# 3.6 NAVIGATION AND TRANSPORTATION

## 3.6.1 Introduction

This section describes the affected environment associated with navigation and transportation along approximately 500 miles of the LOMR from Rulo, Nebraska (RM 498) to St. Louis, Missouri. The focus is on the existing navigation and surface transportation resources, including riverborne commerce and commercial dredging operations that may be affected by the Proposed Action and alternatives. A summary of management and operation of the Missouri River system by the USACE for navigation and other congressionally authorized purposes provides the context within which navigation occurs on the LOMR. The regulatory setting provides regulations applicable to navigation and transportation and the agencies with jurisdiction in the Project area.

Changes in the production of commercial sand and gravel resulting from changes in permitted dredging under the Proposed Action and alternatives could affect navigation and riverborne commerce and traffic and transportation patterns. Sand and gravel produced from dredging in the LOMR dominates the navigation and riverborne commerce on the river (on a tonnage and barge trip basis). Therefore, changes in production of these commodities could affect not only the barge traffic associated with commercial dredging but also recreational and other commerce-related vessels. Furthermore, because sand and gravel are trucked from onshore sand plants to their market destinations, any significant change in the volume of this material sourced from the river would affect the number of trucks and truck trips on the major transportation corridors.

The existing navigation and surface transportation resources described in the section and the regulatory setting were used as a baseline to evaluate the potential impacts of the Proposed Action and alternatives.

Information used in the preparation of this section came from a variety of sources, including the USACE, roadway maps of the Project Area, and aerial photos.

## 3.6.2 Regulatory Setting

This section describes regulations pertaining to navigation and transportation, as well as agencies that may be responsible for these resources, in the areas that could be affected by the Proposed Action and alternatives.

#### 3.6.2.1 Federal

*U.S. Coast Guard*

The USCG is one of the five armed forces of the United States. The USCG protects the maritime economy and the environment, and defends the maritime borders of the United States.

The USCG Sector Commander Upper Mississippi is responsible for safety of navigation, security, and law enforcement along the Missouri River. The USCG Sector Upper Mississippi River Prevention Department is responsible for maintaining and setting buoys and shore aids along the Missouri River. The Prevention Department also focuses on licensed mariner issues, permits, casualty investigations, and security verifications. The USCG Sector Upper Mississippi River Response Department uses USCG small boats, other law enforcement partnerships, and first responders to patrol and respond to emergencies and incidents on the Missouri River.

The USCG District Commander, Eighth Coast Guard District, has administrative supervision over reaches of the Missouri River within the limits of the district and is responsible for enforcement of emergency regulations to govern navigation on the river. During critical flood stages on the river, when lives, major shore installations, or levees are endangered, the District Commander in charge of the locality has the authority to declare the reach of the river closed to navigation or to prescribe temporary speed regulations if necessary to prevent immediate human suffering or to mitigate major property damage or destruction from wave action.

*U.S. Army Corps of Engineers*

Operation and maintenance (O&M) of the BSNP is managed by two USACE Districts. The river from Rulo to the mouth is managed by the Kansas City District, which has a river field office at Napoleon Missouri. The river from Sioux City Iowa to Rulo is managed by the Omaha District, which has a river field office immediately upstream of Omaha. These districts have water management functions for regulation of tributary dams in the Missouri River basin. The Northwestern Division has water management responsibilities for the Missouri River Mainstem System and coordinating responsibilities for tributary reservoir regulation.

*Waterways Action Plan*

The Waterways Action Plan (WAP) provides general information and target gauges to be used as a guideline for a crisis on the waterways in the Mississippi River basin. The WAP is intended to serve as a guide for officials of the USCG, the USACE, and the marine industry to facilitate the safe and orderly

movement of traffic during a navigational crisis, while minimizing the loss of life and damage to the environment and equipment. This is achieved by comprehensive contingency planning for response actions that addresses all extreme river conditions—high water, high velocity, low water, and ice conditions—on the major inland rivers of the United States and their tributaries, as well as how to respond at the different response phases.

The annexes of the WAP (i.e., the Upper Mississippi River, Illinois River, and Missouri River annexes) break down these response actions by geographic segments of the inland rivers and apply trigger points and recommended actions for each phase of response. The WAP and its annexes are reviewed annually by the USCG, the USACE, and river industry representatives (i.e., the River Industry Action Committee and the Missouri River Action Committee).

### *River and Harbors Appropriation Act of 1899*

Section 10 of the RHA requires authorization from the Secretary of the Army, acting through the USACE, for construction of any structure in, under, or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work would affect the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States. It applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf; dolphin; weir; boom breakwater; jetty; groin; bank protection (e.g., riprap, revetment, and bulkhead); mooring structures such as pilings; aerial or sub-aqueous power transmission lines; intake or outfall pipes; permanently moored floating vessel, tunnel, artificial canal, boat ramp, and aids to navigation; and any other permanent or semi-permanent obstacle or obstruction.

### *Federal Highway Administration*

The FHWA is a division of the U.S. Department of Transportation that specializes in highway transportation. The agency's primary activities are grouped into the Federal-Aid Highway Program and the Federal Lands Highway Program. The role of the FHWA in the Federal-Aid Highway Program is to oversee federal funds used for constructing and maintaining the national highway system (primarily interstate highways, U.S. routes, and most state routes). The FHWA oversees projects using these funds to ensure adherence to federal requirements for project eligibility, contract administration, and construction standards. Under the Federal Lands Highway Program, the FHWA provides highway design and construction services for various federal land management agencies, such as the U.S.

Department of Agriculture (USDA) Forest Service and the National Park Service (NPS). In addition to these programs, the FHWA performs research in the areas of automobile safety, congestion, highway materials, and construction methods.

#### 3.6.2.2 State

*Nebraska Department of Roads*

The NDOR is responsible for building and maintaining the state and federal highways in the state of Nebraska. Eight NDOR district offices are located across the state. That portion of the Project area located in Nebraska falls within District 1 of the NDOR.

*Illinois Department of Transportation*

The Illinois Department of Transportation (IDOT) has responsibility for planning, construction, and maintenance of the Illinois transportation network, which encompasses highways and bridges, airports, public transit, rail freight, and rail passenger systems.

*Kansas Department of Transportation*

The KDOT is responsible for road and bridge maintenance, transportation planning, contract compliance, and transportation-related administrative support for the state of Kansas.

*Missouri Department of Transportation*

The Missouri Department of Transpiration (MoDOT) is headquartered in Jefferson City and has functional control over 10 geographical transportation districts. Each district contains approximately 10 percent of the total road mileage in the state highway system. Each district is under the direction of a district engineer, who is responsible for administering all department activities in the region. The Project area falls within six of these districts: Northwest (District 1), North Central (District 2), Northeast (District 3), Kansas City Area (District 4), Central (District 5), and St. Louis Area (District 6).

The MoDOT is responsible for five major transportation alternatives in the state, including highways, aviation, waterways, public transit, and railroads. Those responsibilities include total operation of the 32,000-mile highway system, including highway location, design, construction, and maintenance. Additionally, MoDOT cooperates and coordinates with owners and operators of the four other modal systems in the development and improvement of airports, rail facilities, and ports and the operational cost of transit systems.

## 3.6.3 Navigation on the Lower Missouri River

### 3.6.3.1 Bank Stabilization and Navigation Project

For the purposes of this analysis, navigation on the LOMR consists primarily of the transport of freight and raw materials via barges. Navigation on the LOMR is made possible by the navigational channel created by the BSNP (see Sections 3.2 and 3.4). As described in Section 3.2, the primary goal of the BSNP was to provide a continuous open-river navigation channel, 9 feet deep and 300 feet wide, from Sioux City, Iowa to the Mississippi River.

Maintenance of the BSNP continues in response to weathering and subsequent removal of rock from the tops of the dikes and revetments, and new structures occasionally built in response to changes in channel configuration. In general, the maintenance program is focused on maintaining the dikes at their design elevations based on the CRP (USACE 2009). See Section 3.4 for a more in-depth discussion of the CRP. Maintenance also requires reservoir releases and infrequent dredging activities by the USACE, particularly during periods of below-normal water supply (USACE 2006a). Maintenance dredging has been done on occasion during drought periods, mostly in downstream reaches (USACE 2008). During the 12-year period from 1994 to 2006, two dredging projects were conducted by the USACE that resulted in removal of 111,333 cubic yards of dredged material from a shallow location in the channel to an in-river disposal area within 500 feet of the dredged site (GAO 2009). Generally speaking, commercial dredging is not required for maintenance of the navigation channel because the dikes and revetments prevent bed material load from settling out and creating shoals (USACE 2008).

### 3.6.3.2 Management of Navigation on the Lower Missouri River

Water levels on the Missouri River are partially regulated by the USACE through controlled releases from six dams and associated reservoirs that comprise the Missouri River Mainstem Reservoir System (System). The System is congressionally authorized (Section 9 of the 1944 Flood Control Act) to be operated for the purposes of navigation as well as flood control, irrigation, power, water supply, water quality control, recreation, and fish and wildlife.

The USACE manages the System according to the water control plan of the Master Manual (USACE 2006a). The Master Manual provides criteria for releases from System storage for flood control, navigation service, and non-navigation service. Each criterion relates to the amount of water in System storage.

Releasing water from the System to augment downstream tributary flows provides navigation support on the Missouri River below Sioux City. Navigation conditions on the LOMR are governed in part by controlled releases from Gavins Point Dam, the farthest downstream of the six System dams. It is located on the Nebraska-South Dakota border, and its primary function is reregulating releases from the upper System dams. Gavins Point Dam releases provide most of the water at Sioux City because there is minimal inflow to the river between the dam and Sioux City. At Kansas City, System flows are augmented by major tributaries, including the Kansas and Platte Rivers.

### *Navigation Season*

Navigation season length and service levels are determined by moisture conditions in the basin. During periods of drought, storage of water in the System is limited. The navigation season may be shortened, and navigation service reduced due to reductions in water releases.

On March 15 of every year, a water-in-storage check of the System is performed to determine whether navigation flows will be supported for that year, and if so, whether flows will be for full service or minimum service. On July 1 of every year, a second water-in-storage check of the System is performed to determine the length of the navigation season. The navigation season is limited to the ice-free season, based on historical records of ice formation on the Missouri River (Table 3.6-1).

**Table 3.6-1 Navigation Season Schedule on the Missouri River**

| Location | Opening Date | Closing Date |
|---|---|---|
| Sioux City, Nebraska | March | November |
| Omaha, Nebraska | March | November |
| Kansas City, Missouri | March | November |
| Missouri River mouth | April | December |

Source: USACE 2006a.

In years when the System water-in-storage is at or below 31 million acre-feet on March 15, navigation support is suspended (USACE 2006a); however, no condition in the current commercial dredging permits suspends dredging under these same conditions. When water levels are low, commercial dredgers may need to dredge closer to their sand plants and use their dredges to maintain adequate depths for the dredge barges. Commercial dredging generally occurs year-round when the wind chill is above freezing.

Releases from the System to support full-service or minimum-service navigation are based on flow target values at four downstream locations on the Missouri River: Sioux City, Omaha, Nebraska City, and Kansas City. The minimum-service level provides an 8-foot depth in the navigation channel, and the full-service level (6,000 cfs greater than minimum service) provides a 9-foot depth. For full navigation service, target flows of 31,000 cfs are set at Sioux City and Omaha, 37,000 cfs at Nebraska City, and 41,000 cfs at Kansas City (USACE 2006a). For minimum navigation service, target flows of 25,000 cfs are set at Sioux City and Omaha, 31,000 cfs at Nebraska City, and 35,000 cfs at Kansas City (USACE 2006a).

### *Low Flows in the Missouri River*

In general, water level is the major factor affecting commercial barge operations on the Missouri River (TranSystems and MoDOT 2008). As described above, water levels on the Missouri River are regulated via the CWCP. During periods of drought, the commercial barge transport season is shortened or not supported Recent investigations have indicated that the most common practice on U.S. inland waterway systems, including the Missouri River, for accommodating freight barge traffic during low-flow conditions is barge light loading (TranSystems and MoDOT 2008). Barge light loading is the practice of loading a barge only to the point where the resulting loaded draft of the barge will safely navigate the applicable river draft.

## 3.6.4 Riverborne Commerce

Iowa, Nebraska, Kansas, and Missouri border the Missouri River and are served by barge traffic along the river. Freight traffic commodities transported on the Missouri River by private companies include various types of agricultural products; chemicals and fertilizers; petroleum products; building materials; and river-related materials such as rock, sand, and gravel dredged from the river (Table 3.6-2). In addition, the USACE implements river maintenance and habitat recovery projects that require shipment of waterway improvement materials, such as stone or rock (GAO 2009).

**Table 3.6-2 Commodity Shipment Data (tons)**

| Commodity | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kansas City to Mouth (RM 374.8 to RM 0) | | | | | | | | | | | |
| Petroleum products | 289 | 239 | 278 | 256 | 217 | 173 | 213 | 216 | 180 | 81 | 132 |
| Chemicals and related products | 516 | 462 | 336 | 289 | 334 | 246 | 118 | 48 | 7 | 14 | 8 |
| Sand and gravel | 5,969 | 6,104 | 7,155 | 6,844 | 7,985 | 6,763 | 7,095 | 7,317 | 7,242 | 7,679 | 5,983 |
| Waterway improvement materials | 194 | 91 | 133 | 153 | 22 | 112 | 5 | 60 | 82 | 57 | 101 |
| Crude materials (except sand, gravel, and waterway improvement materials) | 39 | 45 | 66 | 34 | 30 | 17 | 5 | 0 | 0 | 0 | 2 |
| Primary manufactured goods | 185 | 235 | 156 | 233 | 198 | 202 | 206 | 221 | 88 | 67 | 130 |
| Food and farm products | 589 | 704 | 727 | 530 | 508 | 388 | 128 | 41 | 10 | 34 | 28 |
| Manufactured equipment, machinery, and products | 1 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| *Subtotal* | *7,782* | *7,883* | *8,854* | *8,340* | *9,294* | *7,901* | *7,770* | *7,903* | *7,609* | *7,933* | *6,387* |
| Omaha to Kansas City (RM 627 to RM 374.8) | | | | | | | | | | | |
| Petroleum products | 77 | 82 | 81 | 58 | 12 | 42 | 18 | 56 | 10 | 0 | 0 |
| Chemicals and related products | 313 | 212 | 146 | 167 | 193 | 123 | 39 | 7 | 3 | 2 | 2 |
| Sand and gravel | 663 | 1,393 | 954 | 1,248 | 923 | 1,172 | 1,068 | 1,976 | 1,880 | 1,663 | 1,221 |
| Waterway improvement materials | 13 | 81 | 10 | 12 | 10 | 0 | 0 | 0 | 29 | 0 | 0 |
| Clay and non-metal minerals | 27 | 29 | 30 | 19 | 16 | 8 | 0 | 0 | 0 | 0 | 0 |
| Primary manufactured goods | 5 | 62 | 24 | 26 | 7 | 67 | 2 | 0 | 0 | 0 | 0 |
| Food and farm products | 278 | 407 | 420 | 270 | 250 | 142 | 68 | 2 | 0 | 21 | 28 |
| Manufactured equipment, machinery, and products | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| *Subtotal* | *1,376* | *2,268* | *1,666* | *1,801* | *1,801* | *1,411* | *1,195* | *2,041* | *1,922* | *1,687* | *1,251* |
| Total (mouth to Omaha) | 9,158 | 10,151 | 10,520 | 10,141 | 10,705 | 9,455 | 8,965 | 9,944 | 9,531 | 9,620 | 7,638 |

Notes: • Measurements of tons represent short tons. • The 8-year period of 1999–2007 was a period of drought.

Sources: USACE 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006b, 2007.

Commodity shipment data (Table 3.6-2) were obtained from the USACE Waterborne Commerce Statistics Center. Commodity data were not available for each of the five river segments (St. Joseph, Kansas City, Waverly, Jefferson City, and St. Charles) but are presented for the following two segments of the Missouri River: from the mouth of the river to Kansas City (RM 0 – RM 374.8) and from Kansas City to Omaha (RM 374.8 – RM 627). The majority of commodity shipments on the Missouri River are sand and gravel dredged from the river, and the segment of the Missouri River from the mouth to Kansas City accounts for the majority of commodity movement. Between 1997 and 2007, sand and gravel accounted for nearly 87 percent (approximately 76.1 million short tons)[1] of the total tonnage shipped on the Missouri River between the mouth and Kansas City, and nearly 80 percent (approximately 14 million short tons) of the total tonnage shipped between Omaha, Nebraska, and Kansas City, Missouri.

In general, the cargo volume is currently higher than the period from 1960 to 1990 due to expansion of local cargo, primarily sand and gravel (TranSystems and MoDOT 2008). Investigations have shown that outbound cargo has declined relative to earlier decades due to a variety of factors, including competition for grain shipments from other locations, drought periods, and poor service reliability (TranSystems and MoDOT 2008). In the 10-year period from 1997 to 2007, total annual commercial shipments on the river peaked in 2001 and declined to approximately 7.6 million short tons in 2007, the lowest annual commodity volume for that 10-year period (Table 3.6-2). This period covered the 8-year drought period (1999–2007).

Commercial shipments, including sand and gravel, move throughout the navigation season but tend to peak in spring and fall (USACE 2006b). Missouri is an origin or destination for more than one-half of commercial shipments on the Missouri River; the Port of Kansas City serves as an origin or destination for approximately one-third to one-half of Missouri River commercial tonnage (USACE 2006b).

#### 3.6.4.1 Dredging Barges and Tugs

Barge and tug traffic on the LOMR is primarily related to commercial dredging and generally is limited to areas on the river within 7−10 miles upstream of the onshore sand plants. This range is dictated by travel times to move loaded barges downstream and return empty barges upstream, and by associated fuel costs. Operation is typically from March through December, 10−12 hours per day, 5−6 days per week. Information provided by the commercial Dredgers indicates that, during this period, up to 18 barges and 11 tugs may be present in the St. Charles segment (RM 0 – RM 130), six barges and

[1] Measurements for tons in this section represent short tons.

two tugs in the Jefferson City segment (RM 130 – RM 250), four barges and one tug in the Waverly segment (RM 250 – RM 357), 11 barges and four tugs in the Kansas City segment (RM 357 – RM 391), and two barges and one tug in the St. Joseph segment (RM 391 – RM 498). A description of dredging activities and the associated movement of barges and tugs from dredging sites to sand plants and back is provided in Section 2.2.

### 3.6.4.2 Commerce-Related Vessels

On the Missouri River, commodities are transported by barges pushed by towboats, with a towboat and barge combination called a "tow." Tow size varies by reach, barge size, and product. Typical tow sizes for dry bulk products, including grains and most fertilizers, are four to six barges per tow below Kansas City and two to four barges per tow between Omaha and Kansas City; liquids and other specialized products typically are transported by two barges per tow (USACE 1998). Average annual commerce-related vessel trips on the LOMR are provided in Table 3.6-3.

**Table 3.6-3 Average Annual Commerce-Related Navigation Traffic on the Lower Missouri River (2003–2007)**

| | Trips | | |
|---|---|---|---|
| Segment | Self-Propelled Vessels[a] (Dry Cargo Vessels, Tow and Tug Boats) | Non-Self-Propelled Vessels[a] (Dry Cargo and Tanker Barges) | Total (All Vessel Trips) |
| Kansas City to mouth (RM 374.8 to RM 0) | 83,502 | 24,098 | 107,600 |
| Omaha to Kansas City (RM 627 to RM 374.8) | 4,748 | 4,084 | 9,552 |
| Total (mouth to Omaha) | 88,250 | 28,902 | 117,152 |

[a] Commercial tug and barge traffic is included.

Sources: USACE 2003, 2004, 2005, 2006b, 2007.

Trip data were not available for each of the five river segments but are presented for the following two segments of the Missouri River: from the mouth of the river to Kansas City (RM 0 – RM 374.8), and from Kansas City to Omaha (RM 374.8 – RM 627). A "trip" is defined as a vessel movement. For self-propelled vessels, a trip is logged between every point of departure and every point of arrival. For loaded barges, a trip is logged from the point of loading the barge to the point of unloading the barge (excluding fleeting areas). For empty barges, trips are logged from the point of unloading to the point of loading, counting the fleeting areas in between (for example, if an empty barge moved from Dock A to

Dock B and the barge stopped at three fleeting areas in between, four trips would be logged). Some tow boat trips and empty barge moves are estimated from a sample to expedite processing and reduce costs. The number of trips also includes vessels engaged in foreign trade.

Depending on the product (e.g., grain, liquid chemical, and mineral products), covered, open, and tank barges are used to transport commodities on the river (USACE 1998). The covered barge fleet has declined in the past few years and is more than 800 units smaller than it was in 2004 (TranSystems and MoDOT 2008). High rates of retirements in the open and tank barge fleets are due to an aging fleet; the average operating life for open and tank barges is 25−30 years and 30−40 years, respectively (TranSystems and MoDOT 2008). In general, smaller commercial vessels are more common on the river. The small tank barge (10,000 barrels or less) fleet has increased somewhat in recent years, but the jumbo barge (greater than 10,000 barrels) fleet has decreased due to fewer deliveries (TranSystems and MoDOT 2008).

#### 3.6.4.3 Other Vessels

There are no ferries operating on the LOMR in the Project area (MoDOT 2009). Other navigation in the Project area is limited to seasonal recreational watercraft, such as motor boats, canoes, and kayaks.

### 3.6.5 Surface Transportation

This section describes the regional roadway transportation system that provides for transportation of bulk materials near the sand plants in the Project area or has the potential to be affected by the Proposed Action and the alternatives. Because sand and gravel are trucked from onshore sand plants to their market destinations, any significant change in the volume of this material sourced from the river would affect the number of trucks and truck trips on the major transportation corridors. The estimated annual sand and gravel haul truck trips under existing conditions is presented in Table 3.6-4. Truck trips are based on the annual production capacity of each facility.

In general, each onshore processing facility serves a localized market that is within a 20- to 60-mile radius of the sand plant. Given the proximity of most of the commercial sand plants to major urban areas and points of delivery, haul routes for sand and gravel transport do not typically include rural roads in the Project area. The areas in the vicinity of the sand plants contain an extensive network of roadways, including state and interstate highways and secondary and municipal roads. All sand shipped from the permitted dredging operations occurs by truck. Sand plants have direct access to the

state and interstate highway system for sand and gravel transport to places of use and distributor facilities.

**Table 3.6-4 Estimated Annual Haul Truck Trips under Existing Conditions by River Segment**

| Segment | Facility Name (Company) | River Mile | Annual Tons Delivered | Estimated Tons Delivered per Day[b] | Trips per Day |
|---|---|---|---|---|---|
| St. Joseph | St. Joseph (Holliday) | 447.8 | 326,928 | 1,514 | 151 |
| | Total | | 326,928 | 1,514 | 151 |
| Kansas City | Riverside (Holliday) | 372 | 1,450,773 | 6,717 | 672 |
| | Randolph (Holliday) | 360 | 1,516,925 | 7,023 | 630 |
| | Total | | 2,967,698 | 13,739 | 1,374 |
| Waverly | Lexington (Capital SL) | 318 | 346,202 | 1,603 | 160 |
| | Carrollton (Capital SL) | 287 | 22,918 | 106 | 11 |
| | Total | | 369,120 | 1,709 | 171 |
| Jefferson City | Glasgow (Capital SL) | 226 | 136,273 | 631 | 63 |
| | Boonville (Capital SL) | 196 | 11,338 | 52 | 5 |
| | Rocheport (Capital SL) | 186 | 272,709 | 1,263 | 126 |
| | Jefferson City (Herman) | 146 | 64,861 | 300 | 30 |
| | Jefferson City (Capital SL) | 144 | 1,093,679 | 5,063 | 506 |
| | Total | | 1,578,858 | 7,310 | 731 |
| St. Charles | Hermann (Hermann) | 97 | 61,097 | 283 | 28 |
| | Washington (Rau)[a] | 68 | NA | NA | NA |
| | Washington (Capital SL) | 66 | 136,463 | 632 | 63 |
| | Bridgeton (Limited) | 44 | 288,607 | 1,336 | 134 |
| | St. Charles (J.T.R.) | 32 | 402,245 | 1,862 | 186 |
| | Chesterfield (Limited) | 28 | 535,985 | 2,481 | 248 |
| | Riverview (J.T.R.) | 16 | 60,011 | 278 | 28 |
| | Fort Belle (Limited) | 8 | 82,459 | 382 | 38 |
| | Alton (Limited)[c] | NA | 82,459 | 382 | 38 |
| | Total | | 1,649,326 | 7,636 | 764 |

[a] No existing facility.
[b] Assumes average truck capacity of 20 tons and 216 delivery days per year.
[c] The Alton facility is located on the Mississippi River.

The range of average daily traffic (ADT) values for these transportation corridors is provided in Table 3.6-5. The ADT is the mean daily traffic volume on a roadway over a 24-hour period. As indicated in the table, the sources for the data are ADT maps published by the KDOT, MoDOT, and IDOT. ADT counts are taken at multiple locations along a road, and each of these counts is indicated on the ADT map for the respective state. The ranges for the road types indicated in Table 3.6-5 show the low and high ADT values for sections of the transportation corridors within each of the five river segments shown in Figure 3.6-1 (Sheets 1–5).

**Table 3.6-5 Average Daily Traffic Volume Ranges for Major Transportation Corridors in the Project Area**

| Segment | Interstate | State Route | U.S. Highway |
|---|---|---|---|
| St. Joseph | 4,718–40,031 | 447–26,328 | 1,168–24,690 |
| Kansas City | 14,435–135,239 | 3,225–38,010 | 10,616–88,265 |
| Waverly | 18,288–24,702 | 228–17,506 | 1,792–16,666 |
| Jefferson City | 21,679–36,330 | 127–15,010 | 8,096–49,468 |
| St. Charles | 28,871–182,064 | 630–78,422 | 16,853–129,520 |

Sources: IDOT 2007, KDOT 2010, MoDOT 2008.

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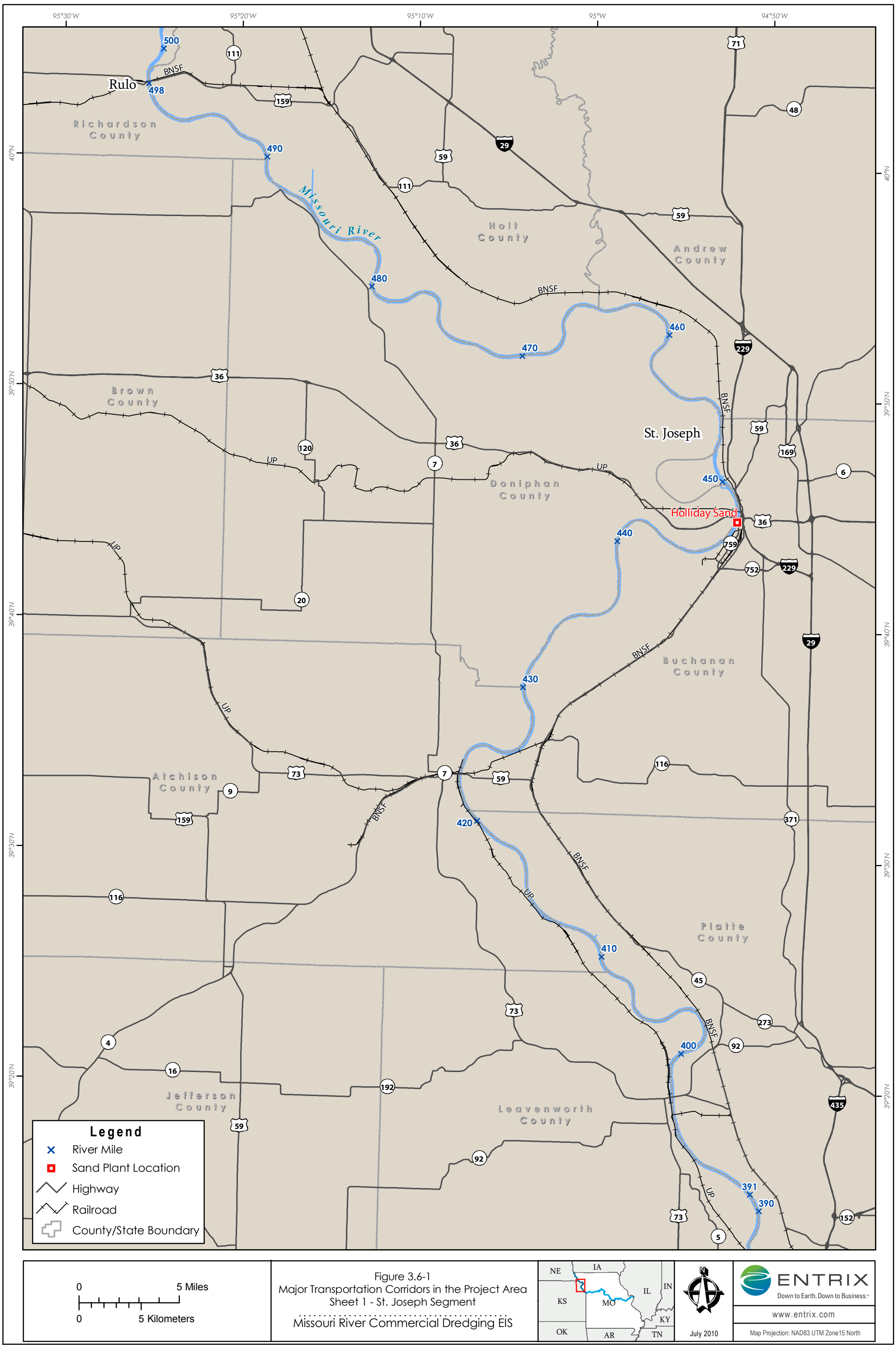


Figure 3.6-1
Major Transportation Corridors in the Project Area
Sheet 1 - St. Joseph Segment

Missouri River Commercial Dredging EIS

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0 5 Miles

0 5 Kilometers

Figure 3.6-1
Major Transportation Corridors in the Project Area
Sheet 2 - Kansas City Segment

Missouri River Commercial Dredging EIS

July 2010

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Map Projection: NAD83 UTM Zone15 North

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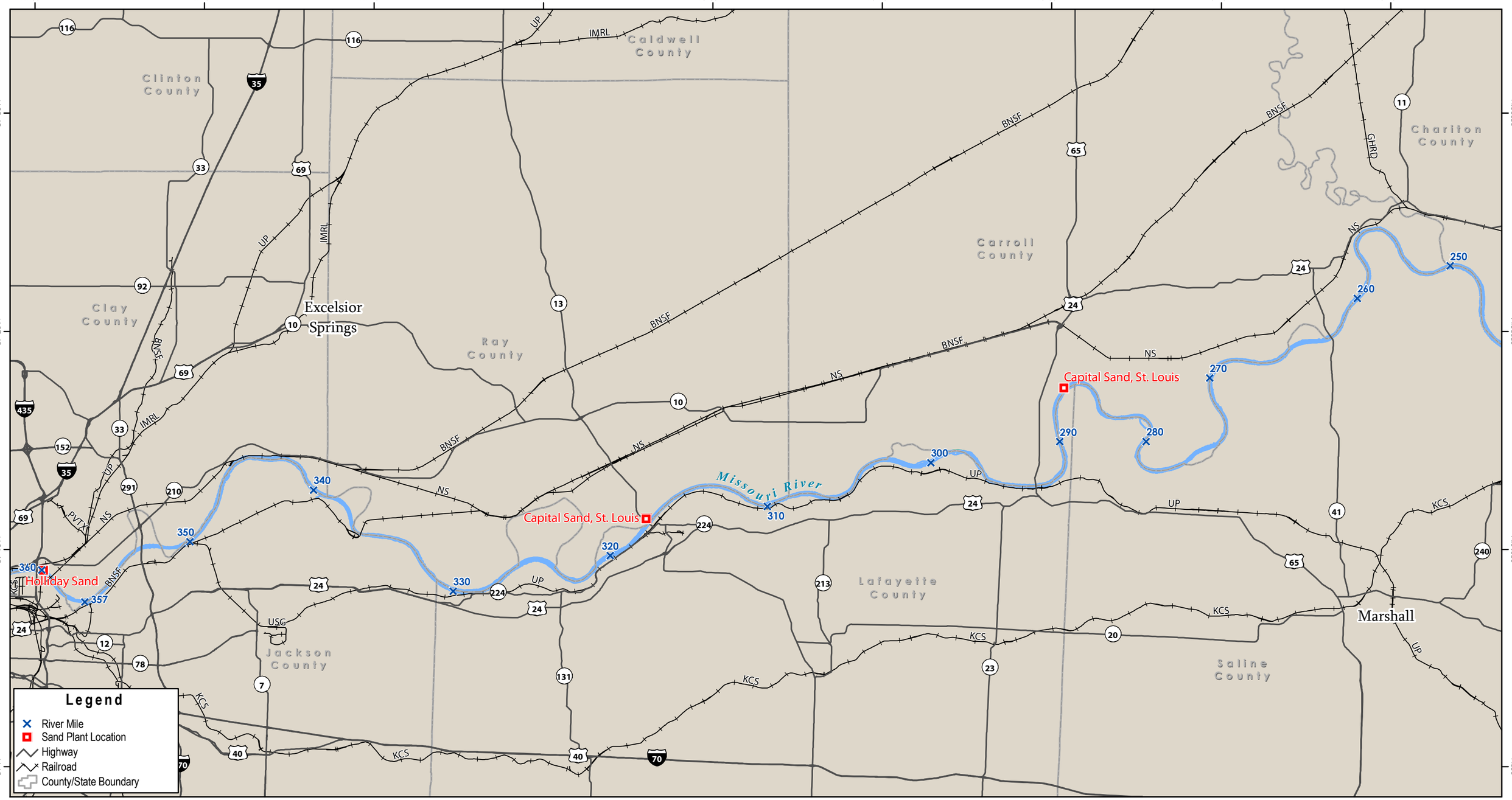


0 10 20 Miles

0 10 20 Kilometers

Figure 3.6-1
Major Transportation Corridors in Project Area
Sheet 3 - Waverly Segment

Missouri River Commercial Dredging EIS

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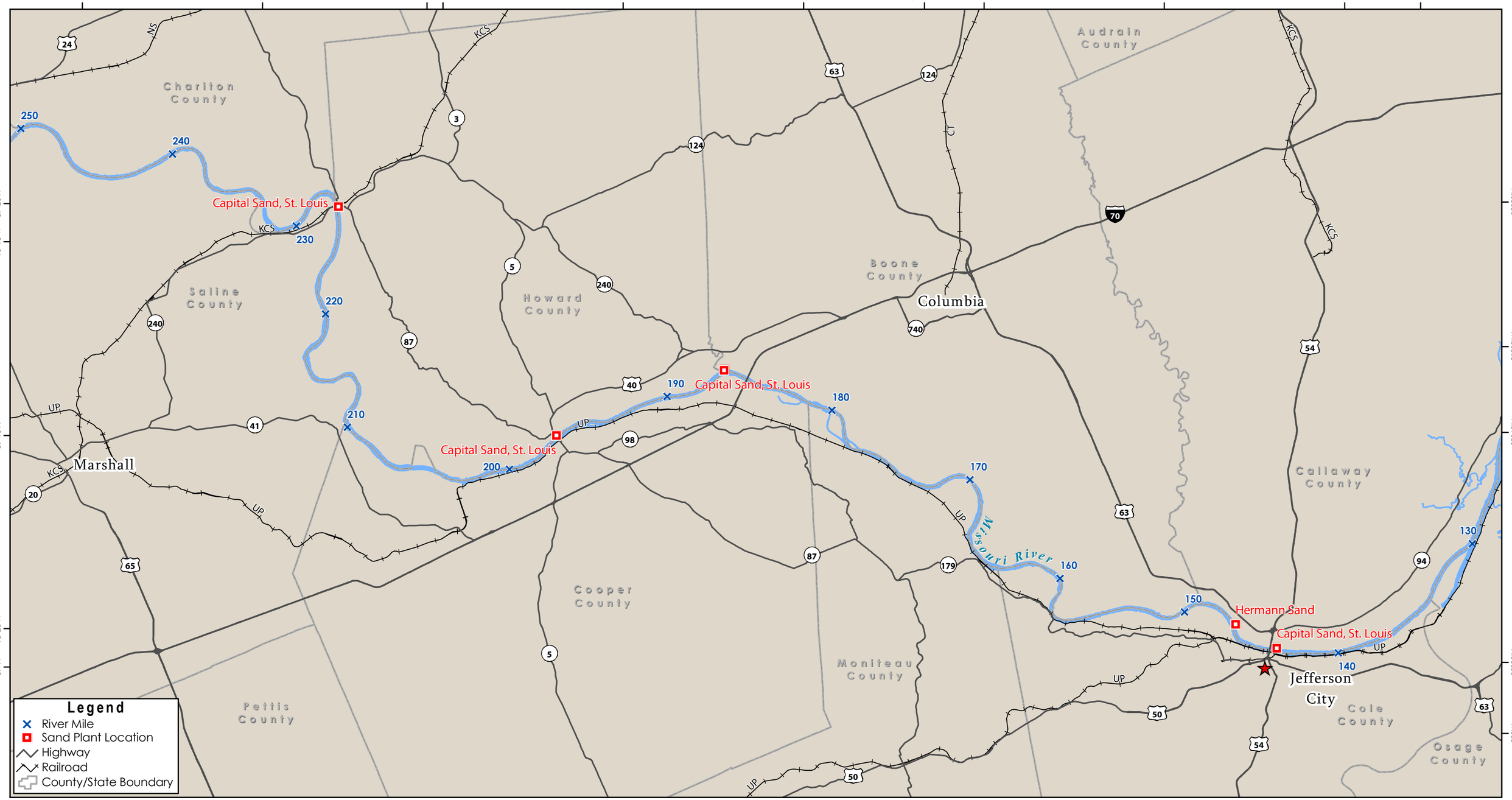


0 5 10 15 20 Miles

0 5 10 15 20 Kilometers

Figure 3.6-1
Major Transportation Corridors in the Project Area
Sheet 4 - Jefferson City Segment

Missouri River Commercial Dredging EIS

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Map Projection: NAD83 UTM Zone15 North

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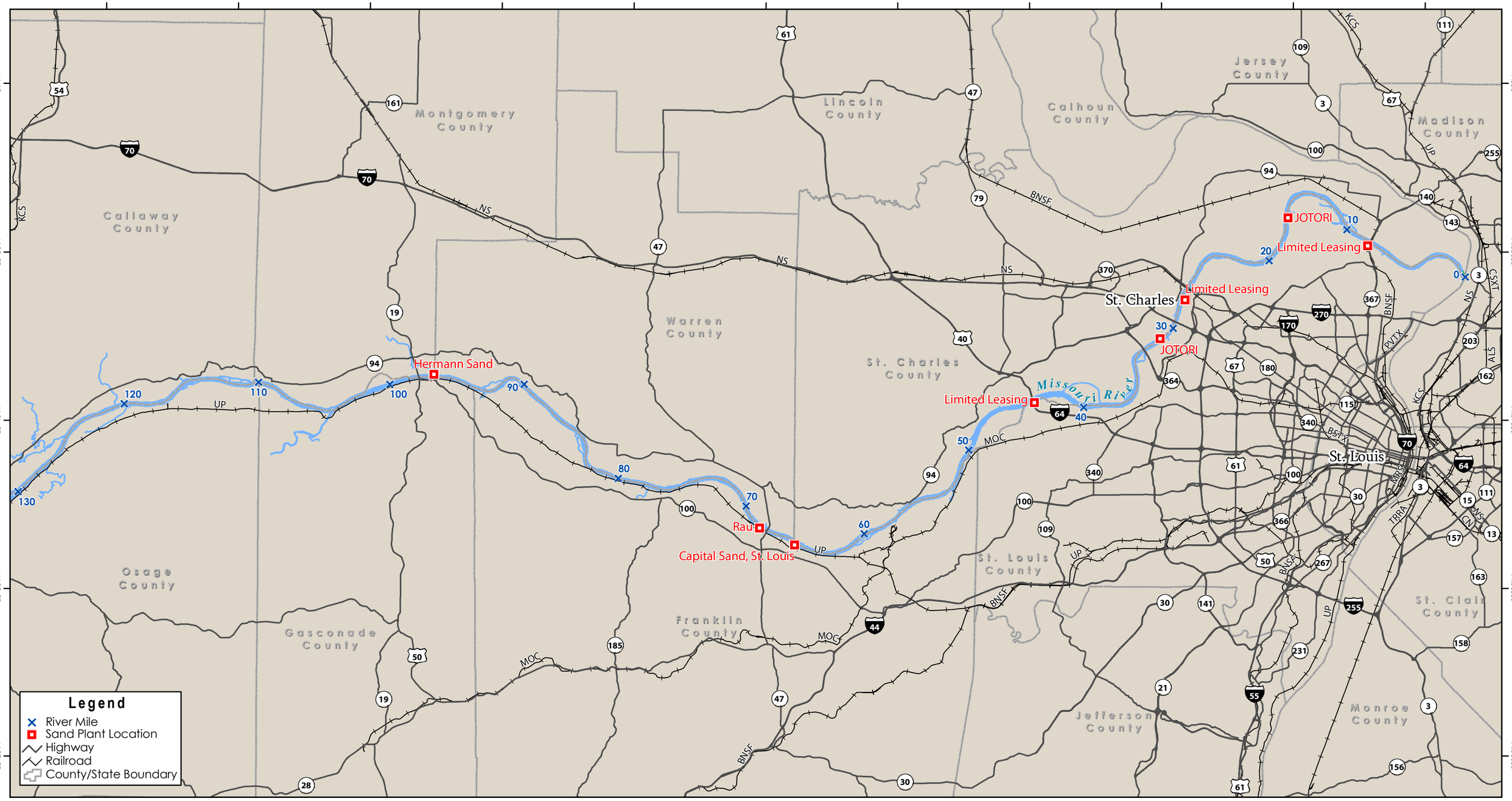


0 5 10 15 20 25 30 Miles

0 5 10 15 20 25 30 Kilometers

Figure 3.6-1
Major Transportation Corridors in the Project Area
Sheet 5 - St. Charles Segment

Missouri River Commercial Dredging EIS

July 2010

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Map Projection: NAD83 UTM Zone15 North

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## 3.6.6 References

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