

**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

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Missouri Department of Transportation (MoDOT)



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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

Marshall County

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 51 and 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)

Employment	Missouri			
	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 its 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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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
	Ballard C/L to KY 286	3.3	2	10'	2'-4'	55	60'	29%	Rural Major Collector
McCracken, KY	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Girardeau C/L	2.3	4	12'	10'	70	n/a	n/a	Interstate

I 57

	Description	Length	Number of Lanes	Lane Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	Functional Class
Alexander, IL	Missouri S/L to Pulaski C/L	4.3	4	12'-20'	n/a	65	n/a	n/a	Interstate
Pulaski, IL	Alexander 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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 Width¹	Shoulder Width¹	Speed Limit	Average ROW	% PSD²	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 its 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 Officials (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 Girardeau 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
Alexander, IL	Missouri S/L to Pulaski C/L	10,700	34.2%	A
Pulaski, IL	Alexander 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 %	LOS¹
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 %	LOS¹
Alexander, IL	Cape Girardeau C/L to IL 3	10,900	11.7%	D

IL 169

	Description	ADT	Truck %	LOS¹
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

Mode	Kentucky (Million Tons)		Illinois (Million Tons)		Missouri (Million Tons)	
	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, then 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
US 45	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
	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
US 51	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
	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
US 60	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
	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
US 61	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
	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	<i>Haliaeetus leucocephalus</i>	Bald eagle	T	Along open bodies of water in large trees
			<i>Sterna antillarum athalassos</i>	Interior least tern	E	Sandbars and shallow water in large rivers.
		Bivalves	<i>Obovaria retusa</i>	Ring pink	E	Large rivers on gravel bars in swift water
			<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
		Fishes	<i>Scaphirhynchus albus</i>	Pallid sturgeon	E	Muddy or silty waters of large rivers with moderate currents
			<i>Etheostoma chienense</i>	Relict darter	E	Known only from the Bayou du Chien - a small sand and mud bottomed stream
		Mammals	<i>Myotis sodalis</i>	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Graves	Fishes	<i>Etheostoma chienense</i>	Relict darter	E	Known only from the Bayou du Chien - a small sand and mud bottomed stream
	Marshall	Bivalves	<i>Lampsilis abrupta</i>	Pink mucket	E	Medium to large rivers with moderate to fast flowing currents
			<i>Obovaria retusa</i>	Ring pink	E	Large rivers on gravel bars in swift water
			<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
			<i>Pleurobema clava</i>	Clubshell	E	Big rivers burrowed in 2-4 inches of sand or gravel
		Birds	<i>Haliaeetus leucocephalus</i>	Bald eagle	T	Along open bodies of water in large trees
	McCracken	Bivalves	<i>Lampsilis abrupta</i>	Pink mucket	E	Medium to large rivers with moderate to fast flowing currents
			<i>Obovaria retusa</i>	Ring pink	E	Large rivers on gravel bars in swift water
			<i>Plethobasus cooperianus</i>	Orangefoot pimpleback	E	Large rivers in 15-20 feet of water with sand or gravel substrates
			<i>Potamilus capax</i>	Fat pocketbook	E	Backwater areas of large rivers in muddy or silty substrates
		Mammals	<i>Myotis sodalis</i>	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
	Carlisle	Bivalves	<i>Potamilus capax</i>	Fat pocketbook	E	Backwater areas of large rivers in muddy or silty substrates
		Birds	<i>Haliaeetus leucocephalus</i>	Bald eagle	T	Along open bodies of water in large trees
			<i>Sterna antillarum athalassos</i>	Interior least tern	E	Sandbars and shallow water in large rivers.
		Mammals	<i>Myotis sodalis</i>	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	<i>Sterna antillarum</i>	Least tern	E	Bare alluvial and dredged spoil islands, Mississippi & Ohio Riv.
		Mammals	<i>Myotis grisescens</i>	Gray bat	E	Caves/abandoned mines
			<i>Myotis sodalis</i>	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Fish	<i>Scaphirynchus albus</i>	Pallid Sturgeon	E	Muddy or silty waters of large rivers with moderate currents
	PULASKI	Mammals	<i>Myotis grisescens</i>	Gray bat	E	Caves/abandoned mines
			<i>Myotis sodalis</i>	Indiana bat	E	Limestone caves (winter) and large trees with exfoliating bark (summer)
		Bivalve	<i>Plethobasis cooperianus striatus</i>	Orange-footed pearly mussel	E	Ohio River
	<i>Lampsilis orbiculata abrupta</i>		Pink mucket pearly mussel	E	Ohio River	
	MASSAC	Bivalve	<i>Potamilis capax</i>	Fat pocketbook pearly mussel	E	Wabash River
		Birds	<i>Sterna antillarum</i>	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, Quaternary age Peoria Loess silt as well as Tertiary and Quaternary 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.

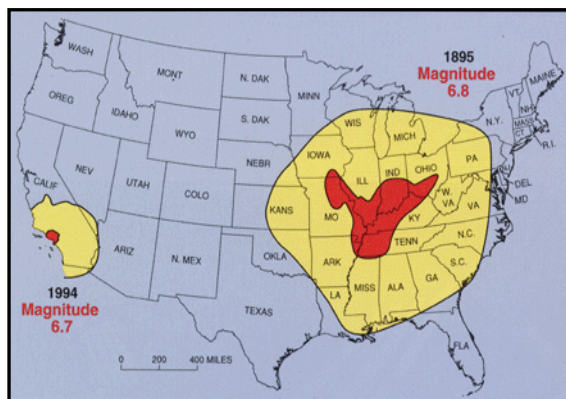


Figure 5-2 Relative Size of Affected Areas

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.

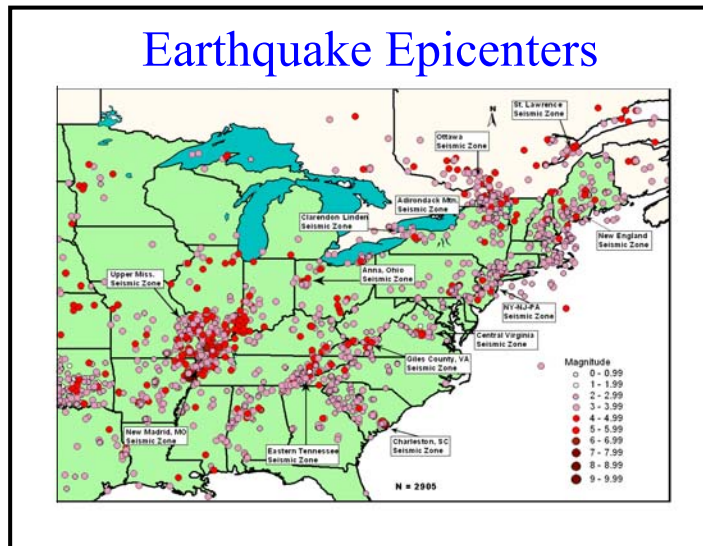


Figure 5-3 Earthquake Epicenters and Magnitudes in the Central and Eastern United States

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 known 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 curves 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 16 th 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.