information will be developed. The criteria for Levels 2 and 3 respectively, will gradually become more definitive and utilize more quantitative rather than qualitative data for analysis.

The following sections detail the proposed three-level screening processes.

2.2 Level 1 – Initial Screening

The initial level of analysis seeks to apply limited measures of evaluation to all alternative corridors that have been developed in order to eliminate some of them from further consideration. Alternative corridors that are eliminated are those that do not fully or best meet the study's Goals and Objectives, or they do not fully or best address the problems and issues identified in the Existing Conditions Report, or they have a characteristic that would prevent their further implementation.

Sometimes referred to as a "fatal flaw" screening, this first level of analysis relies on rather qualitative criteria and analysis garnered from the study's internal working staff or Project Team composed of members of the Kentucky Transportation Cabinet Central Office Planning Division, District Office Planning Staff, Purchase Area Development District (PADD) and Consultants. The evaluative criteria for Level 1 screening focuses on whether or not a corridor could be developed successfully into the project development phase. The focus of this initial analysis includes:

- **Constructability / Implementation / Feasibility -** To what extent is an alternative implementable? This would include issues such as ease of construction, political support, and funding.
- **Compatibility with Goals, Objectives and Issues -** To what extend is an alternative compatible with identified and adopted Goals, Objectives? To what extent does it address identified problems and/or issues?
- **Community / Environmental Impacts -** To what extent does an alternative enhance or degrade the natural, social, built or economic environments?

2.3 Level 2 – Screening Analysis

The Level 2 evaluation will be performed on a smaller set of alternative corridors for which more details will be developed. Some criteria from Level 1 shown above will be carried through to Level 2, although these criteria will be expanded and more detailed measures and information will be applied. More specific measures will be developed and refined to quantify and evaluate potential impacts in greater detail.

Building on Level 1, proposed criteria for Level 2 includes:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time, number of users (volume / ADT), truck %s, capacity / flow analysis (V/C ratios), safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation

- **Support** – likelihood that one or more alternatives will be supported /is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., to date. Also contains description of relevant criteria or issues to be scrutinized.

- **Community Impacts** – compatibility with adjacent and proposed land uses and the affects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc., calculated by lane miles of adjacent property. Also includes an environmental justice analysis

- **Property Impacts** – more specific impact determining need for new right-of-way quantified in acres

- **Environmental Impacts** – impacts on known historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat areas, no of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands

- **Capital cost considerations** – order of magnitude capital costs for proposed alternative corridors derived on a cost per mile basis from typical sections for roadway (at-grade and elevated) and bridge improvements, and typical cost basis for interchanges; will also include bicycle and pedestrian amenities if appropriate

This second level of screening analysis will produce richer quantitative comparisons for a smaller number of alternative corridors. This Level 2 evaluation involves the selection of alternatives that deserve subsequent and more detailed examination in Level 3. Decisions on options to advance and on the appropriate combination of alternative corridors will be based on data resulting from these first two levels of analysis.

2.4 Level 3 – Refinement

Finally, a third round of screening will take place based on the most detailed analysis. This third round of alternative refinement will use the processes described above to focus detailed analysis on the alternatives that have survived from the first two rounds. This analysis phase will broaden the range of information known about the final

alternatives in the above mentioned categories and will seek to determine the most refined quantitative and definitive information about each alternative as possible. At this point, the volume of technical data about each of the alternatives will be at its peak. Measures from Level 2 will be refined to include the following additional measures (if any):

- **Traffic Operations** – no anticipated refinement for Level 3. May involve "new" model runs rather than manual adjustments / interpolation

- **Support** – no anticipated refinement for Level 3, however subsequent comments received will be incorporated

- **Community Impacts** – refine to include more quantitative number of impacts to community by type of land use if available

- **Property Impacts** – refine to include more specific impacts determining need for new right-of-way quantified in acres

- **Environmental Impacts** – refine to include qualitative / quantitative noise and air quality analysis (# of and location by type for sensitive receptors and likely impacts to air quality), threatened rare and endangered species locations, and bridge location geology / compatibility

- **Capital cost considerations** – refine to separate costs for right-of-way, utilities, design and construction costs probably at a "gross level"

3.0 Level 1 Screening Summary

3.1 Introduction

The following discussion presents the analysis and outcome for the Level 1 Initial Screening for each alternative corridor. This discussion, together with the Level 1 Screening Summary sheets, depicts all known Information related to each of the 22 initial alternative corridors, including:

- Alternative number
- Brief description of alternative corridor
- Level 1 evaluation criteria results
- Conclusion / recommendation for further consideration or elimination

3.2 Level 1 Discussion

Corridor 1 – Corridor 1 runs from existing I-24 near Paducah, Kentucky northward along I-24 then heads due west through southern Illinois and across the Shawnee National forest to Missouri Route 146 near Cape Girardeau to existing I-55. Some of the route would be on new right-of-way and it would use the new Bill Emerson Memorial Bridge currently under construction at Cape Girardeau, Missouri.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being constructed. There are some sections over wetlands and/or 100-year flood plains that would require staged construction, which would be launched from new roadway sections. This would be necessary to avoid adverse affects during construction on nearby sensitive areas. Also, a large section of the route is in Illinois, which currently is neither interested in an I-66 corridor nor participating in this study. For these reasons it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues, although on a very basic level. The corridor does provide a new route and makes use of portions of the existing interstate, thus maximizing some investment. However, it does little for western Kentucky from Paducah to the Missouri border in terms of supporting economic development or improving community character and quality of life. It would provide for improved accessibility and connectivity but may not provide the most direct route for some trips, and may in fact have a higher travel time for some of those same trips in the study area. For this it is rated Medium.

Impacts – The impacts to the community are assumed to be low. The route uses existing interstate right-of-way for a portion of the corridor from Paducah into Illinois. Other portions of the corridor would require new right-of-way, but are in an area of south / southwestern Illinois that is less populated. For this category it is rated Low.

However, in terms of environmental impacts, the corridor would bi-sect a large portion of the Shawnee National forest in southern Illinois just east of Cape Girardeau. Although going through a national forest may not be in and of itself a "fatal flaw"; however if another feasible and prudent alternative exists, it must be considered. In the case of Corridor 1, other options exist that do not involve impacts to the forest. For this reason, the rating is High in this category.

Overall, the corridor is recommended for elimination from further consideration. Its environmental impacts, lack of support and interest from Illinois, and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues all limit its ability to be implemented successfully; especially when other corridors are more viable.

Corridor 2 - Corridor 2 is similar to Corridor 1. It shares a common alignment on existing I-24 and a section of new right-of-way in southern Illinois in Pulaski County. However, Corridor 2 travels more southwesterly avoiding the Shawnee National Forest as it proceeds closer to the Mississippi River between Illinois and Missouri. In this area, it passes through natural areas, wetlands and the 100-year flood plain(s) before crossing at the new Bill Emerson Memorial Bridge in Cape Girardeau. From here, it too heads to existing I-55. Like Corridor 1, much of Corridor 2 would be on new right-of-way.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being constructed. There are larger sections of the corridor west of the Mississippi River and south of the Shawnee National Forest that would be built over wetlands and/or 100-year flood plains that would require staged construction and be launched from new sections. This would be necessary to avoid adverse affects to sensitive environmental areas during construction. Also, a large section of the route is in Illinois, which currently is neither interested in an I-66 corridor nor participating in this study. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – The corridor does satisfy some of the goals, objectives and issues, although largely on a basic level. The corridor does provide a new route and makes use of portions of the existing interstate. However, it is developed in such a way to avoid major environmental areas that it seems circuitous. The route also does little for western Kentucky from Paducah to the Missouri border in terms of facilitating economic development or improving community character and quality of life. It would provide for some improved accessibility and connectivity but may not provide the most direct route and may have a higher travel time for some trips in the study area. For this it is rated Medium.

Impacts – Impacts to the community are assumed to be low. The route uses existing interstate right-of-way for a portion of the corridor from Paducah into Illinois. Other portions of the corridor would require new right-of-way but the area needed is less likely to be populated and/or developed. For this category it is rated Low. With regard to

environmental impacts, the corridor avoids the large portion of the Shawnee National forest just east of Cape Girardeau in southern Illinois. It does however have sections that encroach on existing natural areas, wetlands and the 100-year floodplain near the Mississippi River. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for elimination from further consideration. Its environmental impacts, lack of support and interest from Illinois, and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues combine to limit its ability to be implemented especially when other corridors are more viable.

Corridor 3 - Corridor 3 is similar to Corridor 2. It shares a common alignment on existing I-24 and a section of new right-of-way in southern Illinois in Pulaski County as well. However, it follows a section of US 45 just north of Metropolis, Illinois and heads north and west before proceeding on a new alignment in southern Illinois. Like Corridor 2, it travels more southwesterly avoiding the Shawnee National Forest and runs close to the Mississippi River between Illinois and Missouri through natural areas, wetlands and the 100-year flood plain before crossing at the new Bill Emerson Memorial Bridge in Cape Girardeau. From this point, it heads to existing I-55.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being constructed. There are larger sections of the corridor west of the Mississippi River and south of the Shawnee National Forest that would be built over wetlands and/or 100 year flood plains that would require staged construction and would be launched from new roadway sections to mitigate adverse impacts during construction. Also, a large section of the route is in Illinois, which currently is neither interested in an I-66 corridor nor participating in this study. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues, although on a very basic level. The corridor does provide a new route and makes use of portions of the existing interstate thus using existing investments in those facilities. However, its routing takes a circuitous path to avoid major environmental areas. The route also does little for western Kentucky from Paducah to the Missouri border in terms of facilitating economic development or improving community character and quality of life. The corridor would provide for improved accessibility and connectivity but may not provide the most direct route and might result in an increase in travel times for some trips in the study area. For this it is rated Medium.

Impacts – Impacts to the community are assumed to be low. The route uses existing interstate right-of-way for a portion of the corridor from Paducah into Illinois. Other portions of the corridor would require new right-of-way, but are in areas of southwestern Illinois that are less likely to be populated and/or developed. For this category it is rated Low. In terms of environmental impacts, the corridor misses the large portion of the Shawnee National forest just east of Cape Girardeau. It does however have sections

that encroach on and present impacts to existing natural areas including wetlands and 100-year floodplains. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for elimination from further consideration. Its environmental impacts, lack of support and interest from Illinois, and the fact that it does little to facilitate economic development in western Kentucky and only minimally satisfies goals, objectives and issues all limit its ability to be implemented successfully. This is especially true when other corridors are more viable in the study area.

Corridor 4 - Corridor 4 is also similar to Corridor 2. It shares a common alignment on existing I-24 and a section of new right-of-way in southern Illinois in Pulaski County. However, Corridor 4 travels more southwesterly also avoiding the Shawnee National Forest while running much closer to the Mississippi River before crossing over it on a new bridge southwesterly of the alignment for Corridor 2. The corridor also would impact a forested area in Missouri and eventually, the route links up with I-55 south of Cape Girardeau. Like Corridors 1, 2 and 3, much of Corridor 4 would be on new right-of-way.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being constructed. Like Corridor 2, there are larger sections of Corridor 4, especially those west of the Mississippi River and south of the Shawnee National Forest that would be built over wetlands and/or 100-year flood plains. These sections would require staged construction and would be launched from new roadway sections. This would be necessary to avoid adverse affects during construction to sensitive nearby environmental areas. Also, a large section of the route is in Illinois, which currently is neither interested in an I-66 corridor nor participating in this study. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues, although in a basic fashion. The corridor does provide a new route and makes use of portions of the existing interstate thus maximizing investment. However, it is developed in such a way as to avoid major environmental areas that it seems circuitous. The route also does little for western Kentucky from Paducah to the Missouri border in terms of facilitating economic development or improving community character and quality of life. The route provides for improved accessibility and connectivity but may not provide the most direct path(s) and may result in increased travel times for some trips in the study area. For this it is rated Medium.

Impacts – Like Corridor 2, impacts to the community for Corridor 4 are also assumed to be low. The route uses existing interstate right-of-way for a portion of the corridor from Paducah into Illinois. Other portions of the corridor would require new right-of-way but are in areas of southwestern Illinois that are less likely to be populated and/or developed. For this category it is rated Low. In terms of environmental impacts, the corridor misses the Shawnee National forest just east of Cape Girardeau. It does

however have sections that encroach on existing natural areas - wetlands, 100-year floodplains and forested areas. In addition, the new river crossing would have environmental affects on the adjacent Mississippi River aquatic ecosystem. For this reason, the rating is High in this category.

Overall, the corridor is recommended for elimination from further consideration. This corridor, like others in the same area, the environmental impacts, lacks support and interest from Illinois, and does little to facilitate economic development in western Kentucky. It also only minimally satisfies goals, objectives and issues. These factors limit its ability to be implemented, especially when other corridors are more viable.

Corridor 5 - Corridor 5 would be located in the existing US 60 corridor running from Paducah, Kentucky through Kevil, La Center, and Barlow. The route would also travel in the vicinity of Wickliffe and would include a new Mississippi River crossing south of there. Once in Missouri, the route would use an extended and upgraded US 60 / US 62 to reach I-57 near Charleston.

Constructability / Implementation / Feasibility – In terms of constructability, most sections of the proposed corridor lend themselves to being readily constructed since an existing highway corridor is already in place. Also, since the corridor is used for transportation purposes, it might be easier to place a new or upgraded facility in this location. The route includes a new river crossing south of Wickliffe, Kentucky, which has been preliminarily supported by McCracken County Fiscal Court. For this it is rated Medium.

Compatibility with Goals, Objectives and Issues – The corridor satisfies a large majority of the goals, objectives and issues. The corridor provides a new route and makes use of portions of the existing facilities thus maximizing investment. The route is fairly direct and would likely facilitate economic development and provide other benefits in western Kentucky and southeastern Missouri . It would also provide for improved accessibility and connectivity in the region. For this it is rated High.

Impacts – Although new right-of-way would probably be needed for the new facility, the area is already in use as a transportation corridor, so any new impacts would largely be similar to what already exists. However, there may be changes in local access points for many residences and businesses. For this category it is rated Medium. In terms of environmental impacts, the corridor avoids many of the sensitive environmental areas in the region. It however may have impacts on productive farmlands and other areas especially the aquatic ecosystem(s) of the Mississippi River near the site of the new bridge south of Wickliffe. For these reasons, the rating is Medium in this category.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues and its impacts are commensurate with likely positive regional benefits.

Corridor 6 / 7 - Corridors 6 and 7 are geographically similar and have been combined into one for analysis purposes. The corridor would use a portion of existing US 60 from Paducah, Kentucky and proceed eastward (similarly to Corridor 5) but would be located within a new highway right-of-way roughly where US 60 turns northwestward south of the Gaseous Diffusion Plant west of Paducah. The route would be more to the south of Kevil, La Center, and Barlow, but would still be in the vicinity of Wickliffe in western Kentucky. This corridor would also require a new Mississippi River crossing south of Wickliffe. In Missouri, the route would use an extended and upgraded US 60 / 62 to reach I-57 near Charleston.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being readily constructed since they would built on new right-of-way with no anticipated conditions that would prevent construction. The corridor is largely situated in undeveloped areas and farmlands. The route includes a new river crossing south of Wickliffe, which has received preliminary support from the City of Paducah and the Purchase Area Development District (PADD). For this the corridors are rated Medium.

Compatibility with Goals, Objectives and Issues – The corridor satisfies a large majority of the goals, objectives and issues. The corridor provides a new route and makes use of portions of the existing facilities (US 60), thus maximizing some existing or planned investments. The route is fairly direct and would likely facilitate economic development and other benefits in both western Kentucky and southeastern Missouri. It would provide for improved accessibility and connectivity and includes a new bridge to replace two existing bridges near Cairo, Illinois. For this it is rated High.

Impacts – Although new right-of-way would probably be needed for the new facility, some of the area is already in use as a transportation corridor so the new impacts would largely be confined to undeveloped areas and/or farmlands. There would be changes in local farm access points for many large farms / parcels in the area and some of the productive land would be precluded form farm use. For this category it is rated Medium. In terms of environmental impacts, the corridor misses many of the most sensitive areas in the region. It however will have impacts on farmlands and other areas especially the aquatic ecosystem(s) of the Mississippi River near the site of the new bridge at Wickliffe. For these reasons, the rating is Medium in this category.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridor 8 - Corridor 8 would be located more south of Corridor 6/ 7. It runs from the Paducah area westward towards Missouri and then heads northwest near a point east of Wickliffe and south of Barlow. The corridor goes through the wildlife, wetlands and 100-year floodplain areas that all border the Mississippi River between Cairo, Illinois

and Barlow, Kentucky. This corridor includes a new Mississippi River crossing well north of Wickliffe and would connect to I-57 in Illinois.

Constructability / Implementation / Feasibility – Construction of virtually all sections of the proposed corridor would be on new right-of-way and some would be on what is now farmlands. The section nearest to the Mississippi River would require staged construction over the sensitive aquatic areas to minimize adverse impacts during construction. This however is not perceived to be difficult. For this it is rated Medium.

Compatibility with Goals, Objectives and Issues – The corridor satisfies a many of the goals, objectives and issues. The corridor provides a new route and makes use of large portions of the existing facilities (I-57) thus maximizing some existing investment. The route is not as direct as others, but still might facilitate economic development and provide other benefits in western Kentucky. It would provide for some degree of improved accessibility and connectivity in the region as well. For this it is rated Medium.

Impacts – New right-of-way would be needed for the new facility. Although these areas are not in the vicinity of developed areas, there would be impacts to areas used for agricultural purposes. For this category it is rated Low. In terms of environmental impacts, the corridor has impacts to sensitive aquatic areas in the region, especially those near the Mississippi River southwest of Barlow; an area known as the Barlow Flats. Also, a new bridge and its approaches would have impacts to the aquatic ecosystem(s) of the Mississippi River near the site of the bridge and on wetlands and 100-year floodplains in Missouri. For these reasons, the rating is High.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented and would provide a connection between I-24 and I-57. It does satisfy the goals, objectives and issues and its impacts are commensurate with its likely benefit.

Corridor 9 / 10 - Corridors 9 and 10 are geographically similar and have been combined into one for analysis purposes. The corridor would use a small portion of existing US 60 from I-24 near Paducah and proceed eastward (similarly to Corridor 5) but would follow a more southerly path placing it between existing US 60 and KY 286 corridors south of the developed areas of Kevil, La Center and Barlow. Like other routes through western Kentucky, the route would pass in the vicinity of Wickliffe and require a new Mississippi River crossing south of the city. In Missouri, the route would use an extended / upgraded US 60 / US 62 before reaching I-57.
Constructability / Implementation / Feasibility – Most sections of the proposed new corridor lend themselves to being readily constructed since they would built on new right-of-way with no anticipated conditions that would prevent construction. The corridor is largely situated in farmland and / or undeveloped areas. The route includes a new river crossing south of Wickliffe, Kentucky, which has received preliminary backing by the McCracken County Fiscal Court. For this the corridors are rated Medium.

Compatibility with Goals, Objectives and Issues – The corridor satisfies a majority of the goals, objectives and issues. The corridor provides a new route and makes use of a small portion of an existing facility (US 60) thus maximizing some existing or planned investments. The route is fairly direct and would likely facilitate economic development and other benefits in both western Kentucky and southeastern Missouri. It would provide for improved accessibility and connectivity and includes a new bridge to replace the two that are currently in use near Cairo, Illinois. For this it is rated High.

Impacts – Although new right-of-way would probably be needed for the new facility, most of the area required would be largely confined to existing and some to farmlands or undeveloped areas. There would be fewer impacts to existing communities as the corridor is well south of populated areas. For this category it is rated Medium. In terms of environmental impacts, the corridor avoids virtually all of the sensitive areas in the region. It however will have impacts on the aquatic ecosystem(s) of the Mississippi River near the site of the new bridge at Wickliffe and for the approaches to the bridge in Missouri. For these reasons, the rating is Medium.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridors 11 / 12/ 13/ 14/ 15 and 21 – These corridors are geographically similar and have been combined into one for analysis purposes. The corridor generally lies south of US 60 in Kentucky and would be located in a new corridor running from I-24 at Paducah along KY 286 / US 62 to the southern limits of the study area. The corridor would pass in the vicinity of Wickliffe and includes a new Mississippi River crossing south of Wickliffe.

Constructability / Implementation / Feasibility – Most sections of the proposed corridor lend themselves to being readily constructed since they would built on new right-of-way with few if any anticipated conditions that would prevent construction. The corridor is largely situated in farmland and /or undeveloped areas and is well south of populated localities. The route includes a new river crossing south of Wickliffe, which has received preliminary support from the McCracken County Fiscal Court. For this the corridors are rated High.

Compatibility with Goals, Objectives and Issues – The corridor satisfies a majority of the goals, objectives and issues. The corridor provides a new route that is fairly direct and would likely facilitate economic development and other benefits in western Kentucky and in southeastern Missouri. It would provide for improved accessibility and connectivity and includes a new bridge to replace the two that are currently in use. It is one of the closest corridors to the new industrial park planned for the western Kentucky region. For this it is rated High.

Impacts – New right-of-way would probably be needed for the new roadway. Most of the land needed though would be largely confined to undeveloped areas and/or heavily used farmlands. There would be few impacts however to existing communities or developed areas as the corridor is well south of populated areas. For this category it is rated Medium. In terms of environmental impacts, the corridor avoids most all of the sensitive areas in the region, including the nearby agricultural district. It does however have impacts to some nearby farmlands, and on other areas especially the aquatic ecosystem(s) of the Mississippi River near the site of the new bridge at Wickliffe. For this category, the rating is Medium.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be implemented, it would have political support, it does satisfy the goals, objectives and issues, and its impacts are commensurate with likely benefits.

Corridor 16 – Corridor 16 starts at US 641 south of I-24 in northern Marshall County in Kentucky and proceeds westward on a new right-of-way south of KY 286. It would utilize a new river crossing south of Wickliffe and then use the extended and upgraded US 60 / 62 corridor in Missouri.

Constructability / Implementation / Feasibility – There is a lengthy section of the corridor that would require staged / launched construction over the wildlife preserve / conservation areas / 100 year floodplain in McCracken County southeast of Paducah; an area known as the Clarks River National Wildlife Reserve. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues identified by the study. The corridor does provide a new route but is longer than others. It does not use I-24 as its eastern terminus (thus, minimizing connectivity to I-66 east of Marshall County), and also makes little use of existing facilities. The route would support economic development in the western Kentucky and southeastern Missouri regions however, and it does provide for improved accessibility and connectivity. It however, may not provide the most desirable or direct route when compared to others. For this it is rated Medium.

Impacts – New right-of-way would be needed along the entire length of the route. This would cause more community impacts since the route is longer than others. For this category it is rated Medium. Similarly, there are some environmental impacts to existing natural areas, including wildlife preserve and conservation / park areas, wetlands and 100-year floodplains and an agricultural district. These areas are largely confined to two locations however, and not the entire length of the route. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for elimination from further consideration. Its localized environmental impacts, the fact that it does not lend itself to being readily implemented, its lack of system connectivity east of Marshall County, and its level of

impacts all combine to make it less likely to be implemented, especially when other corridors are more viable.

Corridor 17 – Corridor 17 starts along US 68 south of I-24 in northern Marshall County and proceeds westward on new right-of-way south of KY 286 and south and north of Corridor 16 as described above. It too would utilize a new river crossing south of Wickliffe, Kentucky and also use US 60 / 62 in Missouri.

Constructability / Implementation / Feasibility –There is a section of the corridor that would require staged / launched construction over the Clarks River National Wildlife Reserve in McCracken County south east of Paducah. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues. The corridor does provide a new route but that route is long, and makes little use of existing facilities. The route would support economic development in the western Kentucky and southeast Missouri regions. It will provide for improved accessibility and connectivity but may not provide the most desirable or direct route especially since it does not use I-24 as its eastern terminus (thus, minimizing connectivity to I-66 east of Marshall County). For this it is rated Medium.

Impacts – New right-of-way would be needed along the entire length of the route. This would cause more community impacts since the route is longer than others. For this category it is rated Medium. Similarly, there are some environmental impacts to existing natural areas, including wildlife preserve and conservation / park areas, wetlands and 100-year floodplains and an agricultural district. These areas are largely confined to two locations however, and not the entire length of the route. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for elimination from further consideration. Its localized environmental impacts, its lack of system connectivity east of Marshall County, the fact that it does not lend itself to being readily implemented and its community and especially environmental impacts, all combine to make it less likely to be continued in the analysis, especially when other corridors are more viable.

Corridor 18 – Corridor 18 starts at the interchange near I-24 and US 68 in northern Marshall County and proceeds westward on Corridor 17 as described above. It has similar characteristics and would also utilize a new river crossing south of Wickliffe, Kentucky.

Constructability / Implementation / Feasibility –There is a section of the corridor that would require staged / launched construction over the Clarks River National Wildlife Reserve areas and 100 year floodplains in McCracken County south east of Paducah. For this it is rated Low.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues. The corridor does provide a new route but that route is long and makes little use of existing facilities. The route may support economic development in the region (western Kentucky and southeastern Missouri) and will accommodate some improved accessibility and connectivity, despite the fact that it may not be the most desirable or direct route especially since it does not use I-24 as its eastern terminus (essentially minimizing connectivity to I-66 east of Marshall County). For this it is rated Medium.

Impacts – New right-of-way would be needed along the entire length of the route. This would cause more community impacts since the route is longer than others. For this category it is rated Medium. Similarly, there are some environmental impacts to existing natural areas, including wildlife preserve and conservation / park areas, wetlands and 100-year floodplains and an agricultural district. These areas are largely confined to two locations however, and not the entire length of the route. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for elimination from further consideration. Its localized environmental impacts, lack of system connectivity east of Marshall County, the fact that it does not lend itself to being readily implemented and its impacts, especially those to the natural environment, all combine to make it less likely to be continue in the analysis, especially when other corridors are more viable.

Corridor 19 – Corridor 19 starts at US 60 / US 62 / US 68 junction at the bridge over the Tennessee River in McCracken County southeast of Paducah. From there, it traverses across I-24 along a route well south of (actually out of) the current study area. It proceeds westward on a new alignment and would utilize a new river crossing south of Wickliffe in far northern Carlisle County, Kentucky.

Constructability / Implementation / Feasibility – In terms of constructability, there is a section of the corridor that would require staged / launched construction over the wildlife preserve / conservation areas and 100 year floodplains in McCracken County south east of Paducah. Other sections however are on undeveloped land. The corridor also is the closest to the proposed western Kentucky industrial /business park in Graves County, Kentucky. For this it is rated Medium.

Compatibility with Goals, Objectives and Issues – For the most part, the corridor does satisfy some of the goals, objectives and issues. The corridor does provide a new route but is long and circuitous. The route may support economic development in the region as it comes the closest to the planned western Kentucky business park. It does provide for some improved accessibility and connectivity, but may not provide the most desirable or direct route for the majority of travelers who would use the highway. It's river crossing is not near the region's preferred location of Wickliffe however. For this it is rated Medium.

Impacts – Although the corridor is lengthy, it is very isolated, remote and sparsely developed. Impacts to the community would be minimal. For this category it is rated Low. Similarly, there are some environmental impacts to existing natural areas, including the Clarks River National Wildlife Reserve, wetlands, and 100-year floodplains. These areas are largely confined to two locations – one at the beginning or the route and a large section at the western end of the route as it approaches existing US 60 / 62 in Missouri. For this reason, the rating is Medium in this category.

Overall, the corridor is recommended for advancement to Level 2 and for further consideration. Although there are localized environmental impacts, they are not "fatal flaws". The corridor does lend itself to being implemented. However, the corridor is out of the study area. This however may prove to be advantageous as it may be easier to locate needed new right-of-way especially when compared to other corridors that are the near the developed and congested Paducah / McCracken County area.

Corridor 20 - Corridor 20 would rebadge existing I-24 in Kentucky and cross into Illinois. It would also rebadge either I-57 in Illinois or I-55 in Missouri as I-66. This alternative corridor would also require a link in southern Illinois from I-24 to either I-57 or I-55 and may also consider a new / upgraded Mississippi River crossing south of Wickliffe along US 60 and an extended and upgraded US 60 in Missouri to reach I-57 near Charleston.

Constructability / Implementation / Feasibility – The reuse of existing facilities is very feasible. The improved US 60 facility would become the corridor through western Kentucky from I-24 at Paducah across a new bridge south of Wickliffe while I-66 would be coincident with I-24 into Illinois. Illinois and Missouri would then need to decide how or when to program I-66 in their respective states. The bridge at Wickliffe is preliminarily endorsed by the City of Paducah and the PADD. For this it is rated High.

Compatibility with Goals, Objectives and Issues – The corridor would satisfy a large majority of the goals, objectives and issues. The corridor would not provide a new route per se, but would use substantial portions of existing facilities thus maximizing investment. The new bridge and upgraded roadways would provide for improved accessibility and connectivity. For this it is rated High.

Impacts – New right-of-way would probably be needed for the link from I-24 to either I-57 or I-55 across southern Illinois and for programmed improvements along US 60. However, the slated improvements for US 60 are largely underway or have been substantially planned for. As a result, there would be little new or additional changes anticipated to existing businesses or communities in the US 60 corridor. Some local access points for many residences and businesses would be impacted as a result of US 60 improvements. The need for new right-of-way across a sparsely populat4ed southern Illinois presents little obstacles as well. or this category it is rated Low. Likewise, in terms of environmental impacts, the corridor misses many of the sensitive areas in the region. It is within an existing transportation right-of-way that is already disturbed and programmed for upgrade(s). The new bridge south of Wickliffe may have

impacts to the aquatic ecosystem(s) of the Mississippi River and along US 60 / 62 in Missouri. This however is likely to be the only impacts in this category. For these reasons, the rating is Low in this category.

Overall, the corridor is recommended for advancement and further consideration in Level 2 screening. The corridor can be readily implemented, it would have political support, it does take advantage of existing or planned investments, satisfies most of the goals, objectives and issues, and its impacts are low and commensurate with likely benefits.

Corridor 22 - Corridor 22 is similar to Corridor 2, except that it would utilize a portion of existing I-57 rather than go through the environmentally sensitive areas of southwestern Illinois.

Constructability / Implementation / Feasibility – In terms of constructability, most sections of the proposed corridor do lend themselves to being readily constructed since large portions of the new corridor would use existing facilities (I-24 and I-57). A new river crossing would not be needed. However, the corridor is predominantly in Illinois, which has shown little support for the I-66 study. For this reason, the corridor receives a Low rating in this category.

Compatibility with Goals, Objectives and Issues – The corridor satisfies some of the goals, objectives and issues. The corridor provides a new route and makes use of portions of the existing facilities thus maximizing investment somewhat. The route is not as direct as others under consideration and may facilitate limited economic development and other benefits, although few of them are likely to be in western Kentucky. It would provide for some improved accessibility and connectivity but is likely not to be as direct in terms of system connections as other corridors. For this it is rated Low.

Impacts – Impacts to the community are assumed to be Low. Although new right-of-way would probably be needed for the facility, the areas needed are small and are less likely to be populated and/or developed. For this category it is rated Low. In terms of environmental impacts, the corridor misses many of the major environmentally sensitive areas in the western Kentucky region. It does however have impacts on natural areas and wetlands in Illinois. For these reasons, the rating is Medium in this category.

Overall, the corridor is not recommended for advancement and further consideration in Level 2 screening. The corridor would have little support for implementation. Although it does satisfy some of the goals, objectives and issues in a minimal fashion, the environmental impacts are not commensurate with likely positive benefits. Given the fact that there are other more viable corridors, Corridor 22 is recommended for elimination from further consideration.

3.3 Screening Summary / Conclusions

In summary, of the 22 initial alternative corridors, eight (8) are not recommended for further study in Level 2 Screening. Those corridors include: 1, 2, 3, 4, 16, 17, 18, and 22. Similarly, fourteen (14) corridors, combined for analysis purposes into seven (7) corridors, are being recommended to advance to Level 2 Screening and will be studied further. Those corridors that are recommended to advance to Level 2 Screening, include: 5, 6 / 7 (combined corridor), 8, 9 / 10 (combined corridor), 11 / 12 / 13 / 14 / 15 / 21 (combined corridor), 19, and 20.

The following matrix presents a summary of the discussion above and the recommendations and analysis for the Level 1 Screening. Also presented, is a map depicting the revised / combined alternative corridors that are subject to study in Level 2 Screening.

I-66 Corridor Study
Western Kentucky to Missouri
Level 1 Screening Summary

Alt. / Corridor No.	Description	Constructability / Implementation / Feasibility	Compatibility with Goals, Objectives and Issues	Impacts		Advance to Level 2 Screening?
				Community Impacts	Environmental Impacts	
1	From existing I-24 alignment in Illinois due westward on new ROW through Shawnee National Forest to MO 146 near Cape Girardeau via existing bridge to I-55	Low	Medium	Low	High	No
2	From existing I-24 alignment in Illinois due southwestward on new ROW missing major environmental area in Illinois and Missouri around Shawnee National Forest to MO 146 near Cape Girardeau over existing bridge to I-55	Low	Medium	Low	Medium	No
3	From I-24 north of Metropolis, follow US 45 in Illinois northwest then following alternative 2 as described above to I-55	Low	Medium	Low	Medium	No
4	From existing I-24 alignment in Illinois due southwestward on new ROW missing major environmental area in Illinois and Missouri around Shawnee National Forest to new bridge over Miss. River south of Cape Girardeau to I-55	Low	Medium	Medium	High	No
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Medium	High	Medium	Medium	Yes
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Medium	High	Medium	Medium	Yes
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Missouri	Medium	Medium	Medium	Medium	Yes
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	Medium	High	Medium	Medium	Yes
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	Medium	High	Medium	Medium	Yes

I-66 Corridor Study
Western Kentucky to Missouri
Level 1 Screening Summary

Alt. / Corridor No.	Description	Constructability / Implementation / Feasibility	Compatibility with Goals, Objectives and Issues	Impacts		Advance to Level 2 Screening?
				Community Impacts	Environmental Impacts	
16	From I-24 in Marshall County proceed west along new route to McCracken County then follow parallel route to option 14 above	Low	Medium	Medium	Medium	No
17	From I-24 near US 68 in Marshall County proceed west to McCracken County along new route parallel to 16 above to similar route as 14 west and south of Paducah	Low	Medium	Medium	Medium	No
18	From I-24 / US 60 / US 68 location in Marshall County proceed west along new route to McCracken County with 17 then follow parallel route to option 14 above	Low	Medium	Medium	Medium	No
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	Medium	Medium	Low	Medium	No
20	Rebadge existing interstate I-24 as I-66	High	High	Low	Low	Yes
22	From existing I-24 alignment proceed due southwest on new ROW missing major environmental area(s) in Illinois to existing I-57	Low	Low	Low	Medium	No

Shaded corridors indicate those that are not recommended for further consideration

CAPE GIRARDEAU
ALEXANDER
PULASKI
MASSAC
METROPOLIS
BALLARD
SCOTT
BENTON
LA CENTER
KEVIL
BARLOW
PADUCAH
MCCRACKEN
CALVERT CITY
MISSISSIPPI
CAIRO
WICKLIFFE
MARSHALL
SIKESTON
CHARLESTON
WYATT
CARLISLE
BARDWELL
BENTON
Mississippi River
Ohio River
East Fork Clarks River
Kentucky Lake
Purchase Parkway

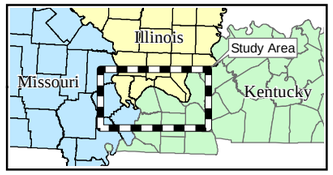
Alternative Corridors
- 5
- 6/7
- 8
- 9/10
- 11/12/13/14/15/21
- 19
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**

KENTUCKY TRANSPORTATION CABINET

MoDOT



Location Map

N
W E
S

0 2.5 5 Miles

Figure 11
LEVEL 1 ALTERNATIVES
I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 7 – LEVEL 2 SCREENING

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

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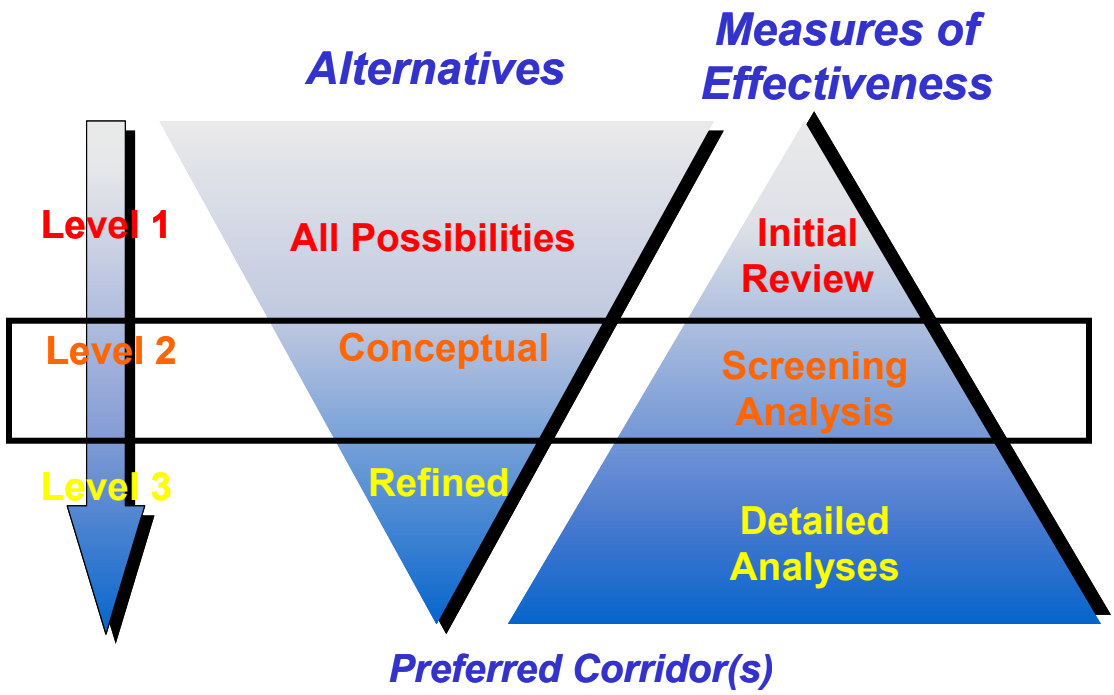
1.0 INTRODUCTION

This working paper presents the Level 2 Evaluation methodology, screening analysis and summary for the I-66 Western Kentucky to Missouri Corridor Study. It is the second in a three-step alternative corridors evaluation and screening process analyzing possible corridors for a new interstate type facility connecting western Kentucky to Missouri. Figure 1.1 demonstrates graphically the scope and nature of the three levels of analysis and outlines the relationship of the Level 2 screening relative to the other levels of screening and analysis.

The first level presented the full range of alternatives and used primarily qualitative criteria to compare and screen the initial group of 22+ alternative corridors to a narrower set. In Level 2, additional and more complex data is being used to develop a more quantitative evaluation of the remaining alternative corridors. The result of this evaluation will be the advancement of the most promising alternatives for further study and refinement in the last level of analysis and screening, Level 3. The result of the Level 3 evaluation will be a preferred alternative corridor for I-66 in the western Kentucky region.

Figure 1.1: Three-Level Evaluation Procedure



The screening / evaluation process used for this project is being undertaken collaboratively by several key individuals who have worked on the project from the beginning. Those individuals include the Project Team who are representatives of the KYTC Central Office Planning staff, KYTC District 1 staff and the consultant team, the I-

66 Project Work Group, and the public who has attended the eight open-house workshops (4 each respectively in Missouri and Kentucky) to date. All input from these individuals, along with the objective screening results were put into the evaluation and analysis process.

2.0 LEVEL 1 SUMMARY

The purpose of the Level 1 Screening was to review the alternative corridors developed to date and to perform an initial screening by applying a few comparative, qualitative measures to all alternative corridors. The goal of Level 1 Screening was to initially analyze and screen only the feasible alternative corridors that best met the project's goals, objectives and issues. Similarly, those alternatives that were not worthy of future study – those that did not meet the goals, objectives and identified issues or those that had consequences that were not commensurate with their benefits were not advanced to Level 2 Screening . The Level 1 screening produced alternatives that were recommended for further evaluation. Among them were: Alternative 5, 6 / 7 (combined corridor), Alternative 8, Alterative 9 / 10 (combined corridor), Alternative 11 / 12 / 13 / 14 / 15 / 21 (combined corridor), Alternative 19, and Alternative 20. Also, an Alternative 0 or No Build alternative was and will be part of the analysis as a base-line for comparison. These corridors were subsequently refined to accommodate a new interstate type facility and to minimize environmental and other impacts. These revised corridors are described in more detail below -

Corridor 0 (No Build) - This represents a "do nothing" option and includes those existing and committed projects that are being planned for the western Kentucky / southeastern Missouri regions respectively by the Kentucky Transportation Cabinet (KYTC) as identified in the current Six Year Plan and the Missouri Department of Transportation (MoDOT) as identified in the short range planning documents. The existing and committed projects include: US 60 improvements west to LaCenter, the Paducah Outer Loop project, and an assumed north – south I-69 project largely following existing routes. There are no major projects in Missouri impacting study area for this alternative.

Corridor 5 - From I-24 at Paducah generally following the existing US 60 corridor to Wickliffe, Kentucky over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to I-57 in Missouri north east of Charleston

Corridor 6 / 7 - From existing US 60 east of Kevil, Kentucky go southwest on a new corridor towards Wickliffe, Kentucky over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to I-57 in Missouri north east of Charleston

Corridor 8 - From I-24 at Paducah, generally following the existing US 60 corridor (similar to 5 above) to just south of Barlow, Kentucky; proceed northwest on new route across the wetland and floodplain area of the Barlow Flats over a new bridge across the Ohio River to I-57 in Illinois north of Cairo

Corridor 9 / 10 - From I-24 near Paducah, Kentucky follow new route southwesterly to Wickliffe, Kentucky (parallel to, but north of KY 286) across the Mississippi River on a new bridge at Wickliffe to I-57 north east of Charleston

Corridor 11 / 12 / 13 / 14 / 15 / and 21 - From I-24 south of Paducah follow new route southwest and largely parallel to existing KY 286 to Wickliffe, Kentucky then over the Mississippi River on a new bridge to I-57 north east of Charleston

Corridor 19 - From existing US 60 bridge across Tennessee River in Kentucky proceed south west across I-24 to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge in Carlisle County to I-57 north east of Charleston

Corridor 20 - Re-badge existing interstate I-24 in Kentucky as I-66. This corridor would also include constructing I-66 across southern Illinois along an unspecified route from a point along I-24 north of Metropolis connecting to the Bill Emerson Memorial Bridge at East Cape Girardeau, Illinois / Cape Girardeau, Missouri.

3.0 LEVEL 2 ALTERNATIVES ANALYSIS

3.1 Introduction

The Level 1 analysis examined the 22 initial alternative corridors and determined that eight (8) were not recommended for further study in Level 2 Screening. Those corridors include: 1, 2, 3, 4, 16, 17, 18, and 22. Similarly, fourteen (14) corridors, combined for analysis purposes into seven (7) corridors (described above), as well a No Build option were all recommended to be advanced to Level 2 Screening and are being studied in further detail. Those corridors that are being studied at this level include: Alternatives 0 (No Build) 5, 6 / 7 (combined corridor), 8, 9 / 10 (combined corridor), 11 / 12 / 13 / 14 / 15 / 21 (combined corridor), 19, and 20. In addition, through the course of screening and refining these alternatives, two (2) new additional corridor alternatives were developed. Those corridors included:

- Corridor 8A - US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan, plus additional improvements from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 southwest of Barlow, Kentucky to I-57 in Illinois.

- Corridor 8B - US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road from US 60 to a new bridge over the Mississippi River south of Wickliffe then to US 60 in Missouri to I-57.

3.2 Level 2 Evaluation Criteria

The analysis for this level is more expansive and quantitative than that which was conducted for Level 1, which was largely qualitative in nature. New subcategories were introduced in Level 2 to provide a more detailed comparison of the alternatives. The evaluation categories and subcategories for Level 2 include:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time, number of users (volume / ADT), truck percentage(s), safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation. Measures were taken at four (4) screen line locations, which are common points in the study area used to calculate the various measures. The screen lines are generally described as: (1) Paducah, Kentucky (2) Western McCracken County, Kentucky, (3) Ballard County, Kentucky and (4) a Mississippi River crossing. Specific measures examined in this category for the future year 2030 included:

1. Average Daily Traffic (ADT) – How many vehicles per day will use the new highway corridor (estimates for 2003 – base year / No Build and future year of 2030)
2. Level of Service (LOS)
3. Travel Time / Travel Time Savings (note: travel time and travel time savings are derived for two trips (1) from I-24 to I-55 south – essentially from Paducah, Kentucky to Sikeston, Missouri and (2) from I-24 to I-55 north – essentially Paducah, Kentucky to Cape Girardeau, Missouri. Travel time savings are expressed as a comparison of each alternative corridor as compared to the No Build (Alternative 0)
4. Safety / Security

To facilitate the analysis, the Kentucky statewide I-66 model was used as the basis for coding and running the analysis of the corridors under evaluation for Level 2 screening.

- **Support** – likelihood that one or more alternatives will be supported / is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., to date. Also contains description of relevant criteria or issues to be scrutinized. Specific measures include:

  1. Corridor - Based on input from public meetings, project work group, and stakeholder meetings, what percentage of the community favors an alternative corridor
  2. Issues - Based on input from public meetings, project work groups, and stakeholder meetings, what community issues are addressed or will need to be addressed by the corridor and the analysis

- **Community Impacts** – compatibility with adjacent and proposed land uses and the affects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc., calculated by miles and acres of adjacent property. Also included was an environmental justice analysis. Specific impacts include those to:

  1. Farmland
  2. Kentucky Agricultural Districts
  3. State / Federal Forest – Parks / Recreation lands
  4. Urban areas
  5. Probable Environmental Justice Impacts

- **Property Impacts** – more specific impact determining need for new right-of-way quantified in acres

- **Environmental Impacts** – impacts on known historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat areas, number of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands. Specific measures include:

  1. Number of Listed National Historic Registry Sites
  2. Nature / Wildlife Preserves / Conservation Lands
  3. Number of Stream Crossings
  4. Bird's Point Floodway impacts
  5. Floodplain / Floodway (100 yr. / 500 yr.) – expressed in miles and acres
  6. Wetlands

- **Capital cost considerations** – order of magnitude capital costs for proposed alternative corridors derived on a cost build up basis from typical sections for roadway (at-grade and elevated) and bridge improvements, also includes typical costs for interchanges, and appropriate costs for engineering, contingencies, etc. Specific costs include:

  1. Roadway
  2. Bridge
  3. Right-of-way
  4. Engineering / Mobilization / Demobilization
  5. Total

Note that although seemingly detailed estimates of impacts and costs are provided, the analysis was NOT to an engineering level. Assumptions are for analysis purposes, and include a 180-foot wide typical section for current year 2003 cost estimating and a 600-foot section for right-of-way purposes calculated on an average cost per acre basis. For environmental analysis, a bandwidth of 2,000 feet around an imaginary centerline of the corridor was used for analysis purposes with all data assumed available from the project's mapping databases. Comparisons should only be made to other alternatives within the context of this study.

4.0 LEVEL 2 EVALUATION SUMMARY

The Level 2 evaluation assigned some qualitative ratings but mostly developed a numerical value or quantitative rating for each alternative in the respective evaluation category. Additional comments were also provided when appropriate. Quantitative values presented in the matrices are approximations or estimates based on general corridors located within the proposed corridors and based on working assumptions

explained in the sections above describing the measures. While the detail level used in this analysis is more than in the previous phase, it is still at a planning rather than engineering level of detail. The summary results of the Level 2 evaluation are presented below.

4.1 Alternative 0

Traffic Operations

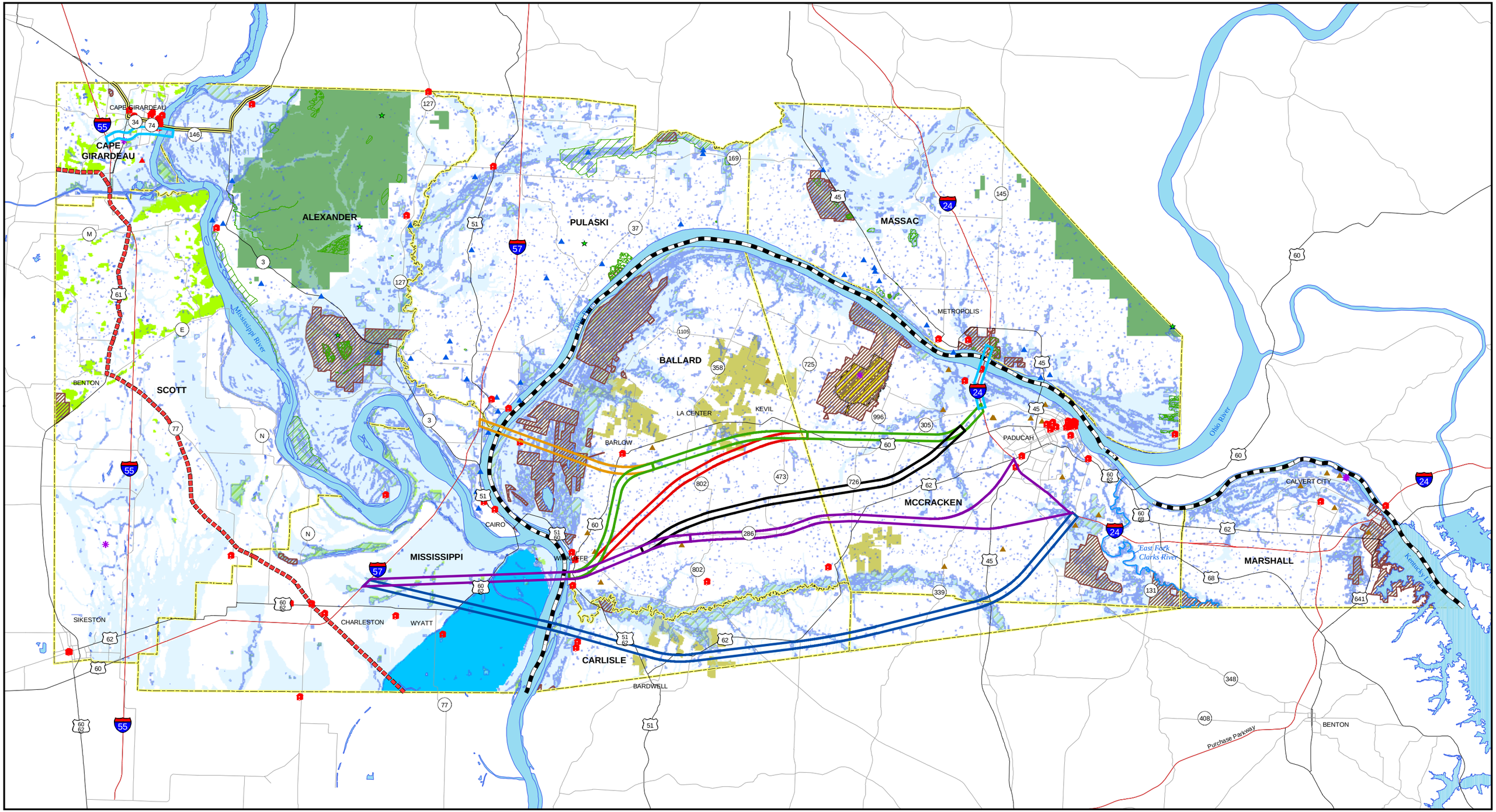
Alternative 0 is the No Build alternative and is concerned with US 60 in McCracken, and Ballard counties. It consists of all projects that are "existing and committed" – those with funding in place for initial project phases at a minimum. Essentially, it involves widening US 60 from Paducah to just east of LaCenter, Kentucky. Within the analysis, this alternative has an ADT ranging from 45,000 near Paducah at screen line #1 to 10,000 in Ballard County at screen line #3. Screen lines 2 and 4 respectively have ADTs of 11,000 (W. McCracken County) and 11,500 (over the Mississippi River). In terms of truck traffic, Alternative 0 has truck traffic of 7 to 17%, which represents an ADT of 1,000 to 3,500 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are crossing the Mississippi River. In terms of LOS, the segment with the highest ADT (the segment nearest Paducah) conversely has the lowest LOS of E (4-lanes). The LOS E continues along screen lines 3 and 4 respectively. The only improvement is at screen line 2 because the section is 4 lanes.

The travel time for the No Build serves as the baseline for comparison to other alternatives. For the two trips; Paducah to Sikeston and Paducah to Cape Girardeau, the travel times are 76 and 98 minutes respectively.

The No Build option will make some improvements to US 60; but only those programmed in the KYTC's Six Year Plan. This will have some very tangible improvements in terms of safety and security, including the provision of an upgraded routes and improved / increased access to points west of Paducah. It does not however provide for a new bridge over the Mississippi River which would provide a great deal of redundancy in terms of connectivity (east – west connections) and access for the transportation system in western Kentucky / southeastern Missouri.

Support

There is some minimal support for the No Build option in both Kentucky and Missouri. Most of those who are interested in the No Build option want more improvements than just those that are currently programmed. These same individuals also tend to be concerned with the anticipated impacts of the US 60 improvements on adjacent communities including nearby residences, businesses, farms, etc.

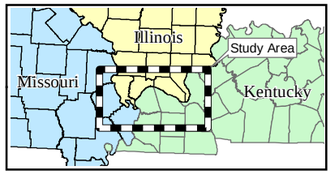


Alternative Corridors

- 5
- 6/7
- 8
- 9/10
- 11,12,13,14,15 & 21
- 19
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

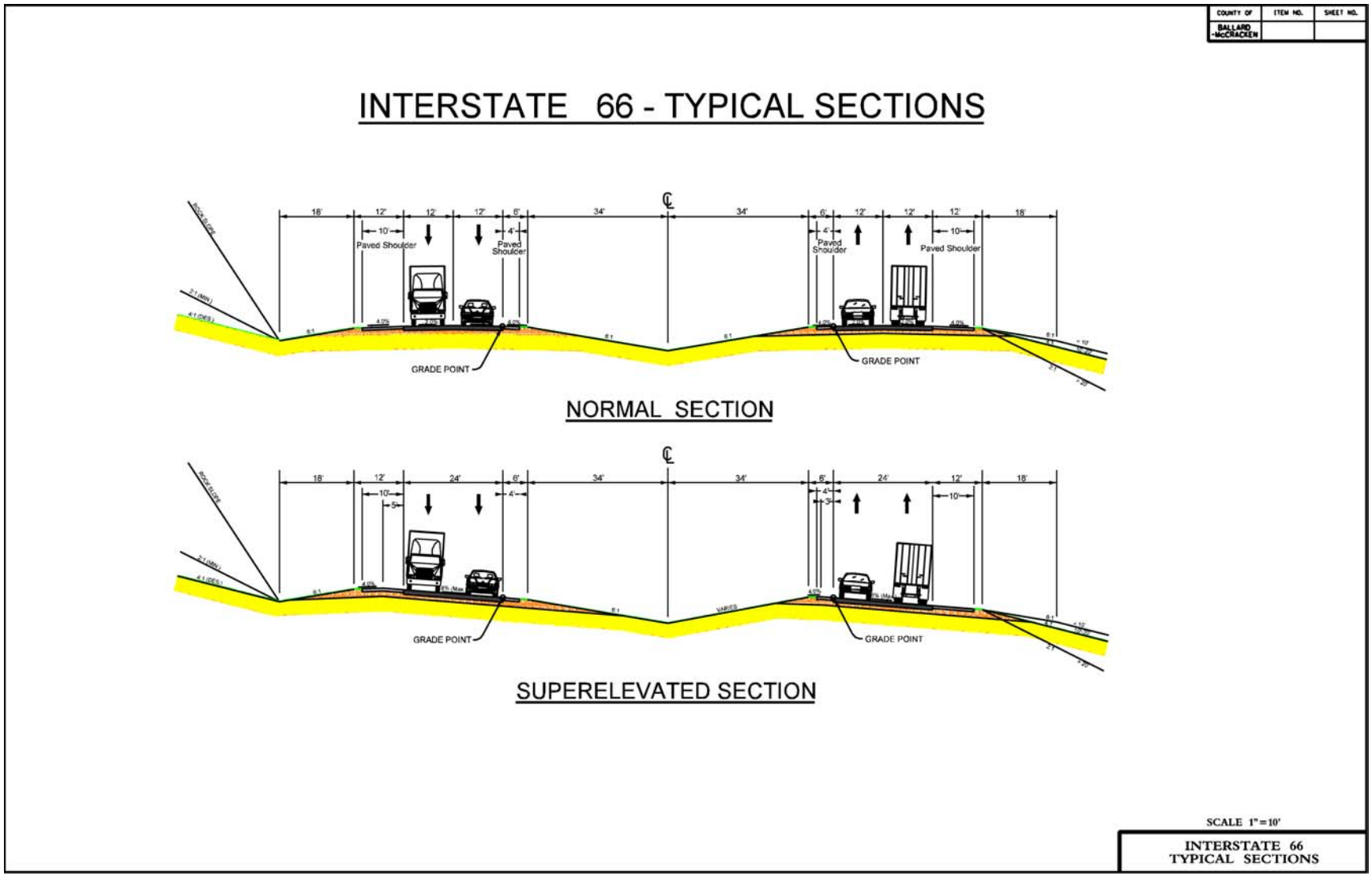
0 2.5 5 Miles

Figure 12

LEVEL 2 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Figure 2.2 Preliminary Conceptual Alternatives - Typical Sections *(assumed for planning purposes)*



Community Impacts
Community impacts have been fully documented in previous studies. The no-build alternative for the I-66 project also does not recommend further improvements beyond those existing and committed, therefore no anticipated incremental impacts are anticipated. Also, there are no adverse potential environmental justice (EJ) issues.

Property Impacts
Property impacts have been fully documented in previous studies. The no-build alternative also does not recommend further improvements beyond those existing and committed, therefore no new property impacts are anticipated.

Environmental Impacts
Environmental impacts have been fully documented in previous studies. The no-build alternative also does not recommend further improvements beyond those existing and committed, therefore no environmental impacts are anticipated.

Capital Costs
Capital costs have been fully documented in previous studies and are programmed in the KYTC's Six Year Plan. The current total for projects in the study area is $26.3 million dollars. In Ballard / McCracken County, US 60 will be widened to 4-lanes from 1 mile east of Denis Jones Road to Bethel Church Road (includes Kevil Bypass). Total costs (design and right-of-way) are $10.25 million. In Ballard County, US 60 will be widened to 4-lanes from proposed southern bypass of LaCenter to 1 mile east of Denis Jones Road. Total cost (design) is $800,000. In McCracken County, the project includes upgrading US 60 to 4-lanes from Bethel Church Road to KY 1154. Total costs (Right-of-way, utilities and construction) are $15.3 million.

4.2 Alternative 5

Traffic Operations
Alternative 5 is approximately 38.5 miles in length and is mainly concerned with US 60 in McCracken, and Ballard counties, although it makes upgrades beyond the No Build – Alternative 0, essentially upgrading US 60 to 4-lanes from Paducah to Wickliffe. Within the analysis, this alternative has an ADT ranging from 50,000 near Paducah at screen line #1 to 7,000 in Ballard County at screen line #4 over the Mississippi River. The count at the bridge is due to the fact that some north-south traffic continues to use the existing US 51 bridge to reach destinations beyond Cape Girardeau. This represents an increase over the No Build for all screen lines except the Mississippi River crossing location (screen line 4), which actually shows a decrease. Screen lines 2 and 3 respectively have ADTs of 11,500 (W. McCracken County) and 13,500 (Ballard County). In terms of truck traffic, Alternative 5 shows increased truck traffic from Alternative 0. Alternative 5 has truck traffic of 10 to 21%, which represents an ADT of 1,500 to 5,000 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screen line 3 in Ballard County. In terms of LOS, the segment with the highest ADT, the segment nearest Paducah also

has the lowest LOS at D (4-lanes). All other sections show improvement to LOS A despite increased volumes (ADT).

The travel time for alternative 5 represents an improvement from the No Build. The travel time for the Paducah to Sikeston trip decreases by 13 minutes from 76 in the baseline to 63. Similarly, the travel time for the Paducah to Cape Girardeau trip also decreases by 9 minutes from the baseline going from 98 minutes to 89 minutes.

Alternative 5 goes beyond the programmed improvements of the No Build option and actually improves US 60 all the way from Paducah to Wickliffe. The alternative also includes a new bridge over the Mississippi River. This new facility would add to safety of the system and provide a redundant link from Kentucky to Missouri for security and other purposes. The bridge location is the least preferred by the Coast Guard as it adversely affects river traffic. Likewise, alternative 5 improves system connectivity and access.

Support

There is a minimal level of support for this alternative. Issues raised in regard to alternative 5 includes concerns over impacts to residences, businesses, farms, etc., that are parallel to existing US 60.

Community Impacts

In terms of community impacts, alternative 5 has impacts to farmlands, Kentucky agricultural districts, urban areas, and has property impacts and potential environmental justice (EJ) impacts. Farmland impacts are anticipated along 30 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 9,506 acres. Similarly, the impacts to the agricultural districts in Kentucky are anticipated to be along 1.3 miles or 343 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are anticipated along 2 miles and account for 288 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated medium because of low income and elderly residents near Barlow and La Center.

Property Impacts

Total property impacts are anticipated to be 2,800 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts

The anticipated environmental impacts are to stream crossings, the Bird's Point Floodway, other floodplains and floodways (100 and 500 year) and to wetlands. There are 56 stream crossings throughout the corridor. There are also 3 miles of adjacent corridor impacts to the Bird's Point Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 12 miles of impacts to the 500 year floodplain and 0.2 miles of impacts to the 100 year flood plain. This translates to 2,944 and 35 acres respectively. Additionally, there are 1.7 miles of adjacent wetland impacts for a total of

466 acres. There are no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands.

Capital Costs
The total capital costs for alternative 5 are $536 million. $272 million is for roadway construction, $100 million for construction of a new bridge across the Mississippi River, $89 million for right-of-way and utilities and $75 million for contingencies, engineering, design and mobilization / demobilization of construction.

4.3 Alternative 6/7

Traffic Operations
Alternative 6/7 is approximately 37.13 mile in length and is a new corridor from the Ballard / McCracken County line (it would use existing US 60 on the other segment). It has similar performance characteristics to alternative 5 described above. The analysis reveals that this alternative has an ADT ranging from 50,000 near Paducah at screen line #1 to 7,000 in Ballard County at screen line #4 over the Mississippi River. This represents an increase over the No Build for all screen lines except the Mississippi River crossing location (screen line 4), which actually shows a decrease. Screen lines 2 and 3 respectively have ADTs of 11,500 (W. McCracken County) and 14,000 (Ballard County). In terms of truck traffic, Alternative 6/7 shows increased truck traffic from Alternative 0. Alternative 6/7 has truck traffic of 11 to 21%, which represents an ADT of 1,500 to 5,500 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screen line 3 in Ballard County. In terms of LOS, the segment with the highest ADT is that segment nearest Paducah. Conversely, this segment has the lowest LOS of D (4-lanes). All other sections show improvement to LOS A despite increased volumes (ADT).
The travel time for alternative 6/7 represents an improvement from the No-Build (Alternative 0). The travel time for the Paducah to Sikeston trip decreases by 14 minutes from 76 in the baseline to 62. Similarly, the travel time for the Paducah to Cape Girardeau trip also decreases by 9 minutes from the baseline going from 98 minutes to 89 minutes. This represents similar travel times for alternative 5.

Alternative 6/7 provides a new interstate corridor and also includes a new bridge over the Mississippi River. These new facilities would add to safety of the system and provide a redundant link from Kentucky to Missouri for security and other purposes. The bridge location is the least preferred by the Coast Guard as it adversely affects river traffic. Alternative 6/7 also improves system connectivity and access.

Support
There is a minimal level of support for this alternative. Issues raised in regard to Alternative 6/7 include concerns with impacts to residences, businesses, farms, etc., that are parallel to existing US 60.

Community Impacts
Community impacts for alternative 6/7 are similar in scope to those for Alternative 5. There are impacts to farmlands, Kentucky agricultural districts, urban areas, property impacts and potential EJ impacts. Farmland impacts are anticipated along 30 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 8,671 acres. Similarly, the impacts to the agricultural districts in Kentucky are anticipated to be along 1.4 miles or 352 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation lands. Impacts to urban areas are anticipated along 2 miles and account for 285 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated medium.

Property Impacts
Total property impacts are anticipated to be 2,700 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts
The anticipated environmental impacts of Alternative 6/7 are to stream crossings, the Bird's Point Floodway, other floodplains and floodways (100 and 500 year) and to wetlands. There are 54 stream crossings throughout the corridor. There are also 3 miles of adjacent corridor impacts to the Bird's Point Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 12 miles of impacts to the 500 year floodplain and 0.2 miles of impacts to the 100 year flood plain. This translates to 2,944 and 35 acres respectively. Additionally, there are 1.8 miles of adjacent wetlands impacts for a total of 425 acres. There are no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands.

Capital Costs
The total capital costs for Alternative 6/7 are $528 million. $260 million is for roadway construction, $106 million is for construction of a new bridge across the Mississippi River, $88 million is for right-of-way and utilities and $74 million is for contingencies, engineering, design, and mobilization / demobilization of construction.

4.4 Alternative 8

Traffic Operations
Alternative 8 is approximately 29.05 miles in length and is a new corridor roughly from KY 286 (connects to the corridor for Alterative 11/12/13/14/15 & 21) to I-57 in Illinois. It has similar performance characteristics in terms of traffic operations to Alternatives 5 and 6/7. The analysis for Alternative 8 reveals that this alternative has an ADT ranging from 50,000 near Paducah at screen line #1 to 10,000 at screen line #4 over the Ohio River. This represents an increase over the No Build for all screen lines except the river crossing location (screen line 4). Screen lines 2 and 3 respectively have ADTs of 13,000 (W. McCracken County) and 11,500 (Ballard County). In terms of truck traffic, Alternative 8 shows increased truck traffic from Alternative 0. Alternative 8 has truck

traffic of 10 to 24%, which represents an ADT of 1,500 to 5,000 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screen line 3 in Ballard County. In terms of LOS, the segment with the highest ADT is that segment nearest Paducah. Conversely, this segment has the lowest LOS of D (4-lanes). All other sections show improvement to LOS A despite increased volumes (ADT).

The travel time for Alternative 8 represents an improvement from the No Build. The travel time for the Paducah to Sikeston trip decreases by 10 minutes from 76 in the baseline to 66. Similarly, the travel time for the Paducah to Cape Girardeau trip also decreases by 15 minutes from the baseline going from 98 minutes to 83 minutes.

Alternative 8 provides a new interstate connector from other options nearest KY 286 also includes a new bridge over the Ohio River. These new facilities would add to safety of the system and provide a redundant link from Kentucky to Illinois and into Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic as it is across the Ohio River and does not impact river traffic as much as other proposed river crossing locations would. .

Likewise, Alternative 8 also improves system connectivity and access.

Support

There is some support for Alternative 8. Issues associated with this corridor include impacts to wetlands, floodplains, and potential wildlife refuge and habitat area impacts near Barlow, Kentucky.

Community Impacts

Community impacts for Alternative 8 are slightly smaller in scope than those for Alternative 5 or 6/7. There are impacts to farmlands, Kentucky agricultural districts, urban area, property impacts and potential EJ impacts. Farmland impacts are anticipated along 21 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 7,222 acres. Similarly, the impacts to the agricultural districts in Kentucky are anticipated to be along 1.3 miles or 343 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are anticipated along 1 mile of the corridor and account for 135 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated low. There could possibly be some positive EJ benefits to the Cairo, Illinois area because of the improved access offered by the community's proximity to the new bridge.

Property Impacts

Total property impacts are anticipated to be 2,113 acres. The needed right-of-way is a mixture of farmlands, agricultural district lands, urban areas and other land uses.

Environmental Impacts
The anticipated environmental impacts of Alternative 8 are to a NHR site, nature / wildlife preserves and conservation lands, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands. There is one anticipated impact to a NHR site – approximately a 4/10s of a mile segment of the Trail of Tears National Historic Trail. There are also 2 miles or 455 acres of impact to nature / wildlife preserves and conservation land in northwest Ballard County. In addition, there are 49 stream crossings throughout the corridor. For floodplains, there are 7 miles of impacts to the 500 year floodplain and 0.5 miles of impacts to the 100 year flood plain. This translates to 1,810 and 123 acres respectively. Additionally, there are 4 miles of wetland impacts for a total of 1,001 acres. There are no anticipated impacts to the Bird's Point Floodway.

Capital Costs
The total capital costs for Alternative 8 are $517 million. $206 million is for roadway, construction, $129 million for construction of a new bridge across the Ohio River, $114 million for right-of-way and utilities and $68 million for contingencies, engineering, design and mobilization / demobilization of construction.

4.5 Alternative 8A

Traffic Operations
Alternative 8A is roughly 29.05 miles in length and is a new connector from US 60 in Kentucky to I-57 in Illinois and includes a new bridge over the Ohio River. It has similar performance in terms of traffic operations to Alternative 8. The analysis for Alternative 8A reveals that this alternative has an ADT ranging from 51,500 near Paducah at screen line #1 to 7,000 at screen line #4 over the Ohio River. This represents an increase over the No Build for all screen lines except the river crossing location (screen line 4). Screen lines 2 and 3 respectively have ADTs of 14,000 (W. McCracken County) and 12,500 (Ballard County). In terms of truck traffic, Alternative 8A shows increased truck traffic from Alternative 0 at all locations except for the river crossing. Alternative 8A has truck traffic of 7 to 14%, which represents an ADT of 500 to 4,000 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screen line 2 in western McCracken County. In terms of LOS, the screen line with the highest ADT has the worst level of service at LOS F – which is actually a decrease from the No Build because the facility has only two lanes in which to accommodate the increased traffic. Similarly, screen line # 2 also shows a decrease form LOS A in the No to B in the analysis. LOS at screen lines 3 and 4 are unchanged from the No Build.

The travel time for Alternative 8A represent slight improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by 2 minutes from 76 in the baseline to 74. Similarly, the travel time for the Paducah to Cape Girardeau trip decreases by 7 minutes from the baseline going from 98 minutes to 92 minutes.

Alternative 8A provides a new bridge connector from US 60 in Kentucky to I-57 in Illinois. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky to Illinois and into Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. The location across the Ohio River would have minimum impacts on river traffic. Likewise, Alternative 8A also improves system connectivity and access.

Support

Support exists for continuing US 60 improvements and for upgrading the corridor. There is some support for a potential new bridge somewhere over the Ohio River northwest of Barlow, Kentucky. Issues of concern include impacts to areas adjacent to US 60 as well as wetland and wildlife habitat area impacts and concerns over the river crossing location near Barlow.

Community Impacts

Community impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River. For analysis purposes, no other details are provided in this level of screening. However, impacts can be assumed to be similar to those of the No Build or Alternative 0.

Property Impacts

Property impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River. For analysis purposes, no other details are provided in this level of screening. However, property impacts can be assumed to be similar to those of the No Build or Alternative 0.

Environmental Impacts

Environmental impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Ohio River. For analysis purposes, no other details are provided in the level of screening. Environmental impacts can be assumed to be similar to those of the No Build or Alternative 0 for the roadway. There is anticipated to be considerable impacts to the wildlife management / recreation areas (including wetlands and waterfowl habitat areas) southwest of Barlow, Kentucky for the location of the river crossing / bridge.

Capital Costs

The total capital costs for Alternative 8A are assumed to be more than $184 million. There are no additional costs assumed for roadway due to the fact that US 60 will be upgraded. Incremental costs for the roadway component from east of LaCenter, Kentucky to southwest of Barlow, Kentucky were not available for Level 2 evaluation. The costs of a new bridge over the Ohio River northwest of Barlow, Kentucky for this alternative are $129 million. Costs for right-of-way and utilities are $29 million, while

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*											
		Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River (Ohio River for 8 & 8A)		
		Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	45,000 (US 60)	3,500 (7%)	E (4 lanes)	11,000 (US 60)	1,500 (14%)	A (4 lanes)	10,000 (US 60)	1,000 (10%)	E (2 lanes)	11,500 (Bridge Over Ohio River)	2,000 (17%)	E (2 lanes)
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,000 (10%)	D	11,500	3,000 (26%)	A	13,500	2,500 (19%)	A	7,000	1,500 (21%)	A
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,500 (11%)	D	11,500	3,000 (26%)	A	14,000	2,500 (18%)	A	7,000	1,500 (21%)	A
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	50,000	5,000 (10%)	D	13,000	3,000 (23%)	A	11,500	2,500 (24%)	A	10,000 (Bridge Over Ohio River)	1,500 (15%)	A
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	51,500 (US 60)	4,000 (8%)	F (4 lanes)	14,000 (US 60)	2,000 (14%)	B (4 lanes)	12,500 (US 60)	1,500 (12%)	A (4 lanes)	7,000 (Bridge Over Ohio River)	500 (7%)	A (4 lanes)
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	44,500 (US 60)	3,500 (8%)	E (4 lanes)	7,000 (US 60)	1,500 (21%)	A (4 lanes)	6,000 (US 60)	500 (8%)	A (4 lanes)	5,500	500 (9%)	A (4 lanes)
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	25,000	3,500 (14%)	B	15,500	3,000 (19%)	A	9,500	2,500 (26%)	A	7,000	1,500 (21%)	A
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	35,000	5,000 (14%)	C	19,000 - 30,000	3,500-4,500 (15-18%)	A-B	12,500	3,000 (24%)	A	7,500	1,500 (20%)	A
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	16,000	3,500 (22%)	A	17,500	3,000 (17%)	A	10,500	2,000 (19%)	A	8,000	1,500 (19%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	15,500	1,500 (10%)	A	15,500	1,500 (10%)	A	16,000	1,500 (10%)	A	17,000	2,000 (12%)	A

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*			
		Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	76	98	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	63 (13)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	62 (14)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	66 (10)	83 (15)	Provides some level of improvement - New bridge over Ohio River	Makes some new system connections
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	74 (2)	91 (7)	Provides some level of improvement - New bridge over Ohio River	Keeps existing connectivity and access, provides for new river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	74 (2)	98 (0)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	61 (15)	87 (11)	Provides improvement - New bridge over Mississippi River	Makes new system connections
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	58 (18)	84 (14)	Provides improvement - New bridge over Mississippi River	Makes new system connections
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	60 (16)	88 (10)	Provides improvement - New bridge over Mississippi River	Connects to planned regional industrial / development site
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	74 (2)	67 (31)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Support		Community Impacts					
		Corridor	Issues	Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 5	Parallels US 60 corridor, some farm and / or residential impacts, least favorable river crossing location	30 mi/9,506 ac	1.3 mi/343 ac	None	2 mi/288 ac	Medium	2,800
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 6 / 7	Farm impacts, least favorable river crossing location	30 mi/8,671 ac	1.4 mi/352 ac	None	2 mi/285 ac	Medium	2,700
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, preferred river crossing	21 mi/7,222 ac	1.3 mi/343 ac	None	1 mi/135 ac	Medium	2,113
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Support exists for US 60 improvements; however little support has been expressed for a new bridge southwest of Barlow, KY	Impacts to adjacent development on US 60 plus wetland, floodplain and potential wildlife refuge impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and south of Wickliffe, impacts to farmland in Missouri					
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	Support is somewhat strong for Alternative 9/10. It is equal to Alternative 11/12/13/14/15/21	Farmland impacts, uses least favorable river crossing	28 mi/8,618 ac	None	None	1 mi/264 ac	Low	2,643
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	Support is strong for Alternative 11/12/13/14/15/21. It is equal to Alternative 9/10	Farmland impacts, uses least favorable river crossing	29 mi/7,319 ac	1.7 mi/420 ac	None	0 mi/144 ac	Low	2,786
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	There has been no vocal support for Alternative 19 during public	Large need for new right of way, closest to planned industrial park, impacts to flats area, preferred river crossing location	34 mi/10,134 ac	0.8 mi/269 ac	< 1 mi/8 ac	None	Low	3,049
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	There has been some level of support for Alternative 20, there has also been equal support against the alternative especially from residents of KY	In southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of newly built bridge	33 mi/7,957 ac	None	8 mi/1,964 ac	3 mi/469 ac	High	3,514

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts**							Capital Costs***					Advance to Level 3 Screening?
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Birds Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (100 yr. / 500 yr.) (in miles)	Floodplain / Floodway (100 yr. / 500 yr.) (in acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total	
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated							No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million					Yes
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	56	3 miles/723 acres	12/0.2	2,944/35	1.7 mi/466 ac	$272	$100	$89	$75	$536	No
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	54	3 miles/723 acres	12/0.2	2,944/35	1.8 mi/425 ac	$260	$106	$88	$74	$528	No
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7/0.5	1,810/123	4.0 mi/1,001ac	$206	$129	$114	$68	$517	No
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and northwest of Barlow - impacts to Barlow Flats and adjacent wildlife management area in northeastern Ballard County, KY							$0	$129	$29	$26	$184	No
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated south of Wickliffe and to Bird's Point floodway area in Missouri							$0	$140	$41	$28	$209	Yes
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	None	None	46	3 miles/723 acres	11.5/0.1	2,787/33	1.4 mi/357 ac	$274	$105	$95	$77	$551	No
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	None	None	54	3 miles/723 acres	11.5/ < 1	2774/21	1.2 mi/312 ac	$287	$109	$148	$80	$624	Yes
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	1 (0.4 miles of Trail of Tears NHT)	< 1 mi/8 ac	77	4.5 miles/1,068 acres	13/0.2	3,179/54	1.6 mi/615 ac	$317	$140	$163	$93	$713	No
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	1 (4.5 miles of Trail of Tears NHT)	None	41	None	8/1	1,991/300	1.9 mi/530 ac	$340	$0	$127	$69	$536	Yes

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

contingencies, engineering, design and mobilization / demobilization of construction are estimated at $26 million.

4.6 Alternative 8B

Traffic Operations

Alternative 8B is approximately 38.5 miles in total length and is a new connector from US 60 to I-57 in Missouri and includes a new bridge over the Mississippi River. It has similar performance in terms of traffic operations to Alternatives 8 and 8A. The analysis for Alternative 8B reveals that this alternative has an ADT ranging from 44,500 near Paducah at screen line #1 to 5,500 at screen line #4 over the Mississippi River. This represents a decrease over the No Build for all screen lines with screen lines 2 and 3 respectively having ADTs of 7,000 (W. McCracken County) and 6,000 (Ballard County). In terms of truck traffic, Alternative 8B shows decreased truck traffic from Alternative 0 at screen lines 3 and 4. Counts for trucks at screen lines 1 and 2 are equal to the No Build. Alternative 8B has truck traffic of 8 to 21%, which represents an ADT of 500 to 3,500 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screen line 2 in western McCracken County. In terms of LOS, the screen line with the highest ADT has the worst level of service at LOS E – which is the same as the No Build. LOS at screen lines 2, 3 and 4 are unchanged from the No Build.

The travel time for Alternative 8B represents very slight improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by 2 minutes from 76 in the baseline to 74 for 8B. The travel time for the Paducah to Cape Girardeau trip represents no change from the No Build and is also 98 minutes.

Alternative 8B provides a new bridge connector from US 60 in Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on river traffic. Likewise, Alternative 8B also improves system connectivity and access.

Support

Support exists for continuing US 60 improvements and for upgrading the corridor. There is also potential support for a new bridge over the Mississippi River near Wickliffe, Kentucky. Issue of concern include impacts to areas adjacent to US 60 as well as wetland impacts and concerns over the river crossing location, especially impacts to river traffic and impacts to the Bird's Point floodway in Missouri.

Community Impacts

Community impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. For analysis purposes, no other details are

provided in this level of screening. However, impacts can be assumed to be similar to those of the No Build or Alternative 0.

Property Impacts
Property impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. For analysis purposes, no other details are provided in this level of screening. However, property impacts can be assumed to be similar to those of the No Build or Alternative 0.

Environmental Impacts
Environmental impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. For analysis purposes, no other details are provided in this level of screening. However, environmental impacts can be assumed to be similar to those of the No Build or Alternative 0. There is anticipated to be considerably impacts to the Bird's Point Floodway in Missouri, due west of Wickliffe, Kentucky.

Capital Costs
The total capital costs for Alternative 8A are assumed to be more than $209 million. There are no additional costs assumed for the roadway due to the fact that US 60 will be upgraded. Incremental costs for the roadway component from east of LaCenter, Kentucky to Wickliffe, Kentucky were not available for Level 2 evaluation. The costs of a new bridge over the Mississippi River near Wickliffe, Kentucky are $129 million. Costs for right-of-way and utilities are $41 million, while contingencies, design, engineering and mobilization / demobilization of construction are estimated at $28 million.

4.7 Alternative 9/10

Traffic Operations
Alternative 9/10 is roughly 36.34 miles in length and is a new corridor from Paducah to Wickliffe with a new bridge over the Mississippi River connecting to I-57, in Missouri. It shows improvements in terms of operations over the No Build for all segments and screen lines above those observed for Alternatives 5, 6/7 and 8, 8A and 8B. The analysis for Alternative 9/10 reveals that this alternative has an ADT ranging from 25,000 near Paducah at screen line #1 to 7,000 at screen line #4 over the Mississippi River. This represents a decrease in volumes over the No Build for screen lines #1, 3 and 4 with an increase for screen line #2. Screen lines 2 and 3 respectively have ADTs of 15,500 (W. McCracken County) and 9,500 (Ballard County). In terms of truck traffic, Alternative 9/10 shows modest increases in truck traffic from the No Build (Alternative 0); depending upon location. Alternative 9/10 has truck traffic of 14 to 21%, which represents an ADT of 1,500 to 3,500 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are

at screen line 3 in Ballard County. In terms of LOS, this alternative makes an improvement near Paducah at screen line 1 with LOS B. All other segments are also improved over the No Build but are similar in performance to those of Alternative 5, 6/7, and 8.
The travel time for Alternative 9 / 10 represents significant improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by 15 minutes from 76 in the baseline to 61. The travel time for the Paducah to Cape Girardeau trip represents a change of 11 minutes from 98 in the No Build to 87 for this alternative.

Alternative 9/10 provides a new bridge connector from Kentucky to I-57 in Missouri with a new interstate corridor. These new facilities would add significantly to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on river traffic as it causes disruptions to river traffic below because of the location of the piers and the proximity of the structure to the confluence of the Ohio and Mississippi rivers. Likewise, this alternative also improves system connectivity and access.

Support
Support is somewhat strong for Alternative 9/10. It is equal to the support for Alternative 11/12/13/14/15/ & 21. Issues of concern include farmland impacts and river crossing location.

Community Impacts
Community impacts for Alternative 9/10 are similar in scope to those for similar alternatives, namely 6/7 and 11/12/13/14/15 & 21. There are impacts to farmlands, urban areas, property impacts and potential EJ impacts. Farmland impacts are anticipated along 28 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 8,618 acres. There are no impacts to the agricultural districts in Kentucky. Likewise, there are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are low as they are along a 1-mile of the alternative corridor and account for 264 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated low.

Property Impacts
Total property impacts for right-of-way purposes are anticipated to be 2,643 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts
The anticipated environmental impacts of Alternative 9/10 are to stream crossings, the Bird's Point Floodway, other floodplains and floodways (100 and 500 year) and to wetlands. There are 46 stream crossings throughout the corridor. There are also 3 miles of adjacent corridor impacts to the Bird's Point Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 11.5 miles of impacts to the 500 year floodplain and 0.1 miles of impacts to the 100 year flood plain. This translates to

2,787 and 33 acres respectively. Additionally, there are 1.4 miles of adjacent wetlands impacts for a total of 357 acres. There are no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands.

Capital Costs

The total capital costs for Alternative 9/10 are $551 million. $274 million is for roadway, construction, $105 million for construction of a new bridge across the Mississippi River, $95 million for right-of-way and utilities and $77 million for contingencies, design, engineering and mobilization / demobilization of construction.

4.8 Alternative 11/12/13/14/15 and 21

Traffic Operations

Alternative 11/12/13/14/15 and 21 is approximately 38.31 miles in length and is a new corridor from Paducah to Wickliffe, Kentucky with a connection to I-57 in Missouri. It shows improvements in terms of operations over the No Build for all segments and screen lines. The analysis for Alternative 11/12/13/14/15 and 21 reveals that this alternative has an ADT ranging from 35,000 near Paducah at screen line #1 to 7,500 at screen line #4 over the Mississippi River. This represents change from the No Build for all screen lines. Screen lines 1 and 4 decrease; while screen lines 2 and 3 respectively increase. ADTs are 35,000 at screen line #1, 19,000 to 30,000 at screen line #2, 12,500 at screen line #3 and 7,500 at screen line #4. Alternative 11/12/13/14/15 and 21 also shows modest increases in truck traffic from Alternative 0 at screen line locations 1, 2, and 3. Truck ADT is 5,000, 3,500 – 4,500, 3,000 and 7,500 at screen lines 1 to 4 respectively. This represents a truck traffic % of 14 to 24%. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are again at screen line 3 in Ballard County. In terms of LOS, this alternative makes an improvement near Paducah at screen line 1 with LOS C. All other segments are also improved over the No Build and are similar in performance to the others under consideration.

The travel time for Alternative 11/12/13/14/15/&21 represent significant improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by 18 minutes from 76 in the baseline to 58. The travel time for the Paducah to Cape Girardeau trip also decreases by 14 minutes from 98 in the No Build to 84 for this alternative.

Alternative 11/12/13/14/15 & 21 provides a new bridge connector along the new interstate from Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from KENTUCKY directly to Missouri for security purposes. This bridge location is less preferable in terms of the Coast Guard's analysis of affects on river traffic. This alternative would also improve system connectivity and access.

Support

Support is strong for Alternative 11/12/13/14/15/ & 21. It is equal to the support for Alternative 9/10. The river crossing is of concern to the US Coast Guard as it causes disruptions to river traffic below because of the location of the piers and the proximity of the structure to the confluence of the Ohio and Mississippi rivers. The location would also impact the operation of the Bird's Point Floodway in Missouri. Issues of concern include farmland impacts and river crossing location.

Community Impacts

Community impacts for Alternative 11/12/13/14/15 & 21 are similar in scope to those for similar alternatives, namely 6/7 and 9/10. There are impacts to farmlands, Kentucky Agricultural Districts, urban areas, property impacts and potential EJ impacts. Farmland impacts are anticipated along 29 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 7,319 acres. There are also impacts to the agricultural districts in Kentucky. There is 1.7 mile of impacts adjacent to the corridor, which translates to 420 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are low as they only account for 144 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated low.

Property Impacts

Total property impacts for right-of-way purposes are anticipated to be 2,786 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts

The anticipated environmental impacts of Alternative 11/12/13/14/15 & 21 are to stream crossings, the Bird's Point Floodway, other floodplains and floodways (100 and 500 year) and to wetlands. There are 54 stream crossings throughout the corridor. There are also 3 miles of adjacent corridor impacts to the Bird's Point Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 11.5 miles of impacts to the 500 year floodplain and less than 1 mile of impacts to the 100 year flood plain. This translates to 2,774 and 21 acres respectively. Additionally, there are 1.2 miles of adjacent wetlands impacts for a total of 312 acres. There are no anticipated impacts to listed National Historic Register (NHR) sites, nature preserves / conservation lands.

Capital Costs

The total capital costs for Alternative 11/12/13/14/15 & 21 are $624 million. $287 million is for roadway construction, $109 million for construction of a new bridge across the Mississippi River, $148 million for right-of-way and utilities and $80 million for contingencies, design, engineering and mobilization / demobilization of construction.

4.9 Alternative 19

Traffic Operations

Alternative 19 is approximately 41.93-miles in length and is a new corridor from Paducah to Wickliffe, Kentucky and one to I-57 near Wyatt, Missouri. This corridor is well south of the others. It shows improvements in terms of operations over the No Build for all segments and screen lines. The analysis for Alternative 19 reveals that this alternative has an ADT ranging from 17,500 in Western McCracken County at screen line #2 to 8,000 at screen line #4 over the Mississippi River. This represents changes from the No Build for all screen lines. Screen lines 1 and 4 decrease; with the volumes at Paducah decreasing considerably while the counts at screen line 4 decrease more modestly. Counts at screen lines 2 and 3 respectively increase; although very modestly at screen line #3. ADTs are 16,000 at screen line #1, 17,500 at screen line #2, 10,500 at screen line #3 and 8,000 at screen line #4. Alternative 19 also shows modest increases in truck traffic from Alternative 0 at screen line locations 2, and 3. Truck ADT is 3,500, 3,000, 2,000 and 1,500 at screen lines 1 to 4 respectively. This represents a truck traffic % of 17 to 22%. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are also at Paducah near screen line #1. In terms of LOS, this alternative makes an improvement near Paducah at screen line 1 with LOS A. All other segments are also improved to A over the No Build and are similar in performance to the others under consideration.

The travel time for Alternative 19 represents improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by 16 minutes from 76 in the baseline to 60. The travel time for the Paducah to Cape Girardeau trip represents travel time savings of ten minutes from 98 in the No Build to 88 for this alternative.

Alternative 19 provides a new bridge connector from the new interstate facility in Kentucky to I-57 in Missouri. These new facilities would add to safety of the system and provide a redundant river crossing link from Kentucky directly to Missouri for security purposes. This bridge location is preferable in terms of the Coast Guard's analysis of affects on river traffic. Likewise, Alternative 19 also improves system connectivity and access, especially to the planned industrial park in Graves County.

Support

There is modest geographical support for Alternative 19. Issues associated with this corridor include impacts to wetlands and floodplains. The bridge crossing location is preferred by the US Coast Guard, as it would not affect Mississippi River traffic.

Community Impacts

Community impacts for Alternative 19 are slightly more in scope than others that involve a Mississippi River crossing. There are impacts to farmlands, Kentucky agricultural districts, State / Federal / Forests – Parks and Recreation lands, property impacts and potential EJ impacts. Farmland impacts are anticipated along 34 miles of adjacent

roadway throughout the corridor. This translates to an impact area of approximately 10,134 acres. This is the largest impact in this category. Similarly, the impacts to the agricultural districts in Kentucky are anticipated to be along 0.8 miles and account for 269 acres. There are also anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts in the category are slight however as they account for less than 1 mile and only 8 acres. There are no impacts to urban areas anticipated along the corridor. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated low.

Property Impacts

Total property impacts are anticipated to be 3,049 acres for right-of-way purposes. The needed right-of-way is a mixture of farmlands, agricultural district lands, and other land uses.

Environmental Impacts

The anticipated environmental impacts of Alternative 19 are to a NHR site, nature / wildlife preserves and conservation lands, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands. There is one anticipated impact to a National Historic Register (NHR) site – approximately a 4/10s of a mile segment of the Trail of Tears National Historic Trail. There is also less than 1 mile or approximately 8 acres of impacts to nature / wildlife preserves and conservation lands. In addition, there are 77 stream crossings throughout the corridor – the highest number in this evaluation category. There are also 4.5 miles of impacts to the Bird's Point Floodway which translates to 1,068 acres. For floodplains, there are 13 miles of impacts to the 500 year floodplain and 0.2 miles of impacts to the 100 year flood plain. This translates to 3,179 and 54 acres respectively. Additionally, there are 1.6 miles of wetland impacts for a total of 615 acres.

Capital Costs

The total capital costs for Alternative 19 are $713 million. $317 million is for roadway construction, $140 million for construction of a new bridge across the Mississippi River, $163 million for right-of-way and utilities and $93 million for contingencies, design, engineering and mobilization / demobilization of construction.

4.10 Alternative 20

Traffic Operations

Alternative 20 is approximately 48.32 miles in length and is a new unspecified corridor from I-24 north of Paducah to I-55 near Cape Girardeau Missouri, largely across southern Illinois. An assumed corridor was drawn in southern Illinois for analysis purposes, as no "official" corridor was determined. Alternative 20 shows improvements in terms of operations over the No Build for all segments and screen lines. The analysis for Alternative 20 reveals that this alternative has an ADT ranging from 15,500 near Paducah and Western McCracken County at screen lines 1 and 2 to 16,000 at screen line #3 in Ballard County and 17,000 over the Mississippi River at screen line #4 near

Cape Girardeau, Missouri. This represents changes from the No Build for all screen lines. Screen line 1 decreases significantly while counts at screen lines 2, 3 and 4 respectively increase. Alternative 20 shows little change in terms of truck traffic from Alternative 0. At screen line 1, the volume of trucks decreases, perhaps showing that these vehicles stick to existing routes. The truck volumes are unchanged at screen lines 2 and 3 and increase slightly at screen line #3. This represents a truck traffic % of 10 to 12%. The most trucks in terms of number are crossing the Mississippi River at screen line #4. In terms of LOS, this alternative makes an improvement at all screen line locations with LOS A. Again, this improvement to A is similar in performance to the other alternatives under consideration.

The travel time for Alternative 20 represent very slight improvements for the Paducah to Sikeston trip, which decreases by 2 minutes from 76 in the baseline to 74. However, the travel time for the Paducah to Cape Girardeau trip represents a large travel time savings of 31 minutes as the trips goes from 98 in the No Build to 67 for Alternative 20.

Alternative 20 provides no new bridge connector but does provide a new interstate across southern Illinois. It may also require some widening of I-24 in Kentucky and the need for a connector roadway of interstate quality from the bridge at Cape Girardeau to I-55. These new facilities would add to safety of the system and add benefits for security purposes. This alternative provides good access and connectivity benefits for southern Illinois and the Cape Girardeau Missouri areas. It provides little benefit for Western Kentucky because the new route is located in Illinois.

Support

There is strong support for Alternative 20 mainly from constituencies in the Cape Girardeau area. There has been almost an equal amount of opposition to Alternative 20 from study participants who reside in Kentucky. Issues associated with this corridor include impacts to the Shawnee National Forest. The bridge crossing location at Cape Girardeau would make use of the Bill Emerson Bridge currently under construction.

Community Impacts

Community impacts for Alternative 20 include impacts to farmlands, State / Federal / Forests – Parks and Recreation lands, urban area impacts, property impacts and potential EJ impacts. Farmland impacts are anticipated along 33 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 7,957 acres. There are no impacts to Kentucky Agricultural Districts. There are anticipated impacts to state / Federal forests, parks, and/or recreation land, namely the Shawnee National Forest. Impacts in this category are 8 miles and account for 1,964 acres. There are impacts to urban areas anticipated along the corridor, which account for 3 miles and 469 acres respectively. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income and/or elderly) along the corridor is rated high primarily to the location of the corridor near EJ communities near Cape Girardeau.

Property Impacts

Total property impacts are anticipated to be 3,514 acres, largely for right-of-way purposes. The needed right-of-way is a mixture of farmlands, forests / recreation areas, urban areas, and other land uses.

Environmental Impacts

The anticipated environmental impacts of Alternative 20 are to a NHR site, to stream crossings, other floodplains and floodways (100 and 500 year) and to wetlands. There is one anticipated impact to a NHR site – a 4.5-mile segment of the Trail of Tears National Historic Trail. There are no impacts to nature / wildlife preserves and conservation land. In addition, there are 41 stream crossings throughout the corridor. There are no impacts to the Bird's Point Floodway. For floodplains, there are 8 miles of impacts to the 500 year floodplain and 1 mile of impacts to the 100 year flood plain. This translates to 1,991 and 300 acres respectively. Additionally, there are 1.9 miles of wetland impacts for a total of 530 acres.

Capital Costs

The total capital costs for Alternative 19 are more than $536 million. $340 million is for construction of the roadway, $127 million for right-of-way and utilities and $69 million for contingencies, design, engineering and mobilization / demobilization of construction. There are no additional costs assumed for the bridge at Cape Girardeau. Additional costs would include any new widening of I-24 in Kentucky and/or Illinois and the construction of an interstate quality connector from the Bill Emerson Bridge to I-55 near Cape Girardeau.

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*											
		Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River (Ohio River for 8 & 8A)		
		Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	45,000 (US 60)	3,500 (7%)	E (4 lanes)	11,000 (US 60)	1,500 (14%)	A (4 lanes)	10,000 (US 60)	1,000 (10%)	E (2 lanes)	11,500 (Bridge Over Ohio River)	2,000 (17%)	E (2 lanes)
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,000 (10%)	D	11,500	3,000 (26%)	A	13,500	2,500 (19%)	A	7,000	1,500 (21%)	A
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	50,000	5,500 (11%)	D	11,500	3,000 (26%)	A	14,000	2,500 (18%)	A	7,000	1,500 (21%)	A
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	50,000	5,000 (10%)	D	13,000	3,000 (23%)	A	11,500	2,500 (24%)	A	10,000 (Bridge Over Ohio River)	1,500 (15%)	A
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	51,500 (US 60)	4,000 (8%)	F (4 lanes)	14,000 (US 60)	2,000 (14%)	B (4 lanes)	12,500 (US 60)	1,500 (12%)	A (4 lanes)	7,000 (Bridge Over Ohio River)	500 (7%)	A (4 lanes)
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	44,500 (US 60)	3,500 (8%)	E (4 lanes)	7,000 (US 60)	1,500 (21%)	A (4 lanes)	6,000 (US 60)	500 (8%)	A (4 lanes)	5,500	500 (9%)	A (4 lanes)
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	25,000	3,500 (14%)	B	15,500	3,000 (19%)	A	9,500	2,500 (26%)	A	7,000	1,500 (21%)	A
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	35,000	5,000 (14%)	C	19,000 - 30,000	3,500-4,500 (15-18%)	A-B	12,500	3,000 (24%)	A	7,500	1,500 (20%)	A
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	16,000	3,500 (22%)	A	17,500	3,000 (17%)	A	10,500	2,000 (19%)	A	8,000	1,500 (19%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	15,500	1,500 (10%)	A	15,500	1,500 (10%)	A	16,000	1,500 (10%)	A	17,000	2,000 (12%)	A

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations*			
		Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	76	98	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	63 (13)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	62 (14)	89 (9)	Provides some level of improvement - New bridge over Mississippi River	Makes new system connections
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	66 (10)	83 (15)	Provides some level of improvement - New bridge over Ohio River	Makes some new system connections
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	74 (2)	91 (7)	Provides some level of improvement - New bridge over Ohio River	Keeps existing connectivity and access, provides for new river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	74 (2)	98 (0)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	61 (15)	87 (11)	Provides improvement - New bridge over Mississippi River	Makes new system connections
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	58 (18)	84 (14)	Provides improvement - New bridge over Mississippi River	Makes new system connections
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	60 (16)	88 (10)	Provides improvement - New bridge over Mississippi River	Connects to planned regional industrial / development site
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	74 (2)	67 (31)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Support		Community Impacts					
		Corridor	Issues	Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 5	Parallels US 60 corridor, some farm and / or residential impacts, least favorable river crossing location	30 mi/9,506 ac	1.3 mi/343 ac	None	2 mi/288 ac	Medium	2,800
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	Minimal support for Alternative 6 / 7	Farm impacts, least favorable river crossing location	30 mi/8,671 ac	1.4 mi/352 ac	None	2 mi/285 ac	Medium	2,700
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, preferred river crossing	21 mi/7,222 ac	1.3 mi/343 ac	None	1 mi/135 ac	Medium	2,113
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Support exists for US 60 improvements; however little support has been expressed for a new bridge southwest of Barlow, KY	Impacts to adjacent development on US 60 plus wetland, floodplain and potential wildlife refuge impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing	Community impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and south of Wickliffe, impacts to farmland in Missouri					
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	Support is somewhat strong for Alternative 9/10. It is equal to Alternative 11/12/13/14/15/21	Farmland impacts, uses least favorable river crossing	28 mi/8,618 ac	None	None	1 mi/264 ac	Low	2,643
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	Support is strong for Alternative 11/12/13/14/15/21. It is equal to Alternative 9/10	Farmland impacts, uses least favorable river crossing	29 mi/7,319 ac	1.7 mi/420 ac	None	0 mi/144 ac	Low	2,786
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	There has been no vocal support for Alternative 19 during public	Large need for new right of way, closest to planned industrial park, impacts to flats area, preferred river crossing location	34 mi/10,134 ac	0.8 mi/269 ac	< 1 mi/8 ac	None	Low	3,049
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	There has been some level of support for Alternative 20, there has also been equal support against the alternative especially from residents of KY	In southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of newly built bridge	33 mi/7,957 ac	None	8 mi/1,964 ac	3 mi/469 ac	High	3,514

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

I-66 Corridor Study
Western Kentucky to Missouri
Level 2 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts**							Capital Costs***					Advance to Level 3 Screening?
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Birds Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (100 yr. / 500 yr.) (in miles)	Floodplain / Floodway (100 yr. / 500 yr.) (in acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total	
0	No Build or Do Nothing (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated							No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million					Yes
5	From I-24 at Paducah generally follow the existing US 60 corridor to Wickliffe over the Miss. River on new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	56	3 miles/723 acres	12/0.2	2,944/35	1.7 mi/466 ac	$272	$100	$89	$75	$536	No
6 / 7	From existing US 60 east of Kevil go southwest on a new alignment towards Wickliffe over the Miss. River on a new bridge through lowland/floodway in Missouri connecting to US 60 in Missouri east of Charleston to I-57	None	None	54	3 miles/723 acres	12/0.2	2,944/35	1.8 mi/425 ac	$260	$106	$88	$74	$528	No
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7/0.5	1,810/123	4.0 mi/1,001ac	$206	$129	$114	$68	$517	No
8A	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 to I-57 in Illinois.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated west of LaCenter and northwest of Barlow - impacts to Barlow Flats and adjacent wildlife management area in northeastern Ballard County, KY							$0	$129	$29	$26	$184	No
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	Environmental impacts documented in US 60 improvement project - additional impacts anticipated south of Wickliffe and to Bird's Point floodway area in Missouri							$0	$140	$41	$28	$209	Yes
9 / 10	From I-24 near Paducah, follow new route south westerly to Wickliffe (parallel to US 62/KY 286) across the Mississippi River on a new bridge to I-57	None	None	46	3 miles/723 acres	11.5/0.1	2,787/33	1.4 mi/357 ac	$274	$105	$95	$77	$551	No
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	None	None	54	3 miles/723 acres	11.5/ < 1	2774/21	1.2 mi/312 ac	$287	$109	$148	$80	$624	Yes
19	From I-24 near existing US 60 bridge across Tennessee River proceed south west to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge to US 60 / US 62 to Sikeston	1 (0.4 miles of Trail of Tears NHT)	< 1 mi/8 ac	77	4.5 miles/1,068 acres	13/0.2	3,179/54	1.6 mi/615 ac	$317	$140	$163	$93	$713	No
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	1 (4.5 miles of Trail of Tears NHT)	None	41	None	8/1	1,991/300	1.9 mi/530 ac	$340	$0	$127	$69	$536	Yes

* Future Year = 2030 **Based on Environmental Constraints Map ***In Millions of 2003 Constant Dollars

5.0 CONCLUSIONS and NEXT STEPS

5.1 Conclusions – Level 2 Analysis / Recommendation

The more detailed analysis performed in this Level 2 screening / evaluation further reduced the alternatives from nine (9) build alternatives plus the No Build to four (4) total alternatives that are recommended for further evaluation. Those alternatives include:

- Alternative 0 – (No Build) – Only existing and committed projects in KYTC Six Year Plan and MoDOT improvement program.
- Alternative 8B – (US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing)
- Alternative 11/12/13/14/15 & 21 – new interstate corridor parallel to US 62 and KY 286 with a new Mississippi River crossing
- Alternative 20 – unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

All other alternatives previously under consideration are not being carried forward at this point. This is because one or more of the impacts significantly reduce the viability of that alternative or that there are other alternatives still under consideration that are better at satisfying the goals, objectives and issues of the study.

5.2 Next Steps – Level 3 Evaluation

The next and final step in the study process is to complete the Level 3 evaluation for the remaining four alternatives. The Level 3 evaluation is the most detailed evaluation level, and therefore the greatest amount of data will be available at the conclusion of the analysis. The remaining alternatives will be refined based on the first two levels of refinement and analysis. The same general evaluation categories will be used for Level 3, but the process will be more detailed, focusing on refined evaluation measures whenever possible and appropriate. This will be done with the cooperation of other agencies and will focus on:

- Refined travel demand forecasting model
- Refined environmental analysis
- Refined cost estimating
- Examination of river crossing location vis a vis confluence of the Mississippi and Ohio Rivers and the impacts associated with the authorized operation of the Birds Point – New Madrid Floodway with the US Coast Guard and the US Army Corps of Engineers, respectively
- Examination of connector roadway(s) from Cape Girardeau bridge to I-55

- Examination of the need for and time frame of widening(s) of I-24 north of Paducah
- Coordination / cooperation with the Illinois Department of Transportation.

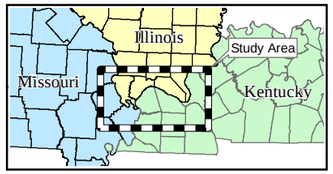
The goal of the Level 3 evaluation is to recommend a corridor that is most suitable for locating the I-66 corridor in western Kentucky.

The corridors that were recommended for advancement to Level 3 are depicted on the following map.

CAPE GIRARDEAU
ALEXANDER
PULASKI
MASSAC
METROPOLIS
BALLARD
LA CENTER
KEVIL
BARLOW
PADUCAH
MCCRACKEN
CALVERT CITY
MARSHALL
BENTON
SCOTT
MISSISSIPPI
CAIRO
WICKLIFFE
CHARLESTON
WYATT
SIKESTON
CARLISLE
BARDWELL
Mississippi River
Ohio River
East Fork Clarks River
Kentucky Lake
Purchase Parkway

Alternative Corridors
- Existing 60 Improved
- Improvements Programmed
- 8b
- 11
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route
- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

0 2.5 5 Miles

Figure 13
LEVEL 3 ALTERNATIVES
I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 8 – LEVEL 3 SCREENING

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

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1.0 INTRODUCTION

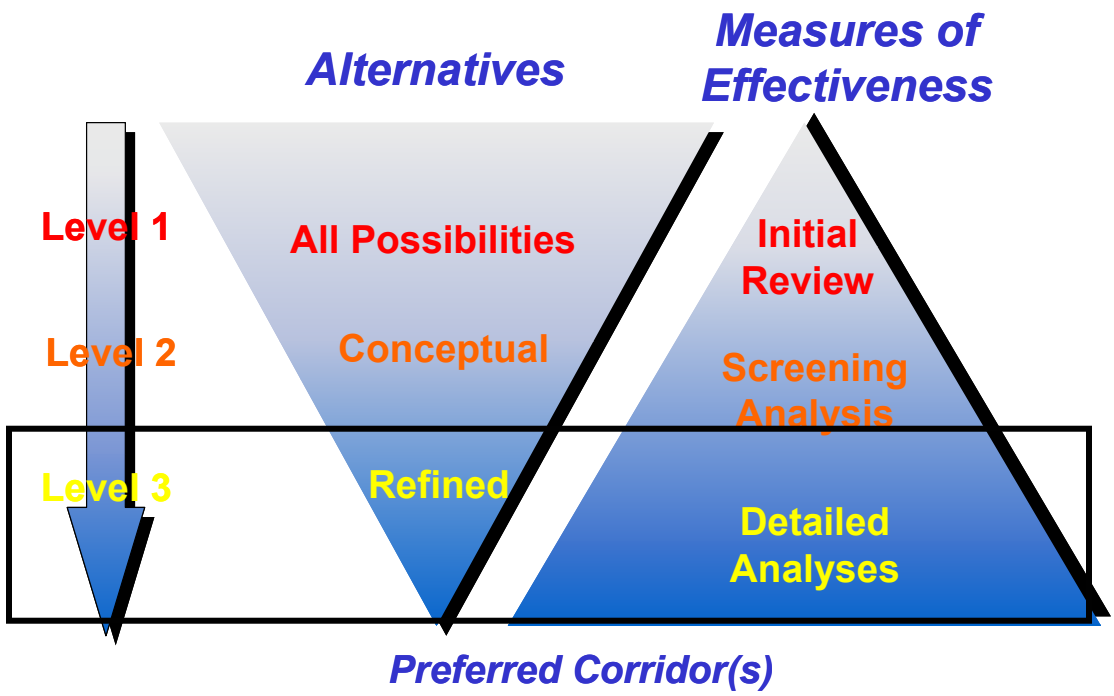
This working paper presents the Level 3 Evaluation methodology, screening analysis and summary for the I-66 Western Kentucky to Missouri Corridor Study. It is the third in a three-step alternative corridors evaluation and screening process analyzing possible corridors for a new limited access type highway facility connecting western Kentucky to Missouri. Figure 1.1 demonstrates graphically the scope and nature of the three levels of analysis and outlines the relationship of the Level 3 evaluation relative to the other two levels of screening and analysis.

The first level presented the full range of alternatives and used primarily qualitative criteria to compare and screen the initial group of 22+ alternative corridors to a narrower set. In Level 2, additional and more complex data was used to develop a more quantitative evaluation of the remaining alternative corridors. Finally, the last stage of analysis, the Level 3 evaluation, focused on the most detailed analysis including:

- Refined travel demand forecasting model
- Refined environmental analysis
- Refined cost estimating
- Examination of river crossing location vis a vis confluence of the Mississippi and Ohio Rivers and the impacts associated with the authorized operation of the Birds Point – New Madrid Floodway with the US Coast Guard and the US Army Corps of Engineers, respectively
- Examination of connector roadway(s) from Cape Girardeau bridge to I-55
- Examination of the need for, and time frame of, widening(s) of I-24 in the vicinity of Paducah
- Coordination / cooperation with the Illinois Department of Transportation.

The screening and evaluation process used for this project is being undertaken collaboratively by the Project Team: representatives of the KYTC Central Office Planning staff, KYTC District 1 and Missouri DOT staffs, the consultant team, the I-66 Project Work Group, and the public who has attended the eight open-house workshops (4 meetings each in Missouri and Kentucky) to date. All input from these individuals, along with the objective screening results were put into the evaluation and analysis process.

Figure 1.1: Three-Level Evaluation Procedure



2.0 LEVEL 1 & 2 SUMMARIES

2.1 Level 1 Summary

The purpose of the Level 1 Screening was to review the alternative corridors developed and to perform an initial screening by applying comparative, qualitative measures to all alternative corridors. The goal of the Level 1 Screening was to identify only the feasible alternative corridors that best met the project's goals, objectives, and issues. These corridors would warrant additional study during the project. Similarly, those alternatives that were not worthy of future study – those that did not meet the goals, objectives and identified issues or those that had consequences that were not commensurate with their benefits, were not considered further. The Level 1 screening produced alternatives that were recommended for further evaluation. Among them were: Alternative 5, 6, / 7 (combined corridor), Alternative 8, Alterative 9 / 10 (combined corridor), Alternative 11 / 12 / 13 / 14 / 15 / 21 (combined corridor), Alternative 19, and Alternative 20. Also, an Alternative 0 or No Build alternative is part of the analysis as a base line for comparison and as a possible stand alone alternative. These corridors were subsequently refined to accommodate a new interstate type facility and to minimize environmental and other impacts. These revised corridors are described in more detail below -

Corridor 0 (No Build) - This represents a "do nothing" but does include those existing and committed projects that are being planned for the western Kentucky / southeastern Missouri regions respectively by the Kentucky Transportation Cabinet (KYTC) as identified in the current Six Year Plan and the Missouri Department of Transportation (MoDOT) as identified in the short range planning documents. The existing and committed projects include: US 60 improvements west to LaCenter, the Paducah Outer Loop project, and an assumed north – south I-69 project largely following existing routes. There are no major shot term projects planned for the study for this alternative in Missouri.

Corridor 5 - From I-24 at Paducah generally following the existing US 60 corridor to Wickliffe, Kentucky over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to I-57 in Missouri north east of Charleston.

Corridor 6 / 7 - From existing US 60 east of Kevil, Kentucky go southwest on a new corridor towards Wickliffe, Kentucky over the Mississippi River on a new bridge through lowland/floodway in Missouri connecting to I-57 in Missouri north east of Charleston

Corridor 8 - From I-24 at Paducah, generally following the existing US 60 corridor (similar to 5 above) to just south of Barlow, Kentucky; proceed northwest on new route across the wetland and floodplain area of the Barlow Flats over a new bridge across the Ohio River to I-57 in Illinois north of Cairo

Corridor 9 / 10 - From I-24 near Paducah, Kentucky follow new route southwesterly to Wickliffe, Kentucky (parallel to, but north of KY 286) across the Mississippi River on a new bridge at Wickliffe to I-57 north east of Charleston

Corridor 11 / 12 / 13 / 14 / 15 / and 21 - From I-24 south of Paducah follow new route southwest and largely parallel to existing KY 286 to Wickliffe, Kentucky then over the Mississippi River on a new bridge to I-57 north east of Charleston

Corridor 19 - From existing US 60 bridge across Tennessee River in Kentucky proceed south west across I-24 to new route south of KY 339 westerly along new route south of study area across the Mississippi River on a new bridge in Carlisle County to I-57 north east of Charleston

Corridor 20 - Re-badge existing interstate I-24 in Kentucky as I-66. This corridor would also include constructing I-66 across southern Illinois along an unspecified route from a point along I-24 north of Metropolis connecting to the Bill Emerson Memorial Bridge at East Cape Girardeau, Illinois / Cape Girardeau, Missouri.

2.2 Level 2 Summary

The more detailed analysis performed in this Level 2 screening / evaluation further reduced the alternatives from nine (9) build alternatives plus the No Build to four (4) total alternatives that were recommended for further evaluation. Those alternatives included:

- Alternative 0 – (No Build) – Only existing and committed projects in KYTC Six Year Plan and MoDOT improvement program.
- Alternative 8B – (US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing)
- Alternative 11/12/13/14/15 & 21 – new interstate corridor parallel to US 62 and KY 286 with a new Mississippi River crossing
- Alternative 20 – unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

In addition, the KYTC / Consultant Project Team also chose to re-evaluate Alternative Corridor 8A - US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Ohio River connecting US 60 southwest of Barlow, Kentucky to I-57 in Illinois.

All other alternatives previously under consideration were not carried forward past this point. This was due to one or more of the impacts preventing the alternative from being a viable corridor or that there were other alternatives still under consideration that were better at satisfying the goals, objectives, and issues of the study, had less impacts or had lower capital costs.

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3.0 LEVEL 3 EVALUATION

3.1 Level 3 Criteria

The analysis for this level is the most extensive and quantitative to date. Although no new evaluation categories were introduced for Level 3, the analysis was to a greater level of detail than previous. In addition, more coordination with other agencies (US Army Corps of Engineers, US Coast Guard, and Illinois Department of Transportation) took place. The evaluation categories and subcategories for Level 3 included:

- **Traffic Operations** – general criteria to evaluate mobility and accessibility improvements including: level of service (LOS), improvements to travel time,

number of users (volume / ADT), truck percentages, safety, security, etc., based on travel demand forecasting model runs and manual adjustments / interpolation. Four (4) screen line locations were used to estimate the various measures. The locations are common points in the study area, and are generally described as: (1) Paducah, KY (2) Western McCracken County, KY, (3) Ballard County, KY, and (4) a Mississippi or Ohio River crossing. Specific measures examined in this category for the base year 2003 and the future year 2030 included:

1. Average Daily Traffic (ADT) – How many vehicles per day will use the new highway corridor at a "screen line". (Note that for this analysis, a screenline was defined as a specific point for that corridor or alternative only. It is not an additive measure of all volumes for all alternatives at a certain point.)
2. Average Daily Truck Traffic – How many trucks per day will use the new highway corridor at a "screen line".
3. Level of Service (LOS)
4. Vehicle Miles of Travel (VMT) – measure of total miles of travel across the model area of travel for all vehicles
5. Vehicle Hours of Travel (VHT) – measure of total hours of travel across the model area for all vehicles
6. Travel Time / Travel Time Savings (note: travel time and travel time savings are derived for two trips (1) from I-24 to I-55 south – essentially from Paducah, KY to Sikeston, MO and (2) from I-24 to I-55 north – essentially Paducah, KY to Cape Girardeau, MO. Travel time savings are expressed as a comparison of each alternative corridor as compared to the No Build (Alternative 0)
7. Safety / Security
8. Connectivity / Access

To facilitate the analysis, the Kentucky statewide I-66 model was used as the basis for coding and running the analysis of the corridors under evaluation.

- **Support** – likelihood that one or more alternatives will be supported / is supported by the local community, including citizens, political leaders, business / industry and other stakeholders, derived from all public comments, letters, emails, etc., to date. Also contains description of relevant criteria or issues to be scrutinized. Specific measures include:

  1. Corridor - Based on input from public meetings, project work group, and stakeholder meetings, what percentage of the community favors an alternative corridor

2. Issues - Based on input from public meetings, project work groups, and stakeholder meetings, what community issues are addressed or will need to be addressed by the corridor and the analysis

- **Community Impacts** – compatibility with adjacent and proposed land uses and the affects and impacts on those land uses (separate impacts to type of property: farmland, commercial / business, parks / recreation, residential, etc., calculated by miles and acres of adjacent property. Also included was an environmental justice analysis. Specific impacts include those to:

  1. Farmland
  2. Kentucky Agricultural Districts
  3. State / Federal Forest – Parks / Recreation lands
  4. Urban areas
  5. Environmental Justice Communities

- **Property Impacts** – specific new right-of-way quantified in acres

- **Environmental Impacts** – impacts on known historic and archeological sites / structures, acres of natural resource / wildlife areas, habitat areas, number of HAZMAT sites, number of stream crossings, floodplain / floodway impacts, and acres of wetlands. Specific measures include:

  1. Number of Listed National Historic Register Sites
  2. Nature / Wildlife Preserves / Conservation Lands
  3. Number of Stream Crossings
  4. Bird's Point Floodway Impacts
  5. Floodplain / Floodway – expressed in miles and acres
  6. Wetlands

- **Capital cost considerations** – order of magnitude capital costs for proposed alternative corridors derived on a cost build up basis from typical sections for roadway (at-grade and elevated) and bridge improvements, also includes typical costs for interchanges, and appropriate costs for engineering, contingencies, etc. Specific costs include:

  1. Roadway
  2. Bridge
  3. Right-of-way
  4. Engineering / Mobilization / Demobilization
  5. Total

Note that although seemingly detailed estimates of impacts and costs are provided, the analysis was NOT to an engineering level. Assumptions are for analysis purposes, and include a 180-foot wide typical section for current year 2003 cost estimating and a 600-foot section for right-of-way purposes calculated on an average cost per acre basis. For environmental analysis, a bandwidth of 2,000 feet from an imaginary centerline of the corridor was used for analysis purposes with all data assumed available from the project's mapping databases. Comparisons should only be made to other alternatives within the context of this study.

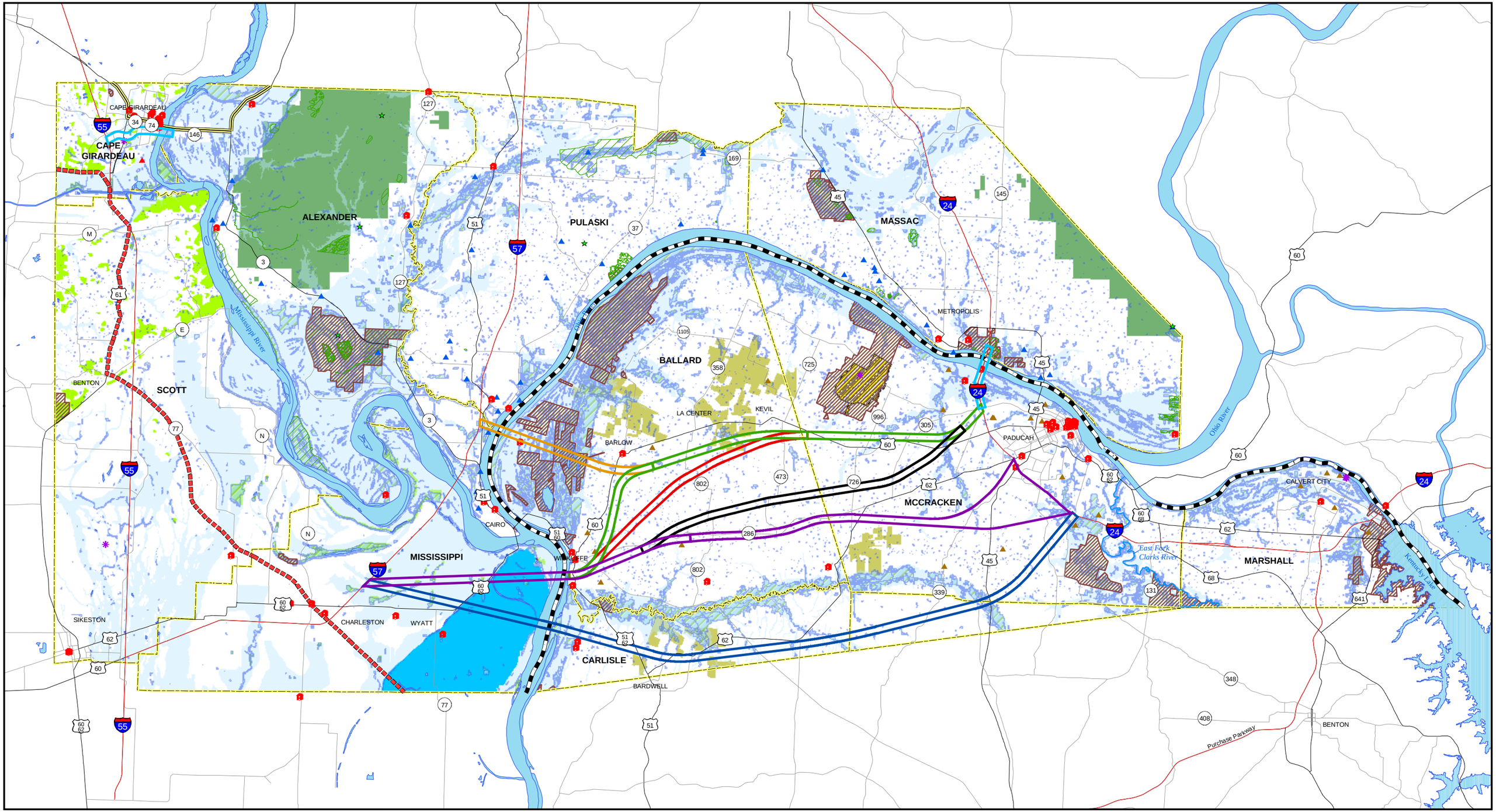
3.2 Level 3 Screening Analysis

Alternative 0

Traffic Operations - Alternative 0 is the No Build alternative. It does, however include all projects that are "existing and committed" – those with funding in place for at least the initial project phases, and includes projects to widen US 60 to 4 lanes in Ballard and McCracken counties. Essentially, it involves widening US 60 from west of Paducah (KY 1154) to just west of LaCenter, Kentucky with bypasses around Kevil and LaCenter. Within the analysis, this alternative has an unadjusted model output volume ADT ranging from 43,000 near Paducah at screen line #1 to 9,000 in Ballard County at screen line #3. (Note that the ADTs are projected for the horizon year 2030.) ADTs Screen lines 2 and 4 respectively have ADTs of 11,000 each at W. McCracken County and the bridge over the Mississippi River. In terms of truck traffic, Alternative 0 has truck traffic of 7% to 17%, which represents an ADT of 900 to 3,300 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are crossing the Mississippi River. In terms of LOS, the segment with the highest ADT (the segment nearest Paducah) conversely has the lowest LOS of E (4-lanes). The LOS E continues along screen lines 3 and 4 respectively. The only improvement is at screen line 2 because the section is 4 lanes and has more moderate volumes.

The travel time for the No Build serves as the baseline for comparison to other alternatives. For the two trips, from Paducah to Sikeston and Paducah to Cape Girardeau, the travel times are 76 and 94 minutes respectively.

The No Build option includes those improvements to US 60 programmed in the KYTC's Six Year Plan. Implementation of these improvements will have some very tangible benefits in the near term with regard to safety, including an upgraded route and increased access to points west of Paducah. It does not however provide for a new bridge over the Mississippi River which would provide additional connectivity (east – west connections) and access for the transportation system in western Kentucky / southeastern Missouri.

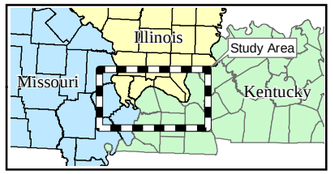


Alternative Corridors

- 5
- 6/7
- 8
- 9/10
- 11,12,13,14,15 & 21
- 19
- 20

- National Historic Register Site
- Illinois Natural Area Location
- NPL Sites
- Active/Permitted Landfills (MO)
- Landfills (KY)
- Landfills (IL)
- Trail of Tears - Auto route
- Trail of Tears - Benge's Route
- Trail of Tears - Water Route

- Agricultural District
- Wildlife Preserve/Conservation Area/Park
- Forested Area (MO)
- Shawnee National Forest
- Wetland
- 100 Year Floodplain
- New Madrid Floodway
- Superfund Site (KY)
- **PROJECT STUDY AREA**



Location Map

N W E S

0 2.5 5 Miles

Figure 12

LEVEL 2 ALTERNATIVES

I-66 CORRIDOR STUDY
Western Kentucky to Missouri
KYTC Item No. 1-23.00

Support - There is some minimal support for the No Build option in both Kentucky and Missouri. Most of those who are interested in the No Build option want more improvements than those that are currently programmed. These same individuals also tend to be concerned with the anticipated impacts of the US 60 improvements on adjacent communities including nearby residences, businesses, farms, etc.

Community Impacts - Community impacts have been documented in previous studies. The no-build alternative for the I-66 project also does not recommend further improvements beyond those existing and committed, therefore no anticipated incremental impacts are anticipated. Also, there are no adverse potential environmental justice (EJ) issues.

Property Impacts - Property impacts have been detailed in previous studies. The no-build alternative also does not recommend further improvements beyond those existing and committed, therefore no new property impacts are anticipated.

Environmental Impacts - Environmental impacts have been discussed in previous studies. The no-build alternative also does not recommend further improvements beyond those existing and committed, therefore no additional environmental impacts are anticipated.

Capital Costs - Capital costs have been documented in previous studies and are programmed in the KYTC's Six Year Plan. The current total for projects in the study area is $26.3 million dollars. In Ballard / McCracken County, US 60 will be widened to 4-lanes from 1 mile east of Denis Jones Road to Bethel Church Road (includes Kevil Bypass). Total costs (design and right-of-way) are $10.25 million. In Ballard County, US 60 will be widened to 4-lanes from the proposed southern bypass of LaCenter to 1 mile east of Denis Jones Road. Total cost (design) is $800,000. In McCracken County, the project includes upgrading US 60 to 4-lanes from Bethel Church Road to KY 1154. Total costs (Right-of-way, utilities, and construction) are $15.3 million.

Alternative 8

Alternative 8, which is essentially Corridor 11, is a highway in/along existing KY 286, US 60 or US 62 corridors. It takes off from a point southwest of Barlow, proceeding northwest on new route, with a new bridge across the Ohio River to I-57 in Illinois. This alternative was re-examined in the Level 3 Screening after being designated in Level 1 for no further analysis. Although examined in detail for environmental and other impacts, the traffic operations analysis for this re-introduced alternative was only partially done. Subsequent discussions with Kentucky resource agencies, namely the KY Nature Preserves Commission and the KY Department of Fish and Wildlife revealed that Alternative 8 was fatally flawed from an environmental standpoint. Therefore, no additional analysis was performed on this alternative.

Traffic Operations – Alternative 8 is approximately 33.33 miles in length and is a new corridor from Paducah to Wickliffe, Kentucky with a connection to I-57 in Missouri. It

shows improvements in terms of operations over the No Build for the segments analyzed that are near screen lines one and two. The analysis for Alternative 8 reveals that this alternative has an ADT at screen line #1 of 30,000 and 18,000 at screen line #2. Truck ADT is 4,400, and 3,000 at screen lines 1 and 2 respectively. This represents 14% and 16% of ADT respectively. In terms of LOS, this alternative makes an improvement near Paducah at screen line 1 with LOS C. The segment for screen line 2 has only slight improvements depending upon exact ADT #s.

Support – There has been some modest vocal support for alternative 8. Although there is support for the roadway corridor, the bridge location is not preferred by the majority of study participants. Issues of concern include impacts to areas such as wetlands and wildlife habitat areas.

Community Impacts – There are community impacts for Alternative 8 to farmlands, Kentucky Agricultural Districts, urban areas, property impacts and some low level potential EJ impacts. Farmland impacts are anticipated along 21 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 7,222 acres. There are also impacts to the agricultural districts in Kentucky. There are 1.3 miles of impacts adjacent to the corridor, which translates to 343 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are to 1 mile for 135 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income, and/or elderly) along the corridor is rated low.

Property Impacts - Property impacts are anticipated mostly near the urbanized areas near Barlow, Kentucky and at the location of the bridge crossing over the Ohio River. There is a need for 2,113 acres for right-of-way purposes.

Environmental Impacts - The anticipated environmental impacts of Alternative 8 are to National Register of Historic Sites, stream crossings, other floodplains, and floodways and to wetlands and habitat areas. There are impacts to 1 National Register Site, the Trail of Tears that is impacted for 4/10 of a mile. There are also impacts to the nature preserves / wildlife management areas in Ballard County. This accounts for 2 miles and 455 acres of impacts. There are 49 stream crossings throughout the corridor. There are no impacts to the Bird's Point New Madrid Floodway in Missouri. For floodplains, there are impacts along 7.20 miles of the corridor which translates to 1,001 acres. Additionally, there are a total of 1,001 acres along a 4.0 mile segment of the corridor of wetland impacts. These are impacts to sensitive wildlife / waterfowl habitat area in the Wildlife Management Areas in north west Ballard County.

Capital Costs - The total capital costs for Alternative 8 are $767 million. $265 million is for construction of the roadway, $266 million is for construction of a bridge over the Ohio River, $128 million for right-of-way and utilities and $108 million for contingencies, design, engineering and mobilization / demobilization of construction.

Alternative 8B

Traffic Operations - Alternative 8B is approximately 38.5 miles in total length and is a new connector from US 60 to I-57 in Missouri and includes a new bridge over the Mississippi River. It is similar in terms of traffic operations to Alternatives 8 and 8A. The analysis for Alternative 8B reveals that this alternative has an ADT on US 60 ranging from 40,000 near Paducah at screen line #1 to 5,500 at screen line #3 in Ballard County. This is a decrease from the No Build because some traffic shifts from US 60 to KY 286 with the construction of a bridge over the Mississippi, south of Wickliffe. KY 286 provides a more direct route from I-24 to the new bridge. Average daily traffic volumes on US 60 at screen lines 2 and 4 are 9,000 (W. McCracken County) and 7,000 (Mississippi River crossing) respectively.

Alternative 8B truck traffic volumes on US 60 are also somewhat lower compared to Alternative 0 for the same reason discussed above. Alternative 8B has truck traffic of 7% to 14%, which represents an ADT of 400 to 2,000 depending upon segment. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are at screenlines 2 in western McCracken County at over the Mississippi River at screenline 4. In terms of LOS, the screen line with the highest ADT has the worst level of service E – which is the same as the No Build. LOS at screen line 2 is unchanged from the No Build, while the LOS for screen lines 3 and 4 improve from E to A with the addition of two (2) traffic lanes.

The total Vehicle Miles of Travel (VMT) increase from the no build to 942 million total miles. There is little discernable change from the No Build for total vehicle hours of travel (VHT) which is 18.7 million hours of total travel.

The travel time for Alternative 8B represents very slight improvements from the No Build. The travel time for the Paducah to Sikeston trip decreases by approximately 2 minutes from just over 76 in the baseline to approximately 74 for 8B. The travel time for the Paducah to Cape Girardeau trip represents no decrease from the No Build.

Alternative 8B provides a new bridge connector from US 60 in Kentucky to I-57 in Missouri. These new facilities would add to the safety of the system and provide a new river crossing link from Kentucky directly to Missouri. This bridge location just south of Wickliffe is less preferable in terms of the Coast Guard's analysis of affects on river traffic. Likewise, Alternative 8B also improves system connectivity and access.

Support - Support exists for continuing US 60 improvements and for upgrading the corridor. There is also support for a new bridge over the Mississippi River near Wickliffe, Kentucky. Issue of concern include impacts to areas adjacent to US 60 as well as wetland impacts and concerns over the river crossing location, especially impacts to river traffic and impacts to the Bird's Point New Madrid Floodway in Missouri.

Community Impacts - Community impacts for Alternative 8B are similar in scope to those for similar alternatives, namely the No Build (Alternate 0) but for a longer stretch

of US 60. There are impacts to farmlands, Kentucky Agricultural Districts, "urban" areas (Paducah, Kevil LaCenter, Barlow, etc.), property impacts and some low level potential EJ impacts. Farmland impacts are anticipated along just over 30 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 10,665 acres. There are also impacts to the agricultural districts in Kentucky. There are 2.58 miles of impacts adjacent to the corridor, which translates to 623 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are medium as they account for 468 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income, and/or elderly) along the corridor is rated low.

Property Impacts - Property impacts are documented in US 60 improvement projects. Additional impacts are anticipated west of LaCenter, Kentucky and at the location of the bridge crossing over the Mississippi River. There is a need for 1,100 acres for right-of-way purposes.

Environmental Impacts - The anticipated environmental impacts of Alternative 8B are to National Register of Historic Sites, stream crossings, the Bird's Point New Madrid Floodway, other floodplains, and floodways and to wetlands. There are impacts to 1 National Register Site, the Trail of Tears that is impacted for 4/10 of a mile. There are also 82 stream crossings throughout the corridor. There are also 3 miles of adjacent corridor impacts to the Bird's Point New Madrid Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 11.74 miles of impacts which translates to 2,970 acres. Additionally, there are 1.56 miles of adjacent wetlands impacts for a total of 441 acres.

Capital Costs - The total capital costs for Alternative 8B are $691 million. $254 million is for construction of the roadway, $297 million is for construction of a bridge over the Mississippi River, $29 million for right-of-way and utilities and $111 million for contingencies, design, engineering and mobilization / demobilization of construction.

Alternative 11 / 12/ 13/ 14 / 15/ and 21

Traffic Operations - Alternative 11/12/13/14/15 and 21 is approximately 40.93 miles in length and is a new corridor from Paducah to Wickliffe, Kentucky with a connection to I-57 in Missouri. It shows improvements in terms of operations over the No Build for many segments and screen lines. The analysis for Alternative 11/12/13/14/15 and 21 reveals that this alternative has an ADT ranging from 30,000 near Paducah at screen line #1 to 7,000 at screen line #3 in Ballard County. This represents change from the No Build for some of the screen lines. Screen lines 1, 3, and 4 all decrease in terms of ADT at the locations while screen line 2 increases by 7,000 ADT. Respective ADTs are 30,000 at screen line #1, 18,000 at screen line #2, 12,500 at screen line #3 and 7,500 at screen line #4. Alternative 11/12/13/14/15 and 21 also shows modest increases in truck traffic when compared to Alternative 0 at all screen line locations. Truck ADT is 4,400, 3,000, 2,500, and 2,200 at screen lines 1 to 4 respectively. This represents a truck

traffic percentage of 14 to 35%. The most trucks in terms of number are nearest Paducah while the most trucks in terms of percentages are again at screen line 3 in Ballard County. In terms of LOS, this alternative makes an improvement near Paducah at screen line 1 with LOS C. All other segments are also improved over the No Build and are similar in performance to the others under consideration.

The total Vehicle Miles of Travel (VMT) increase from the no build to 942 million total miles. There is little discernable change for total vehicle hours of travel (VHT) which is 18.7 million hours of total travel.

The travel time for Alternative 11/12/13/14/15/&21 represents improvement from the No Build. The travel time for the Paducah to Sikeston trip decreases by over 18 minutes from 76 to 58. The travel time for the Paducah to Cape Girardeau trip also decreases by almost 9 minutes from 94 in the No Build to almost 86 minutes for this alternative. In both instances, this is due to the fact that the new corridor for the alternative provides a higher speed, limited access facility versus the existing US 60 or another route with the No Build.

Alternative 11/12/13/14/15 & 21 provides a new bridge connector along the new interstate from Kentucky to I-57 in Missouri. These new facilities would add to the safety of the system and provide a new river crossing link in Carlisle County from Kentucky directly to Missouri for security purposes. This alternative would also improve system connectivity and access.

Support - Support is strong for Alternative 11/12/13/14/15/ & 21. The river crossing location is supported by the US Coast Guard as it minimizes disruptions to river traffic as opposed to bridge locations further north along the river. This location also minimizes impacts to the operation of the Bird's Point New Madrid Floodway in Missouri. Here, the only issues of concern include farmland impacts and river crossing location.

Community Impacts - Community impacts for Alternative 11/12/13/14/15 & 21 are impacts to farmlands, Kentucky Agricultural Districts, urban areas, property impacts, and potential EJ impacts. Farmland impacts are anticipated along approximately 29 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 8,324 acres. There are also impacts to the agricultural districts in Kentucky. There are 2.3 miles of impacts adjacent to the corridor, which translates to 870 acres. There are no anticipated impacts to state / Federal forests, parks, and/or recreation land. Impacts to urban areas are low as they only account for .17 miles and 74 acres. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income, and/or elderly) along the corridor is rated low.
Property Impacts - Total property impacts for right-of-way purposes are anticipated to be 2,325 acres. The needed right-of-way is a mixture of farmlands, urban areas and some other land uses.

Environmental Impacts - The anticipated environmental impacts of Alternative 11/12/13/14/15 & 21 are to National Historic Register Sites, stream crossings, the Bird's Point New Madrid Floodway, other floodplains, and floodways and to wetlands. There is one impact to the Trail of Tears Nation Historic Register Site accounting for four-tenths of a mile. There are also 87 stream crossings throughout the corridor. There are 3 miles of adjacent corridor impacts to the Bird's Point New Madrid Floodway in Missouri. Specifically, this represents 723 acres. For floodplains, there are 12.38 miles of impacts which translates to 3,323 acres respectively. Additionally, there are 1.17 miles of adjacent wetlands impacts for a total of 509 acres.

Capital Costs - The total capital costs for Alternative 11/12/13/14/15 & 21 are $895 million. $328 million is for the construction of a new bridge, $292 million is for the roadway construction, $151 million for right-of-way and utilities and $124 million for contingencies, design, engineering and mobilization / demobilization of construction.

Alternative 20

Traffic Operations - Alternative 20 is approximately 48.32 miles in length and is a new unspecified corridor from I-24 north of Paducah to I-55 near Cape Girardeau Missouri, largely across southern Illinois. A corridor was assumed in southern Illinois for analysis purposes, as no "official" corridor was determined. Alternative 20 shows improvements in terms of operations over the No Build for all segments and screen lines. The analysis for Alternative 20 reveals that this alternative has an ADT ranging from 15,000 near Paducah and Western McCracken County at screen line 1 to 17,000 at screen line # over the Mississippi River near Cape Girardeau, Missouri. This represents changes from the No Build for all screen lines. Screen line 1 decreases significantly while counts at screen lines 2, 3 and 4 respectively increase. Alternative 20 shows little change in terms of truck traffic from Alternative 0. At screen line 1, the volume of trucks decreases, perhaps showing that these vehicles stick to existing routes. The truck volumes increase at screen lines 2, 3 and 4 respectively; representing a truck traffic % of 10% to 12%. The most trucks in terms of number and percentage are crossing the Mississippi River at screen line #4. In terms of LOS, this alternative makes an improvement at all screen line locations with LOS A. Again, this improvement is similar in performance to the other alternatives under consideration.

The total Vehicle Miles of Travel (VMT) increase from the no build to 942 million total miles. There is little discernable change for total vehicle hours of travel (VHT) which is 18.7 million hours of total travel.

The travel time for Alternative 20 represent very slight improvements for the Paducah to Sikeston trip, which decreases by just over 3 minutes from 76 in the baseline to 73. However, the travel time for the Paducah to Cape Girardeau trip represents a large travel time savings of 25.5 minutes as the trip goes from 94 in the No Build to approximately 69 minutes for Alternative 20.

Alternative 20 provides a new interstate from I-24 to I-55 across southern Illinois. It may also require some widening of I-24 in Kentucky and the need for a connector roadway of improved quality (interstate or limited access highway) from the new bridge at Cape Girardeau to I-55. These new facilities would add to safety of the system and add benefits for security purposes. This alternative provides good access and connectivity benefits for southern Illinois and the Cape Girardeau Missouri areas. It provides no benefit for Western Kentucky because the new route is located in Illinois.

Support - There is strong vocal support for Alternative 20 mainly from constituencies in the Cape Girardeau area and southern Illinois area. There has been almost an equal amount of opposition to Alternative 20 from study participants who reside in Kentucky. Issues associated with this corridor include impacts to the Shawnee National Forest and other sensitive areas in Illinois. The Mississippi River crossing at Cape Girardeau would make use of the Bill Emerson Bridge recently opened to traffic. However, the planned connection to the bridge from I-55 may not be limited access highway / interstate quality.

Community Impacts - Community impacts for Alternative 20 include impacts to farmlands, State / Federal / Forests – Parks and Recreation lands, urban area impacts, property impacts and potential EJ impacts. Farmland impacts are anticipated along 35 miles of adjacent roadway throughout the corridor. This translates to an impact area of approximately 8,511 acres. There are no impacts to Kentucky Agricultural Districts. There are anticipated impacts to state / Federal forests, parks, and/or recreation land, namely the Shawnee National Forest. Impacts in this category are along 8.67 miles and account for 2,102 acres. There are impacts to urban areas anticipated along the corridor, which account for 3.88 miles and 504 acres respectively. The probability that there are adverse and/or disproportional impacts to EJ communities (minorities, low income, and/or elderly) along the corridor is rated high primarily to the location of the corridor near EJ communities for elderly, low incomed, and minority individuals near Cape Girardeau.

Property Impacts - Total property impacts are anticipated to be 2,930 acres, largely for right-of-way purposes. The needed right-of-way is a mixture of farmlands, forests / recreation areas, urban areas, and other land uses.

Environmental Impacts - The anticipated environmental impacts of Alternative 20 are to NHR sites, to stream crossings, other floodplains, and floodways (100 and 500 year) and to wetlands. There are two anticipated impacts to NHR sites – both to the Trail of Tears accounting for an impact of 2.9-miles of the trail in 2 separate locations. One crossing is in Illinois in Alexander County and the other crossing is on the Kentucky-Illinois border at Massac and McCracken Counties. There are some impacts to nature / wildlife preserves and conservation lands accounting for .03 miles and 64 acres. In addition, there are 51 stream crossings throughout the corridor. There are no impacts to the Bird's Point New Madrid Floodway. For floodplains, there are 12.78 miles of impacts to floodplains which translates to 3,113 acres respectively. Additionally, there are 2.78 miles of wetland impacts for a total of 843 acres.

Capital Costs - The total capital costs for Alternative 20 are $586 million. $363 million is for construction of the roadway, $128 million for right-of-way and utilities and $77 million for contingencies, design, engineering, and mobilization / demobilization of construction. There are anticipated additional costs assumed for the bridge along I-24 in Kentucky to carry additional traffic.

I-66 Corridor Study
Western Kentucky to Missouri
Level 3 Screening Summary

Alt. / Corridor No.	Description	Length of Route - Total Miles / New Roadway	Traffic Operations [1]											
			Screen Line #1: Paducah			Screen Line #2: W. McCracken Co.			Screen Line #3: Ballard County			Screen Line #4: Mississippi River		
			Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service	Average Daily Traffic	Average Daily Truck Traffic (%)	Level of Service
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	0 mi / 0 mi	43,000 (US 60)	3,300 (7%)	E (4 lanes)	11,000 (US 60)	1,500 (13%)	A (4 lanes)	9,000 (US 60)	900 (10%)	E (2 lanes)	11,000 (Bridge Over Ohio River)	1,900 (17%)	E (2 lanes)
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	33.33 mi / 33.33 mi	30,000	4,400 (14%)	C	18,000	3,000 (16%)	A-B	See Note 5 Below					
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	38.50 mi / 15 mi	40,000 (US 60)	2,000 (7%)	E (4 lanes)	9,000 (US 60)	1,300 (14%)	A (4 lanes)	5,500 (US 60)	400 (7%)	A (4 lanes)	7,000	1,000 (14%)	A (4 lanes)
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	40.93 mi / 40.93 mi	30,000	4,400 (14%)	C	18,000	3,000 (16%)	A-B	7,000	2,500 (35%)	A	9,000	2,200 (20%)	A
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	48.32 mi / 48.32 mi	15,000	1,600 (10%)	A	16,000	1,600 (10%)	A	16,000	1,600 (10%)	A	17,000	2,100 (12%)	A

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Level 3 Screening Summary

Alt. / Corridor No.	Description	Traffic Operations [1]						Support	
		Total Vehicle Miles of Travel (VMT in Millions)	Total Vehicle Hours of Travel (VHT in Millions)	Travel Time in Minutes Paducah to Sikeston (Savings from No-Build)	Travel Time in Minutes Paducah to Cape Girardeau (Savings from No-Build)	Safety / Security	Connectivity / Access	Corridor	Issues
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	935	18.7	76.5 mins	94.4 mins	Improves US 60 in place improvements largely to safety, little for security	Keeps existing connectivity and access	There is minimal support for continuing with current plans. Especially noted are the plans to improve Hwy 60.	Impacts to adjacent development on US 60
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	See Note 5 Below				Provides improvement - connects I-24 to I-57 in Illinois	Provides new river crossing location over Ohio River	There has been no vocal support for Alternative 8 during public workshops	Wetland, floodplain and potential wildlife refuge impacts, Corps of Engineers preferred river crossing
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	942	18.7	73.7 mins (2.8 mins)	95.7 mins (N/A)	Provides some level of improvement - New bridge over Mississippi River	Keeps existing connectivity and access, provides for new river crossing	Support exists for US 60 improvements and support has been expressed for a new bridge near Wickliffe, KY	Impacts to adjacent development on US 60 plus wetland and floodplain impacts at preferred river crossing
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	942	18.7	57.9 mins (18.6 mins)	85.8 mins (8.6 mins)	Provides improvement - New bridge over Mississippi River	Provides new river crossing location over Mississippi River	Support is strong for Alternative 11/12/13/14/15/21.	Farmland impacts, uses least favorable river crossing
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	942	18.7	73.3 mins (3.2 mins)	68.9 mins (25.5 mins)	Provides improvement - New roadway connecting I-24 and I-55 / I-57	Good connections for southern Illinois, little benefit for KY	There has been strong support for Alternative 20 in Illinois. Likewise, there is no support for Alternative 20 from residents of Kentucky.	Some economic benefits to southern Illinois, little economic benefit for KY, impacts to Shawnee National Forest, use of Bill Emerson bridge

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Level 3 Screening Summary

Alt. / Corridor No.	Description	Community Impacts					
		Farmland (miles/acres)	Kentucky Agriculture Districts (miles/acres)	State / Federal Forest - Parks / Recreation (miles/acres)	Urban (miles/acres)	Probable Environmental Justice Impacts	Property Impacts (in acres)
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated					
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	21 mi/7,222 ac	1.3 mi/343 ac	0 mi/0 ac	1 mi/135 ac	Medium	2,113
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	30.54 mi/10,665 ac	2.58 mi/623 ac	0 mi/0 ac	1.88 mi/468 ac	Low	1,100
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	28.87 mi/8,324 ac	2.30 mi/870 ac	0 mi/0 ac	0.17 mi/74 ac	Low	2,325
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	35.23 mi/8,511 ac	N/A	8.67 mi/2,102 ac	3.88 mi/504 ac	High [2]	2,930

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

I-66 Corridor Study
Western Kentucky to Missouri
Level 3 Screening Summary

Alt. / Corridor No.	Description	Environmental Impacts [3]						Capital Costs [4]				
		No. of Listed Natl. Historic Registry Sites	Nature / Wildlife Preserves / Conservation Lands (miles/acres)	No. of Stream Crossings	Birds Point - New Madrid Floodway (miles/acres)	Floodplain / Floodway (miles/acres)	Wetlands (miles/acres)	Roadway	Bridge	Right-of-Way / Utilities	Contingency / Engineering / Mobil. / Demobil.	Total
0	No Build (serves as basis for comparison to other alternatives) - Includes projects currently programmed in the KYTC's Six Year Plan	Community impacts documented in US 60 improvement project - no additional impacts anticipated						No incremental capital costs anticipated over those programmed in 6 Year Plan Total Costs in 6 Year Plan are $26.3 million				
8	From I-24 at Paducah in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceed north west on new route across the Ohio River on a new bridge to I-57 in Illinois	1 (0.4 miles of Trail of Tears NHT)	2 mi/455 ac	49	None	7.20 mi / 1,001 ac	4.0 mi/1,001ac	$265	$266	$128	$108	$767
8B	US 60 planned highway improvements per KYTC 6 Year Plan and Long Range Plan from Paducah to Wickliffe. Includes new connector road and new bridge over the Mississippi River south of Wickliffe US 60 to I-57 in Missouri.	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	82	3 mi/723 ac	11.74 mi/2,970 ac	1.56 mi/441 ac	$254	$297	$29	$111	$691
11 / 12 / 13 / 14 / 15 / 21	From I-24 south of Paducah follow new route southwest parallel to KY 286 to point south of Wickliffe over Mississippi River on new bridge to US 60 / US 62 to I-57	1 (0.4 mi of Trail of Tears)	0 mi/0 ac	87	3 mi/723 ac	12.38 mi/3,323 ac	1.17 mi/509 ac	$328	$292	$151	$124	$895
20	Rebadge existing interstate I-24 as I-66 in KY and build connector in southern Illinois and rebadge I-55 or I-57 as I-66 in Missouri	2 (2.9 mi of Trail of Tears)	0.03 mi/64 ac	51	0 mi/ 0 ac	12.78 mi/3,113 ac	2.78 mi/843 ac	$363	$18	$128	$77	$586

(1) Future Year = 2030 (2) Due to conditions near Cape Girardeau, MO (3) Based on Environmental Constraints Map (4) In Millions of 2003 Constant Dollars (5) Limited Traffic Operations Analysis Were Performed Due To Environmental Constraints

4.0 AGENCY COORDINATION

The Project Team discussed several issues relative to the alternatives under consideration in more detail with various Federal and state agencies, especially the river crossing locations and their potential impacts. During the study process, both a north Mississippi River crossing near Wickliffe, Kentucky and a south Mississippi River location in Carlisle County, Kentucky were identified. Issues discussed included the Mississippi River crossing locations and their navigation impacts with the US Coast Guard, and the impacts on the Birds Point New Madrid Floodway with the US Army Corps of Engineers, Memphis District.

In addition, the KYTC also discussed the potential impacts to the wildlife management areas in northwest Ballard County with the Kentucky Department of Fish and Wildlife and the Kentucky Nature Preserves Commission.

4.1 Mississippi River Navigation Impacts

Upon discussing the proposed Mississippi River crossing locations – one just south of Wickliffe, Kentucky and one in Carlisle County, Kentucky with the US Coast Guard, it was learned that the north Mississippi River crossing location (roughly near mile marker 951 just south of Wickliffe) is close enough to the confluence of the Ohio and Mississippi rivers that it effectively would interfere with safe river navigation. In fact, the affects of a bridge location, including piers, anywhere between mile makers 951 and 949.5 (nearer Wickliffe) would have negative impacts on safe river navigation and thus any bridge location in this area is problematic from that standpoint.

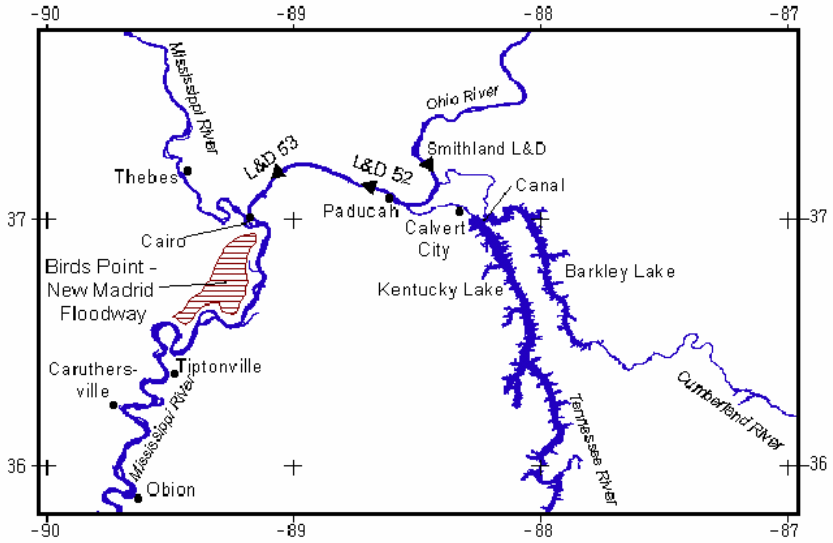
The Coast Guard is more comfortable with and accepting of a river crossing south of mile marker 949 in Carlisle County. This is far enough south of the confluence area of the rivers and would allow for barge tows to have adequate time to maintain a proper and safe course to avoid the bridge piers and other obstructions. Possibly at this point, the right descending pier would be located on the Missouri bank with the left descending pier being placed behind a dikefield. A 1,500+ foot horizontal clearance would be required to safely meet the need of waterway navigation traffic below the bridge. Pier protection, including the use of dolphins would need to be examined during further project stages.

These conclusions were reached based upon advice and consultation given in written correspondence from the Coast Guard dated February 13, 2003 from Mr. Roger Wiebusch, Bridge Administrator for the St. Louis district and detailed discussions during a conference call with the Project Team and Mr. Wiebusch held on June 25, 2003. The subject letter and the conference call also indicated that the Ohio River crossing location (Alternative Corridor 8) is also acceptable with the 1,500+ span. Therefore, it is concluded that any Mississippi River bridge location that is should be no further north than LMR mile marker 949 in Carlisle County, Kentucky.

4.2 Birds Point-New Madrid Floodway Impacts

The Project Team also coordinated the bridge location's impacts on the Birds Point-New Madrid Floodway with US Army Corps of Engineers, Memphis District. The Birds Point-New Madrid Floodway is a component of the Mississippi River and Tributaries (MR&T) Project, and is located on the west bank of the Mississippi River in southeast Missouri just below the confluence of the Ohio and Mississippi Rivers. The construction and operation of the floodway was authorized by the 1928 Flood Control Act and later modified by the 1965 Flood Control Act. The purpose of the floodway is to lower flood stages upstream and adjacent to the floodway during major flood events. The Floodway is roughly 35 miles in length and varies from 4 to 12 miles in width. It comprises about 205 square miles of alluvial valley land. The primary features of the floodway are the setback (mainline) levee, which extends from Birds Point, Missouri, to New Madrid, Missouri, and the frontline levee which is located on the west bank of the river and generally follows its alignment. Within the frontline levee, there are two fuse plug sections. These sections were designed and built 2 feet lower than the remaining portions of the frontline levee. The upper fuse plug section is 11 miles in length and is located in the northernmost reach of the frontline levee. The lower fuse plug is 5 miles in length and is located in the extreme lower end of the frontline levee. In addition, there is an existing 1,500-foot gap, which is located between the setback levee and the end of the frontline levee. This opening currently provides a drainage outlet for interior run-off and allows flood backwaters to enter the floodway.
(Note: The Corps has recently proposed a project to fill the 1,500 gap and replace it with a pumping station. To date, the project has not yet begun.)

The existing Plan of Operation for the Floodway, which was reviewed by Missouri state officials in November 1985 and approved by the President, Mississippi River Commission, in January 1986, calls for crevassing the levees to allow excess water into the floodway. There are three crevasse locations designated as Inflow, Inflow/Outflow No. 1, and Inflow/Outflow No. 2. In order to assure adequate water access to the crevasse sites access lanes are required from the Mississippi River to and along the designated crevasses. With a project design flood rate of rise, approximately 2 feet per day, initial preparation of floodway is required when the stage at the Cairo, IL, gage is approximately 59 feet; completion of preparation of the Inflow Crevasse at 60 feet; and operation of the floodway begins upon order of the President, MRC. See diagram of the Bird's Point New Madrid Floodway on the following page. Again, it is concluded that the bridge location that should be pursued is no further north than LMR mile marker 949 in Carlisle County, Kentucky.



Source: US Army Corps of Engineers

4.3 Ballard County Wildlife Management Areas

Alternative 8 traverses northwest Ballard County and comes in close proximity to the Barlow Bottoms Wildlife Management Area (WMA) controlled by the Kentucky Department of Fish and Wildlife Resources. The area is composes of seven (7) individual tracts of land. However, only two (2) tracts are impacted by Alternative 8. Those tracts are:

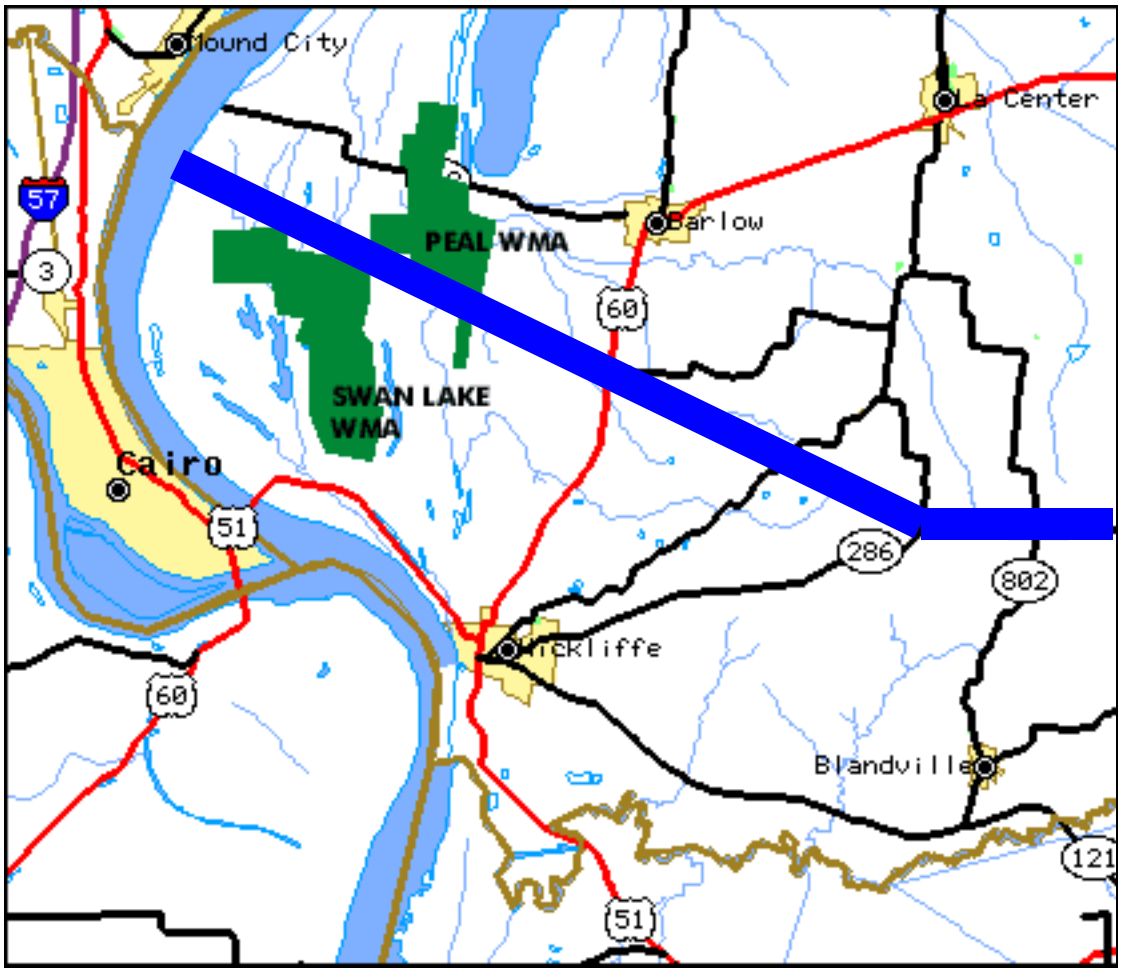
- Swan Lake – a 2,100 acre tract, 6 miles northwest of Wickliffe on US 51/US60 has the state's largest natural lake and an observation tower for wildlife viewing. The habitat is primarily bottomland and flood plain area of the Ohio River, with several lakes and some interior gravel roads. Several migratory species winter here each year, including ring-billed and herring gulls, double-crested cormorants, waterfowl, and bald eagles.

- Peal – a 2,219 acre tract, 4 miles west of Barlow on Mounds City Landing Road. This area is composed of Ohio River bottomland with marshlands and cypress swamps. It has two roads which provide access to three oxbow lakes. Bird watching, camping, hiking, fishing, and hunting activities are permissible.

Alternative 8 (in blue) on the figure on the next page and its location to the Peal and Swan Lake WMAs are shown.

Alternative 8 would impact the northwestern edges of the Swan Lake WMA and would essentially bisect the Peal WMA. The WMAs have been identified as a known and worthwhile resource through the projects public involvement activities.

Location of Alternative 8 in Relation to Wildlife Management Areas



Coordination efforts between the KYTC and the Kentucky Department of Fish and Wildlife and the Kentucky Nature Preserves Commission have taken place. The KYTC had a briefing with the agencies and discussed the project with them. The agencies in turn discussed their concerns and agreed to detail them in writing. Essentially, each agency has serious concerns about the impacts of a bisecting roadway corridor on the WMAs and the wildlife that inhabit the areas. They have documented their concerns and essentially view Alternative 8's impacts on the WMAs, associated lands, and wildlife as a "fatal flaw". The WMAs are home to several species that inhabit the area and need it for winter migration. Impacts to these parts of the WMAs could NOT be mitigated. In addition, some portions of the WMAs were purchased with federal funds.

5.0 CONCLUSIONS

5.1 Conclusions – Level 3 Analysis

The more detailed technical analysis performed in this Level 3 screening / evaluation further evaluated the remaining five (5) alternatives. Those alternatives included:

- Alternative 0 – (No Build) – Only existing and committed projects in KYTC Six Year Plan and MoDOT improvement program.
- Alternative 8 – essentially Corridor 11 in/along existing KY 286, US 60 or US 62 corridors to a point east of Wickliffe, proceeding north west on new route across the Ohio River on a new bridge to I-57 in Illinois.
- Alternative 8B – US 60 improvements from Paducah to Wickliffe with a new Mississippi River crossing
- Alternative 11/12/13/14/15 & 21 – new interstate corridor parallel to US 62 and KY 286 with a new Mississippi River crossing
- Alternative 20 – unspecified corridor connecting I-24 north of Paducah to I-55 near Cape Girardeau, Missouri with no new river crossing either over the Mississippi or Ohio rivers.

Based on the analysis, the following can be concluded:

- Alternative 0 (No Build) is sufficient to meet the needs of the region in the near future but not in the project's horizon year of 2030. It narrowly and minimally addresses the study's goals, objectives, and issues and has minimal support. Therefore, although Alternative 0 will likely meet the needs of the region in the short term, it is not sufficient for longer term needs.

- Alternative 8 can meet the needs of the project and address some of the goals, objectives, and issues of the study. It does provide a new route and a river crossing. However, the impacts caused by this alternative to sensitive natural resource and wildlife management areas are too great to make the corridor feasible. These impacts, coupled with the fact that there are other alternatives with less impacts, make Alternative 8 not practical. Therefore, Alternative 8 should not proceed into the next stage(s) of project development by the KYTC.

- Alternative 8B can meet the needs of the project, address the goals, objectives and issues of the study and provide a new upgraded US 60 (partially controlled access facility) in the long term with a new bridge crossing the Mississippi River south of Wickliffe, Kentucky, (no further north than Lower Mississippi River Mile marker 949) in a fiscally responsible manner. Alternative 8B is a viable option for satisfying the short and long term transportation needs of western Kentucky.

- Alternative 11 / 12 / 13/ 14/ 15/ and 21, can also meet the needs of the project, address the goals, objectives, and issues of the study, and provides a long term new limited access highway with a new bridge crossing the Mississippi River near Wickliffe, Kentucky. However, given the need for additional right-of-way and the higher costs of this alternative, it is unlikely to be funded for construction in the time horizon of the study.

- Alternative 20, although unspecified as to the route through southern Illinois, does meet the needs of the project, address some of the goals, objectives, and issues of the study, and provides a new highway through southern Illinois. However, it does not provide for benefits to western Kentucky. Therefore, Alternative 20 is not recommended for further development by the KYTC.

5.2 Recommendation

The technical analysis reveals that it is feasible and beneficial to develop a project to improve the transportation system in western Kentucky in the shorter term, (i.e. improve US 60). However, a project to locate a limited access highway facility and to plan for the construction of a new Mississippi River crossing are longer term projects and are needed closer to the horizon year of the project - 2030.

Given this, and coupled with the current fiscal constraints in the Commonwealth, the KYTC has chosen as a policy decision, not to pursue a build project option at this time.

I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 9 – PROJECT CONTACTS

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

Qk4
Third Rock Consultants, LLC
Cultural Resource Analysts, Inc.
Fuller, Mossbarger, Scott & May

FEBRUARY 2005

The following list documents agencies and individuals who played various roles or contributed to the project throughout its duration. Other individuals who contributed would also include the public and the Project Work Group. More information about them, their comments, and contributions are in Appendix 1 – Public Involvement Summary or can be obtained by contacting KYTC's Division of planning.

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(*Sadly, Ms. Boatwright passed away in April 2003, before the completion of this project. Her contributions to the project were many, and the entire Project Team gratefully acknowledges and appreciates all of her many efforts.)*

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I-66 CORRIDOR STUDY
WESTERN KENTUCKY TO MISSOURI
BALLARD / MCCRACKEN COUNTY - ITEM # 1-23.00

APPENDIX 10 – RESOURCE AGENCY CORRESPONDENCE

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Kentucky Transportation Cabinet (KYTC) – District 1

Missouri Department of Transportation (MoDOT)

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.

In Association With:

Qk4
Third Rock Consultants, LLC
Cultural Resource Analysts, Inc.
Fuller, Mossbarger, Scott and May Engineers, Inc.

March 2005

The following documents depict the various correspondence and information exchange between and among the KYTC, the Consultant Team and various resource agencies at the state and federal levels.

The correspondences are actual electronic copies of letters, memos, reports, and other records received during the project. These various pieces of information helped shape the decisions that ultimately affected the outcome of the project. Accuracy of information as well as opinions expressed is the responsibility of the issuing agencies.

United States Department of the Interior

NATIONAL PARK SERVICE
Long Distance Trails Group Office - Santa Fe
P.O. Box 728
Santa Fe, New Mexico 87504-0728

IN REPLY REFER TO:

D18(TRTE)

January 6, 2002

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Kentucky Transportation Cabinet
125 Holmes St.
Frankfort, KY 40622

Dear Ms. Coffey:

Thank you for your letter of January 25, 2002, regarding the initiation of a planning study for the proposed Interstate 66 Highway project from McCracken County, Kentucky to Mississippi County, Missouri (KYTC Item #1-23.00). As the National Park Service office responsible for the administration of the Trail of Tears National Historic Trail, we are grateful to the Kentucky Transportation Cabinet for taking into consideration the potential impacts that this highway project might have on the historic trail and its associated resources.

Two variant routes traveled by the Cherokee during their forced migration in 1838-1839 have been designated as the Trail of Tears National Historic Trail. The first, the Water Route, follows the course of the Tennessee River from the Chattanooga area to its confluence with the Ohio River, down that river to the course of the Mississippi River, and then up the Arkansas River to Fort Smith. The second variant, known as the Northern Route, began at the Cherokee Agency, near present day Charleston, Tennessee. This was an overland course that passed through the cities of Nashville, Tennessee; Hopkinsville, Kentucky; Jonesboro, Illinois; Rolla and Springfield, Missouri; Fayetteville, Arkansas; and Tahlequah, Oklahoma. The Trail of Tears National Historic Trail Auto Tour Route closely follows the Northern Route. In addition to these two primary routes, there are several variants that are currently under study for possible designation as part of the National Historic Trail. Among these is a unique route traveled by the John Benge detachment, which left the Wills Valley near Ft. Payne, Alabama, and ran south of the Northern Route, passing through Tennessee, far southwestern Kentucky, southern Missouri, northern Arkansas, and ending near Tahlequah. To assist in your planning process, we've included maps that will give you a better understanding of the route variants through Kentucky.

The proposed Highway project is in the general area of the three trail variants mentioned above. The Water Route follows the main channel of the Mississippi River in western Kentucky. Currently, we are working with the U.S. Army Corps of Engineers to identify the historic river channel, which is likely marked today by old river remnants or oxbow lakes that may be eligible for the National Register of Historic Places based on their association to the Trail of Tears. It appears that the Northern Route is not within the 50-mile corridor you've identified in the Public Notice. Nonetheless, there are several key resources along the route in Kentucky that have either been certified by the National Park Service as a trail component, such as the Whitepath and Fly Smith Graves in Hopkinsville, or may be eligible for the National Register, such as Mantle Rock in Livingston County. The route traveled by the John Benge detachment may enter the 50-mile project corridor. This route is still under study but we have identified it tentatively as crossing Fulton, Hickman, and Carlisle Counties before crossing the Mississippi River at the Iron Banks near Columbus, and traversing Mississippi County, Missouri. Although we have not surveyed this section of the trail, our experience leads us to believe that there are probably extant trail segments in this part of Kentucky that are eligible for the National Register. There is strong public interest in support of adding the Benge Route to the National Historic Trail.

Our principle concerns are directed towards preserving and protecting all historic resources associated with the Trail of Tears, and creating appropriate public recreation and education opportunities along the trail. At this early stage in your planning process, it is impossible to say if and how trail resources will be impacted by this project, but we request that you continue to consider us an interested party as you proceed. We also would like to review any cultural resource reports that are produced associated with this project, and that any archeological testing or historical investigations account for the possibility of Trail of Tears-associated resources.

Feel free to direct any questions or requests for additional information to NPS Historian Aaron Mahr in this office at (505) 988-6736, or at aaron_mahr@nps.gov.

Sincerely,

David M. Gaines
Superintendent

Enclosures

The Trail Today

The story did not end with the arrival of the Cherokee people in Oklahoma. Despite this tragic event, they built successful communities that exist today. Old traces, historic buildings, and other sites are being preserved to commemorate the sorrowful journey.

A variety of local, state, and national efforts have commenced to preserve and interpret Trail resources. A growing awareness of this important story—and those of other removed tribes—has stimulated interest to nationally recognize this chapter in our Nation's past. The Trail of Tears tells of the Cherokee's ordeal—but many tribes can tell similar stories.

In 1987, Congress acknowledged the significance of the Trail by establishing the Trail of Tears National Historic Trail. The National Park Service administers the Trail in cooperation with federal, state, and local agencies; the Cherokee Nation and the Eastern Band of Cherokee Indians; interested groups; and private landowners.

The National Park Service coordinates activities, offering technical and limited financial assistance toward preservation, development, and commemoration of the Trail. Management of Trail resources remains with landowners; non-profit groups; and federal, state, and local agencies. Activities include marking an auto tour route which closely parallels or follows the historical land routes with the official Trail marker; marking the Water Route; historical research; resource protection; development of Trail brochures and other publications, including this interim brochure; and production of exhibits and an interpretive film.

We Need Your Help

The Trail of Tears National Historic Trail will only be successful with the hard work and dedication of public officials, citizen volunteers, and private landowners who want to preserve the historic resources of the Trail and make its story known. The Trail can aid community efforts in historic preservation and interpretation, trails and greenways, and other public recreation efforts.

Many organizations are helping to plan and develop the National Historic Trail. The Trail of Tears Association, a non-profit organization formed in 1993 to promote public awareness and appreciation of the Trail, works closely with the National Park Service. Its address is: Trail of Tears Association, 1100 North University, Suite 133, Little Rock, Arkansas 72207. 501/666-9032.

You can help with the Trail of Tears National Historic Trail by joining or supporting the work of the Trail of Tears Association, state and local historical societies, and other groups that promote or assist with the National Historic Trail. Landowners and site managers can pursue certification of their sites or Trail segments to further public use and protection of Trail resources. Permanent protection of these resources can be achieved by donation of lands or easements to land trusts or other appropriate groups. Financial contributions can support Trail programs. Donations of money, land, or easements may qualify as tax-deductible gifts. For more information, contact the National Park Service at the address listed.

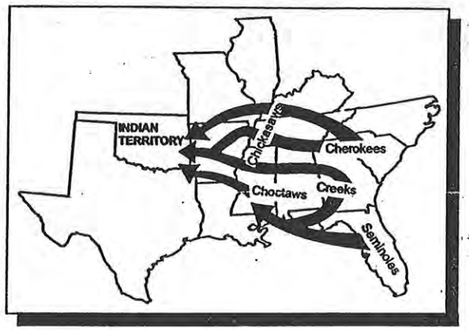
Traveling the Trail

Today, you can contemplate the Trail of Tears as you visit sites along the Trail of Tears National Historic Trail. We want to help you have a safe and meaningful visit.

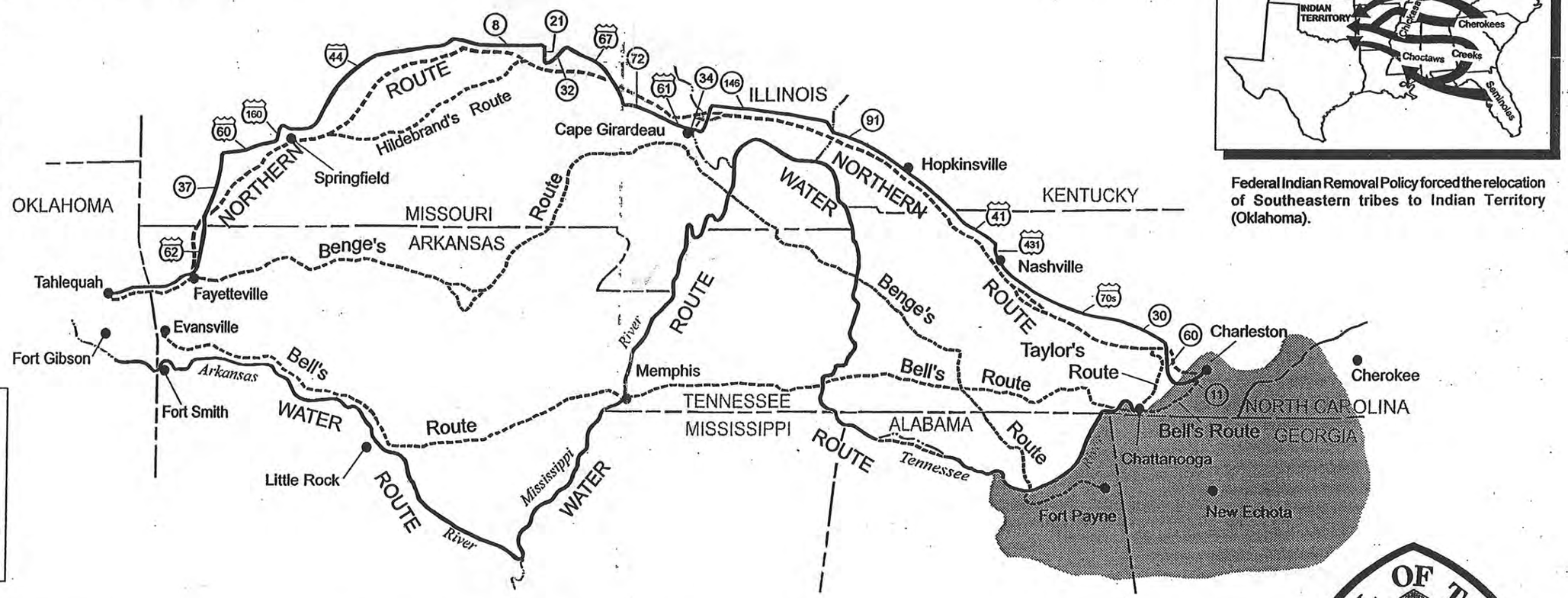
Remember that You're a Guest: Please respect your hosts' hospitality when you visit their certified sites. Leave everything as you find it. Summon owners only in emergencies. They retain the right to ask you to leave at any time. Obey signs—use designated parking areas—and limit your stay to the time necessary to appreciate the historic site.

Protect the Trail: Respect the features of the sites that you visit. Don't use metal-detectors or dig at sites—collect artifacts, or remove anything. Some sites contain burials. Please respect these sacred places.

Stay Safe: Many parts of the historic routes are on road rights-of-way. Remain alert, and aware of your children's and pets' locations. Beware of traffic. Know where your nearest emergency help can be found.



Federal Indian Removal Policy forced the relocation of Southeastern tribes to Indian Territory (Oklahoma).



Auto Tour Route

Auto tour route highways, closely following the historic land routes, are marked with the official Trail marker to aid you in visiting Trail sites. Contact the National Park Service for more information.

Stop at local chambers of commerce and information centers to learn about Trail-related sites and other interesting features and activities. Many Trail sites lack amenities; plan ahead—use public restrooms and other facilities before you visit sites.

Certified Trail Sites

Non-federal historic sites, Trail segments, and interpretive facilities become part of the Trail of Tears National Historic Trail through certification—a voluntary process in which an owner or manager agrees to adhere to National Park Service standards for resource preservation and public enjoyment. Look for the official Trail marker at all certified locations. Updated lists of certified sites and facilities are issued periodically by the National Park Service's Long Distance Trails Group Office - Santa Fe.

Non-certified Sites and Facilities

State, county, and city parks along the Trail route preserve Trail resources. Although not yet certified, they are open for public use.

Some sites on the Trail of Tears are privately owned, while many sites are on or along existing highways. Consult guidebooks and ask permission before going on private land.

Federal Sites

The historic Trail route passes through and by lands now managed by several federal agencies, such as the USDA Forest Service, the U.S. Army Corps of Engineers, the Tennessee Valley Authority, and the National Park Service. Some units of these agencies may provide interpretive information related to the Trail of Tears. Check locally, or consult the National Park Service

TRAIL OF TEARS NATIONAL HISTORIC TRAIL

LODI 8/96

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
C. THOMAS BENNETT, COMMISSIONER

January 20, 2002

Ms. Annette Coffey, P.E., Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40601

RE: Information on potential I-66 corridors in Marshall, McCracken, and Ballard counties, Kentucky.

Dear Ms. Coffey:

Members of my staff have reviewed the above-referenced information. Accordingly, we offer the following comments.

Members of my staff have participated in several meetings held by KTC regarding this project. They have found these meetings to be both informative and productive. I trust that KTC has also benefited from their attendance.

As members of my staff have noted in these meetings, our main area of concern is how any selected alternative will impact the area's fish and wildlife resources, their habitats, and sportsmen opportunities. In particular, we are concerned about impacts to wetland habitat, which is one of the most productive fish and wildlife habitats.

From the information you provided, it appears that any of the potential could have some impacts to those resources. However, corridor 8 could have significant impacts to wetland habitats and to properties owned by the Kentucky Department of Fish and Wildlife Resources. These lands provide significant fish and wildlife habitats and resources and are significant recreational lands for the general public.

We look forward to working with you and other members of your agency on this project in the future. If you should have any questions regarding our comments, please contact Mr. Wayne L. Davis, Environmental Section Chief, at 502/564-7109, ext. 365.

U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: obr
Phone: (314) 539-3900, Ext 382
FAX: (314) 539-3755

16591.1
14 February 2002

Ms. Annette Coffey, P.E.
Director, Division of Planning
Commonwealth of Kentucky
Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Subj: PROPOSED INTERSTATE HIGHWAY 66 FROM I-24 IN KENTUCKY TO I-57 IN MISSOURI

Dear Ms. Coffey:

This is in reply to your letter of 25 January 2002, concerning the proposed new construction of Interstate Highway 66.

The General Bridge Act of 1946 requires that the location and plans for bridges over navigable waters of the United States be approved by the Commandant, U. S. Coast Guard prior to commencing construction. Depending on the route selected, the proposed Interstate 66 would cross the Ohio River, Upper Mississippi River or the Lower Mississippi River. These rivers are considered to be navigable waterways of the United States for bridge administration purposes at the bridge site.

Applications for bridge permits should be addressed to Commander (obr), Eighth Coast Guard District, 1222 Spruce Street, St. Louis, Missouri 63103-2832, Attention: Bridge Branch. The application must be supported by sufficient information to permit a thorough assessment of the impact of the bridge and its immediate approaches on the environment. We recommend that the impacts of procedures for constructing cofferdams, sand islands, and falsework bents, etc., that will be employed to build the bridge be discussed. The Environmental Assessment (EA) should also contain data on the number, size and types of vessels currently using the waterway. This information should be compared with past and projected future trends on the use of the waterway.

Please advise if the project will be funded by the Federal Highway Administration or entirely with state funds. This will enable us to determine which agency is the lead federal agency for satisfying the requirements of National Environmental Policy Act (NEPA).

16591.1
14 February 2002

Subj: PROPOSED INTERSTATE HIGHWAY 66 FROM I-24 IN KENTUCKY TO I-57 IN MISSOURI

We appreciate the opportunity to comment on the project in this early stage. You can contact Mr. David Orzechowski at (314) 539-3900, extension 382 to discuss this project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

C-17 Geotech
BLEVINS

A-2
Annette Coffey

RECEIVED
TRANSPORTATION CABINET
DIVISION OF PLANNING
FEB 19 2 04 PM '02

MEMORANDUM

P-7-02

TO: Annette Coffey, P.E.
Director
Division of Planning

FROM: William Broyles P.E.
Geotechnical Engineering
Branch Manager
Division of Materials

BY: Michael Blevins P.G. MB
Geotechnical Branch

DATE: February 18, 2002

SUBJECT: Marshall, McCracken and Ballard Counties
I-66 (I-24 to I-57 Missouri)
Item 01-23.00
Mars # 6878901D
Intermediate Planning Study

At your request, personnel from the Geotechnical Branch have completed a preliminary office review of the subject project.

The Geologic Formations within the project area are part of the Quaternary, Tertiary and Cretaceous Systems. The Quaternary System consists of alluvium, loess and continental deposits. The alluvium contains clay, silt, sand and gravel. Loess deposits are primarily composed of silt and can be very sandy at the bottom of the formation. Continental deposits consist of gravel, sand, silt and clay with some chert pebbles.

The Tertiary System includes Formations of the Jackson, Claiborne, Wilcox Porters Creek Clay and the Clayton & McNairy. The Jackson and Claiborne Formations contain sand, silt, clay, and clay breccia, and the Claiborne also contains a few lignite seams. The Wilcox Formation contains sand, silt and clay. The Porters Creek Clay consist of clay and sand. The Clayton and McNairy Formations are found in the Cretaceous System and consist of sand, clay and silt deposits. The formations can be located on the attached geologic map.

The geotechnical considerations are as follows:

Concerns associated with these formations include wet embankment foundations, unstable subgrades, highly erodible and moisture sensitive soils. Wet embankment foundations may be addressed by using type III filter fabric and 1-3 feet of aggregate for stabilization. Unstable subgrades may be improved by using type IV filter fabric and aggregate or cement stabilization. Extra handling of the materials may required by the contractor to meet the proper moisture contents for compaction purposes. Embankment slopes will likely be 2:1 or flatter.

Generally, materials encountered in these formations when exposed in cut sections are highly erodible and may require erosion control methods such as rock and fabric or an erosion control blanket to minimize erosion of the cut face. Cut slopes for this project will likely be 2:1.

The Porters Creek Clay outcrops in and around the area of Paducah. The Branch prefers an alignment and/or grade that would avoid having this formation exposed in a cut section or directly below subgrades. The formation is extremely moisture sensitive and highly erodible and will cause unstable subgrades and cuts. The location of the Porters Creek Clay may be found on the attached Geologic Map.

Alluvium, loess and continental deposits cover much of the area that any alignment will traverse. Positive drainage is essential in maintaining stable foundations and subgrades.

Any bridge foundations will most likely involve the use of drilled shafts and scour at pier and abutment locations should be considered. The project is located within the seismic zone 3, an area where heavy earthquake damage could occur.

If there are any questions, please advise.

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
C. THOMAS BENNETT, COMMISSIONER

February 18, 2002

Mr. Alex Barber
Commissioner's Office
Department for Environmental Protection
14 Reilly Road
Frankfort, KY 40601

RE: Project Number: SERO2002-11
Early Study for possible construction of segment of Interstate Highway 66 (I-66) in Marshall, McCracken, and/or Ballard Counties in Kentucky and Mississippi County in Missouri from I-24 in northwestern Marshall County or McCracken County in Kentucky to I-57 in Mississippi County in Missouri - KY Transportation Cabinet

Dear Mr. Barber:

Members of my staff have reviewed the above-referenced notice. Accordingly, we offer the following comments and recommendations.

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has concerns how the proposed project may impact the local fish and wildlife resources, unique habitats (i.e. wetlands), threatened and endangered species, state wildlife management areas and sportsmen opportunities. Any project evaluation should address the potential for impacts to each of these.

The area that is being examined for this project has significant fish and wildlife resources, wetland habitat, endangered species, and sportsmen opportunities. All of which could be impacted by the development of this project. Additionally, KDFWR owns several tracts of land in Ballard County, which could be impacted by this project, depending upon the alignment of the highway.

We are attaching a list of threatened and endangered species that have been found in Ballard, Marshall, and McCracken counties and may occur within the proposed project area. Please be aware that our Kentucky Fish and Wildlife Information System (http://www.kfwis.state.ky.us/) is a dynamic system and this data only represents our current knowledge.

Members of my staff are available to discuss our concerns regarding this project and answer any questions you or your staff may have. The point of contact for KDFWR is Wayne L. Davis, Environmental Section Chief (502/564-7109, ext. 365).

We appreciate the opportunity to comment.

Sincerely,

C. Tom Bennett
Commissioner

CTB/WLD/kh

cc: Edwin F. Crowell, Asst. Director, Division of Fisheries
Paul W. Rister, Western Fishery District Biologist
Pat Brandon, Regional Supervisor, Purchase Wildlife Region
Lee A. Barclay, USFWS, Cookeville, TN
Environmental Section Files

Kentucky Threatened & Endangered Species Reported from Marshall County

Common Name	Scientific Name	Status Code	Re
American brook lamprey	Lampetra appendix (Dekay, 1842)	223,602,999	Re
Alabama shad	Alosa alabamae (Jordan and Evermann, 1896)	223,601,999	Re
central mudminnow	Umbra limi (Kirtland, 1840)	223,602,999	Re
dollar sunfish	Lepomis marginatus (Holbrook, 1855)	223,601	Re
Johnny darter	Etheostoma nigrum susanae (Rafinesque, 1820)	223,106,302,601,999	Re
cypress darter	Etheostoma proeliare (Hay, 1881)	223,302,602,999	Re
blue-winged teal	Anas discors Linnaeus, 1766	121,601,221	Re
hooded merganser	Lophodytes cucullatus (Linnaeus, 1758)	121,601,221	Re
fanshell	Cyprogenia stegaria (Rafinesque, 1820)	101,601,223	Re
pink mucket	Lampsilis abrupta (Say, 1831)	601,101,223	Re
pocketbook	Lampsilis ovata (Say, 1817)	601,223	Re
ring pink	Obovaria retusa (Lamarck, 1819)	101,601,223	Re
orange-foot pimpleback	Plethobasus cooperianus (I. Lea, 1834)	101,601,223	Re
pyramid pigtoe	Pleurobema pyramidatum (I. Lea, 1840)	107,601,223,106	Re
rabbitsfoot (subsp: cylindrica)	Quadrula cylindrica cylindrica (Say, 1817)	602,223,106	Re

KFWIS HOME

Species Status Codes

Code	Status	Description
000	Unclassified	(null)
101	Federal Endangered.	Those species in danger of extinction throughout all or a significant portion of their range.
102	Federal Threatened.	Those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
103	Federal proposed: Endangered	(null)
104	Federal proposed: Threatened	(null)
105	Fed. status review: C1:	Substantial information is on hand to support the biological appropriateness of proposing to list.
106	Fed. status review: C2:	Possibly appropriate to list, but inconclusive data at present
107	Fed. status review: C3:	Species is no longer receiving consideration.
108	Critical habitat determined	(null)
109	Federal candidate	(null)
111	Plan approved by Director	(null)
112	Draft plan received	(null)
113	Plan in preparation	(null)
114	Status unknown	(null)
115	Under notice of review	(null)
116	Federal delisted	(null)
117	Federal downlisted	(null)
121	Federal Migratory	(null)
122	Marine Mammal	(null)
131	EPA Indicator	(null)
142	USFS Indicator	(null)
201	KDFWR - State Endangered	(null)
202	KDFWR - State Threatened	(null)
203	KDFWR - State High Interest (null)	
204	KDFWR - State Proposed	(null)
205	KDFWR - State status undetermined	(null)
206	KDFWR - State downlisted	(null)
207	KDFWR - State delisted	(null)
210	Depleted:	Commercial species that are depressed from former abundance by over-harvesting.

Kentucky Threatened & Endangered Species Reported from Marshall County

Common Name	Scientific Name	Status Code	Re
American brook lamprey	Lampetra appendix (Dekay, 1842)	223,602,999	Re
Alabama shad	Alosa alabamae (Jordan and Evermann, 1896)	223,601,999	Re
central mudminnow	Umbra limi (Kirtland, 1840)	223,602,999	Re
dollar sunfish	Lepomis marginatus (Holbrook, 1855)	223,601	Re
Johnny darter	Etheostoma nigrum susanae (Rafinesque, 1820)	223,106,302,601,999	Re
cypress darter	Etheostoma proeliare (Hay, 1881)	223,302,602,999	Re
blue-winged teal	Anas discors Linnaeus, 1766	121,601,221	Re
hooded merganser	Lophodytes cucullatus (Linnaeus, 1758)	121,601,221	Re
fanshell	Cyprogenia stegaria (Rafinesque, 1820)	101,601,223	Re
pink mucket	Lampsilis abrupta (Say, 1831)	601,101,223	Re
pocketbook	Lampsilis ovata (Say, 1817)	601,223	Re
ring pink	Obovaria retusa (Lamarck, 1819)	101,601,223	Re
orange-foot pimpleback	Plethobasus cooperianus (I. Lea, 1834)	101,601,223	Re
pyramid pigtoe	Pleurobema pyramidatum (I. Lea, 1840)	107,601,223,106	Re
rabbitsfoot (subsp: cylindrica)	Quadrula cylindrica cylindrica (Say, 1817)	602,223,106	Re

KFWIS HOME

Species Status Codes

Code	Status	Description
000	Unclassified	(null)
101	Federal Endangered.	Those species in danger of extinction throughout all or a significant portion of their range.
102	Federal Threatened.	Those species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
103	Federal proposed: Endangered	(null)
104	Federal proposed: Threatened	(null)
105	Fed. status review: C1:	Substantial information is on hand to support the biological appropriateness of proposing to list.
106	Fed. status review: C2:	Possibly appropriate to list, but inconclusive data at present
107	Fed. status review: C3:	Species is no longer receiving consideration.
108	Critical habitat determined	(null)
109	Federal candidate	(null)
111	Plan approved by Director	(null)
112	Draft plan received	(null)
113	Plan in preparation	(null)
114	Status unknown	(null)
115	Under notice of review	(null)
116	Federal delisted	(null)
117	Federal downlisted	(null)
121	Federal Migratory	(null)
122	Marine Mammal	(null)
131	EPA Indicator	(null)
142	USFS Indicator	(null)
201	KDFWR - State Endangered	(null)
202	KDFWR - State Threatened	(null)
203	KDFWR - State High Interest (null)	
204	KDFWR - State Proposed	(null)
205	KDFWR - State status undetermined	(null)
206	KDFWR - State downlisted	(null)
207	KDFWR - State delisted	(null)
210	Depleted:	Commercial species that are depressed from former abundance by over-harvesting.

221	Protected: Game. Consumptive Recreational.	A species that is harvested recreationally for flesh or trophy value and so designated by State or Federal law (does not include Game Fish, see Protected: Sport Fish, code 224). An open season has been designated.
222	Protected: Furbearer.	A species that is harvested for fur value and so designated by State or Federal law. An open season has been designated.
223	Protected: Nongame.	A species in which protection is provided because a closed season has been designated officially by State or Federal law, or in which method of take is regulated, but the species is not considered Game.
224	Protected: Sport Fish.	A species harvested recreationally for flesh or trophy value and so designated by State or Federal law. An open season has been designated.
225	Unprotected: Nongame.	No protection (e.g. limits) is provided for this species and may taken year-round except during a specified time depending on the year.
226	Non-consumptive recreational	(null)
301	Sensitive.	A species that is especially susceptible to environmental perturbation.
302	Biological Indicator.	A species whose occurrence indicates environmental quality (high or low quality).
401	Commercial.	A species that is commercially harvested for fur or flesh or similar value.
410	Pest	(null)
411	Pest/Nuisance	A species that is considered a pest or nuisance to humans but does not cause livestock or crop losses.
412	Pest/Livestock	A species that causes livestock losses.
413	Pest/Crops	A species that cause agricultural or crop losses.
501	Probably extirpated (or extinct)	The species has been reported in Kentucky historically but has probably been extirpated from Kentucky.
502	Accidental:	A species for which there may be too few records of the species in Kentucky to classify it to another status category.
503	Migrant	A species that moves between two areas a distance which is greater than its normal home range.
504	Anadromous Fish	(null)
505	Catadromous Fish	(null)
601	KSNPC - State endangered.	A species which is in danger of extirpation and/or extinction thoughout all or a significant portion of its range in Kentucky.
602	KSNPC - State threatened.	A species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in Kentucky.

603	KSNPC - State special concern.	A species that should be continually monitored because a) it exists in a limited geographic area, b) it may become threatened or endangered due to modification or destruction of habitat, c) certain characteristics or requirements make it especially vulnerable to specific pressures, or d) experienced researchers have identified other factors.
604	KSNPC - State proposed	(null)
605	KSNPC - State status undetermined.	A species that has been suggested as threatened or endangered or extirpated but insufficient information exists for assignment to Special Concern or Threatened or Endangered.
606	KSNPC - State downlisted	(null)
607	KSNPC - State delisted	(null)
608	KSNPC - Historic	(null)
609	KSNPC - Federal candidate	Animals that are not monitored in Kentucky by KSNPC because of their reported abundance.
701	Existing FMP exists	(null)
702	Pending FMP is currently in preparation	(null)
703	Other no FMP or PMP exists	(null)
704	Only PMP exists	(null)
711	Commercial/consumption	(null)
712	Commercial/industrial	(null)
713	Commercial/bait	(null)
714	Subsistence	(null)
715	International treaty	(null)
801	Economic Importance: High	(null)
802	Economic Importance: Moderate	(null)
803	Economic Importance: Low	(null)
999	See Comments significant portion of their range.	(null)

Kentucky Threatened & Endangered Species Reported from Ballard County

Common Name	Scientific Name	Status Code	Refe
lake sturgeon	Acipenser fulvescens (Rafinesque, 1817)	223,106,601	Refe
alligator gar	Atractosteus spatula (Lacepede, 1803)	223,601,999	Refe
Alabama shad	Alosa alabamae (Jordan and Evermann, 1896)	223,601,999	Refe
cypress minnow	Hybognathus hayi (Jordan, 1885)	223,601,999	Refe
taillight shiner	Notropis maculatus (Hay, 1881)	223,602,999	Refe
inland siverside	Menidia beryllina (Cope, 1866)	223,602,999	Refe
spotted sunfish	Lepomis punctatus (Valenciennes, 1831)	223,602,999	Refe
cypress darter	Etheostoma proeliare (Hay, 1881)	223,302,602,999	Refe
great egret	Casmerodius albus (Linnaeus, 1758)	223,121,601	Refe
yellow-crowned night-heron	Nyctanassa violaceus (undescribed)	223,121,602	Refe
blue-winged teal	Anas discors Linnaeus, 1766	121,601,221	Refe
hooded merganser	Lophodytes cucullatus (Linnaeus, 1758)	121,601,221	Refe
bald eagle	Haliaeetus leucocephalus (Linnaeus, 1766)	223,101,121,601,102	Refe
northern Harrier	Circus cyaneus (Linnaeus, 1766)	223,121,602	Refe
interior least tern	Sterna antillarum athalassos (undescribed)	223,101,121,601	Refe
brown creeper	Certhia americana Bonaparte, 1838	223,601,121	Refe
Indiana myotis	Myotis sodalis Miller and Allen, 1928	223, 101, 108, 601	Refe
evening bat	Nycticeius humeralis (Rafinesque, 1818)	223, 602	Refe
orange-foot pimpleback	Plethobasus cooperianus (I. Lea, 1834)	101,601,223	Refe
bleufer	Potamilus purpuratus (Lamarck, 1819)	601,223	Refe
rabbitsfoot (subsp: cylindrica)	Quadrula cylindrica cylindrica (Say, 1817)	602,223,106	Refe

KFWIS HOME

Kentucky Threatened & Endangered Species Reported from McCracken County

Common Name	Scientific Name	Status Code	Refe
alligator gar	Atractosteus spatula (Lacepede, 1803)	223,601,999	Refe
Alabama shad	Alosa alabamae (Jordan and Evermann, 1896)	223,601,999	Refe
cypress minnow	Hybognathus hayi (Jordan, 1885)	223,601,999	Refe
taillight shiner	Notropis maculatus (Hay, 1881)	223,602,999	Refe
spotted sunfish	Lepomis punctatus (Valenciennes, 1831)	223,602,999	Refe
Johnny darter	Etheostoma nigrum susanae (Rafinesque, 1820)	223,106,302,601,999	Refe
yellow-crowned night-heron	Nyctanassa violaceus (undescribed)	223,121,602	Refe
blue-winged teal	Anas discors Linnaeus, 1766	121,601,221	Refe
hooded merganser	Lophodytes cucullatus (Linnaeus, 1758)	121,601,221	Refe
Indiana myotis	Myotis sodalis Miller and Allen, 1928	223, 101, 108, 601	Refe
ring pink	Obovaria retusa (Lamarck, 1819)	101,601,223	Refe

KFWIS HOME

Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

James C. Codell, III
Secretary of Transportation

Clifford C. Linkes, P.E.
Deputy Secretary

Paul E. Patton
Governor

MEMORANDUM

TO: Annette Coffey, Director
Division of Planning

FROM: Michael L. Hill, Director
Division of Multimodal Programs

DATE: February 25, 2002

SUBJECT: Item No. 1-23.00
Interstate 66 (I-66) Planning Study
Marshall, McCracken, and/or Ballard Counties

Thank you for the opportunity to comment on this significant project.

The Division of Multimodal Programs' responsibilities include air quality conformity issues and the determination of air quality impacts of large construction projects on the state's rural nonattainment areas. Marshall County and a southern portion of Livingston County are designated as an isolated rural air quality maintenance area for the one-hour ozone standard. This area is in conformity with respect to a recently revised (effective 2-8-02) State Implementation Plan (SIP). The provisions of this designation will apply until, at least, 2025. During the period of this designation, implementation of any new projects would require that air quality conformity be demonstrated. The I-66 project is not included in the current Statewide Transportation Improvement Program (STIP); therefore, a new conformity analysis would be required in order to proceed. Additionally, new federal standards for ozone and particulate matter are expected to be implemented in 2004 and could impact Marshall and Livingston Counties as well as McCracken and Ballard Counties. Please contact Jesse Mayes of this Division, at (502) 564-7686, for more information on the air quality impacts of the I-66 construction.

In addition, the construction of a segment of Interstate Highway 66 (I-66) in this area potentially has major impacts on the Paducah Small Urban Area (SUA). Currently, a small urban area study is being developed for the Paducah

area including a travel demand model covering all of McCracken County. During the course of the study, one of the goals has been to anticipate potential impacts of I-66. When completed, a copy of the small urban area study will be provided to the Division of Planning. Please contact Barry House of this Division, at (502) 564-7686, for any questions regarding this study.

The coordination and connectivity of bicycle and pedestrian facilities is important in the early planning and design stages of projects. Design Guidance from the United States Department of Transportation released in February, 2000, states "bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist.

One of the I-66 project goals is to "improve access and mobility in depressed or impoverished regions." Although Kentucky Interstate bridges and facilities traditionally do not accommodate bicycles or pedestrians, including additional modes of travel in the construction of the Mississippi River crossing will help meet that project goal. This Division recommends a separate bicycle and pedestrian path be incorporated in the design of the Mississippi River crossing. Other states have expanded Interstate bridges allowing bicycle and pedestrian access, including Pennsylvania and Oregon. Examples of this type of access can be provided upon request. Additional bicycle and pedestrian concerns to be addressed during design are Ballard County's extensive bicycle routes that need to be accommodated in overpass and ramp construction of this project. Please contact Paula Nye of this Division, at (502) 564-7686, for any questions about bicycle and pedestrian concerns.

We look forward to working with your Division to facilitate your study efforts in our air quality nonattainment and maintenance areas, SUA and MPO areas, and by increasing awareness of bicycle and pedestrian issues.

MLH/LJS/RPS/AJT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

February 27, 2002

Ms. Annette Coffey
Director, Division of Planning
Kentucky Transportation Cabinet
125 Holmes Avenue
Frankfort, Kentucky 40622

Re: FWS# 02-0985

Dear Ms. Coffey:

Thank you for your letter and enclosures of January 25, 2002, concerning the proposed construction of Interstate 66 from Interstate 24 in Marshall or McCracken County, Kentucky, to Interstate 57 in Mississippi County, Missouri. Fish and Wildlife Service (Service) personnel have reviewed the information submitted and we offer the following comments.

The work area for the Cookeville Ecological Services Field Office covers the entire State of Kentucky but does not include Missouri. The Ecological Services Field Office in Columbia, Missouri, should be contacted regarding the presence of Service trust resources in that state. Our comments, therefore, refer only to the sections of the proposed highway that would be constructed in Marshall, Ballard, and McCracken Counties, Kentucky.

We are concerned that large highway projects, such as Interstate 66, have the potential to fragment wildlife habitat and serve as conduits for secondary commercial and residential development (and associated indirect adverse impacts to the natural environment). We recommend that the proposed route follow, as closely as possible, existing transportation corridors to avoid and minimize both direct and indirect environmental impacts.

Rare species collection records available to the Service indicate that several federally protected species, as well as several "Species of Management Concern," occur or potentially occur in the project study area. We have attached a list of these species to this correspondence (Attachment I). Rare aquatic species are particularly abundant in both the Ohio and Mississippi Rivers, although other streams and rivers in the area may also contain rare fish and mussels. You should assess potential impacts to the federally listed species and determine if the proposed work may affect them. A "may affect" finding could necessitate initiation of formal consultation with this office and our subsequent issuance of a biological opinion. While "Species of Management Concern" are not currently listed, they are being evaluated for potential listing and we would appreciate any measures that you could take to minimize adverse impacts to individuals and their habitat.

Information available to the Service indicates that numerous streams and wetlands exist in the vicinity of the proposed I-66 corridor. Due to the large number of USGS quads involved, we are unable to provide copies of maps for all the known potential locations of wetlands. However, there is a web site that provides digital access to National Wetlands Inventory data for the entire State of Kentucky. The address for this website is *ww.kfwis.state.ky.us/KFWIS/DownloadNWIP/download.htm*. It should be noted that these digital maps are not to be used as a substitute for field verification. They are provided as a planning tool. The Corps of Engineers should be contacted regarding the presence of regulatory wetlands and the requirements of wetlands protection statutes.

Your concern for the protection of endangered species and environmentally sensitive areas is appreciated. If you have questions regarding this information, or if we can be of further assistance, please contact Rob Tawes of my staff at telephone 931/528-6481, ext 213.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

Attachment

xc: Wayne Davis, KDFWR, Frankfort, KY
Field Supervisor, FWS, Columbia, MO
Jim Townsend, COE, Louisville, KY
Randy Clark, COE, Memphis, TN

Rare Species List
Interstate-66, from I-24 to Missouri State Line

Federally Protected Species

Indiana bat - *Myotis sodalis* (E)
least tern - *Sterna antillarum* (E)
bald eagle - *Haliaeetus leucocephalus* (T)
pallid sturgeon - *Scaphirhynchus albus* (E)
sturgeon chub - *Macrhybopsis gelida* (C)
sicklefin chub - *Macrhybopsis meeki* (C)
orangefoot pimpleback - *Plethobasus cooperianus* (E)
fat pocketbook - *Potamilus capax* (E)

Species of Management Concern

Rafinesque's big-eared bat - *Corynorhinus rafinesquii*
rabbitsfoot - *Quadrula cylindrica*

E = federally endangered
T = federally threatened
C = Candidate species

Federal Emergency Management Agency
Washington, D.C. 20472

February 28, 2002

Annette Coffey, P.E.
Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Dear Ms. Coffey:

This is to acknowledge receipt of your January 25, 2002, letter to the Federal Emergency Management Agency (FEMA). FEMA is currently reviewing your concerns and will get back to you as soon as possible.

Should you need further assistance, please contact Ms. Zina Colbert at (202) 646-4582. Please reference folder 17830 when inquiring about this response. Thank you for your cooperation.

Sincerely,

Howard Leikin, for

Robert F. Shea
Acting Administrator, Federal Insurance
and Mitigation Administration

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS TN 38103-1894

Reply to
Attention of:

March 1, 2002

Construction-Operations Division

Ms. Annette Coffey, P.E.
Director, Division of Planning
Transportation Cabinet
Commonwealth of Kentucky
Frankfort, Kentucky 40622

Dear Ms. Coffey:

Thank you for your letter of January 25, 2002 asking us to identify specific issues or concerns that affect the development of a proposed highway project identified in the Kentucky Transportation Cabinet (KYTC) public notice KYTC Item # 1-23.00.

The highway segment of concern was given as Interstate Highway 66 (I-66) in Marshall, McCracken, and/or Ballard Counties in Kentucky and Mississippi County in Missouri from I-24 in northwestern Marshall County or McCracken County in Kentucky to I-57 in Mississippi County in Missouri. The project vicinity shown on the second page of the public notice includes an area in the Memphis District that is significant in wetlands and includes a Mississippi River crossing. These proposed improvements would likely require Department of the Army Section 10 and Section 404 Permits.

The proposed routing should avoid any crossing that will interfere with a future operation of the Birds Point-New Madrid Floodway, Missouri. The Floodway is an authorized and integral component of the Mississippi River and Tributaries Project. The purpose of the Floodway is to lower flood stages along the Mississippi River upstream and adjacent to the floodway during major flood events. The operation of the floodway is critical in that the design grade for the levees, which provide flood protection to urban and rural areas along the Mississippi River in these areas, is based on its proper operation. Pertinent information regarding the Floodway is provided for your use (Enclosures 1 through 3).

If an Environmental Impact Study is required for this project, the Memphis District would consider using it, as a cooperating agency, for our National Environmental Protection Act permit review. Due to the potential, significant impacts of such a project, we would like to meet with your planners at an early stage before designs get too advanced. We believe early coordination on this matter could result in significant time-savings down the road as appropriate permits are applied for and processed.

Please contact Mr. Larry Watson (901) 544-0736 or Mr. Ray Lartigue (901) 544-3370 of our staff if you have any questions or if we can provide any further assistance..

Sincerely,

Robert D. Cash, P.E.
Chief, Construction-Operations Division

Enclosures

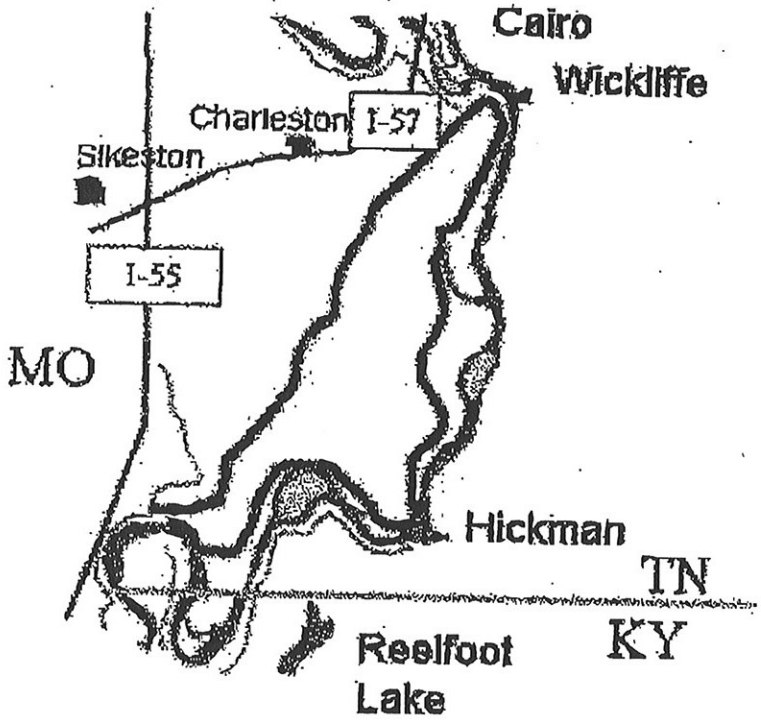
Floodway Information

The Birds Point - New Madrid Floodway was authorized by the Flood Control Act of 1928 as part of the Mississippi River and Tributaries (MR&T) Project. It remains a vital part of the MR&T project to this day. Its purpose is to lower flood stages upstream and adjacent to the floodway during major flood events. The floodway is protected from flooding, during more ordinary high water events, by the frontline levee to a height equivalent to 60.5 feet on the Cairo gage. However, the President of the Mississippi River Commission is authorized (by the Flood Control Act of 1965) to operate the floodway "to include breaching of the fuse plug levee during floods which reach 58 feet and threaten to exceed 60 feet at Cairo." Based on this, the authorized level of flood protection, the expected frequency of floodway operation is on the average of 1 in 80 years.

Under the current plan of operation, adopted in 1986, breaching of sections of the frontline levee would be accomplished by pumping blasting agent into pipes that have been pre-emplaced into the levee. Over two miles of the frontline levee, at the northern section of the floodway, would be operated as required by hydrologic conditions. In the area immediately behind the crevasse sections, bluehole and sanding effects will be expected for a distance of approximately one-half mile. Other areas of the frontline levee, in the southern reach, would also be operated to provide inflow/outflow for floodwaters.

Currently there is a 1,500 foot gap between the frontline and setback levees at the southern end of the floodway. This gap allows backwater from the Mississippi River to enter the floodway at high river stages. It should be noted that a very high percentage of the floodway is already flooded by backwater at the stages mentioned in the above paragraph. The Flood Control Act of 1954 authorized closure of the gap; additionally a pumping station was authorized for the area by the Water Resources Development Act of 1986. These features are part of the St. Johns Bayou and New Madrid Floodway Project. A Supplemental Environmental Impact Statement for the project is currently out for comments. Closure of the gap would eliminate backwater from entering the floodway; however, the floodway would remain a dedicated floodway and there are currently no plans for its de-authorization.

If you require more information regarding the Birds Point - New Madrid Floodway and its operation, please call Patsy Fletcher of our Readiness Branch at 901-544-3461. For information regarding the St. John's Bayou and New Madrid Floodway project, please contact Larry Sharpe, 901-544-3476.


Cairo
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Charleston
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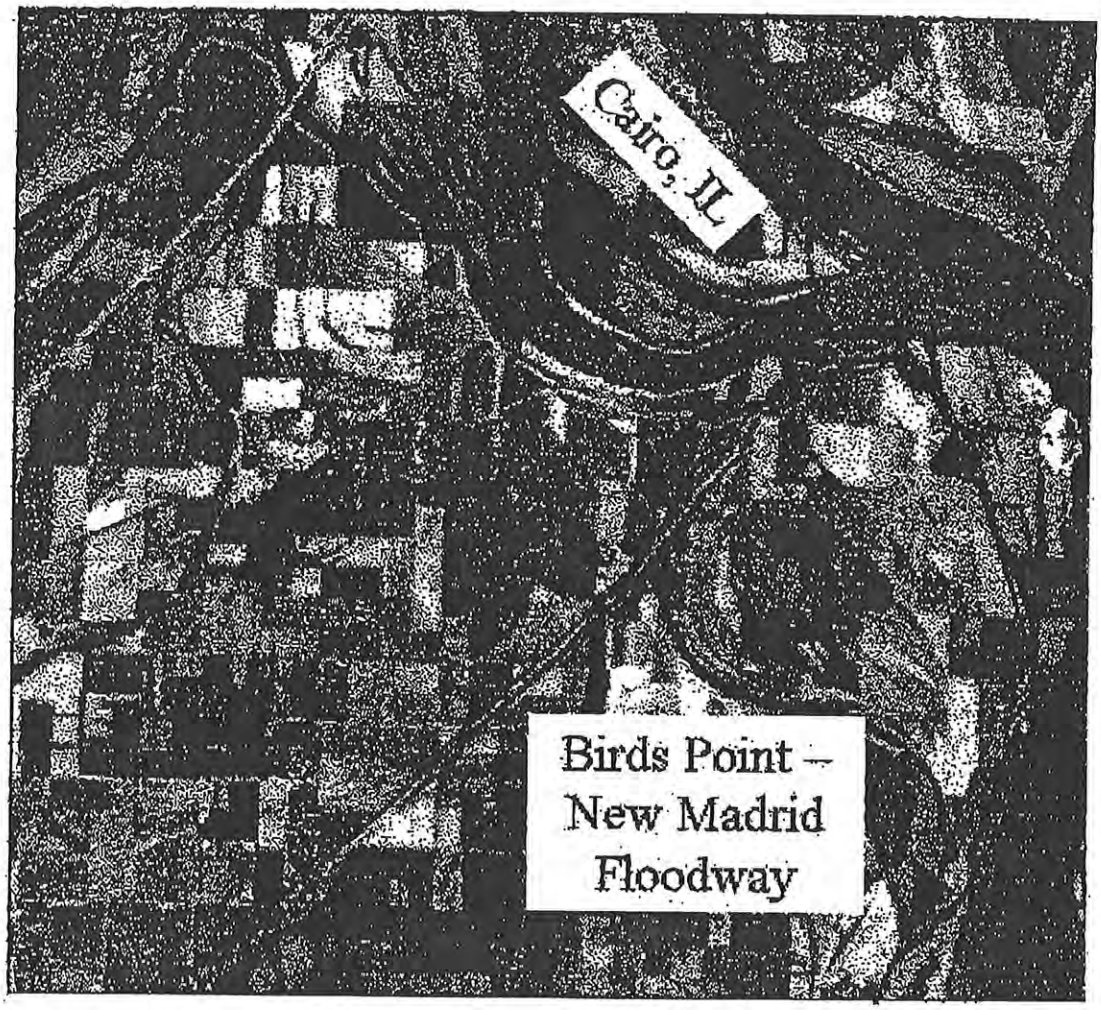
Sikeston
I-55
MO
Hickman
TN
KY
Reelfoot
Lake

Enclosure 2



Enclosure 3

From: Palmer-Ball, Brainard (NREPC, KSNPC)
Sent: Wednesday, March 06, 2002 11:31 AM
To: Barber, Alex (NREPC, DEP)
Subject: KSNPC response to KIRP

TO: Alex Barber, NREPC-DEP, Intergovernmental Review Coordinator

FROM: Brainard Palmer-Ball, Jr., Ky State Nature Preserves Commission

RE: KSNPC response to KIRP

DATE: March 6, 2002

A day late on this one, Alex.

RE: Project No. SERO2002-1(I-66 Scoping In western Kentucky)

KSNPC has reviewed the project description and has directly forwarded a summary of USFWS and state listed species in the western Kentucky counties that could be affected. At this point in time, it is too early to speculate on specific potential issues that could arise, but the summary of listed species by county should provide the Ky. Transportation Cabinet with a good basis for beginning to assess potential impacts to threatened and endangered species.

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES
DIVISION OF FORESTRY
LEAH W. MACSWORDS, DIRECTOR
627 COMANCHE TRAIL
FRANKFORT, KENTUCKY 40601

March 1, 2002

Mr. Alex Barber
Department for Environmental Protection
14 Reilly Road
Frankfort, Kentucky 40601

Dear Mr. Barber:

The Division of Forestry has reviewed Transportation Cabinet's early study for possible construction of a segment of Interstate Highway 66 (SERO2002-11). The division operates John P. Rhody Nursery (JPRN) near Gilbertsville, Kentucky. The nursery is located off of Ky. Hwy. 282 just north of the airport. The land lies between the airport and Interstate 24 in Marshall County and is located in the study area.

This nursery is the larger of two state operated tree seedling nurseries and is critical to current operation of the division. Loss of the nursery would significantly impact the budget and mission of the division. From an environmental standpoint the nursery is bounded on the south by a cypress slough with significant plant and fauna value. The pair of nesting Bald Eagles presently using the area demonstrates the significance of this area.

Please contact James Funk, Branch Manager, Forest Resources Branch, at (502) 564-4496 if you have any questions or desire additional information.

Sincerely,

Leah W. MacSwords
Director

LWM:SK:gs

Attachments

c: Hugh N. Archer, Commissioner
Jim Funk

DONALD S. DOTT, JR.
DIRECTOR

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION
801 SCHENKEL LANE
FRANKFORT, KENTUCKY 40601-1403
(502) 573-2886 VOICE
(502) 573-2355 FAX

March 6, 2002

Ms. Annette Coffey, Director
Division of Planning
Transportation Cabinet
Frankfort, Kentucky 40601

Dear Ms. Coffey:

We have reviewed the I-66 project planning package for western Kentucky that was submitted through the state clearinghouse for comments (SERO2002-11). Enclosed with this letter is a summary prinout by county of USFWS and state listed species that occur in the counties of western Kentucky that could be affected by this project. This summary should serve as a basis for further consideration of threatened and endangered species issues that might arise during planning for possible implementation of the project.

Thank you for the opportunity to review this project proposal.

Sincerely,

Brainard Palmer-Ball Jr.

Brainard Palmer-Ball, Jr.
Field Representative

Enclosure

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Ballard	AMPHIBIANS	BIRD-VOICED TREEFROG	HYLA AVIVOCA	T	
Ballard	AMPHIBIANS	GREEN TREEFROG	HYLA CINEREA	S	
Ballard	AMPHIBIANS	NORTHERN CRAWFISH FROG	RANA AREOLATA CIRCULOSA	S	
Ballard	BIRDS	BALD EAGLE	HALIAEETUS LEUCOCEPHALUS	E	LT
Ballard	BIRDS	BANK SWALLOW	RIPARIA RIPARIA	S	
Ballard	BIRDS	BROWN CREEPER	CERTHIA AMERICANA	E	
Ballard	BIRDS	DOUBLE-CRESTED CORMORANT	PHALACROCORAX AURITUS	H	
Ballard	BIRDS	FISH CROW	CORVUS OSSIFRAGUS	S	
Ballard	BIRDS	GREAT BLUE HERON	ARDEA HERODIAS	S	
Ballard	BIRDS	GREAT EGRET	ARDEA ALBA	E	
Ballard	BIRDS	HOODED MERGANSER	LOPHODYTES CUCULLATUS	T	
Ballard	BIRDS	INTERIOR LEAST TERN	STERNA ANTILLARUM ATHALASSOS	E	LE
Ballard	BIRDS	LEAST BITTERN	IXOBRYCHUS EXILIS	T	
Ballard	BIRDS	MISSISSIPPI KITE	ICTINIA MISSISSIPPIENSIS	S	
Ballard	BIRDS	SEDGE WREN	CISTOTHORUS PLATENSIS	S	
Ballard	BIRDS	YELLOW-CROWNED NIGHT-HERON	NYCTANASSA VIOLACEA	T	
Ballard	BIVALVES	BLEUFER	POTAMILUS PURPURATUS	E	
Ballard	BIVALVES	ORANGEFOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	E	LE
Ballard	BIVALVES	POCKETBOOK	LAMPSILIS OVATA	E	
Ballard	BIVALVES	PYRAMID PIGTOE	PLEUROBEMA RUBRUM	E	
Ballard	BIVALVES	RABBITSFOOT	QUADRULA CYLINDRICA CYLINDRICA	T	
Ballard	BIVALVES	RING PINK	OBOVARIA RETUSA	E	LE
Ballard	BIVALVES	SHEEPNOSE	PLETHOBASUS CYPHYUS	S	
Ballard	CRUSTACEANS	A CRAYFISH	ORCONECTES LANCIFER	E	
Ballard	CRUSTACEANS	A CRAYFISH	ORCONECTES PALMERI PALMERI	E	
Ballard	CRUSTACEANS	A CRAYFISH	PROCAMBARUS VIAEVIRIDIS	T	
Ballard	CRUSTACEANS	CAJUN DWARF CRAYFISH	CAMBARELLUS SHUFELDTII	S	
Ballard	FISHES	ALLIGATOR GAR	ATRACTOSTEUS SPATULA	E	
Ballard	FISHES	BLACK BUFFALO	ICTIOBUS NIGER	S	
Ballard	FISHES	BLACKTAIL SHINER	CYPRINELLA VENUSTA	S	
Ballard	FISHES	CHAIN PICKEREL	ESOX NIGER	S	
Ballard	FISHES	CHESTNUT LAMPREY	ICHTHYOMYZON CASTANEUS	S	
Ballard	FISHES	CYPRESS DARTER	ETHEOSTOMA PROELIARE	T	
Ballard	FISHES	CYPRESS MINNOW	HYBOGNATHUS HAYI	E	
Ballard	FISHES	FLATHEAD CHUB	PLATYGOBIO GRACILIS	S	
Ballard	FISHES	INLAND SILVERSIDE	MENIDIA BERYLLINA	T	
Ballard	FISHES	LAKE CHUBSUCKER	ERIMYZON SUCETTA	T	
Ballard	FISHES	LAKE STURGEON	ACIPENSER FULVESCENS	E	
Ballard	FISHES	NORTHERN MADTOM	NOTURUS STIGMOSUS	S	

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Ballard	FISHES	PALLID STURGEON	SCAPHIRHYNCHUS ALBUS	E	LE
Ballard	FISHES	PLAINS MINNOW	HYBOGNATHUS PLACITUS	S	
Ballard	FISHES	REDSPOTTED SUNFISH	LEPOMIS MINIATUS	T	
Ballard	FISHES	SICKLEFIN CHUB	MACRHYBOPSIS MEEKI	H	C
Ballard	FISHES	SPOTTAIL SHINER	NOTROPIS HUDSONIUS	S	
Ballard	FISHES	STURGEON CHUB	MACRHYBOPSIS GELIDA	H	C
Ballard	FISHES	TAILLIGHT SHINER	NOTROPIS MACULATUS	T	
Ballard	GASTROPODS	ARMORED ROCKSNAIL	LITHASIA ARMIGERA	S	
Ballard	GASTROPODS	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA	S	
Ballard	MAMMALS	EVENING BAT	NYCTICEIUS HUMERALIS	T	
Ballard	MAMMALS	INDIANA MYOTIS	MYOTIS SODALIS	E	LE
Ballard	MAMMALS	RAFINESQUE'S BIG-EARED BAT	CORYNORHINUS RAFINESQUII	S	
Ballard	MAMMALS	SOUTHEASTERN MYOTIS	MYOTIS AUSTRORIPARIUS	E	
Ballard	PALUSTRINE COMMUNITI		CYPRESS SWAMP	N	
Ballard	REPTILES	ALLIGATOR SNAPPING TURTLE	MACROCLEMYS TEMMINCKII	T	
Ballard	REPTILES	MIDLAND SMOOTH SOFTSHELL	APALONE MUTICA MUTICA	S	
Ballard	REPTILES	WESTERN MUD SNAKE	FARANCIA ABACURA REINWARDTII	S	
Ballard	REPTILES	WESTERN RIBBON SNAKE	THAMNOPHIS PROXIMUS PROXIMUS	T	
Ballard	VASCULAR PLANTS	AMERICAN FROG'S-BIT	LIMNOBIUM SPONGIA	T	
Ballard	VASCULAR PLANTS	BLUE JASMINE LEATHER-FLOWER	CLEMATIS CRISPA	T	
Ballard	VASCULAR PLANTS	BLUE MUD-PLANTAIN	HETERANTHERA LIMOSA	S	
Ballard	VASCULAR PLANTS	BLUE SCORPION-WEED	PHACELIA RANUNCULACEA	S	
Ballard	VASCULAR PLANTS	BLUE-JOINT REEDGRASS	CALAMAGROSTIS CANADENSIS VAR MACOUN	E	
Ballard	VASCULAR PLANTS	BOG RUSH	JUNCUS ELLIOTTII	H	
Ballard	VASCULAR PLANTS	BROAD-LEAF GOLDEN-ASTER	HETEROTHECA SUBAXILLARIS VAR LATIFOLIA	T	
Ballard	VASCULAR PLANTS	BUSH'S MUHLY	MUHLENBERGIA BUSHII	E	
Ballard	VASCULAR PLANTS	BUXBAUM'S SEDGE	CAREX BUXBAUMII	H	
Ballard	VASCULAR PLANTS	CAROLINA FANWORT	CABOMBA CAROLINIANA	T	
Ballard	VASCULAR PLANTS	CLUSTERED BLUETS	OLDENLANDIA UNIFLORA	E	
Ballard	VASCULAR PLANTS	COMPASS PLANT	SILPHIUM LACINIATUM VAR ROBINSONII	T	
Ballard	VASCULAR PLANTS	CREEPING ST. JOHN'S-WORT	HYPERICUM ADPRESSUM	H	
Ballard	VASCULAR PLANTS	ILLINOIS PONDWEED	POTAMOGETON ILLINOENSIS	S	
Ballard	VASCULAR PLANTS	LAKECRESS	ARMORACIA LACUSTRIS	T	
Ballard	VASCULAR PLANTS	LARGE SEDGE	CAREX GIGANTEA	T	
Ballard	VASCULAR PLANTS	NARROW-LEAVED MEADOW-SWEET	SPIRAEA ALBA	E	
Ballard	VASCULAR PLANTS	ONE-FLOWER FIDDLELEAF	HYDROLEA UNIFLORA	S	
Ballard	VASCULAR PLANTS	PALE MANNA GRASS	TORREYOCHLOA PALLIDA	E	
Ballard	VASCULAR PLANTS	PALE UMBRELLA-WORT	MIRABILIS ALBIDA	E	
Ballard	VASCULAR PLANTS	PEACH-LEAVED WILLOW	SALIX AMYGDALOIDES	H	

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Fedesa Status
Ballard	VASCULAR PLANTS	PICKEREL WEED	PONTEDERIA CORDATA	T	
Ballard	VASCULAR PLANTS	PURPLE SANDGRASS	TRIPLASIS PURPUREA	H	
Ballard	VASCULAR PLANTS	RIVER BULRUSH	SCIRPUS FLUVIATILIS	E	
Ballard	VASCULAR PLANTS	ROSE TURTLEHEAD	CHELONE OBLIQUA VAR SPECIOSA	S	
Ballard	VASCULAR PLANTS	SOUTHERN CRABAPPLE	MALUS ANGUSTIFOLIA	S	
Ballard	VASCULAR PLANTS	SWAMP CANDLES	LYSIMACHIA TERRESTRIS	E	
Ballard	VASCULAR PLANTS	SWEET CONEFLOWER	RUDBECKIA SUBTOMENTOSA	E	
Ballard	VASCULAR PLANTS	WATER HICKORY	CARYA AQUATICA	T	
Ballard	VASCULAR PLANTS	WATER-PURSLANE	DIDIPLIS DIANDRA	S	
Ballard	VASCULAR PLANTS	WOOLLY SEDGE	CAREX LANUGINOSA	E	
Carlisle	AMPHIBIANS	GREEN TREEFROG	HYLA CINEREA	S	
Carlisle	AMPHIBIANS	NORTHERN CRAWFISH FROG	RANA AREOLATA CIRCULOSA	S	
Carlisle	BIRDS	BACHMAN'S SPARROW	AIMOPHILA AESTIVALIS	E	
Carlisle	BIRDS	BALD EAGLE	HALIAEETUS LEUCOCEPHALUS	E	LT
Carlisle	BIRDS	BARN OWL	TYTO ALBA	S	
Carlisle	BIRDS	FISH CROW	CORVUS OSSIFRAGUS	S	
Carlisle	BIRDS	GREAT BLUE HERON	ARDEA HERODIAS	S	
Carlisle	BIRDS	GREAT EGRET	ARDEA ALBA	E	
Carlisle	BIRDS	HOODED MERGANSER	LOPHODYTES CUCULLATUS	T	
Carlisle	BIRDS	INTERIOR LEAST TERN	STERNA ANTILLARUM ATHALASSOS	E	LE
Carlisle	BIRDS	LARK SPARROW	CHONDESTES GRAMMACUS	T	
Carlisle	BIRDS	MISSISSIPPI KITE	ICTINIA MISSISSIPPIENSIS	S	
Carlisle	BIVALVES	FAT POCKETBOOK	POTAMILUS CAPAX	E	LE
Carlisle	BIVALVES	TEXAS LILLIPUT	TOXOLASMA TEXASIENSIS	E	
Carlisle	CRUSTACEANS	A CRAYFISH	ORCONECTES LANCIFER	E	
Carlisle	CRUSTACEANS	A CRAYFISH	ORCONECTES PALMERI PALMERI	E	
Carlisle	CRUSTACEANS	CAJUN DWARF CRAYFISH	CAMBARELLUS SHUFELDTII	S	
Carlisle	FISHES	BLACKTAIL SHINER	CYPRINELLA VENUSTA	S	
Carlisle	FISHES	CHAIN PICKEREL	ESOX NIGER	S	
Carlisle	FISHES	CYPRESS MINNOW	HYBOGNATHUS HAYI	E	
Carlisle	FISHES	REDSPOTTED SUNFISH	LEPOMIS MINIATUS	T	
Carlisle	FISHES	SMALLSCALE DARTER	ETHEOSTOMA MICROLEPIDUM	E	
Carlisle	FISHES	TAILLIGHT SHINER	NOTROPIS MACULATUS	T	
Carlisle	GASTROPODS	ARMORED ROCKSNAIL	LITHASIA ARMIGERA	S	
Carlisle	GASTROPODS	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA	S	
Carlisle	MAMMALS	COTTON MOUSE	PEROMYSCUS GOSSYPINUS	T	
Carlisle	MAMMALS	EVENING BAT	NYCTICEIUS HUMERALIS	T	
Carlisle	MAMMALS	INDIANA MYOTIS	MYOTIS SODALIS	E	LE
Carlisle	MAMMALS	RAFINESQUE'S BIG-EARED BAT	CORYNORHINUS RAFINESQUII	S	

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Carlisle	MAMMALS	SOUTHEASTERN MYOTIS	MYOTIS AUSTRORIPARIUS	E	
Carlisle	PALUSTRINE COMMUNITI		CYPRESS SWAMP	N	
Carlisle	REPTILES	ALLIGATOR SNAPPING TURTLE	MACROCLEMYS TEMMINCKII	T	
Carlisle	REPTILES	MIDLAND SMOOTH SOFTSHELL	APALONE MUTICA MUTICA	S	
Carlisle	REPTILES	SOUTHERN PAINTED TURTLE	CHRYSEMYS PICTA DORSALIS	T	
Carlisle	TERRESTRIAL COMMUNIT.		COASTAL PLAIN MESOPHYTIC CANE FOREST	N	
Carlisle	VASCULAR PLANTS	BLUE JASMINE LEATHER-FLOWER	CLEMATIS CRISPA	T	
Carlisle	VASCULAR PLANTS	BLUE SCORPION-WEED	PHACELIA RANUNCULACEA	S	
Carlisle	VASCULAR PLANTS	BROAD-LEAF GOLDEN-ASTER	HETEROTHECA SUBAXILLARIS VAR LATIFOLIA	T	
Carlisle	VASCULAR PLANTS	CAROLINA FANWORT	CABOMBA CAROLINIANA	T	
Carlisle	VASCULAR PLANTS	EPIPHYTIC SEDGE	CAREX DECOMPOSITA	T	
Carlisle	VASCULAR PLANTS	GREATER BLADDERWORT	UTRICULARIA MACRORHIZA	E	
Carlisle	VASCULAR PLANTS	ROSE TURTLEHEAD	CHELONE OBLIQUA VAR SPECIOSA	S	
Carlisle	VASCULAR PLANTS	SNOW MELANTHERA	MELANTHERA NIVEA	S	
Carlisle	VASCULAR PLANTS	TURK'S CAP LILY	LILIUM SUPERBUM	T	
Carlisle	VASCULAR PLANTS	WATER-PURSLANE	DIDIPLIS DIANDRA	S	
Graves	AMPHIBIANS	BIRD-VOICED TREEFROG	HYLA AVIVOCA	T	
Graves	AMPHIBIANS	GREEN TREEFROG	HYLA CINEREA	S	
Graves	AMPHIBIANS	NORTHERN CRAWFISH FROG	RANA AREOLATA CIRCULOSA	S	
Graves	AMPHIBIANS	THREE-LINED SALAMANDER	EURYCEA GUTTOLINEATA	T	
Graves	BIRDS	BACHMAN'S SPARROW	AIMOPHILA AESTIVALIS	E	
Graves	BIRDS	BARN OWL	TYTO ALBA	S	
Graves	BIRDS	FISH CROW	CORVUS OSSIFRAGUS	S	
Graves	BIRDS	GREAT BLUE HERON	ARDEA HERODIAS	S	
Graves	BIRDS	GREAT EGRET	ARDEA ALBA	E	
Graves	BIRDS	LARK SPARROW	CHONDESTES GRAMMACUS	T	
Graves	BIRDS	MISSISSIPPI KITE	ICTINIA MISSISSIPPIENSIS	S	
Graves	BIRDS	SHARP-SHINNED HAWK	ACCIPITER STRIATUS	S	
Graves	BIVALVES	LITTLE SPECTACLECASE	VILLOSA LIENOSA	S	
Graves	CRUSTACEANS	A DWARF CRAYFISH	CAMBARELLUS PUER	E	
Graves	FISHES	BLACKTAIL REDHORSE	MOXOSTOMA POECILURUM	E	
Graves	FISHES	BLACKTAIL SHINER	CYPRINELLA VENUSTA	S	
Graves	FISHES	BLUNTFACE SHINER	CYPRINELLA CAMURA	E	
Graves	FISHES	BRIGHTEYE DARTER	ETHEOSTOMA LYNCEUM	E	
Graves	FISHES	BROWN MADTOM	NOTURUS PHAEUS	E	
Graves	FISHES	CENTRAL MUDMINNOW	UMBRA LIMI	T	
Graves	FISHES	CYPRESS MINNOW	HYBOGNATHUS HAYI	E	
Graves	FISHES	DOLLAR SUNFISH	LEPOMIS MARGINATUS	E	
Graves	FISHES	FIREBELLY DARTER	ETHEOSTOMA PYRRHOGASTER	E	

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Graves	FISHES	GOLDSTRIPE DARTER	ETHEOSTOMA PARVIPINNE	E	
Graves	FISHES	GULF DARTER	ETHEOSTOMA SWAINI	E	
Graves	FISHES	LAKE CHUBSUCKER	ERIMYZON SUCETTA	T	
Graves	FISHES	LEAST MADTOM	NOTURUS HILDEBRANDI	E	
Graves	FISHES	REDSPOTTED SUNFISH	LEPOMIS MINIATUS	T	
Graves	FISHES	RELICT DARTER	ETHEOSTOMA CHIENENSE	E	LE
Graves	FISHES	SWAMP DARTER	ETHEOSTOMA FUSIFORME	E	
Graves	MAMMALS	EVENING BAT	NYCTICEIUS HUMERALIS	T	
Graves	MAMMALS	SOUTHEASTERN MYOTIS	MYOTIS AUSTRORIPARIUS	E	
Graves	REPTILES	EASTERN RIBBON SNAKE	THAMNOPHIS SAURITUS SAURITUS	S	
Graves	REPTILES	KIRTLAND'S SNAKE	CLONOPHIS KIRTLANDII	T	
Graves	REPTILES	WESTERN MUD SNAKE	FARANCIA ABACURA REINWARDTII	S	
Graves	REPTILES	WESTERN RIBBON SNAKE	THAMNOPHIS PROXIMUS PROXIMUS	T	
Graves	VASCULAR PLANTS	AMERICAN FROG'S-BIT	LIMNOBIUM SPONGIA	T	
Graves	VASCULAR PLANTS	COMPASS PLANT	SILPHIUM LACINIATUM VAR ROBINSONII	T	
Graves	VASCULAR PLANTS	FLOATING PENNYWORT	HYDROCOTYLE RANUNCULOIDES	E	
Graves	VASCULAR PLANTS	HAIRY HAWKWEED	HIERACIUM LONGIPILUM	T	
Graves	VASCULAR PLANTS	MOCK BISHOP'S-WEED	PTILIMNIUM CAPILLACEUM	T	
Graves	VASCULAR PLANTS	NODDING RATTLESNAKE-ROOT	PRENANTHES CREPIDINEA	T	
Graves	VASCULAR PLANTS	PORCUPINE SEDGE	CAREX HYSTERICINA	H	
Graves	VASCULAR PLANTS	ROSE TURTLEHEAD	CHELONE OBLIQUA VAR SPECIOSA	S	
Graves	VASCULAR PLANTS	SWEET CONEFLOWER	RUDBECKIA SUBTOMENTOSA	E	
Graves	VASCULAR PLANTS	THREAD-LIKE NAIAD	NAJAS GRACILLIMA	S	
Graves	VASCULAR PLANTS	WATER LOCUST	GLEDITSIA AQUATICA	S	
Graves	VASCULAR PLANTS	WEAK STELLATE SEDGE	CAREX SEORSA	S	
Marshall	AMPHIBIANS	BIRD-VOICED TREEFROG	HYLA AVIVOCA	T	
Marshall	AMPHIBIANS	GREEN TREEFROG	HYLA CINEREA	S	
Marshall	AMPHIBIANS	NORTHERN CRAWFISH FROG	RANA AREOLATA CIRCULOSA	S	
Marshall	BIRDS	BARN OWL	TYTO ALBA	S	
Marshall	BIRDS	BEWICK'S WREN	THRYOMANES BEWICKII	S	
Marshall	BIRDS	BROWN CREEPER	CERTHIA AMERICANA	E	
Marshall	BIRDS	FISH CROW	CORVUS OSSIFRAGUS	S	
Marshall	BIRDS	GREAT BLUE HERON	ARDEA HERODIAS	S	
Marshall	BIRDS	YELLOW-CROWNED NIGHT-HERON	NYCTANASSA VIOLACEA	T	
Marshall	BIVALVES	CLUBSHELL	PLEUROBEMA CLAVA	E	LE
Marshall	BIVALVES	LONGSOLID	FUSCONAIA SUBROTUNDA SUBROTUNDA	S	
Marshall	BIVALVES	ORANGEFOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	E	LE
Marshall	BIVALVES	PINK MUCKET	LAMPSILIS ABRUPTA	E	LE
Marshall	BIVALVES	POCKETBOOK	LAMPSILIS OVATA	E	

CountyName	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Marshall	BIVALVES	PYRAMID PIGTOE	PLEUROBEMA RUBRUM	E	
Marshall	BIVALVES	RABBITSFOOT	QUADRULA CYLINDRICA CYLINDRICA	T	
Marshall	BIVALVES	RING PINK	OBOVARIA RETUSA	E	LE
Marshall	BIVALVES	SHEEPNOSE	PLETHOBASUS CYPHYUS	S	
Marshall	BIVALVES	SPECTACLECASE	CUMBERLANDIA MONODONTA	E	
Marshall	BIVALVES	TEXAS LILLIPUT	TOXOLASMA TEXASIENSIS	E	
Marshall	CRUSTACEANS	A CRAYFISH	PROCAMBARUS VIAEVIRIDIS	T	
Marshall	FISHES	ALABAMA SHAD	ALOSA ALABAMAE	E	C
Marshall	FISHES	AMERICAN BROOK LAMPREY	LAMPETRA APPENDIX	T	
Marshall	FISHES	BLACK BUFFALO	ICTIOBUS NIGER	S	
Marshall	FISHES	CENTRAL MUDMINNOW	UMBRA LIMI	T	
Marshall	FISHES	CHESTNUT LAMPREY	ICHTHYOMYZON CASTANEUS	S	
Marshall	FISHES	CYPRESS DARTER	ETHEOSTOMA PROELIARE	T	
Marshall	FISHES	DOLLAR SUNFISH	LEPOMIS MARGINATUS	E	
Marshall	FISHES	OLIVE DARTER	PERCINA SQUAMATA	E	
Marshall	FISHES	PALLID SHINER	HYBOPSIS AMNIS	H	
Marshall	FISHES	REDSPOTTED SUNFISH	LEPOMIS MINIATUS	T	
Marshall	GASTROPODS	ARMORED ROCKSNAIL	LITHASIA ARMIGERA	S	
Marshall	GASTROPODS	MUDDY ROCKSNAIL	LITHASIA SALEBROSA	S	
Marshall	GASTROPODS	ORNATE ROCKSNAIL	LITHASIA GENICULATA	S	
Marshall	GASTROPODS	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA	S	
Marshall	INSECTS	DUKES' SKIPPER	EUPHYES DUKESI	S	
Marshall	MAMMALS	EVENING BAT	NYCTICEIUS HUMERALIS	T	
Marshall	MAMMALS	SOUTHEASTERN MYOTIS	MYOTIS AUSTRORIPARIUS	E	
Marshall	PALUSTRINE COMMUNITI		BOTTOMLAND HARDWOOD FOREST	N	
Marshall	REPTILES	EASTERN RIBBON SNAKE	THAMNOPHIS SAURITUS SAURITUS	S	
Marshall	REPTILES	MIDLAND SMOOTH SOFTSHELL	APALONE MUTICA MUTICA	S	
Marshall	REPTILES	NORTHERN PINE SNAKE	PITUOPHIS MELANOLEUCUS MELANOLEUCUS	T	
Marshall	REPTILES	WESTERN MUD SNAKE	FARANCIA ABACURA REINWARDTII	S	
Marshall	VASCULAR PLANTS	BEARDED SKELETONGRASS	GYMNOPOGON AMBIGUUS	S	
Marshall	VASCULAR PLANTS	BLUE MUD-PLANTAIN	HETERANTHERA LIMOSA	S	
Marshall	VASCULAR PLANTS	BUCKLEY'S GOLDENROD	SOLIDAGO BUCKLEYI	S	
Marshall	VASCULAR PLANTS	BUSH'S MUHLY	MUHLENBERGIA BUSHII	E	
Marshall	VASCULAR PLANTS	CAROLINA FANWORT	CABOMBA CAROLINIANA	T	
Marshall	VASCULAR PLANTS	CREAM WILD INDIGO	BAPTISIA BRACTEATA VAR LEUCOPHAEA	S	
Marshall	VASCULAR PLANTS	EPIPHYTIC SEDGE	CAREX DECOMPOSITA	T	
Marshall	VASCULAR PLANTS	FRASER'S LOOSESTRIFE	LYSIMACHIA FRASERI	E	
Marshall	VASCULAR PLANTS	FRINGED NUTRUSH	SCLERIA CILIATA VAR CILIATA	E	
Marshall	VASCULAR PLANTS	HAIRY HAWKWEED	HIERACIUM LONGIPILUM	T	

CountyName	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
Marshall	VASCULAR PLANTS	LONGLEAF STITCHWORT	STELLARIA LONGIFOLIA	S	
Marshall	VASCULAR PLANTS	MOUNTAIN SILVER-BELL	HALESIA TETRAPTERA	E	
Marshall	VASCULAR PLANTS	NUTTALL'S MOCK BISHOP'S-WEED	PTILIMNIUM NUTTALLII	E	
Marshall	VASCULAR PLANTS	OVATE FIDDLELEAF	HYDROLEA OVATA	E	
Marshall	VASCULAR PLANTS	PORCUPINE SEDGE	CAREX HYSTERICINA	H	
Marshall	VASCULAR PLANTS	SMALL SUNDROPS	OENOTHERA PERENNIS	E	
Marshall	VASCULAR PLANTS	SWAMP CANDLES	LYSIMACHIA TERRESTRIS	E	
Marshall	VASCULAR PLANTS	TALL HAIRY GROOVEBUR	AGRIMONIA GRYPOSEPALA	T	
Marshall	VASCULAR PLANTS	TREPOCARPUS	TREPOCARPUS AETHUSAE	T	
Marshall	VASCULAR PLANTS	WATER HICKORY	CARYA AQUATICA	T	
McCracken	AMPHIBIANS	GREEN TREEFROG	HYLA CINEREA	S	
McCracken	AMPHIBIANS	NORTHERN CRAWFISH FROG	RANA AREOLATA CIRCULOSA	S	
McCracken	AMPHIBIANS	THREE-TOED AMPHIUMA	AMPHIUMA TRIDACTYLUM	E	
McCracken	BIRDS	BACHMAN'S SPARROW	AIMOPHILA AESTIVALIS	E	
McCracken	BIRDS	BANK SWALLOW	RIPARIA RIPARIA	S	
McCracken	BIRDS	BARN OWL	TYTO ALBA	S	
McCracken	BIRDS	BELL'S VIREO	VIREO BELLII	S	
McCracken	BIRDS	FISH CROW	CORVUS OSSIFRAGUS	S	
McCracken	BIRDS	GREAT BLUE HERON	ARDEA HERODIAS	S	
McCracken	BIRDS	HOODED MERGANSER	LOPHODYTES CUCULLATUS	T	
McCracken	BIRDS	MISSISSIPPI KITE	ICTINIA MISSISSIPPIENSIS	S	
McCracken	BIRDS	SHARP-SHINNED HAWK	ACCIPITER STRIATUS	S	
McCracken	BIVALVES	BLEUFER	POTAMILUS PURPURATUS	E	
McCracken	BIVALVES	FAT POCKETBOOK	POTAMILUS CAPAX	E	LE
McCracken	BIVALVES	LONGSOLID	FUSCONAIA SUBROTUNDA SUBROTUNDA	S	
McCracken	BIVALVES	ORANGEFOOT PIMPLEBACK	PLETHOBASUS COOPERIANUS	E	LE
McCracken	BIVALVES	PINK MUCKET	LAMPSILIS ABRUPTA	E	LE
McCracken	BIVALVES	POCKETBOOK	LAMPSILIS OVATA	E	
McCracken	BIVALVES	PYRAMID PIGTOE	PLEUROBEMA RUBRUM	E	
McCracken	BIVALVES	RABBITSFOOT	QUADRULA CYLINDRICA CYLINDRICA	T	
McCracken	BIVALVES	RING PINK	OBOVARIA RETUSA	E	LE
McCracken	BIVALVES	SHEEPNOSE	PLETHOBASUS CYPHYUS	S	
McCracken	CRUSTACEANS	A CRAYFISH	ORCONECTES LANCIFER	E	
McCracken	CRUSTACEANS	A DWARF CRAYFISH	CAMBARELLUS PUER	E	
McCracken	FISHES	ALLIGATOR GAR	ATRACTOSTEUS SPATULA	E	
McCracken	FISHES	BLACK BUFFALO	ICTIOBUS NIGER	S	
McCracken	FISHES	BLACKTAIL SHINER	CYPRINELLA VENUSTA	S	
McCracken	FISHES	BURBOT	LOTA LOTA	S	
McCracken	FISHES	CENTRAL MUDMINNOW	UMBRA LIMI	T	

Countyname	Element Class	Common Name	Scientific Name	KSNPC Status	Usesa Status
McCracken	FISHES	CHAIN PICKEREL	ESOX NIGER	S	
McCracken	FISHES	CHESTNUT LAMPREY	ICHTHYOMYZON CASTANEUS	S	
McCracken	FISHES	CYPRESS DARTER	ETHEOSTOMA PROELIARE	T	
McCracken	FISHES	CYPRESS MINNOW	HYBOGNATHUS HAYI	E	
McCracken	FISHES	INLAND SILVERSIDE	MENIDIA BERYLLINA	T	
McCracken	FISHES	LAKE CHUBSUCKER	ERIMYZON SUCETTA	T	
McCracken	FISHES	LAKE STURGEON	ACIPENSER FULVESCENS	E	
McCracken	FISHES	NORTHERN MADTOM	NOTURUS STIGMOSUS	S	
McCracken	FISHES	REDSPOTTED SUNFISH	LEPOMIS MINIATUS	T	
McCracken	FISHES	TAILLIGHT SHINER	NOTROPIS MACULATUS	T	
McCracken	GASTROPODS	ARMORED ROCKSNAIL	LITHASIA ARMIGERA	S	
McCracken	GASTROPODS	ONYX ROCKSNAIL	LEPTOXIS PRAEROSA	S	
McCracken	GASTROPODS	ORNATE ROCKSNAIL	LITHASIA GENICULATA	S	
McCracken	GASTROPODS	VARICOSE ROCKSNAIL	LITHASIA VERRUCOSA	S	
McCracken	INSECTS	NORTHERN HAIRSTREAK	SATYRIUM FAVONIUS ONTARIO	S	
McCracken	MAMMALS	EVENING BAT	NYCTICEIUS HUMERALIS	T	
McCracken	MAMMALS	INDIANA MYOTIS	MYOTIS SODALIS	E	LE
McCracken	MAMMALS	SOUTHEASTERN MYOTIS	MYOTIS AUSTRORIPARIUS	E	
McCracken	PALUSTRINE COMMUNITI		FLOODPLAIN RIDGE/TERRACE FOREST	N	
McCracken	PALUSTRINE COMMUNITI		WET PRAIRIE	N	
McCracken	REPTILES	ALLIGATOR SNAPPING TURTLE	MACROCLEMYS TEMMINCKII	T	
McCracken	REPTILES	EASTERN RIBBON SNAKE	THAMNOPHIS SAURITUS SAURITUS	S	
McCracken	REPTILES	MIDLAND SMOOTH SOFTSHELL	APALONE MUTICA MUTICA	S	
McCracken	VASCULAR PLANTS	BRANCHED THREE-AWN GRASS	ARISTIDA RAMOSISSIMA	H	
McCracken	VASCULAR PLANTS	BROAD-LEAF GOLDEN-ASTER	HETEROTHECA SUBAXILLARIS VAR LATIFOLIA	T	
McCracken	VASCULAR PLANTS	BUCKLEY'S GOLDENROD	SOLIDAGO BUCKLEYI	S	
McCracken	VASCULAR PLANTS	COMPASS PLANT	SILPHIUM LACINIATUM VAR ROBINSONII	T	
McCracken	VASCULAR PLANTS	CREAM WILD INDIGO	BAPTISIA BRACTEATA VAR LEUCOPHAEA	S	
McCracken	VASCULAR PLANTS	CREEPING ST. JOHN'S-WORT	HYPERICUM ADPRESSUM	H	
McCracken	VASCULAR PLANTS	HAIR GRASS	MUHLENBERGIA GLABRIFLORIS	S	
McCracken	VASCULAR PLANTS	MOUNTAIN SILVER-BELL	HALESIA TETRAPTERA	E	
McCracken	VASCULAR PLANTS	ONE-FLOWER FIDDLELEAF	HYDROLEA UNIFLORA	S	
McCracken	VASCULAR PLANTS	PORCUPINE SEDGE	CAREX HYSTERICINA	H	
McCracken	VASCULAR PLANTS	RED BUCKEYE	AESCULUS PAVIA	T	
McCracken	VASCULAR PLANTS	ROSE TURTLEHEAD	CHELONE OBLIQUA VAR SPECIOSA	S	
McCracken	VASCULAR PLANTS	ROUGH RATTLESNAKE-ROOT	PRENANTHES ASPERA	E	
McCracken	VASCULAR PLANTS	SNOW MELANTHERA	MELANTHERA NIVEA	S	
McCracken	VASCULAR PLANTS	SOUTHERN CRABAPPLE	MALUS ANGUSTIFOLIA	S	
McCracken	VASCULAR PLANTS	SWEET CONEFLOWER	RUDBECKIA SUBTOMENTOSA	E	

County Name	Element Class	Common Name	Scientific Name	KSNPC Status	Usda Status
McCracken	VASCULAR PLANTS	TALL BUSH-CLOVER	LESPEDEZA STUEVEI	S	
McCracken	VASCULAR PLANTS	TEXAS ASTER	ASTER DRUMMONDII VAR TEXANUS	T	
McCracken	VASCULAR PLANTS	TURK'S CAP LILY	LILIUM SUPERBUM	T	
McCracken	VASCULAR PLANTS	VETCHLING PEAVINE	LATHYRUS PALUSTRIS	T	
McCracken	VASCULAR PLANTS	WATER HICKORY	CARYA AQUATICA	T	

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

MEMORANDUM

TO: Alex Barber
State Environmental Review Officer
Department for Environmental Protection

FROM: Timothy Kuryla TK
EIS Coordinator
Division of Water

DATE: April 4, 2002

SUBJECT: SN, I-66, Possible Alignments (Ballard, Carlisle, Graves, McCracken, and Marshall Counties), SERO 020205-011

IN GENERAL

The Division of Water has reviewed the Scoping Notice prepared by the Transportation Cabinet regarding possible alignments for the construction of I-66 (Ballard, Carlisle, Graves, McCracken, and Marshall Counties). The Division comments on matters the Division desires considered in the Environmental Assessment.

The applicant needs to consult, before construction can begin, with the U.S. Army Corps of Engineers to ascertain if a 33 USC § 1341 ("401") water quality certification by the Division of Water, or a 33 USC § 1344 ("404") dredge or fill material permit, or both, are required. Any impact to 200 linear feet or more of any stream or stream bank (below ordinary highwater) (as shown on U.S. Geological Survey 7.5 minute topographical maps for the project area) or one acre or more of any wetland, will require a "401" water quality certification. This includes excavations and impoundments.

Stream crossings except for Oustanding Resource Waters (ORWs), Cold water Aquatic Habitats (CAHs), and high quality waters are covered by a general certification. ORW, CAH, and high quality water stream crossings require an individual water quality certification and mitigation.

If a floodplain outside the right of way is involved, prior approval must be obtained from the Division of Water before construction may begin. The EA needs to address the impacts on flooding of each stream crossing, all fills in floodplains, and any channel relocation or alteration.

The submitted data are general. With specific data as are found in the Transportation Cabinet Land and Water Ecology Section "404" checklist, plus Corps of Engineers or Coast Guard Public Notice, the Division of Water may find a problem relating to floodplain construction and water quality. Therefore, the Division requests an opportunity to review, at the Preliminary Design stage, the land and water ecology checklist for the proposed project should it be funded. (If a Public Notice is prepared for the proposed project, the Division will review it).

The Division of Water notes the relevant portions of the Transportation Cabinet's Standard Specifications for Road and Bridge Construction are Sections 212 and 213. Section 212 governs the protection and stabilization of those areas exposed to erosion as the result of construction practices. Section 213 protects water quality by governing construction practices that can result in nonpoint source pollution.

The Division of Water finds that these guidelines adequately address possible highway construction impacts on aquatic habitat and propose appropriate mitigation measures that insure minimal sediment and other damage to water quality. These sections need to be cited in the EA.

The Division of Water recommends that the Transportation Cabinet use the Groundwater Sensitivity Regions of Kentucky map published by the Kentucky Geological Survey (KGS) to determine sensitive groundwater areas.

If sinkholes are modified for drainage, the Division of Water notes U.S. Environmental Protection Agency (EPA) requires an Underground Injection Control Permit (40 CFR §§ 144.11, 144.25, 146.51). The activity is classified as a Class V well (40 CFR § 144.6).

The Division of Water has data and maps regarding wellhead protection areas located throughout the Commonwealth. Highway design must take into account these areas.

Potable water intakes and wells, and wastewater treatment plant discharges may be affected by proposed alignments. Highway design must take into account these sites.

Owners of onsite wastewater disposal systems must have Groundwater Protection Plans (GPP). Purchasing right of way lands on which these systems are located means assuming the obligations imposed by 401 KAR 5:037.

Deep road cuts can act as "French" drains. These cuts could drain aquifers that are used as domestic and public water supply sources. Highway design needs to take into account the location of these aquifers. The Division of Water maintains data on wells drilled since 1985 and of all wells it inspects.

THIS APPLICATION

The Division of Water observes that Ballard County has several Wildlife Management Areas (WMAs). Swan Pond is classified under 401 KAR 5:031, Section 7(2)(b) as an Outstanding Resource Water (ORW). This category is used where waters support federally threatened and endangered species. There also may be streams in the special use waters listed in 401 KAR 5:030, Section 3. That pond and these streams cannot be degraded in any way and should not be crossed.

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

April 12, 2002

Annette Coffey, P E., Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, Kentucky 40622

Re: Early study for possible construction of segment of Interstate Highway 66 (I-66) in Marshall, McCracken, and/or Ballard Counties in Kentucky and Mississippi County in Missouri from I-24 in northwestern Marshall County or McCracken County in Kentucky to I-57 in Mississippi County in Missouri (SERO 2002-11)

Dear ~~Ms. Coffey~~ Annette:

The Natural Resources and Environmental Protection Cabinet (NREPC) serves as the state clearinghouse for review of environmental documents generated pursuant to the National Environmental Policy Act (NEPA). Within the Cabinet, the Commissioner's Office in the Department for Environmental Protection **coordinates** the review for Kentucky State Agencies.

The Kentucky agencies listed on the attached sheet have been provided an opportunity to review the above referenced report. Responses were received from 8 (also marked on attached sheet) of the agencies that were forwarded a copy of the document. Attached are the comments from the Kentucky Divisions of Water, Conservation, and Forestry, the Kentucky Nature Preserves Commission, and the Kentucky Department of Fish and Wildlife Resources.

If you should have any questions, please contact me at (502) 564-2150, ext. 112.

Sincerely,

Alex Barber
State Environmental Review officer

Enclosure

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
ENVIRONMENTAL REVIEW

Early study for possible construction of segment of Interstate Highway 66 (I-66) in Marshall, McCracken, and/or Ballard Counties in Kentucky and Mississippi County in Missouri from I-24 in northwestern Marshall County or McCracken County in Kentucky to I-57 in Mississippi county in Missouri

The following agencies were asked to review the above referenced project. Each agency that returned a response will appear below with their comments and the date the project response was returned.

C denotes Comments
NC denotes No Comment
IR denotes Information Request
NR denotes No Response

REVIEWING AGENCIES:

Division of Water _____ comments

Division of Waste Management _____

Division for Air Quality _____

Department of Health Services _____

Economic Development Cabinet _____ ns

Division of Forestry _____ comments

Department of Surface Mining Reclamation & Enforcement___ nc

Department of Parks _____ nc

Department of Agriculture _____

Nature Preserves Commission _____ comments

Kentucky Heritage Council _____

Division of Conservation _____ comments

Department for Natural Resources _____ ns

Department of Fish & Wildlife Resources _____ comments

Transportation Cabinet _____ ns

Department for Military Affairs _____ nc

Barber, Alex (NREPC, DEP)

From: Palmer-Ball, Brainard (NREPC, KSNPC)
Sent: Tuesday, February 26, 2002 10:41 AM
To: Barber, Alex (NREPC, DEP)
Subject: KSNPC responses to KIRPs

TO: Alex Barber, NREPC-DEP, Intergovernmental Review Coordinator

FROM: Brainard Palmer-Ball, Jr., Ky State Nature Preserves Commission

RE: KSNPC responses to KIRPs

DATE: February 26, 2002

RE: Project No. SERO2002-11 (I-66 project planning in western Kentucky)

KSNPC has reviewed the project summary and notes the presence of several rare species issues concerning placement of the road through this region. A more detailed response has been forwarded directly to the Kentucky Transportation Cabinet responding to this plan.

James E. Bickford
Secretary

Paul E. Patton
Governor

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES
DIVISION OF CONSERVATION
663 TETON TRAIL
FRANKFORT, KENTUCKY 40601

MEMORANDUM

TO: Alex Barber, Department of Environmental Protection

FROM: Mark Davis, Division of Conservation MD

DATE: March 4, 2002

SUBJECT: Environmental Review Project #SER02002-11

As requested, the Division of Conservation has reviewed the possible construction of a segment of Interstate Highway 66 (I 66) in Marshall, McCracken, and/or Ballard Counties in Kentucky.

There are 27 agricultural districts certified by the Kentucky Soil and Water Conservation Commission located in the project area. Six are in Ballard County, five in Carlisle County, and sixteen in McCracken County (see enclosed map). These agricultural districts were established in order to conserve, protect, develop, and improve agricultural land for production of food, fiber, and other agricultural products. Under KRS 262.850(12), state agencies must mitigate any impact their programs may have on land in agricultural districts.

In addition to the location of these agricultural districts, the loss of farmland is an issue. Both prime farmland and farmland of statewide importance would be impacted by this project. Every year pressure imposed by utility right-of-ways, urban expansion, and new roads reduce the land available for agricultural use in the Commonwealth. Documents that could be utilized to identify these farmland designations are the *Soil Survey of Ballard and McCracken Counties* (NRCS 1976), the *Soil Survey of Carlisle and Hickman Counties* (NRCS 1997) and *Important Farmland Soils of Kentucky* (NRCS 1985). All are available through this office.

One other concern we would like to comment on is the control of erosion and sedimentation during and after earth-disturbing activities when this project begins. We recommend best management practices(BMPs) be utilized to prevent nonpoint source water pollution. This would protect the water quality and aquatic habitat of several perennial and intermittent streams that this project could impact. The manual, Best Management Practices for Construction Activities, contains information on the kinds of BMPs most appropriate for this project and is available through the Ballard, McCracken, or Carlisle County Conservation Districts and this office.

MJD/aeh
Enclosure

EDUCATION PAYS

Phone (502) 564-3080 Fax (502) 564-9195

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
ENVIRONMENTAL REVIEW
TRANSMITTAL

Date: February 5, 2002 **Project Number:** SERO2002-11

Title: Early study for possible construction of segment of Interstate Highway 66 (I-66) in Marshall, McCracken, and/or Ballard Counties in Kentucky and Mississippi County in Missouri from I-24 in northwestern Marshall County or McCracken County in Kentucky to I-57 in Mississippi county in Missouri

Sponsor: Annette Coffey, P E., Director, Division of Planning, Kentucky Transportation Cabinet, 125 Holmes Street, Frankfort, Kentucky 40622

Comment Deadline: **March 5, 2002**

The Natural Resources and Environmental Protection Cabinet serves as the state clearinghouse for environmental review for Kentucky State Government. Comments received from your agency are forwarded with all other state agency comments to the originating sponsor. If your agency is unable to meet the comment deadline listed above, please contact Alex Barber at (502) 564-2150 extension 112 prior to the due date and suitable arrangements will be made.

Review Instructions:

Please review the enclosed document carefully, bearing in mind the quality of the statement and the impact of the project. If the document is the Final EIS, consider the response made to your own and other agency's previous comments. Retain a copy of this form for your own files and return one with your comments to:

Department for Environmental Protection
Commissioner's Office
Attn: Alex Barber
14 Reilly Road
Frankfort, Kentucky 40601

Response:

- [x] Comments Attached
- [ ] No Comment
- [ ] Information Request

Name: MARK Davis **Date:** March 5, 2002

Agency: Conservation **Phone:** 564-3080

DIVISION OF
CONSERVATION

FEB 8 8 26 AM '02

RECEIVED

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

May 21, 2002

Mr. Ed Hartowicz
Third Rock Consultants
2514 Regency Road, Suite 104
Lexington, Kentucky 40503

Dear Mr. Hartowicz:

Thank you for your letter and enclosures of April 1, 2002, concerning the I-66 potential corridor study in Ballard, McCracken, and Marshall Counties, Kentucky. The project involves a Strategic Corridor Planning Study to examine potential corridors for the proposed I-66 highway. Fish and Wildlife Service personnel have reviewed the information submitted and offer the following comments.

According to our records, the following threatened and endangered species are known to occur in the affected counties, and may occur in the project impact area:

Indiana bat - Myotis sodalis
Bald eagle - Haliaeetus leucocephalus
Least tern - Sterna antillarum athalassos
Orange-footed pearly mussel - Plethobasus cooperianus
Ring pink - Obovaria retusa
Tuberculed-blossom pearly mussel - Epioblasma torulosa torulosa
Pink mucket pearly mussel - Lampsillis orbiculata
Rough pigtoe - Pleurobema plenum
Clubshell - Pleurobema clava
Fat pocketbook - Potamilus capax
Fanshell - Cyprogenia stegaria
Pallid sturgeon - Scaphirhynchus albus

You should assess potential impacts and determine if the proposed project may affect these species. A finding of "may affect" could require initiation of formal consultation. We would appreciate a copy of any survey report on these species done for this project, as well as your determination of effect.

In addition to the federally listed species, there are known records for the Alabama shad *(Alosa alabamae*), sturgeon chub (*Hybopsis gelida*), and sicklefin chub (*Hybopsis meeki*) in the vicinity of the proposed project. These species are candidates for listing. They are not legally protected under the Act at this time, and consultation and biological assessment requirements of Section 7 of the Act do not currently apply to them. However, we would appreciate any measures you might implement to avoid impacting these rare fish.

Thank you for the opportunity to comment on this proposal. Please contact Timothy Merritt (telephone 931/528-6481, ext. 211, or email *timothy_merritt@fws.gov*) of my staff if you have questions regarding the information provided in this letter.

Sincerely,

James C. Widlake

for Lee A. Barclay, Ph.D.
Field Supervisor

xc: Mr. Wayne Davis, KDFWR, Frankfort, KY
Mr. Eric Somerville, EPA, Atlanta, GA
Mr. Jeff Grubbs, KDOW, Frankfort, KY

U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: obr
Phone: (314)539-3900x2382
FAX: (314)539-3755
Email: dorzechowski@cgsfl.uscg.mil

16591.1/942.0 LMR
15 January 2003

Ms. Annette Coffey, P.E.
Director, Division of Planning (A-2)
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0, LOWER MISSISSIPPI RIVER, AND MILE 977.0 OHIO RIVER

Dear Ms. Coffey:

Please refer to your letter dated 2 January 2003 concerning the subject bridge.

The Coast Guard is the sole agency tasked with the responsibility for permitting bridges across navigable waters of the United States. This responsibility includes evaluating the impacts of the bridge from a navigational standpoint, determining the proper location for the piers and the required navigational clearances. Since the Lower Mississippi River is a navigable waterway, a Coast Guard Bridge permit will be required.

I appreciate the opportunity to provide navigational input in the early stages of project development. We have initiated our review of the navigational requirements for the new bridge crossings described in the enclosures to your letter. There appear to be four as follows:

1. A new bridge at Mile 948.0, Lower Mississippi River
2. A new bridge at Mile 951.0, Lower Mississippi River.
3. A new bridge at Mile 952.0, Lower Mississippi River.
4. A new bridge at Mile 977.0, Ohio River.

I expect to have the pier location and navigational requirements established within 30 days. At that time I will notify you of our findings. We look forward to working with you and your staff on this very important project. You can contact Mr. David Orzechowski at (314) 539-3900, Ext. 2382 to discuss this project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: obr
Phone: (314)539-3900x2382
FAX: (314)539-3755
Email: dorzechowski@cgstl.uscg.mil

DIV OF PLANNING

2003 FEB 18 A 11: 29

16591.1/948.0 LMR
13 February 2003

Ms. Annette Coffey, P.E.
Director, Division of Planning (A-2)
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0,
LOWER MISSISSIPPI RIVER

Dear Ms. Coffey:

Please refer to our letter dated 15 January 2003 concerning the proposed subject bridge.

The Coast Guard has reviewed and determined navigational requirements along with pier locations for the four potential crossing alternatives under consideration, i.e.: Mile 948.0, 951.0 or 952.0 Lower Mississippi River (LMR) and mile 977.0 Ohio River (OHR).

From a navigational viewpoint, a bridge crossing at mile 977.0 OHR is the most desired. At this location it would be near the existing Illinois Central Railroad Bridge at mile 977.7. This would require the right descending pier being located on the Illinois bank and the left descending pier being far enough out to span both of the railroad spans customarily used by river navigation. A 1500-foot horizontal clearance would be required to safely meet the needs of navigation.

An acceptable alternative crossing would be located at mile 948.0 LMR. At this location the right descending pier would be located on the Missouri bank with the left descending pier being placed behind the dikefield. A 1500+ foot horizontal clearance will be required to safely meet the needs of navigation at this location.

A bridge crossing over the LMR is not recommended at any location from the confluence downstream to mile 949.5. This is due to large tows moving in both directions from the three rivers in a series of gradual bends and would provide the greatest impediment to navigation. Vessels transiting in this stretch of the river are in what navigation refers to as a "slick turn". This term refers to the river current continually pushing you towards the left descending bank all the while you are steering towards the right descending bank to where the navigational channel proceeds to cross over the center of the river towards the right descending side. Also, the effects of high and low water are a continuing condition that affects needed sailing line for large tows.

16591.1/948.0 LMR
13 February 2003

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0,
LOWER MISSISSIPPI RIVER

I appreciate the opportunity to make comments regarding the needed navigation clearances early in the design process. Should you have any questions, please contact Mr. David Orzechowski at (314) 539-3900, Ext. 2382 to discuss this project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
C. THOMAS BENNETT, COMMISSIONER

April 8, 2002

Ed Hartowicz
Third Rock Consultants
2514 Regency Road, suite 104
Lexington, KY 40503

Re: Threatened/Endangered species review: I-66 Potential Corridor Study, Ballard, McCracken, and Marshall Counties, Kentucky

Dear Mr. Hartowicz:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System indicates that federally threatened or endangered species are known to occur in the above referenced counties (see attached sheets). Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

Based on the information and map provided, KDFWR cannot determine the extent of impacts to fish and wildlife resources without knowing the extent of the proposed project. When further information is available to our agency we can make a final determination regarding environmental impacts.

The KDFWR also recommends the following for any portion of the project that will be instream or near streams:

1. Development/excavation during a low flow period to minimize disturbance;
2. Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt to the stream;
3. Replanting of disturbed areas after construction, including stream banks and right-of-ways, with native vegetation for soil stabilization and enhancement of fish and wildlife populations;
4. Return all disturbed instream habitat to its original condition upon completion of construction in the area, and;
5. Preservation of tree canopy overhanging the stream.

I hope this information will be helpful to you. Should you require additional information, please contact me at (502) 564-7109, ext. 367.

Sincerely,

Marla T. Barbour
Fisheries Biologist III

cc: Environmental Section File

Federally Threatened & Endangered Species Reported from McCracken County

Common Name	Scientific Name	Status Code	Reference
ring pink	Obovaria retusa (Lamarck, 1819)	101,601,223	Reference
Indiana myotis	Myotis sodalis Miller and Allen, 1928	223, 101, 108, 601	Reference

KFWIS HOME

Federally Threatened & Endangered Species Reported from Ballard County

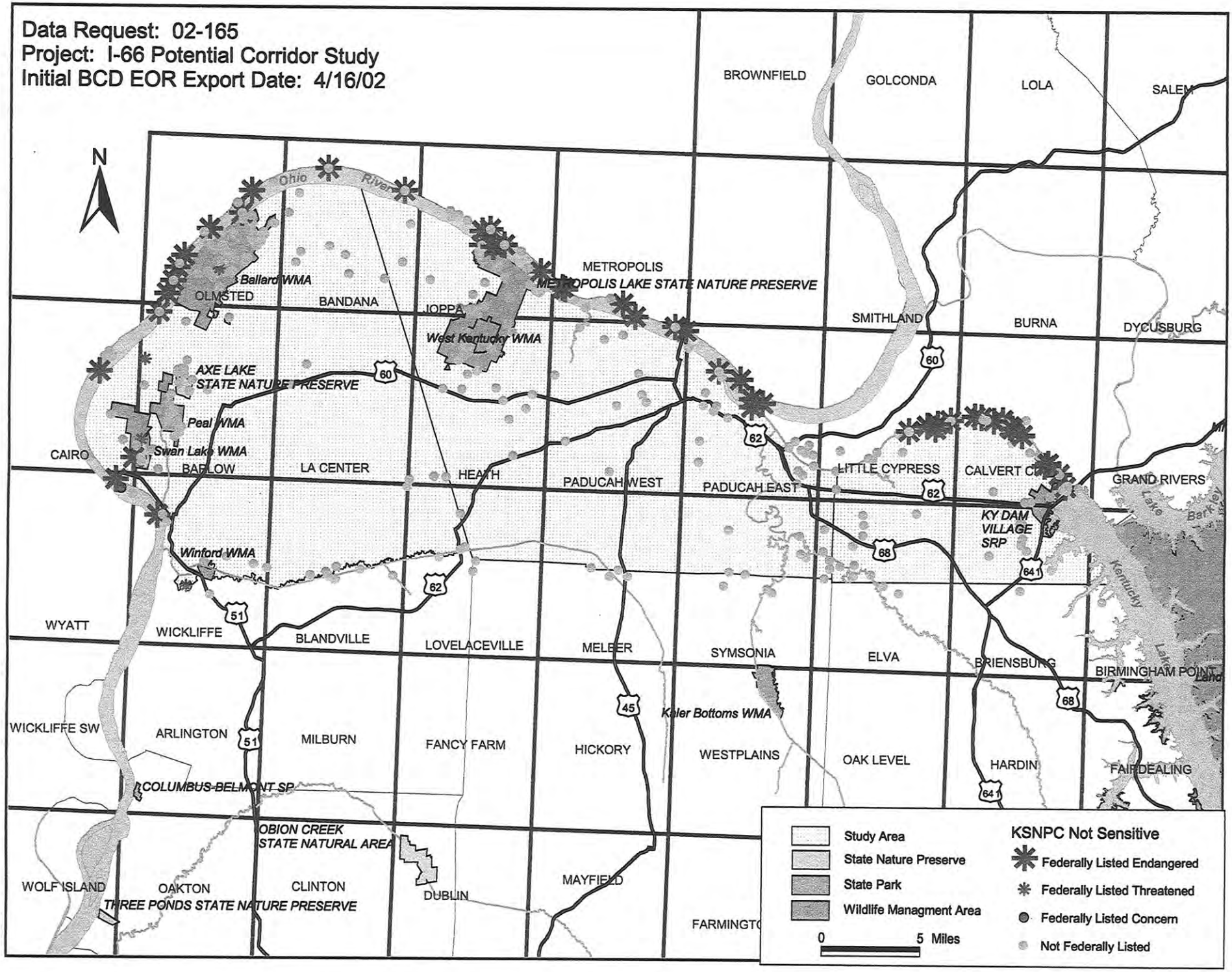
Common Name	Scientific Name	Status Code	Reference
interior least tern	Sterna antillarum athalassos (undescribed)	223,101,121,601	Reference
Indiana myotis	Myotis sodalis Miller and Allen, 1928	223, 101, 108, 601	Reference
bald eagle	Haliaeetus leucocephalus (Linnaeus, 1766)	223,101,121,601,102	Reference
orange-foot pimpleback	Plethobasus cooperianus (I. Lea, 1834)	101,601,223	Reference

KFWIS HOME

Federally Threatened & Endangered Species Reported from Marshall County

Common Name	Scientific Name	Status Code	Reference
ring pink	Obovaria retusa (Lamarck, 1819)	101,601,223	Reference
fanshell	Cyprogenia stegaria (Rafinesque, 1820)	101,601,223	Reference
pink mucket	Lampsilis abrupta (Say, 1831)	601,101,223	Reference
orange-foot pimpleback	Plethobasus cooperianus (I. Lea, 1834)	101,601,223	Reference

KFWIS HOME


Data Request: 02-165
Project: I-66 Potential Corridor Study
Initial BCD EOR Export Date: 4/16/02
N
Ohio River
BROWNFIELD
GOLCONDA
LOLA
SALEM
METROPOLIS
METROPOLIS LAKE STATE NATURE PRESERVE
Ballard WMA
OLMSTED
BANDANA
IOPPA
West Kentucky WMA
SMITHLAND
BURNA
DYCUSBURG
AXE LAKE
STATE NATURE PRESERVE
Peal WMA
Swan Lake WMA
CAIRO
BARLOW
LA CENTER
HEATH
PADUCAH WEST
PADUCAH EAST
LITTLE CYPRESS
CALVERT CITY
GRAND RIVERS
KY DAM
VILLAGE
SRP
Lake Barkley
Kentucky Lake
Winford WMA
WYATT
WICKLIFFE
BLANDVILLE
LOVELACEVILLE
MELBER
SYMSONIA
ELVA
BRIENSBURG
BIRMINGHAM POINT
Kaler Bottoms WMA
WICKLIFFE SW
ARLINGTON
MILBURN
FANCY FARM
HICKORY
WESTPLAINS
OAK LEVEL
HARDIN
FAIRDEALING
COLUMBUS-BELMONT SP
OBION CREEK
STATE NATURAL AREA
WOLF ISLAND
OAKTON
CLINTON
DUBLIN
MAYFIELD
THREE PONDS STATE NATURE PRESERVE
FARMINGTO
60
62
51
45
68
641
Study Area
State Nature Preserve
State Park
Wildlife Managment Area
0
5 Miles
KSNPC Not Sensitive
Federally Listed Endangered
Federally Listed Threatened
Federally Listed Concern
Not Federally Listed

DONALD S. DOTT, JR.
DIRECTOR

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION
801 SCHENKEL LANE
FRANKFORT, KENTUCKY 40601-1403
(502) 573-2886 VOICE
(502) 573-2355 FAX

April 23, 2002

Ed Hartowicz
Third Rock Consultants
2514 Regency Road, Suite 104
Lexington, KY 40503

Data Request **02-165**

Dear Mr. Hartowicz:

This letter is in response to your data request of April 2, 2002 for the I-66 Potential Corridor Study, Ballard and McCracken Counties, Kentucky, KYTC Item 1-23.00 project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur Ballard, McCracken and a portion of Marshall County . Based on our most current information, we have determined that 366 occurrences of the plants or animals and 3 occurrences of the exemplary natural communities that are monitored by KSNPC are reported as occurring in the specified area.

Please see the attached reports and maps for more information about the species and communities that are known to occur in this area. The information is provided without specific location information for the occurrences, as we understand that this is a general planning study. The map provided shows the locations of species Dan communities so that it may be easier to see concentrations of occurrences.

There are several Wildlife Management Areas and Nature Preserves shown on the attached map. There are still significant natural areas, wetlands, and large forest blocks which are not under management or protection at this time in the Barlow Bottoms area of Ballard County that are not shown on this map. Please contact us if more information is needed.

I would like to take this opportunity to remind you of the terms of the data request license,

EDUCATION PAYS

which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.

If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines
Data Manager

Enclosures: Data Reports and Interpretation Keys
GIS Map of element occurrences and managed areas

DONALD S. DOTT, JR.
DIRECTOR

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION
801 SCHENKEL LANE
FRANKFORT, KENTUCKY 40601-1403
(502) 573-2886 VOICE
(502) 573-2355 FAX

INVOICE

April 23, 2002

Ed Hartowicz
Third Rock Consultants
2514 Regency Road, Suite 104
Lexington, KY 40503

Purchase Order Number _____ Data Request 02-165

This letter is an invoice for the amount of $ 105.00 for data services requested in your letter of April 2, 2002 for the I-66 Potential Corridor Study, Ballard and McCracken Counties, Kentucky, KYTC Item 1-23.00 project. Please make payment to the Kentucky Nature Preserves Fund, and include the data request number on the payment.

Please contact us if we can be of further assistance.

EDUCATION PAYS

DONALD S. DOTT, JR.
DIRECTOR

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION
801 SCHENKEL LANE
FRANKFORT, KENTUCKY 40601-1403
(502) 573-2886 VOICE
(502) 573-2355 FAX

INVOICE

April 23, 2002

Ed Hartowicz
Third Rock Consultants
2514 Regency Road, Suite 104
Lexington, KY 40503

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EDUCATION PAYS

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If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines
Data Manager

Enclosures: Data Reports and Interpretation Keys
GIS Map of element occurrences and managed areas

Standard Managed Area Report
Managed Areas Reported For The I-66 Potential Corridor Study, Ballard McCracken Counties.

KSNPC Data Request 02-165

MACODE	MANAGED AREA NAME	OWNER CODE	MANAGED AREA TYPE	COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	NORTH LAT	SOUTH LAT	EAST LONG	WEST LONG	KENTUCKY ACREAGE	MANAGER	MANAGER AGENCY	MANAGER PHONE
M.USKYHP*18	AXE LAKE STATE NATURAL AREA	PPF	PPFRS	Ballard	BARLOW, KY.-ILL.	370440N	0890505W	370504N	370414N	0890429W	0890559W	385			
M.USKYHP*112	AXE LAKE SWAMP STATE NATURE PRESERVE	SKN	SKNPR	Ballard	BARLOW, KY.-ILL.	370350N	0890445W	370413N	370321N	0890433W	0890457W	458	JOYCE BENDER	KENTUCKY STATE NATURE PRESERVES COMMISSION	502 573-2886
M.USKYHP*325	BALLARD WILDLIFE MANAGEMENT AREA	SKW	SKWWM	Ballard	OLMSTED, ILL.-KY.;BARLOW, KY.-ILL.	370930N	0890345W	371150N	370623N	0890024W	0890542W	8373	CHARLIE WILKINS	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 224-2244
M.USKYHP*295	BARKLEY PRAIRIE STATE NATURAL AREA	PPC	PPCRS	McCracken	HEATH, KY.	370405N	0884557W	370408N	370402N	0884554W	0884600W	8			
M.USKYHP*1456	BARLOW BOTTOMS WILDLIFE MANAGEMENT AREA	SKW	SKWWM	Ballard	BARLOW, KY.-ILL.	370530N	0890610W	370544N	370509S	0890555E	0890630W	150	KENTUCKY DEPARTMENT OF FISH AND WILDLIFE RESOURCES	KENTUCKY DEPARTMENT OF FISH AND WILDLIFE RESOURCES	
M.USKYHP*69	BAYOU CREEK RIDGE STATE NATURAL AREA	FTV	SKWRS	McCracken	JOPPA, ILL.-KY.	371025N	0884825W	371042N	371005N	0884757W	0884905W	150	CHARLES LOGSDON	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 488-3233
M.USKYHP*949	CYPRESS CREEK SWAMP NATURE PRESERVE	PNC	PNCPR	Marshall	BRIENSBURG, KY.	365830N	0881830W	365848N	365755N	0881815W	0881904W	284	JIM ALDRICH	THE NATURE CONSERVANCY	606 259-9655
M.USKYHP*155	KENTUCKY DAM VILLAGE STATE RESORT PARK	MUL	SKPSP	Marshall	CALVERT CITY, KY.;BRIENSBURG, KY.	370010N	0881745W	370102N	365843N	0881644W	0881827W	1351	FRANK WAGGONER	DEPARTMENT OF PARKS	502 362-4271
M.USKYHP*27	KENTUCKY RESERVOIR	FTV	FTVRV	Marshall;Calloway;Trigg ;Lyon	CALVERT CITY, KY.;HAMLIN, KY.-TENN.;NEW CONCORD, KY.;RUSHING CREEK, KY.-TENN.;HICO, KY.;FENTON, KY.;FAIRDEALING, KY.;MONT, KY.;BIRMINGHAM POINT, KY.;BRIENSBURG, KY.;GRAND RIVERS, KY.;PARIS LANDING, TENN.-KY.	370000N	0881500W	370159N	362950N	0880157W	0881759W	57504	LARRY FIELDING	TENNESSEE VALLEY AUTHORITY	901 642-2041
M.USKYHP*172	METROPOLIS LAKE OUTSTANDING RESOURCE WATER	MUL	SDWOR	McCracken	JOPPA, ILL.-KY.	370855N	0884600W						ROBERT WARE	DIVISION OF WATER	502 564-3410
M.USKYHP*184	METROPOLIS LAKE STATE NATURAL AREA	FTV	FTVRS	McCracken	JOPPA, ILL.-KY.	370904N	0884614W	370904N	370903N	0884613W	0884615W	2	L DARRYL ARMSTRONG	TENNESSEE VALLEY AUTHORITY	502 886-3398
M.USKYHP*148	METROPOLIS LAKE STATE NATURE PRESERVE	SKN	SKNPR	McCracken	JOPPA, ILL.-KY.	370850N	0884600W	370905N	370836N	0884539W	0884623W	123	JOYCE BENDER	KENTUCKY STATE NATURE PRESERVES COMMISSION	502 573-2886
M.USKYHP*280	OHIO RIVER OUTSTANDING RESOURCE WATER (BALLARD CO)	PPI	SDWOR	Ballard	OLMSTED, ILL.-KY.;BARLOW, KY.-ILL.	370845N	0890530W						ROBERT WARE	DIVISION OF WATER	502 564-3410

Standard Managed Area Report
Managed Areas Reported For The I-66 Potential Corridor Study, Ballard McCracken Counties.

KSNPC Data Request 02-165

MACODE	MANAGED AREA NAME	OWNER CODE	MANAGED AREA TYPE	COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	NORTH LAT	SOUTH LAT	EAST LONG	WEST LONG	KENTUCKY ACREAGE	MANAGER	MANAGER AGENCY	MANAGER PHONE
M.USKYHP*120	OHIO RIVER OUTSTANDING RESOURCE WATER (MCCRACKEN CO)	PPI	SDWOR	McCracken	METROPOLIS, ILL.-KY.	370815N	0884305W						ROBERT WARE	DIVISION OF WATER	502 564-3410
M.USKYHP*211	PEAL WILDLIFE MANAGEMENT AREA	SKW	SKWWM	Ballard	BARLOW, KY.-ILL.;WICKLIFFE, KY.-MO.	370245N	0890545W	370337N	365837N	0890458W	0890652W	2019	CHARLIE WILKINS	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 224-2244
M.USKYHP*71	SHAWNEE STEAM PLANT	FTV	FTVPP	McCracken	JOPPA, ILL.-KY.;PADUCAH WEST, KY.-ILL.;HEATH, KY.	370900N	0884600W	371048N	370704N	0884458W	0884925W	2677	A.W. SEABAUGH	TENNESSEE VALLEY AUTHORITY	502 443-3626
M.USKYHP*78	SWAN LAKE OUTSTANDING RESOURCE WATER	SKW	SDWOR	Ballard	BARLOW, KY.-ILL.	370045N	0890700W						ROBERT WARE	DIVISION OF WATER	502 564-3410
M.USKYHP*299	SWAN LAKE WILDLIFE MANAGEMENT AREA	SKW	SKWWM	Ballard	BARLOW, KY.-ILL.;CAIRO, ILL.-KY.-MO.	370130N	0890730W	370302N	370012N	0890712W	0890900W	2536	CHARLIE WILKINS	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 224-2244
M.USKYHP*229	TENNESSEE RIVER MUSSEL SANCTUARY	MUL	SKWMS	Marshall;Livingston	CALVERT CITY, KY.	370200N	0881740W	370331N	370040N	0881600W	0881947W	700	PETE PFEIFFER	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 564-3596
M.USKYHP*176	TENNESSEE RIVER OUTSTANDING RESOURCE WATER	MUL	SDWOR	Livingston;Marshall	CALVERT CITY, KY.;LITTLE CYPRESS, KY.-ILL.	370330N	0881950W						ROBERT WARE	DIVISION OF WATER	502 564-3410
M.USKYHP*91	WEST KENTUCKY WILDLIFE MANAGEMENT AREA	MUL	SKWWM	McCracken	JOPPA, ILL.-KY.;HEATH, KY.	370745N	0884800W	371048N	370504N	0884553W	0885113W	6969	CHARLES LOGSDON	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 488-3233
M.USKYHP*15	WICKCLIFFE MOUNDS ARCHAEOLOGICAL SITE	SMS	SMSPR	Ballard	WICKLIFFE, KY.-MO.	365815N	0890530W	365819N	365809N	0890522W	0890538W	20	KIT WESLER	MURRAY STATE UNIVERSITY	502 335-3681
M.USKYHP*83	WINFORD WILDLIFE MANAGEMENT AREA	SKW	SKWWM	Carlisle;Ballard	WICKLIFFE, KY.-MO.	365545N	0890320W	365607N	365527N	0890252W	0890351W	237	CHARLIE WILKINS	DEPARTMENT OF FISH AND WILDLIFE RESOURCES	502 224-2244

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
771 Corporate Drive, Suite 210
Lexington, KY 40503-5479

January 10, 2003

Annette Coffey, P.E.
Director
Division of Planning
Transportation Cabinet
125 Holmes Street
Frankfort, KY 40601

Dear Ms. Coffey:

With regard to your letter of January 2, 2003, for I-66, I offer the following:

If the project uses Federal money to convert farmland to nonagricultural uses, either form AD-1006 or form NRCS-CPA-106 should be submitted to each respective county Natural Resources Conservation Service (NRCS) representative. As in your letter, this would be Marshall County and McCracken County, Kentucky. If needed, you may receive the forms from the NRCS field offices. The forms may also be obtained via Internet at http://policy.nrcs.usda.gov/scripts/lpsiis.dll/M/M_440_523.htm. The Marshall County District Conservationist is Dianna Angle (270-527-3236, extension 3) and the McCracken County District Conservationist is John Shely (270-554-5242, extension 3).

When sending the forms to the NRCS field office, please ascertain that the routes, alternative routes, etc. are clearly located on topographic maps, soil maps, or other similar scale maps.

Should you have questions, contact State Soil Scientist Bill Craddock at (859) 224-7369.

Sincerely,

DAVID G. SAWYER
State Conservationist

cc:
B. Giesecke, NRCS, Madisonville, KY
J. Shely, NRCS, Paducah, KY
D. Angle, NRCS, Benton, KY

U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: obr
Phone: (314)539-3900x2382
FAX: (314)539-3755
Email: dorzechowski@cgsfl.uscg.mil

16591.1/942.0 LMR
15 January 2003

Ms. Annette Coffey, P.E.
Director, Division of Planning (A-2)
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0, LOWER MISSISSIPPI RIVER, AND MILE 977.0 OHIO RIVER

Dear Ms. Coffey:

Please refer to your letter dated 2 January 2003 concerning the subject bridge.

The Coast Guard is the sole agency tasked with the responsibility for permitting bridges across navigable waters of the United States. This responsibility includes evaluating the impacts of the bridge from a navigational standpoint, determining the proper location for the piers and the required navigational clearances. Since the Lower Mississippi River is a navigable waterway, a Coast Guard Bridge permit will be required.

I appreciate the opportunity to provide navigational input in the early stages of project development. We have initiated our review of the navigational requirements for the new bridge crossings described in the enclosures to your letter. There appear to be four as follows:

1. A new bridge at Mile 948.0, Lower Mississippi River
2. A new bridge at Mile 951.0, Lower Mississippi River.
3. A new bridge at Mile 952.0, Lower Mississippi River.
4. A new bridge at Mile 977.0, Ohio River.

I expect to have the pier location and navigational requirements established within 30 days. At that time I will notify you of our findings. We look forward to working with you and your staff on this very important project. You can contact Mr. David Orzechowski at (314) 539-3900, Ext. 2382 to discuss this project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
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DIV OF PLANNING

2003 FEB 18 A 11: 29

16591.1/948.0 LMR
13 February 2003

Ms. Annette Coffey, P.E.
Director, Division of Planning (A-2)
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0,
LOWER MISSISSIPPI RIVER

Dear Ms. Coffey:

Please refer to our letter dated 15 January 2003 concerning the proposed subject bridge.

The Coast Guard has reviewed and determined navigational requirements along with pier locations for the four potential crossing alternatives under consideration, i.e.: Mile 948.0, 951.0 or 952.0 Lower Mississippi River (LMR) and mile 977.0 Ohio River (OHR).

From a navigational viewpoint, a bridge crossing at mile 977.0 OHR is the most desired. At this location it would be near the existing Illinois Central Railroad Bridge at mile 977.7. This would require the right descending pier being located on the Illinois bank and the left descending pier being far enough out to span both of the railroad spans customarily used by river navigation. A 1500-foot horizontal clearance would be required to safely meet the needs of navigation.

An acceptable alternative crossing would be located at mile 948.0 LMR. At this location the right descending pier would be located on the Missouri bank with the left descending pier being placed behind the dikefield. A 1500+ foot horizontal clearance will be required to safely meet the needs of navigation at this location.

A bridge crossing over the LMR is not recommended at any location from the confluence downstream to mile 949.5. This is due to large tows moving in both directions from the three rivers in a series of gradual bends and would provide the greatest impediment to navigation. Vessels transiting in this stretch of the river are in what navigation refers to as a "slick turn". This term refers to the river current continually pushing you towards the left descending bank all the while you are steering towards the right descending bank to where the navigational channel proceeds to cross over the center of the river towards the right descending side. Also, the effects of high and low water are a continuing condition that affects needed sailing line for large tows.

16591.1/948.0 LMR
13 February 2003

Subj: PROPOSED NEW I-66 HIGHWAY BRIDGE, MILE 954.0 – 948.0,
LOWER MISSISSIPPI RIVER

I appreciate the opportunity to make comments regarding the needed navigation clearances early in the design process. Should you have any questions, please contact Mr. David Orzechowski at (314) 539-3900, Ext. 2382 to discuss this project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

DIV OF PLANNING
2003 FEB 21 A 10:10

February 20, 2003

Ms. Annette Coffey, P.E., Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

RE: **Early Coordination Regarding**
Planning Study for I-66 from I-24 in Kentucky to Missouri

Dear Ms. Coffey:

Thank you for your early coordination with us regarding the above-referenced project. EPA Regions 4, 5, and 7 reviewed the information provided in your letter of January 2, 2003, in accordance with Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. EPA Region 4 is acting as the lead EPA Region for the project at the present time. The purpose of this letter is to provide you with the results of our review, in response to your request for comments on the potential corridors.

Our enclosed preliminary comments pertain to known issues in the geographic area, and are subject to change when more detailed information becomes available. It appears that your screening process identified several priority environmental issues, which will require further evaluation as the project proceeds.

We look forward to reviewing the forthcoming NEPA documents for this project, and a continued productive working relationship with you and the other agencies involved with this project. If you have any questions or need more information, please contact Ramona McConney of my staff at (404) 562-9615.

Sincerely,

Heinz J. Mueller, Chief
Office of Environmental Assessment

EPA Comments on
Planning Study for I-66 from I-24 in Kentucky to Missouri

General: We recognize that the maps you provided outline general corridors, which are subject to further study and detailed refinements. Based on the preliminary nature of the maps and information, our comments may change as the project progresses, and more detailed information becomes available.

The NEPA document(s) prepared for this I-66 segment should discuss the status of the adjacent I-66 segments, as well as identify and provide an analysis of different alternative termini locations within the Study Area, in relation to the termini of the neighboring segments. In addition, I-66 traffic impacts on the other roads in the area need to be considered.

Purpose & Need: In order for EPA to fully evaluate the alternatives, the NEPA document should identify the basic underlying transportation problems (deficiencies) or needs between the two logical termini for the segment under consideration.

Traditional traffic data or analysis should be presented to substantiate each identified need. For example: if the problem is congestion, then Level of Service (LOS) data should be presented to support this need. In addition, traffic numbers [e.g., LOS, vehicle miles of travel (VMT), vehicle hours of travel (VHT), etc.], if applicable, for existing (current) and future (20 year) forecasts should also be presented.

The traffic analysis should include projected traffic volumes that would utilize the facility from the connecting portions of the proposed I-66. Although this segment would presumably have independent utility, each segment of the proposed I-66 is envisioned to connect with other segments.

The traffic analysis must include an estimation of additional traffic volumes, particularly truck traffic, that would utilize the proposed I-66. This should include traffic considered as "pass-through" (NAFTA-generated or other national traffic) to the study area, as well as traffic that either originates, or would ultimately end, their destination in the study area. This traffic information should be split out and reported separately.

Alternatives: EPA recommends that the Draft EIS identify a preferred alternative. This minimizes some of the issues associated with rating every action alternative, and enables us to provide a thorough review of the environmental issues associated with the preferred alternative.

The preferred alternative should avoid or minimize adverse impacts, so that the need for mitigation of impacts will be lessened or eliminated. A critical factor of the analysis of alternatives is the avoidance or minimization of adverse impacts. When alternatives are rejected, a rationale for rejection should be provided. The rationales should include environmental reasons, along with other considerations. As part of the NEPA process, the no-action alternative must also be carefully evaluated.

The Alternates/Corridors which include new routes and new bridging would result in impacts to the environment. Such impacts should be carefully evaluated, and avoidance and/or mitigation measures, and their feasibility, should be considered throughout the NEPA process.

Alternate/Corridor 20: We concur that rebadging existing Interstate I-24 as I-66 apparently would result in the fewest environmental impacts of the alternatives/corridors under

consideration. Secondary and cumulative impacts should also be considered when evaluating this alternative.

Secondary and Cumulative Impacts: NEPA requires the analysis and disclosure of the direct, secondary and cumulative impacts of major federal actions on the environment. While the direct impacts of transportation projects may or may not be significant, the secondary or indirect effects of the project on land use, and the subsequent environmental effects, can be both temporally and geographically more extensive.

With respect to transportation projects, such as the proposed I-66, which both appear to serve and induce land use changes, the analysis of these changes and their subsequent environmental effects is important to the understanding of the overall impact of the federal action on the natural, cultural and socioeconomic environment.

Consideration of secondary and cumulative impacts requires the assessment of an area's ability to absorb additional development, the loss of businesses or residences, and the watershed's ability to absorb the loss of additional wetlands. Further, the upcoming NEPA document should include a detailed description of how local land use regulations would affect growth induced in the study area by the feasible alternatives.

Induced Travel: In the upcoming NEPA document, describe the short and long-term effects the project is expected to have on induced travel. The anticipated effect of the project on the number of car trips should be stated, since the presumption is that adding the I-66 segment will result in enhanced access and traffic flow.

TR

Threatened and Endangered Species: The map of the study area shows wildlife preserves and natural areas. Efforts should be made to avoid and/or minimize impacts to these areas, and on wildlife and endangered species migrating to and from these areas. We recognize the Shawnee National Forest as a particular area of environmental concern.

The impact of the project on threatened and endangered species, and their habitats, should be evaluated during the scoping process, and appropriate avoidance and/or mitigation measures should be developed in consultation with the FWS, as appropriate. EPA principally defers to the FWS regarding endangered species assessments, and encourages your continued coordination with the FWS.

Cultural and Historic Resources/Section 4(f) Properties: The maps you provided show the presence of sites with historic and cultural significance, but it is unclear whether any of the potential corridors would impact those sites. Coordination with the State Historic Preservation Officers of the involved States will be needed to assist in addressing potential impacts, and compliance with Section 106 of the National Historic Preservation Act.

Each NEPA document should describe the cultural resources which the undertaking may effect, and demonstrate to the public that appropriate consultation with the State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO) is underway or has occurred.

If consultation is completed, any mitigation for adverse effects agreed to through the Section 106 process should be included in the NEPA documentation, so that the public, as well as the EPA, has a complete picture of the action and all of its potential impacts to the environment,

both natural and man-made. This enables all reviewers to give better, more informed comments.

The upcoming NEPA document should account for certain public lands, and all historic properties protected under Section 4(f), especially the Shawnee National Forest. Under Section 4(f), if the selected alternative impacts any of these "Section 4(f)" properties, then the upcoming NEPA document must include an analysis which shows that: (1) there is no feasible and prudent alternative to the use of land from the Section 4(f) property, and (2) the selected alternative includes all possible planning to minimize harm from such use.

Air Quality: The NEPA document should contain a discussion of the transportation air quality regulatory requirements, and regional air quality concerns in the project area. A localized carbon monoxide (CO) analysis, in metropolitan areas, may help in the evaluation of alternative alignments.

The document should assess existing air quality conditions in terms of National Ambient Air Quality Standards (NAAQS), Federal Prevention of Significant Deterioration (PSD) increments, and state air quality standards (particularly if they are more stringent than the federal regulations).

Any aspects of the project that could adversely affect air quality, in terms of creating new violations of Federal air quality standards, increasing the frequency and severity of existing violations of the standards, or delaying attainment of the standards, should be identified. All emissions resulting from the project must be in compliance with applicable air quality regulations, particularly the NAAQS for criteria air pollutants [e.g., ozone, carbon monoxide (CO), nitrogen oxides, sulfur dioxide, lead and particulate matter (PM)] in designated non-attainment or maintenance areas.

Wetlands: EPA is concerned about the project's potential to impact wetlands in the study area. There are a number of palustrine forested wetlands and palustrine emergent wetlands in the study area.

The upcoming NEPA document should describe the functions and values of each wetland, so that a reviewer can ascertain and compare the gravity of wetland impacts from each alternative. The upcoming NEPA document should account for direct, indirect, and cumulative wetland impacts from each alternative. The upcoming NEPA document should give a detailed description of strategies for avoiding, minimizing and mitigating wetland impacts, and commit to implementing these strategies.

The NEPA document's wetland mitigation strategy should commit to reproducing the functions and values lost in the impacted wetlands, and establish compensatory sites as close as possible to impacted wetlands (preferably adjacent to the impacted wetlands). We suggest that the feasible alternatives avoid forested wetlands, as these wetlands are difficult to reproduce elsewhere.

Clean Water Act Section 303(d) Impaired Water Bodies: We are concerned with the potential of this project to impact impaired sections of water bodies in the study area. The Mississippi River is an example of a water body in the study area listed as an impaired stream under Section 303(d) of the Clean Water Act. The water quality impairment is due primarily to priority organics, metals, nutrients, habitat alterations, and siltation.

Under Section 303(d), impaired streams are subject to the Total Maximum Daily Load

(TMDL) program, which is used to return the streams to compliance with water quality standards. Under the TMDL program, all point and non-point sources that affect the Mississippi River are subject to maximum pollutant loadings that can be introduced into the river. We recommend that the upcoming NEPA document include information regarding impaired segments of rivers in the study area and any TMDLs that are associated with impaired segments. The upcoming NEPA document should also describe what the impacts of the feasible alternatives would be to stretches of the impaired rivers.

Noise: Interstate construction and operational (highway) noise should be predicted for the no build and each of the build alternatives. State-of-the-art noise modeling should be utilized, with consistent methods used by the DOTs of all the states involved. Given that I-66 will cross state boundaries, consistency in the noise analysis could become an issue. In order to provide consistency within the streamlined NEPA process, EPA recommends the following measures:

Definitions of Substantial Noise Increases - Pursuant to 23 CFR 772, the Federal Highway Administration (FHWA) provides the state DOTs discretion in their interpretation of what constitutes a "substantial increase" in noise levels attributable to their highway projects. When predicted traffic noise levels substantially exceed the existing noise level, it is defined as a traffic noise impact which warrants further attention. Some states consider a 10 dBA or greater increase as substantial, while other states believe that increases are not substantial until 15 dBA or greater. EPA believes that a 10 dBA or greater increase due to the project is substantial (significant), since a 10 dBA increase is perceived as a doubling of sound by the human ear. For those states that adhere to the 15 dBA or greater threshold, EPA requests that noise analysis also be provided for a 10-14 dBA increment category, as well as the 15 dBA or greater increment category.

Consistent Use of Noise Metrics - Similar to the states' discretion in defining substantial incremental increases, FHWA allows the use of either the L_{eq} or the L_{10} metric in the noise analysis. In order to achieve consistency within the noise analysis of this highway, EPA requests that if the use of L_{10} is prescribed by state regulation, a noise analysis using L_{eq} should also be provided to supplement the required L_{10} analysis. However, if all states along the route use L_{10}, then L_{eq} data need not be secondarily provided since consistency would already be achieved.

Consistent Use of Noise Models - Modeling should also be consistent for noise analyses along highway. It is particularly important that the same noise model version be used for both the Draft EIS and Final EIS, and among EISs for I-66 sections to the extent possible. For example, use of STAMINA followed by the use of the Traffic Noise Model could create concern regarding model acceptability.

Noise abatement should be considered when project noise impacts approach FHWA Noise Abatement Criteria, or meet or exceed the existing noise levels by the state thresholds, i.e., incremental increases of 10 dBA or greater (preferred by EPA), or 15 dBA or greater.

In general, avoiding noise impacts via alignment shifts is frequently the most effective form

of "mitigation," (since it avoids or minimizes the need for attenuation), and should therefore be emphasized during the alternatives analysis.

Water Quality: The EIS should identify and discuss the location, amount, type, and quality of waters of the U.S., including wetlands, in the study area, identify who delineated them (i.e., U.S. Army Corps of Engineers (COE), contractor, lead agency, etc.), the delineation method(s) used, and impacts to these resources for each action alternative.

All discussions of waters of the U.S. should be broken out by rivers/streams and wetlands. Include maps, text, and tables that feature areas occupied by wetlands, aquatic systems, and non-wetland riparian habitat.

NEPA/404 Merger: If waters of the United States may be impacted by activities regulated by Section 404 of the Clean Water Act, EPA strongly recommends that the NEPA document contain a thorough discussion of the proposed project's consistency with Federal Guidelines for specification of disposal sites for dredged or fill materials, [the 404(b)(1) Guidelines found at 40 CFR Part 230].

In addition, a draft mitigation plan should be developed during the NEPA process to compensate for predicted wetland and stream losses that remain after efforts to avoid and minimize such impacts.

The project proponents should consider requesting concurrence for the project from reviewing agencies under the NEPA/404 merger process agreement, in the states where the selected alignment is located, and where the agreement is accepted. Specifically, the project proponents would request the reviewing agencies for concurrence on three proposed points: (1) the purpose and need for the project, (2) the alternatives retained for further study, and (3) the preferred alternative. This process is helpful because makes the project proponents and the reviewing agencies aware of each other's views, and it provides an opportunity for constructive dialog. If any reviewing agency raises issues about a proposed concurrence point, then these issues can be resolved before the upcoming NEPA document is submitted for review.

Water Quality: EPA is concerned about degradation of water quality in waterways, from erosion, siltation and other pollutants associated with road construction and operations. The NEPA document should discuss potential impacts to water quality, designated uses, and biological resources from construction and operations of the proposed I-66 segment. The discussion in the document should be of sufficient detail to determine which alternatives are environmentally preferable. Site-specific water quality problems need to be assessed in greater detail, if applicable, including the adoption of site-specific mitigation measures to protect water quality and designated uses.

The NEPA document should discuss what mitigation measures (e.g., nonpoint source controls) will be implemented to protect or improve water quality, designated uses, and biological resources. Mitigation measures related to protection of water quality should be tailored to the condition of the specific water resource, as well as the severity of the potential impacts. Best Management Practices (BMPs) should be used to reduce erosion during construction and operation of the facility.

Environmental Justice: Consistent with Executive Order 12898 (*Federal Actions to Address Minority and Low-Income Populations)*, potential EJ impacts should be considered in the NEPA document. The general purpose is to foster non-discrimination in federal programs, and to provide minority and low-income communities greater opportunities for public participation in, and access to, public information regarding human health and environmental issues.

Agricultural Land: The NEPA document should clarify if any agricultural land, specifically prime and unique farmland, would be impacted by the proposed construction. If so, the document should use the U.S. Department of Agriculture classification scheme to describe the present use of agricultural land which would be affected. If this acreage includes prime agricultural land (Class 2), consideration should be given to the Council on Environmental Quality (CEQ) guidelines, (August 30, 1976 and August 11, 1980). Mitigation measures should be developed to avoid loss of such valuable resources.

Biodiversity: Biodiversity is defined as the variety of plants and animals (biota) of a site or region, and is typically measured by the number of different species and number of individuals per species. In general, the more diverse an area (number of habitat types and animal inhabitants) and the better represented these components are (population counts), the more rigorous (resistant, undisturbed, natural, "healthy") the area is considered.

Consistent with CEQ guidance, the NEPA document should discuss biodiversity aspects of the proposal as appropriate. Coordination with the USFWS/NMFS and the state fish and wildlife agency is recommended regarding the design of any project mitigation areas to enhance or restore biodiversity.

One of the biggest threats to the environment is loss of ecosystem functionality due to fragmentation. Roads, agriculture and other development often lead to cutting natural systems into smaller pieces. Large, contiguous tracts of natural land are required not only for species habitat range, such as migratory birds or black bears, but for ecosystem function.

Many ecological processes require large areas of land, often crossing more than one land cover type. Viable landscape linkages are needed to connect these different land types, or the processes are disrupted and their capabilities to function healthily are compromised. For these reasons, conservation must take on the new challenge of not only protecting pristine areas, but ecological connectivity as well.

Public involvement: Public involvement should be initiated early and solicited throughout the NEPA documentation process. It is essential to know the values of a community in order to avoid, minimize and mitigate impacts as well as narrow the field of alternatives. The community also needs to be informed of the tradeoffs and constraints of the process.

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS TN 38103-1894

Reply to Attention of:

July 3, 2003

Readiness Branch
Construction Operations Division

Ms. Annette Coffey, P.E.
Director, Division of Planning
Transportation Cabinet
Commonwealth of Kentucky
Mail Code A-2
Frankfort, Kentucky 40622

Dear Ms. Coffey:

Thank you for the opportunity to comment on the proposed alignment of Interstate 66. Members of my staff recently participated in a conference call with representatives from your office, Parsons Brinckerhoff, and the U.S. Coast Guard. At the end of the teleconference, Mr. Bruce Siria requested that the Memphis District send a letter to your organization outlining the Corps' position and concerns regarding any construction within the Birds Point–New Madrid Floodway. We understand that a selected corridor is to be recommended at a July 17 meeting of the Transportation Cabinet.

The U.S. Army Corps of Engineers strongly opposes any proposed alignments that cross the floodway and recommends that the Kentucky Transportation Cabinet select a route for Interstate 66 that is outside the floodway.

The enclosures to this letter summarize our concerns from 1) operational; 2) engineering; 3) real estate; and 4) regulatory standpoints. These documents also outline the stringent criteria that must be met if your agency does select a route through the floodway.

If you or your staff has any questions regarding this matter, please contact me. Once again, I'd like to propose that members of my staff meet with your planning team to fully brief them on our concerns. Copies of this letter with enclosures are being forwarded to the U.S. Coast Guard and the President of the Mississippi River Commission.

Sincerely,

for Jack V. Scherer
Colonel, Corps of Engineers
District Engineer

Enclosures

Enclosure 1
Operations

Concerns

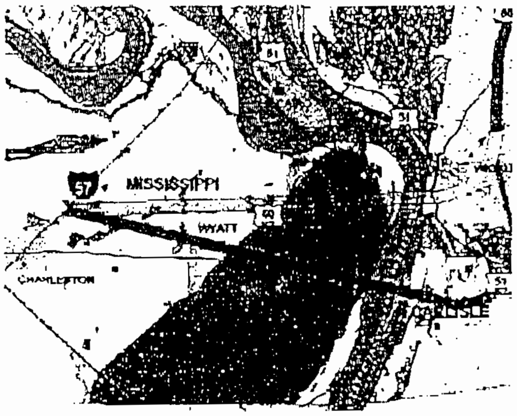

Figure 1 - Optional Corridors for I-66 Crossing the Floodway

Figure 1 is a section of the plate provided by Parsons Brinckerhoff entitled "Final Alternative Corridors." The northern corridor (11-North according to the legend) crosses the Inflow Crevasse where 11,099 feet of levee would be artificially crevassed utilizing Dense Blasting Agent (DBA) -105P, a blasting agent with a cratering effect of 1.5 time that of TNT. The southern corridor, 11-South, while outside the limits of the inflow crevasse, still crosses the floodway within the fuse plug area. Any corridor crossing within the upper fuse plug area would have to cross lands that the Corps purchased due to anticipated damages from bluehole and sanding effects.

The Memphis District strongly opposes both of these proposed alignments and would oppose any alignment crossing within the upper fuse plug area. The Memphis District would prefer that Interstate 66 not cross the floodway. If, however, your agency would like to pursue an alternative south of the upper fuse plug, you must consider the following criteria prior to initiating any detailed planning.

Criteria

Bridge Clearance

Any proposed bridge crossing the Mississippi River adjacent to the floodway cannot impose any restrictions for the operational tows involved in floodway operation. At a minimum, the low steel elevation of the bridge shall be 385.97 NGVD.

Safety Zone

The safety zone for liquefaction potential, airblast, and ground motion has been established to be one-half mile from any of the three detonated crevasse locations.

Access Lanes

In order to access crevasse locations with floating plant carrying the components of the DBA 105-P, the Corps has purchased easements riverward of the levee that cannot be blocked or hindered by any permanent structures, such as bridge peirs.

Evacuation

Due to safety concerns for inhabitants and workers, all roadways entering the floodway would be closed during operation of the floodway. Under current authority, the floodway could be operated when the Cairo gage reaches an elevation of 58.0 feet with a forecast in excess of 60.0

feet. Therefore, in the interest of public safety, the Corps would require that an Interstate crossing the floodway be closed when the Cairo gage nears these stages.

Background

The Birds Point - New Madrid Floodway is located in southeast Missouri in Mississippi and New Madrid counties on the right descending bank of the Mississippi River just below Cairo, Illinois. It contains approximately 205 square miles, varies from 4 to 12 miles in width, and is approximately 30 miles long. The purpose of the Floodway is to provide additional conveyance in this reach of the river in order to prevent the Project Design Flood from exceeding its design elevations at and above Cairo on the Mississippi and lower Ohio River and along the Mississippi River adjacent to the floodway.

Construction and operation of the Birds Point – New Madrid Floodway was originally authorized by the Flood Control Act of 15 May 1928, which adopted the report of the Chief of Engineers published in House Document 90, 70th Congress. Section 8 of the Act addressed the responsibilities for construction and operation of the Mississippi River and Tributaries Project, of which the Birds Point – New Madrid Floodway is a component. The salient features of the floodway included construction of the setback levee (see Figure 2) to project design grade, the degrading of the frontline levee to an elevation equivalent to the flowline that corresponded to 55.0 feet on the Cairo, IL gage and the acquisition of the necessary flowage easements. The plan of operation called for the frontline levee to begin natural overtopping at an equivalent stage of 55.0 feet (1 in 17 year frequency) on the Cairo gage.

Figure 2 – Physical features of the Birds Point – New Madrid Floodway

The flood of 1937 necessitated operation of the floodway; however, it became evident that natural overtopping alone would not allow an adequate flow through the floodway. After several natural crevasses, dynamite was utilized to crevasse other sections of the frontline levee.

Modification to the floodway was authorized by the Flood Control Act of 27 October 1965, substantially as recommended by the report of the Chief of Engineers published in House Document 308, 88th Congress. This document provided for raising the 57 mile frontline levee to give more protection to the floodway area by,

> "...raising the levees forming the east boundary of the Birds Point – New Madrid Floodway and modifying operation thereof to include breaching of the fuse plug levee during floods which reach 58 feet and threaten to exceed 60 feet at Cairo."

The current operation plan was implemented in October 1986. The Memphis District and the

Mississippi Valley Division developed this plan to eliminate some of the disadvantages of previous operational plans. The intent of the 1986 Operation Plan is to allow natural overtopping of the upper fuse plug section before artificially crevassing the levee. Under a natural overtopping condition, or artificial crevassing with a forecast to exceed 60 feet at Cairo, the floodway is afforded a 1 in 80 year level of protection. However, if the integrity of a feature of the main stem flood control project is threatened, artificial operation of the floodway may be required and is authorized (1965 Flood Control Act) at or above a 58-foot stage on the Cairo gage with a stage in excess of 60 feet predicted.

The two fuse plug sections of the frontline levee (shown in figure 3) are two feet lower than the remainder of the frontline levee to provide for natural overtopping of the levee at high river stages. The upper fuseplug section is 11.3 miles long, and the inflow crevasse within the upper fuseplug is 11,099 feet in length. Due to the bluehole and sanding effects expected from overtopping, the Corps purchased in fee value a one-half mile strip of land along the entire 11.3 miles of the upper fuse plug. This area was quit claimed to the local levee district for maintenance. The quitclaim deed(s) contained a clause that stipulated that no permanent structures could be built in the area. On the lower end of the floodway, the fuseplug is 4.5 miles long and Inflow/Outflow Crevasse #2 within the lower fuseplug is 5,500 feet in length. Inflow/Outflow Crevasse #1, located in the vicinity of Big Oak Tree State Park, is also 5,500 feet in length.

Figure 3 – Operational Features of the Floodway

Under the plan of operation, three crevasse sections of the frontline levee (shown in figure 3) would be artificially crevassed by detonating a slurry blasting agent known as Dense Blasting Agent (DBA) 105P, which has a cratering effect 1.5 times that of TNT. The slurry would be pumped in a series of 4" polyethylene pipes that have been pre-emplaced in the three sites. Upon order of the President, Mississippi River Commission, the slurry would be detonated in 1,000-foot sections, as needed, according to hydrologic conditions, allowing a minimum discharge of 550,000 cubic feet per second to pass through the floodway.

Enclosure 2
Engineering

Concerns

The U.S. Army Corps of Engineers and the Mississippi River Commission have a continuing obligation to ensure that the Mississippi River and Tributaries (MR&T) Project can efficiently and safely pass floods through the Lower Mississippi River Valley. An integral feature of the MR&T Project is the safe and efficient operation of the Birds Point – New Madrid Floodway (floodway).

Criteria

Because the integrity of the flood protection works in the vicinity of the floodway are dependent on the diversion of flood discharges through the floodway, no increase in grade of the upper fuseplug levee can be permitted; nor can any impediment of the approach flow conditions be allowed.

The operation of the floodway and the level of protection afforded the interior of the floodway is stage dependent; therefore, any structure proposed must have sufficient openings to preclude any change in the stage discharge relationship of the Mississippi River in the vicinity of the floodway.

Any increases in other locations considered must also address the remedial measures required to preserve the current level of flood protection.

Any proposed structures within the interior of the floodway will be required to pass all anticipated flow diversions at the same level as currently indicated by the Mississippi Basin Model tests.

Proposed structures within the floodway would have to be designed to resist potential localized velocities and scour created by the flow diversion and the accumulation of any floating debris.

Operation of the floodway will require suspension of traffic along any proposed route through the floodway with the duration of traffic suspension being dependent upon the recession of the floodwaters within the floodway and safety inspections of the floodway area.

Background

Current physical conditions pertaining to the floodway are reflective of the provisions outlined in the 1965 Flood Control Act (FCA) dated 27 October 1965. This law provided for raising the levees forming the east boundary of the floodway. It also provided for operation of the floodway when floods reach 58 feet and are projected to exceed 60 feet

on the Cairo, IL gage. Such operation includes artificial breaching of the levees which right shall not be limited to the existing fuseplug sections.

The operation of the floodway during major floods will divert those flows necessary to insure the integrity of the flood protection works on the Mississippi and Ohio Rivers upstream and adjacent to the floodway. To ensure that integrity, Mississippi River flood discharge below Cairo, IL, to New Madrid, MO, are required to be limited to 1,810,000 cubic feet per second (cfs) of the total Mississippi River Project Flood of 2, 360,000 cfs. This will require a minimum discharge of 550,000 cfs to pass through the floodway.

The current operation plan is designed to accomplish the required diversions by artificially crevassing sections of the frontline levee (FLL) in three locations. These three locations are designated as Inflow Crevasse, an 11,099-foot section in the upper fuse plug, Inflow/Outflow Crevasse No. 1, a 5500-foot section in the FLL across from Hickman, KY and Inflow/Outflow Crevasse No. 2, a 5500-foot section of the lower fuseplug section. Under the current operational plan, at approximately 60 feet on the Cairo, IL gage. the Inflow Crevasse in the UFP Section will be completely prepared for operation. The Director of Public Safety of the State of Missouri will be notified of impending actions and upon order of the President, MRC artificial crevassing of the Inflow Crevasse will begin in 1,000-foot sections as needed according to hydrologic conditions. Preparation of the Inflow/Outflow Crevasses for artificial breaching will follow operation of the Inflow Crevasse. However, if the integrity of a feature of the mainstem flood control project is threatened, operation of the floodway may be required and is authorized at or above a 58- foot stage on the Cairo gage with a stage in excess of 60-feet predicted.

Enclosure 3
Real Estate

Concerns

Operation of the Project is controlled by the President of the Mississippi River Commission. The Chief of Engineers would be consulted prior to any activation. Therefore, any necessary grant of the right to construct a highway across the floodway would be determined by those entities within the Corps. Additionally, Congressional alteration of operational authorities could be required in order to grant any Consent to the proposed Interstate Highway right-of-way. If Congressional Authority changes operation of the floodway for proposed highway, then new easements would have to be acquired over the entire floodway.

Criteria

The Corps of Engineers must consent to the utilization of any easements or real estate interests requested for the interstate. "As a general rule, activities or construction and use of structures or facilities which would injure or defeat the purposes for which the property interest was acquired will not be approved."

At present, the easements held by the United States in the floodway and the conditions and reservations in the fuse plug Quitclaim Deeds, preclude the consent to the highway right-of-way, absent a showing of no impact on floodway operations by engineering analysis of the appropriate engineering branches.

Background

The United States possesses Flowage Easements, Access Lane Easements, and Levee and Crevassing Easements for the operation of the Birds Point-New Madrid Floodway. Reservation of certain rights in the United States, which are conditions of utilization, apply to an area approximately one-half mile in width and runing the entire length of the Upper Fuse Plug area.

In that area, the United States reserved "...the perpetual right, power, privilege, and easement to overflow or inundate the lands ... together with any improvements situated thereon, at any time, or for any length of time, with waters of the Mississippi River and its tributaries as may be necessary or required in connection with the operation and maintenance of the Birds Point - New Madrid Floodway...."

Restrictions in that area prohibit building for human habitation, other than those presently existing, nor shall any building be constructed or maintained on the land ... that no structure of any other type, other than those presently existing, shall be constructed or maintained on the land ... without the prior written approval of the representative of the United States in charge of the Birds Point - New Madrid Floodway Project...."

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Restrictions in that area prohibit building for human habitation, other than those presently existing, nor shall any building be constructed or maintained on the land ... that no structure of any other type, other than those presently existing, shall be constructed or maintained on the land ... without the prior written approval of the representative of the United States in charge of the Birds Point - New Madrid Floodway Project...."

Enclosure 4
Regulatory

Concerns

The alternative alignment that crosses the Ohio/Mississippi floodplain near Wickliffe, KY and Mound City, IL would present some concerns relative to the wetlands in that corridor. However, such design features as an elevated roadway and some wetland mitigation could overcome these concerns. The opportunities for wetland mitigation within the Wildlife Management Areas in and near the corridor should be considered.

The proposed alternatives that cross the Birds Point – New Madrid Floodway would likely involve wetland impacts that would include some mitigation requirements in addition to the stringent requirements dealing with operation of the floodway.

Criteria

Construction of a route through the floodway will have 404 permitting requirements.

Background

In weighing alternative corridors, the alternative crossing from Wickliffe, KY and Mound City, IL may appear less desirable due to wetland concerns. However, any alternative crossing the Birds Point – New Madrid Floodway would not only have 404 permitting requirements; it would require that all operational, engineering and real estate criteria be met. After a review of the criteria, the crossing from Wickliffe to Mound City would appear more desirable.

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS TN 38103-1894

Reply to
Attention of:

DISCUSSION PAPER

SUBJECT: Proposed Interstate 66 Road Crossing of Mississippi River

ISSUE: Effects of Road Crossing on Mississippi River Flood Regimes

We, at the Memphis District Corps of Engineers, are proponents for improvement in the infrastructure and in helping the nation move forward. The building of the Interstate 66 crossing over the Mississippi River would be an example of that improvement and we support that effort. But with that, we want to be insured that design efforts and considerations are given to our concerns in dealing with the flooding regimes of the Mississippi River and Tributaries.

Our major concerns are potential impacts to floodway operation and headloss or changes in the water surface elevations as a result of any proposed bridge or embankment construction. The operation of the floodway is a very complex and controversial issue. Having a major roadway crossing the floodway just magnifies the complexity and presents another potential obstacle to operation if needed. Note that failure to operate the floodway during a Project Design Flood or one nearing this level of an event results in the overtopping of levees and floodwalls in this reach of the Mississippi River and Tributaries project. The impacts extend up the Ohio River and outside the boundaries of Mississippi Valley Division.

Also, the flowage easements within the Birds Point-New Madrid Floodway in southeast Missouri have restrictive clauses that preclude improvements that would affect the operation of the floodway, which may in turn require substantial conveyance openings on any proposed features within the floodway area. Any proposed construction would need detailed engineering studies that indicated that the operation of the floodway would not be impacted. The studies would have to show that sufficient openings are provided such that there are no appreciable changes in the water surface elevations in and above this reach of the Mississippi and Ohio Rivers. Previous efforts related to the port development in the upper fuse plug section required physical modeling of this reach of the river along with proposed developments. The Corps considers physical modeling the minimum level of detail in this kind of engineering analyses. This is a very controversial issue in a reach of the Mississippi River floodplain that requires, by virtue of the lives that could be impacted, this level of study.

Regardless of the designs efforts taken and what the results may show, Mississippi Valley Division still retains final review authority on addressing issues on the Mississippi River. Therefore, detailed review will be a major effort by the Corps of Engineers and will result in intensive correspondence between design agencies and the Corps.

If you have any questions concerning this issue, please contact Dewey Jones at 901-544-0676 or Tracy James at 901-544-0673.