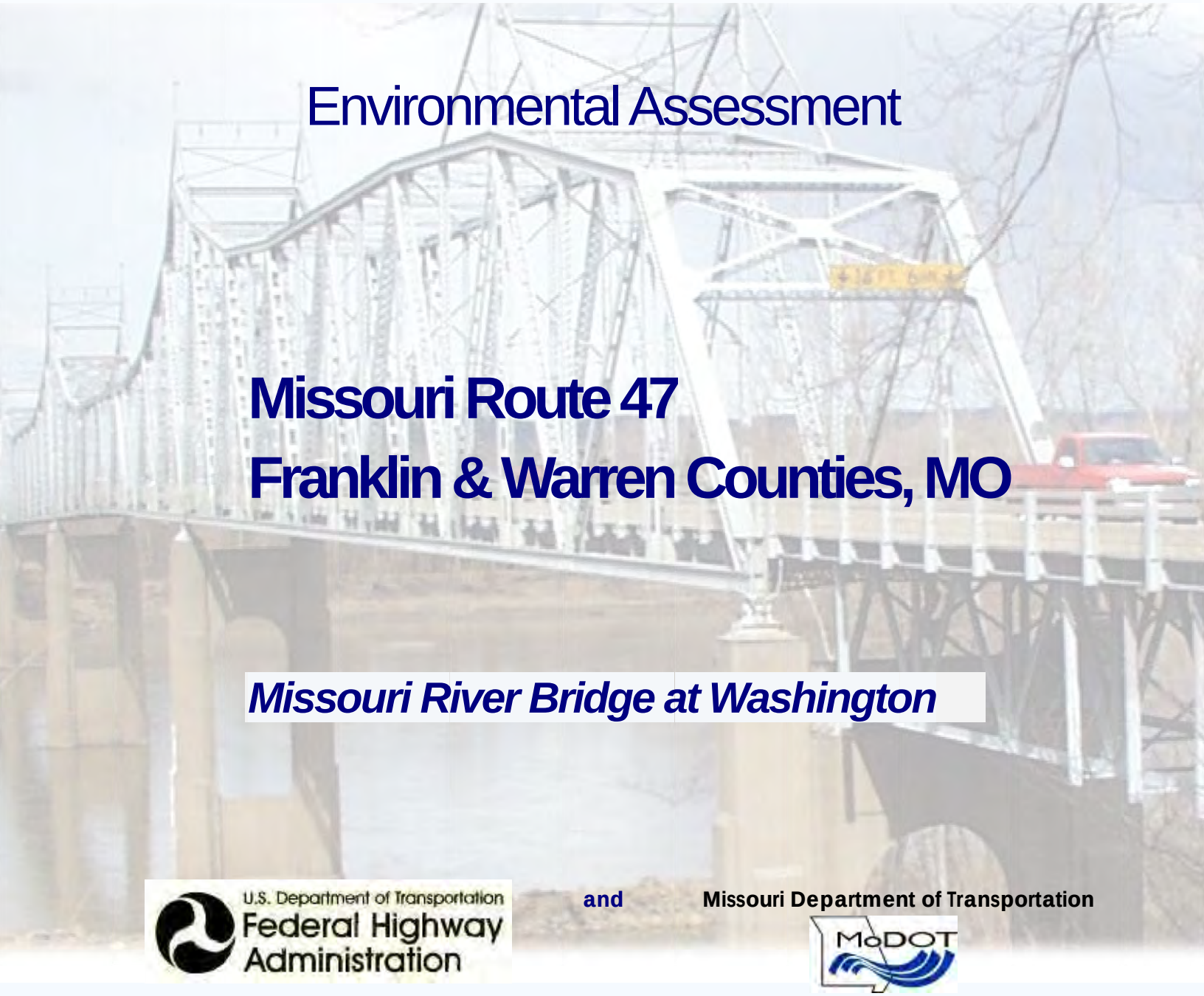


Environmental Assessment

Missouri Route 47
Franklin & Warren Counties, MO

Missouri River Bridge at Washington

U.S. Department of Transportation
Federal Highway Administration

and

Missouri Department of Transportation

MoDOT

November 2010

MISSOURI ROUTE 47, FRANKLIN AND WARREN COUNTIES, MISSOURI

MISSOURI RIVER BRIDGE AT WASHINGTON

JOB NUMBER J3P2155

ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to 42 U.S.C. 4332(2)(c)
and 49 U.S.C. 303 by the

U.S. Department of Transportation
Federal Highway Administration

and

The Missouri Department of Transportation

COOPERATING AGENCIES
U.S. Army Corps of Engineers
U.S. Coast Guard

12/2/10	Peggy J. Casey	Program Development Team Leader
Date of Approval	For FHWA	Title
12/2/10		Director
Date of Approval	For MoDOT	Title

The following persons may be contacted for additional information concerning this document:

Ms. Peggy Casey
Program Development Team Leader
FHWA Division Office
3220 West Edgewood, Suite H
Jefferson City, Missouri 65109
(573) 638-2620

Mr. Kevin Keith
Director
Missouri Dept. of Transportation
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2803

Environmental Assessment/Consultation Form (NEPA)

23 CFR 771.119
Missouri Department of Transportation/Federal Highway Administration

REGION	STATE PROJECT NO.	PROJECT TITLE, ENVIRONMENTAL DOCUMENT TYPE
Missouri Division	J3P2155	Missouri Route 47, Franklin and Warren Counties, Missouri Missouri River Bridge at Washington Environmental Assessment

INCLUDES PROGRAMMATIC SECTION 4(f)

REASON FOR CONSULTATION:

With the Mississippi and Missouri Rivers flowing for more than 1,000 miles through Missouri, the state has 55 major river bridges. The Missouri Department of Transportation (MoDOT) has 25 crossings over the Missouri River alone, many of which are critical links to communities on opposite sides of the river. These bridges are big and costly, both to construct and to maintain, and many are old. Protecting these significant investments through maintenance, rehabilitation, or replacement is crucial for Missouri's economic vitality.

In eastern Missouri, the historic Missouri River Bridge at Washington is nearing the end of its service life. The structure was rehabilitated in 1996 and again in 2009. The 2009 rehabilitation is expected to add only seven to eight years of service life. Because of the bridge's condition and the vital nature of the river crossing to motorists, the 1998 Transportation Equity Act for the 21st Century (TEA-21) authorizing federal surface transportation programs for highways for a six-year period contained an earmark of $3,000,000 to "Construct [a] Highway 47 Missouri River Bridge at Washington." A 2002 study, the Route 47 Major Transportation Investment Analysis (MTIA), looked at ways to improve transportation in an area of Franklin, Warren, and St. Charles Counties. The MTIA identified bridge and floodplain improvement needs, recommending replacement of the historic bridge and construction of a new, elevated two-lane highway for better reliability across the floodplain north of the Missouri River in Warren County.

All highway improvement projects that use federal money must comply with the National Environmental Policy Act of 1969, commonly known as NEPA. NEPA requires that an Environmental Impact Statement (EIS) be prepared for all major federal actions significantly affecting the quality of the human environment. Developing an EIS is an objective process that helps determine what actions, if any, would best serve area transportation needs. The EIS is a key part of the multiple stages required to plan, develop, and construct federally funded major highway projects. MoDOT and FHWA recognized that replacing the bridge was a possible result of the EIS process. Completing the EIS analyses, deciding on a course of action, and preparing to implement that action can take considerable time—eight years or more from the start of the EIS to opening a new major river bridge. Therefore, an EIS was initiated in 2008 so that a solution could be selected, completed, and usable before the existing bridge requires rehabilitation again.

Considerable effort was spent to develop the EIS purpose and need and examine a wide range of early alternatives with opportunities for both resource agency and public input. As analyses progressed and given the prohibitive financial and environmental costs of constructing three miles of roadway through the Missouri River floodplain in Warren County, it was decided to focus solely on the more pressing need of replacing the deteriorating bridge and the purpose and need was revised substantially to reflect this.

A FHWA/U.S. Coast Guard (USCG) guidance memorandum dated January 7, 1985, states "Demolition of

an historic bridge will require the preparation of an EIS unless the bridge is not considered important for preservation. Acceptable documentation to show importance could include . . . (2) The bridge is not identified as important for preservation in a state historic bridge preservation plan approved by the State Historic Preservation Officer (SHPO)." Missouri's Historic Bridge Preservation Plan, which was formulated in consultation with the SHPO, does not identify the Route 47 Bridge at Washington as a bridge important for preservation. With the reduced scope of the proposed project and as impact analyses have progressed, it is apparent that the impacts associated with the alternatives being considered are generally minor. To date no significant controversy has been voiced about the project.

Information for the Public on Transportation Decision Making

Have you ever wondered how decisions are made about transportation projects that affect your life? How government officials decide where to put a bus stop, road, or bridge? How these and other transportation projects are planned? And how to make sure your opinions are heard and considered by the planners, road designers, elected officials, and other citizens? The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) wrote a guide[1] to answer these and other transportation-related questions.

Because of the reduced project scope, lack of controversy, and generally minor impacts, the FHWA and MoDOT decided to rescind the Notice of Intent to prepare an EIS, revise the original project termini to encompass only the proposed bridge replacement, and develop an Environmental Assessment (EA). This EA describes the purpose and need for the project, identifies the alternates being considered, and discusses the expected impacts that would result from the proposed bridge replacement.

MoDOT's 2011–2015 Statewide Transportation Improvement Program has funding only for preparing the environmental document; there is no funding for construction of a new bridge. The majority of the 1998 earmarked money was used on the 2009 bridge rehabilitation, with some of the rest directed toward developing the EIS and the remainder set aside for future design of the project.

[1] http://www.fhwa.dot.gov/planning/decisionmaking/index.htm , electronic version of Publication No. FHWA-HEP-09-034 HEPP/11-01(15M)P

PURPOSE AND NEED FOR ACTION:

Missouri Route 47 loosely surrounds the St. Louis metropolitan area on the northwest, west, and southwest (see Figure 1, next page), beginning in Lincoln County at Route 79 in Winfield and extending to US 67 in Desloge, St. Francois County. It connects Interstate Route 70 in Warren County with Interstate Route 44 to the south in Franklin County.

The majority of traffic approaching the bridge from the north comes from Interstate 70 either at Warrenton (via Route 47) or at Foristell (via Route T, then Routes TT and 94). These traffic streams merge at the Route 94/Route 47 south junction near Dutzow, continuing southward to the bridge. South of the river, Washington is the most significant origin/destination.

The Route 47 bridge at Washington is the only Missouri River crossing between Route 19 at Hermann, 30 miles to the west, and the US Route 40/61 bridge in Chesterfield, 24 miles to the east. If the bridge's condition reaches the point where it can no longer be rehabilitated and is closed, motorists would need to detour 80 miles on state highways.

The bridge underwent a major rehabilitation in 1996, when the bridge deck and railings were totally replaced and the most deteriorated pieces of bridge steel were repaired, replaced, or strengthened. The bridge was also modified to allow taller vehicles to fit through the truss openings, the steel was painted, and new navigation lighting was installed.

By 2008, the bridge had deteriorated again and needed additional work to keep it safely open to traffic. A rehabilitation project in 2009 repaired, modified, or replaced deteriorated structural steel members, bearings, and joints. Concrete surfaces were sealed and critical steel surfaces repainted.

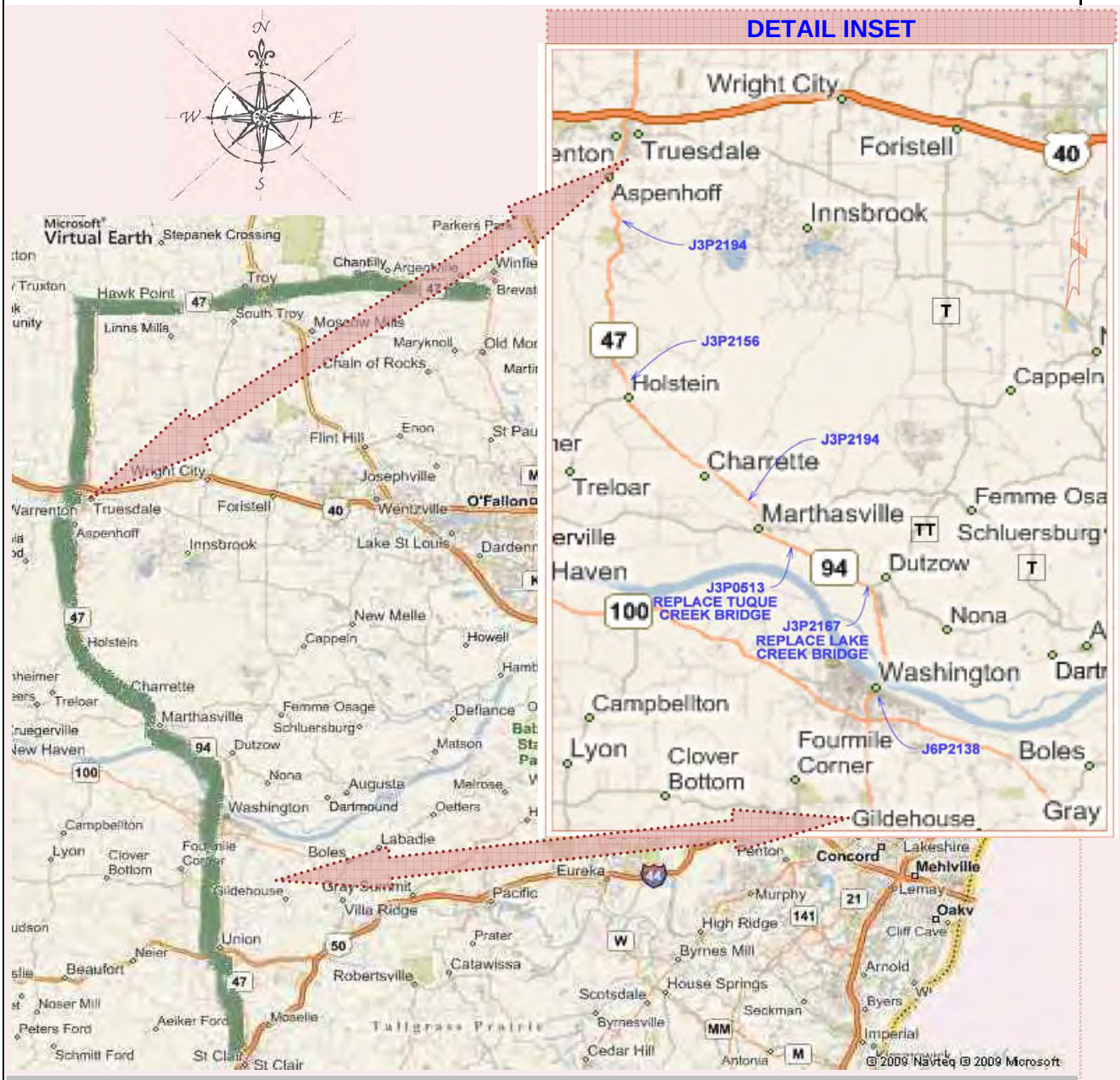


Figure 1. Missouri Route 47

Rehabilitation and repairs can only keep the more than 70-year-old bridge operational over the short term, until a permanent solution can be implemented. The costs for these temporary gains are substantial—approximately $8.1 million and $5.2 million for the 1996 and 2009 rehabilitation projects, respectively.

The Purpose of the Proposed Project

The primary purpose of the project is to replace the historic Route 47 bridge over the Missouri River.

Project Needs

1) The bridge is 76 years old and nearing the end of its useful service life. Its age and condition create an ongoing need for maintenance, resulting in substantial expense to taxpayers and periodic lane closures that greatly inconvenience the traveling public.

2) The Route 47 bridge is deficient (functionally obsolete) and does not meet MoDOT's standards for lane width, shoulders, or vehicular load.

3) The existing bridge lacks safe accommodation for bicyclists and pedestrians.

The remainder of this section will discuss the project needs in more detail.

A ***Deficient Bridge*** is one that is defined as either ***structurally deficient*** or ***functionally obsolete*** based on Federal Highway Administration criteria. A structurally deficient bridge is one in poor condition or with insufficient load capacity compared with modern design standards. A bridge that is functionally obsolete has poor roadway alignment or clearance or width restrictions that no longer meet the usual criteria for the system it serves.

Description of the Existing Bridge and Roadway

Route 47 is classified as a minor arterial in Warren County, with a posted speed limit of 55 miles per hour north of the proposed project. South of the Augusta Bottom Road junction, Route 47 has two 12-foot lanes and 6-foot shoulders until the shoulders end and lanes narrow at the bridge.

The Route 47 bridge (K-969) is located at Missouri River Mile 67.6 (United States Army Corps of Engineers). It was built in 1934 and is eligible for listing on the National Register of Historic Places. The bridge is 2,562 feet long, with two 11-foot lanes and no shoulders. It carries one lane of vehicular traffic in each direction across the Missouri River between Warren County on the north and Franklin County on the south. The historic bridge consists of steel I-beam, deck truss, and cantilevered through-truss span designs (see Figure 2). The through-truss sections' posted vertical clearance is 16 feet 5 inches and the bridge is posted with a 40-ton truck weight limit (30 tons for single-unit trucks). The speed limit on the bridge is 40 miles per hour.

Route 47 Bridge from above, facing north

Aerial view of Route 47 Bridge, looking upstream

Traffic on Route 47 Bridge, looking south

Side view of bridge showing lower chord and road deck

Figure 2. The Historic Route 47 Bridge

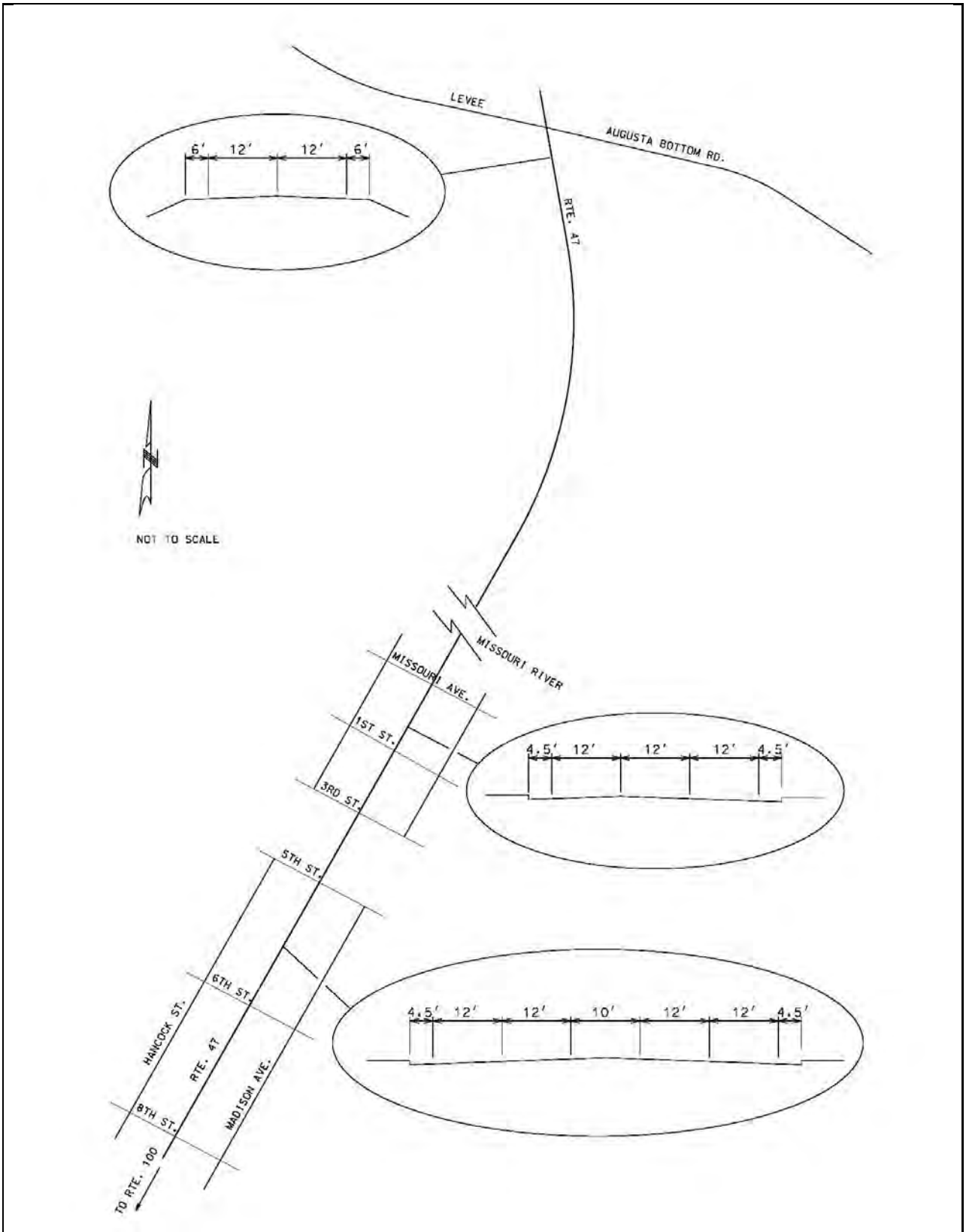


Figure 3. Existing Roadway Description

Route 47 is classified as a principal arterial in Franklin County. Route 47 heads south from the bridge in the city of Washington with two southbound lanes and one northbound lane (Figure 3, previous page), incorporating a second northbound lane at Fifth Street. There are alternating auxiliary left-turn lanes from Third Street through Eighth Street. South of Eighth Street, Route 47 has two lanes in each direction with a center, two-way left-turn lane. There is a 4.5-foot wide marked bicycle lane on each side, with SHARE THE ROAD signs posted to alert motorists that bicyclists frequently use the route. All through lanes are 12 feet wide, with 3-foot shoulders that widen to 10 feet south of Eighth Street. This is a typical urban cross section with barrier curb and gutter and paved shoulder or sidewalk from the bridge southward, except for the short stretch between the bridge and 1st Street where the east side has open drainage (ditch) and no sidewalk. Posted speed limit is 30 miles per hour.

Minor Arterials move both local and through traffic at relatively high travel speeds. They are the second most heavily traveled highways in rural areas.

Principal Arterials in urban settings are regional travel routes used to move large amounts of traffic between neighborhoods and other places. Principal arterials carry through traffic and link local streets with other through routes, including interstates. Commercial areas of cities are often found along these roads.

The Bridge's Current Condition

The bridge is inspected every year and the substructure (piers), superstructure (truss and beams), and deck (riding surface) are each assigned a numerical condition rating. These ratings range from nine (excellent condition) to zero (a failed condition that cannot be corrected and typically requires closing the bridge). Before the 2009 rehabilitation, the bridge was considered structurally deficient based on the condition of its superstructure. The substructure condition was rated satisfactory (six), the deck was considered fair (five), and the superstructure was in serious condition (three), indicating a need for immediate repair or rehabilitation. Typical bridge deficiencies include deteriorated steel and failing paint (Figure 4). Failing paint allows the steel to corrode. Even though corroded steel can be cleaned and repainted, once such deterioration starts, it will continue, though at a slower rate than if the steel is not repainted. Ultimately, the main steel truss members must be replaced.

The 2009 rehabilitation project repaired and repainted the structure and is expected to increase the bridge's service life an additional seven to eight years. The rehabilitation was basically a maintenance project and did not result in any substantial, long-term condition improvements. At the June 2010 inspection following completion of the work, the deck and substructure ratings remained the same—fair (five) and satisfactory (six), respectively—and the superstructure rating increased from serious condition (three) to fair (five). The condition of the superstructure following rehabilitation did improve enough that the bridge is no longer considered structurally deficient, although it remains functionally obsolete.

The existing historic bridge was designed for less vehicular loading (truck weight and axle arrangements) than modern design standards require. The bridge was originally designed to meet national standards (American Association of State Highway and Transportation Officials, AASHTO) based on a 30,000-pound truck with two axles 14 feet apart—6,000 pounds on the front axle and 24,000 pounds on the rear axle. Today's design standards for new bridge construction for both AASHTO at the national level and MoDOT at the state level are based on a 72,000-pound truck with three axles combined with a 640 pound per linear foot uniform lane load. The standard uses a truck weight distribution of 8,000 pounds on the front axle and 32,000 pounds each on the second and third axles. The first and second axles are 14 feet apart and the second and third axles can vary from 14–30 feet apart.

Lane Load refers to a hypothetical line of vehicles (imagine a single-lane traffic jam) on the bridge.

Uniform Lane Load is the weight of those vehicles distributed evenly over the length of the bridge.

A 640 pound per linear foot uniform lane load would result from a uniform load of 64 pounds per square foot applied over a 10-foot width for the entire span length.

Legal weight trucks can cross the bridge at present. However, overweight vehicles must be evaluated during the permit application process and certain overweight vehicles are not permitted to cross. Increased truck volume and heavier legal loads than those for which the bridge was originally designed contribute to a need for more maintenance and ultimately reduce its remaining service life.

Figure 4. Photo Collage of Bridge Condition before 2009 Rehabilitation

The bridge lanes are narrow and there are no shoulders—Missouri's current standards for new bridges longer than 1000 feet call for 12-foot lanes and 10-foot shoulders. Missouri's bridge standards meet or exceed the AASHTO national standards, which recommend 12-foot lanes for bridges with more than 2,000 vehicles per day traffic and allow the use of shoulders narrower than 10 feet on bridges that are more than 200 feet long. The maximum width clearance between trusses on the bridge roadway is only 21 feet 11 inches. Based on the number of lanes and vehicles per day traffic on this bridge, it is rated functionally obsolete for having a clearance width less than 28 feet.

Although the 1996 rehabilitation improved the vertical clearance beneath the overhead trusses on the bridge, the posted vehicle height limit of 16 feet 5 inches may prevent some oversized loads from crossing the bridge. While 16 feet 5 inches vertical clearance meets both MoDOT's recommendations and AASHTO's minimum requirements for existing bridges, AASHTO's minimum requirement for a new through truss bridge is 17 feet 6 inches vertical clearance.

The bridge is the only link for bicycle traffic between the KATY Trail north of the river in Warren County and the city of Washington, but its narrow width and lack of shoulders or bicycle lanes likely discourage many cyclists from using the crossing.

MoDOT monitors the bridge condition regularly and if it worsens, additional repairs, restrictions, or closure may be needed. The bridge's age and condition create an ongoing need for maintenance, resulting in substantial expense to taxpayers and periodic lane closures that greatly inconvenience the traveling public. The 2009 rehabilitation project cost approximately $5.2 million and required about 10 months to complete. Traffic was reduced to one lane on the bridge during much of the construction. Temporary traffic signals operating continuously directed alternate north and southbound traffic on Route 47. The speed limit was reduced to 30 miles per hour and weight limit was reduced to 20 tons during the rehabilitation project. Motorists were encouraged to travel across the bridge during non-peak hours when possible and to carpool or use school buses as well as allowing plenty of time for delays. There was local concern about disruption to businesses from the traffic control measures implemented, but closing certain streets and channeling traffic was the only means of improving the flow of commuters across the bridge.

Safety

Crash statistics and safety data summarized or presented in this EA are protected under federal law. See Appendix A. During the five-year period from April 2003 through July 2008, twenty-nine crashes occurred on the bridge. Sideswipes were the most common crash type, representing twenty-one occurrences. Narrow lanes on the bridge are a possible contributing factor. Rear end crashes were the other common crash type, with six occurrences. Two crashes occurred when pieces of the overhead bridge structure fell to the deck.

Although the bridge's crash rate is significantly lower than similar bridges based on the traffic carried, any number of crashes is undesirable. The Route 47 bridge average crash rate was 176 crashes per 100 million vehicle miles traveled for the five-year period from 2004 through 2008. That compares with average crash rates of 936 for the Route 54 bridge at Louisiana, Missouri; 961 for the Route 159 bridge in Holt County; 498 for the Route 136 bridge in Atchison County; and 1,373 for the Route 60/62 bridge in Mississippi County.

Most of the 29 crashes on the bridge resulted in property damage only, although two of the crashes involved injuries, with one being disabling. However, every crash has the potential for injury and while the crash rate is not excessively high, newer, wider bridges such as those at Lexington and Cape Girardeau have experienced much lower crash rates (56 and 0, respectively) for the time period they have been open to traffic (May 2005 and December 2003, respectively). Wider lanes and shoulders would give vehicles on the Route 47 bridge more maneuvering space for collision avoidance, thus potentially improving safety for the traveling public. A significant reduction in the number of crashes is likely, given the bridge's high traffic volumes.

Access versus Mobility

Highways must generally satisfy two, competing aims: mobility and access. As access to adjoining developed areas increases, a highway's ability to maintain traffic flow decreases and vice versa. ***Access management*** balances access needs with the need for mobility on public roads. Managing the location, spacing, design, and operation of driveways, median openings, and street connections as well as traffic signal spacing can improve safety and mobility for everyone by enabling smoother traffic flow with fewer crashes.

The crash rate on Route 47 from Dutzow to the Missouri River in Warren County averaged 157.4 crashes per 100 million vehicle miles traveled during the five-year period of 2004 through 2008, which is lower than the statewide average crash rate of 260.7 for a Missouri route during the same period. This is not surprising, since the roadway has a relatively flat and straight alignment with few driveways or other access points.

The Route 47 crash rate in Franklin County is substantially higher for the same five-year period. It averaged 1,222 crashes per 100 million vehicle miles traveled—nearly twice the crash rate for the most similar available comparison of a five-lane roadway. Because this high crash rate is related to the close spacing of driveways along the roadway, lowering the crash rate would require substantial changes in access management, which is beyond the scope of the proposed project.

Amount of Traffic Using Route 47

From 2004 through 2008, the Annual Average Daily Traffic (AADT) ranged between approximately 9,500 and 11,750 vehicles per day (vpd) in the area of the bridge as shown in Table 1. This volume is expected to increase to more than 17,000 by 2033. Trucks make up about eight percent of the traffic.

Table 1. Annual Average Daily Traffic (AADT) for Route 47

LOCATION	2004 AADT	2005 AADT	2006 AADT	2007 AADT	2008 AADT
north of the bridge	10,860	11,077	11,299	11,525	11,756
on the bridge	9,505	9,694	9,888	10,086	10,288
south of the bridge	10,445	10,654	10,867	11,084	11,306

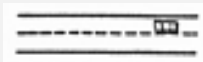
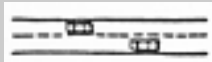
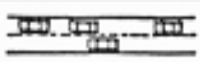
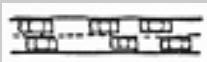
Source: MoDOT District 3, May 2009

Congestion and Capacity (Traffic Operation)

Traffic engineers use a measure called level of service (LOS) to describe roadway congestion. LOS is a relative measure of traffic density and traffic flow ranges along a given section of roadway. It is a way to describe what a driver would encounter while traveling through an intersection, interchange, or open section of roadway during peak-hour traffic. The greater the traffic volume per lane a highway must carry, the worse its LOS will be.

Level of service categorizes the quality of traffic operation on a roadway with a six-level, A to F rating system. LOS A is defined as the best traffic operation, with no congestion; F is defined as the poorest, with extreme congestion. Table 2 illustrates and briefly describes each LOS.

Table 2. Level of Service (LOS) Descriptions

LEVEL OF SERVICE		DESCRIPTION	DELAY (seconds/vehicle).
A		Free flow. Low volumes and no delays.	0.0 to 5.0
B		Stable flow. Speeds restricted by travel conditions. Minor delays.	5.1 to 15.0
C		Stable flow. Speeds and maneuverability closely controlled due to higher volumes.	15.1 to 25.0
D		Stable flow. Speeds affected by change in operating conditions. High-density traffic restricts maneuverability.	25.1 to 40.0
E		Unstable flow. Low speeds, considerable delay, volumes at or near capacity.	40.1 to 60.0
F		Forced flow. Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic.	60.1 to above

Poor LOS can result from conditions such as higher traffic volumes than the number of traffic lanes can accommodate, inadequate intersection or interchange capacity or design, and lack of signals or poorly timed signals. Poor geometrics that cause vehicles to slow below posted speed limits and the presence of disruptive traffic movements such as those caused by intersections or a lack of turning lanes in areas with numerous entrances are other factors that may contribute to poor LOS.

Levels of Service were calculated in accordance with the Transportation Research Board's *1994 Highway Capacity Manual (HCM), Special Report 209,* for arterial analysis. Table 3 shows the existing counted and future projected traffic volumes and LOS. The levels of service shown are for 3–4 p.m. peak-hour traffic, the heaviest of the day and the worst-case periods for drivers. During non-peak times, traffic can be expected to flow more freely, with an improvement of at least one letter in the level of service.

Table 3. Existing and Future Traffic and Levels of Service for Route 47

LOCATION	EXISTING (2007)		CONSTRUCTION YEAR (2013)		DESIGN YEAR (2033)	
	ADT	LOS	ADT	LOS	ADT	LOS
north of bridge	11,756	D	12,980	D	17,130	E
on bridge	10,494	D	12,040	D	15,900	D
City of Washington, Third St. to Eighth St.	12,000 (2008)	C	13,250	C	17,500	C/D*

*Southbound lanes/northbound lanes Source: MoDOT District 3, July 2009

The analysis indicates that the bridge itself will remain at LOS D, while the existing roadway north of the bridge will drop from LOS D to LOS E. This future level of service decline would result from localized congestion along Route 47 caused by drivers entering and exiting the two-lane roadway at access points north of the bridge. Although MoDOT considers E to be an acceptable LOS in the design year (2033) for urban areas, LOS below D is not considered acceptable for the rural sections of the Route 47 study area, such as north of the river in Warren County.

System Continuity

Route 47 south of Marthasville is the primary connection between Washington, Union, and St. Clair as well as to the east-west highways Route 100, Route 50, and Interstate 44. As part of the Route 47 MTIA mentioned previously, MoDOT conducted an origin and destination survey in June 1997 to identify travel trends along Route 47 from Marthasville to St. Clair.

The survey collected trip start points, end points, and reasons for travel. Travel was found to be primarily between the communities of Washington, Union, St. Clair, Sullivan, and Marthasville, with through trips comprising only about two percent of total trips. Travel between Lincoln County and points north and Crawford/Washington Counties and points south represented the most common through trips. The most common trip purpose was work/business-related, with Washington and Union major attractions for work trips. Shopping, social/recreational, and healthcare were the three top-ranking non-work trip types.

St. John's Mercy Hospital, adjacent to Route 47 near the Missouri River Bridge is the largest employer in Washington. The city has a number of industrial employers, including Atapco/Hazel, Clemco Industries (North American operations headquarters), and Sporlan Valve. The Washington and Union school districts are also major area employers, with the two districts serving most of southern Warren County and north-central Franklin County. Washington has numerous restaurants, discount retailers, gas stations, tourist shops, antique stores, and convenience stores.

East Central College just east of downtown Union is a major area employer as is the Franklin County Government Center in Union. This center is the hub for administrative services in Franklin County. Union

also has several medium sized industries as well as an assortment of businesses such as restaurants, discount retailers, gas stations, and convenience stores.

Whether travelers are heading to work or going shopping, children being driven or bussed to school, or patients going to the hospital or doctors' offices, people depend on a river crossing at this location.

Bicycle and Pedestrian Accommodations

Consideration must be given to safely accommodating pedestrians and bicyclists during the development of federally funded highway projects (23 CFR 652.5). There is also significant local interest in a safe crossing over the Missouri River for bicyclists and pedestrians. The KATY Trail State Park passes through the communities of Marthasville and Dutzow north of the Missouri River in Warren County. The city of Washington attracts KATY Trail travelers because of its nearby location as well as its shops, businesses, and riverfront bike path. Both the downtown historical society and the chamber of commerce have encouraged bicyclists to come to the bed and breakfasts and wineries in the downtown district. They have also encouraged Amtrak users to bring bicycles to enhance their visit to the area. However, the existing bridge's narrow width and lack of shoulders or other bicycle accommodations does not encourage bicycle travel between the KATY Trail and Washington.

Washington has several bicycle/pedestrian paths in city parks and a network of bike lanes along city streets and has long been interested in a KATY trail connection but the narrow bridge is an obstacle to this. A study almost 10 years ago found that adding a cantilevered trail to the existing structure would cost about 6 million dollars. It was determined to be cost prohibitive and was not pursued further. However, a Washington bicycle shop owner with interest in a KATY trail connection has been meeting with the City Council Transportation committee every month to discuss improving bicycle accessibility through town and regional trails.

In early 2009, Franklin County and Trailnet began work on a countywide bicycle and pedestrian master plan. Trailnet is a St. Louis based non-profit that encourages programs, planning, and policy to promote walking and bicycling throughout the St. Louis bi-state region. Cities across the county, including the City of Washington, have endorsed the study and are excited at the opportunity to start working with the regional planning organizations to obtain funding for the trail extension. Partially funded by Trailnet, the study, "The Bikeable-Walkable Community Planning Process for Franklin County, Missouri," is focusing on areas around the cities where residential development near job and other activity centers provides opportunities for bicycle and pedestrian facilities. The master plan will identify opportunities to improve safety, connectivity, and accessibility for bicyclists and pedestrians; recommend design treatments for different types of roads in the county; prioritize recommended improvements; and identify potential funding sources to implement the plan.

Conclusion

Overall Route 47 does an acceptable job of carrying traffic between Dutzow in Warren County and Fifth Street in Washington (Franklin County), with some noted weaknesses. Acceptable levels of service are expected for the highway in the study area through the design year 2033, except north of the bridge where localized improvements could be made to maintain acceptable levels of service. Auxiliary lanes for right and left turns could be added at locations that generate sufficient traffic to cause impacts. Adding such turn lanes would remove the turning traffic from the through lanes, allowing freer flowing traffic for those continuing through the area. The vehicles in the left-turn lanes could await openings in the oncoming traffic to safely turn into entrances and side roads without impeding the regular flow of through traffic behind them, while those making right turns could quickly leave the through lanes, slow, and make their turns. These improvements are unrelated to the Route 47 river crossing and would be needed for traffic management regardless of the bridge's condition.

The roadway pavement north of the river is in fair condition at present. A project anticipated within the next five years (MoDOT Job No. J3P2194) would resurface the road, pave the shoulders, and add rumble stripes to improve condition and safety from just south of the Route M/MM intersection at Warrenton to 1.4 mile south of Route CC and from 0.7 mile north of Route N to the Missouri River bridge at Washington. Another project (MoDOT Job No. J3P2156) would construct the same improvements

between the two disconnected sections of the J3P2194 project. As future traffic volumes rise, localized improvements unrelated to the Route 47 river crossing can be made to maintain acceptable levels of service north of the bridge. General locations of these projects and others mentioned in this conclusion are shown in Figure 1 DETAIL INSET.

South of the river the roadway is in good condition and handles the traffic volume well, although access management improvements could reduce the crash rate in Washington. A repaving project from the Missouri River Bridge to south of Route 100 (J6P2138) is scheduled for award in fall of 2010.

The highway currently accommodates bicycle traffic on both sides of the river, with shoulders for use by bicyclists north of the river and bike lanes within the City of Washington. However, the river remains an impediment for bicyclists wanting to travel between the KATY Trail to the north and the city of Washington, with its inviting charm, to the south. The bridge itself does not offer safe bicycle/pedestrian accommodation.

Other improvements proposed for the area support and maintain the current two-lane configuration of Route 47. The Lake Creek bridge just south of the Route 94 south junction experiences occasional temporary closures for repair. MoDOT's 2011–2015 Statewide Transportation Improvement Program (STIP) includes a project to replace the Lake Creek bridge just south of the Route 94 south junction (MoDOT Job No. J3P2167), scheduled for award in 2014. [A project to replace the Route 47 bridge over Tuque Creek (MoDOT Job No. J3P0513, 1.3 mile south of the Route 94 north junction) is to be awarded in 2011.]

Although the Lake Creek bridge will be entirely replaced with a new, wider (32-foot), and virtually maintenance-free structure, the recent rehabilitation of the historic Missouri River bridge merely maintains that bridge in its current configuration. At over 70 years of age, the existing bridge has exceeded its design life and the rehabilitation is expected to last only seven to eight years. The bridge's through-truss design rules out widening the roadway surface without replacing at least the truss superstructure, which is, unfortunately, the bridge's most striking visual feature as well as the bridge component in the worst condition. The bridge is reaching the end of its useful life and as its deterioration accelerates, it will eventually cost more to maintain than to replace.

ALTERNATIVES CONSIDERED:

Initial Range of Alternatives

The alternatives considered initially (shown on page 21) include the No-Build Alternative, two build alternatives that would reuse the substructure of the existing bridge, and eight alternatives that would construct a new bridge. All of the build alternatives would cross over the Union Pacific Railroad line just south of the Missouri River.

Each of the eight new bridge alternatives would provide two 12-foot travel lanes and 10-foot shoulders to allow maneuvering room during emergencies and the removal of disabled vehicles from the travel lanes. (Because the Partial Replacement Alternative would only accommodate 11-foot lanes and 2-foot shoulders, the Partial Replacement Plus Upstream Companion and Partial Replacement Plus Downstream Companion Alternatives would provide two 12-foot travel lanes and 10-foot shoulders in one direction of travel only.) Consistent with other Missouri River bridges in the state, the new bridge alternatives would include a protected lane for bicyclists and pedestrians. A concrete barrier would separate the eight-foot-wide lane from vehicular traffic. The new bridge design would allow future relocation of the bicycle/pedestrian lane if additional traffic capacity is needed. The protective barrier could be removed, allowing the entire, original bridge deck to be used for traffic lanes and shoulders, and a bike/ped lane would be cantilevered off the side of the bridge.

All eight new bridge alternatives would satisfy the project purpose and needs. Each would eliminate the ongoing maintenance needs, expense, and inconvenience to motorists arising from the age and condition of the existing bridge. Each new bridge alternative would construct a bridge that meets MoDOT's standards for lane width, shoulders, and vehicular load. Each would provide safe accommodation for

bicyclists and pedestrians. Six of the eight new bridge alternatives would remove the existing bridge after construction of the new bridge. Two would retain the existing bridge but replace its truss superstructure with steel plate girder spans and a new bridge deck. With the width constraints described earlier, it would then serve as a companion bridge to an adjacent new structure. Characteristics unique to a specific alternative along with benefits and drawbacks of each initial alternative are described next (comparison table on pages 22–23).

No-Build The No-Build Alternative would retain the existing, historic bridge and would make no improvements beyond normal bridge maintenance. Normal maintenance includes washing the bridge twice a year to remove de-icing chemicals, sealing the bridge deck every three to five years, sealing and replacing the expansion joints as needed, and replacing minor portions of the steel and concrete that have deteriorated. This alternative would not include any new major construction.

With the No-Build alternative, when the bridge deteriorates to a point where normal bridge maintenance is no longer sufficient to ensure safe operation, it would either need another major rehabilitation or be subject to weight restrictions and/or closure. However, due to the age and condition of the existing bridge, even routine maintenance and rehabilitations are very costly and can only serve as a short-term solution.

- 👍 Would retain existing, historic bridge
- 👍 No significant environmental impacts
- 👎 Would not correct existing deficiencies or meet MoDOT's standards for lane width, shoulders, or vehicular load—existing bridge's driving surface is only 22 feet, half as wide as MoDOT's typical contemporary two-lane major river bridge
- 👎 Would not meet today's national standards or MoDOT's requiring full-width shoulders on bridges over 1000 feet long (such as this one) so disabled vehicles do not block the flow of traffic, causing traffic backups and affecting the movement of emergency responders to and through the area
- 👎 Would not provide safe accommodation for bicyclists and pedestrians
- 👎 Continued rusting of the steel superstructure over time would decrease the bridge's load-carrying ability more and more rapidly, resulting in the repeated lowering of posted load limits or possible bridge closure

The No-Build alternative fails to meet the project needs or address the deficiencies outlined earlier in "PURPOSE AND NEED FOR ACTION." It will be retained in this EA as a baseline for comparison with the other alternatives evaluated.

Rehabilitation The Rehabilitation Alternative would carry out a rehabilitation similar to the 1996 and 2009 rehabilitation projects to further extend the current bridge's life. This alternative would not alter the existing bridge's width or overhead clearance.

- 👍 Would retain existing, historic bridge
- 👍 No significant environmental impacts
- 👎 Would not correct existing deficiencies or meet MoDOT's standards for lane width, shoulders, or vehicular load—existing bridge's driving surface is only 22 feet, half as wide as MoDOT's typical contemporary two-lane major river bridge
- 👎 Would not meet today's national standards or MoDOT's requiring full-width shoulders on bridges over 1000 feet long (such as this one) so disabled vehicles do not block the flow of traffic, causing traffic backups and affecting the movement of emergency responders to and through

the area

- Would not provide safe accommodation for bicyclists and pedestrians
- Would need multiple rehabilitations to maintain the Route 47 crossing over the long-term
- Rehabilitation cost and likelihood of bridge closure during project would increase as deterioration of major load-carrying elements reaches critical levels, with more frequent and burdensome impacts to the traveling public

The Route 47 Missouri River Bridge deck and railings were completely replaced during the 1996 rehabilitation project. A typical bridge deck has a life expectancy of about 25 to 30 years. The 2009 rehabilitation project included many repairs to the superstructure—deck joints replaced, various steel truss system members repaired or replaced, lower portion of the structure painted—and is expected to last 7 to 8 years. Based on the nature of the bridge's deterioration, MoDOT expects to gain a shorter and shorter extended life expectancy from each additional rehabilitation.

Material fatigue is an important factor in evaluating the remaining life expectancy of a relatively old structure. Some elements of this bridge are approaching the end of their useful life. Although some repairs may be economically realistic, others are too costly to be practical. Given such considerations, the age of the bridge, and its narrow width, another major rehabilitation is not considered economically prudent.

The Rehabilitation alternative fails to meet the project needs or address the deficiencies outlined previously in "PURPOSE AND NEED FOR ACTION." Therefore, it will be eliminated from further consideration in this EA.

Partial Replacement The Partial Replacement Alternative (new superstructure) would remove the truss superstructure from the existing, deficient bridge, replace it with steel plate girder spans, and construct a new bridge deck. This alternative would allow some widening of the roadway but would not provide full shoulders or a separate bike lane. A 26-foot roadway, likely the widest that could be built on the existing piers, would accommodate 11-foot lanes and 2-foot shoulders.

- Would partially correct existing deficiencies by increasing the roadway width enough to provide slightly wider lanes and narrow shoulders and removing the overhead and lateral restraints of existing truss segments
- Reusing some existing infrastructure (the piers and approaches) would minimize environmental impacts to the river and surrounding areas
- Could last 50 years with regular maintenance of the existing piers and new bridge deck
- Would retain only the piers of the existing, historic bridge
- Would not meet today's national standards or MoDOT's requiring full-width shoulders on bridges over 1000 feet long (such as this one) so disabled vehicles do not block the flow of traffic, causing traffic backups and affecting the movement of emergency responders to and through the area
- Would not provide safe accommodation for bicyclists and pedestrians
- Greater depth of plate girder span compared with existing truss girder would require steeper grade on bridge or additional cost to modify substructure for needed navigational clearance
- Would require complete closure of the bridge for up to 12 months, with resultant inconvenience and costs related to planting and harvest seasons as well as impacts to school and employment access and emergency services

The nearest alternative Missouri River crossings are at Hermann, 30 miles west, and the I-64 bridge in Chesterfield, 24 miles east. The shortest possible detour route on state roads would be 62 miles from one side of the bridge to the other. The lengthy detours that would be needed during the construction project have many different types of consequences, as does the timing of construction.

Because the Partial Replacement alternative fails to fully meet the project needs or address the deficiencies outlined in "PURPOSE AND NEED FOR ACTION," it will be eliminated from further consideration as a stand-alone alternative in this EA.

Existing Location The Existing Location Alternative would completely demolish and remove the existing, deficient bridge and build a new two-lane bridge to replace it on the same alignment.

- Would meet project needs and address deficiencies outlined in "PURPOSE AND NEED FOR ACTION"
- Would require minimal new right of way and no displacements
- Would minimize environmental impacts to land and river, compared with all other new bridge alternatives considered
- Would remove existing, historic bridge
- No direct connection between the city of Washington and Route 47 north of the Missouri River during the anticipated three-year construction period (closest river crossings are at Hermann to the west and at Chesterfield to the east)

The Existing Location Alternative would provide a Missouri River crossing that is not deficient; meets MoDOT's standards for lane width, shoulders, and vehicular load; and safely accommodates bicyclists and pedestrians. However, the resultant three-year shut-down and its accompanying adverse socioeconomic impacts on the region, including the city of Washington and towns such as Marthasville, Dutzow, and Augusta along Routes 47 and 94 north of the river, far outweigh the benefits of the existing location. Therefore, the Existing Location Replacement will be eliminated from further consideration.

Overlap Existing The Overlap Existing Alternative would replace the existing, deficient bridge with a new two-lane bridge using staged construction to locate the new bridge as close to the existing bridge location as possible without disrupting Route 47 traffic during construction. Construction would be started on a new bridge immediately upstream from the existing bridge. Once enough of the new structure was built to carry traffic, the traffic would be routed onto the partially completed new bridge, the old bridge would be removed, and construction of the new bridge would be completed.

- Would meet project needs and addresses deficiencies outlined in "PURPOSE AND NEED FOR ACTION""
- Would minimize both the footprint of the new structure and the change in horizontal alignment, without requiring a temporary closure to traffic
- Would disrupt Route 47 traffic only minimally during construction, to establish connection with the new bridge
- Would remove existing, historic bridge
- More expensive and time-consuming, would possibly add a year to construction schedule

With staged construction, the new bridge piers could not be in line with the existing bridge piers but would need to be offset away from the navigation channel, making the span over the channel too long for conventional plate girder construction alternative. Therefore, although the Overlap Existing alternative would meet the project needs and address the deficiencies outlined in PURPOSE AND NEED FOR ACTION," it is not feasible from a technical standpoint and will be eliminated from further consideration.

Far Upstream and Far Downstream The Far Upstream Alternative would replace the existing, deficient Missouri River bridge with a new two-lane bridge about 10 miles west of the existing crossing, north of Route 185.

The Far Downstream Alternative would replace the existing, deficient Missouri River bridge with a new two-lane bridge about two miles to the east, from St. Charles County into a developing area of the city of Washington.

Either of these alternatives

- 👍 Would meet project needs and address deficiencies outlined in "PURPOSE AND NEED FOR ACTION"
- 👍 Would avoid impacts to developed areas
- 👎 Would remove existing, historic bridge
- 👎 Would have substantial negative impacts on existing travel patterns and users
- 👎 Significant new roadway construction across the floodplain would have great environmental impact and lack of support from regulatory agencies

Traffic patterns show the majority of southbound traffic on the existing bridge travels either on Route 47 from Warrenton or via Routes T/TT/94 from the Foristell area. Locating a new bridge away from Route 47 would subject these current users to substantial adverse travel, especially with the Far Upstream location, which is a greater distance from the existing bridge.

With the only Level III Trauma Center between St. Louis and Jefferson City just a few blocks from the existing bridge and the fire districts' only ladder truck in the area housed in Washington, a substantial relocation of the bridge would greatly increase emergency response times to crisis situations in Warren and St. Charles counties.

The existing bridge also provides direct access to the Washington Regional Airport and a relocation of the bridge away from Washington would negatively impact the movement of people and goods to industries in Washington.

Records indicate the area around Far Upstream alternative contains possible archaeological resources, including historic grave sites, prehistoric sites, and shipwreck sites. The Far Downstream alternative has potential for both historic and prehistoric archaeological sites, with a good to moderate possibility of encountering human remains. Both alternatives would require extensive deep testing for archaeological sites in the floodplain.

Although the Far Upstream and Far Downstream alternatives fully meet the project needs and address the deficiencies outlined in "PURPOSE AND NEED FOR ACTION," these more distant replacement bridge locations place too great a burden on traffic whose origin or destination is Washington or areas to the south of Washington. They will be eliminated from further consideration based on the environmental obstacles they present and their adverse impact on existing travel patterns.

Adjacent Upstream The Adjacent Upstream Alternative would replace the existing, deficient bridge with a new two-lane bridge approximately 50 feet upstream from the current location.

- 👍 Would meet project needs and address deficiencies outlined in "PURPOSE AND NEED FOR ACTION"
- 👍 Would need less new right of way than the Far Upstream and Far Downstream alternatives

- Would maintain uninterrupted traffic on Route 47 during construction
- United States Coast Guard location preference for new bridge based on river's geometry and needs of river traffic
- Would remove existing, historic bridge

The Adjacent Upstream new bridge would be roughly the same length as the existing bridge, with the downstream levee controlling placement of the northern abutment. North of the river, the Adjacent Upstream alternative would return to the existing alignment near the Charette Creek levee and Augusta Bottom Road. On the south, it would return to the existing Route 47 alignment between Missouri Avenue and First Street. Staging construction of the southern approach spans and the tie-in to the north would allow Route 47 traffic to remain uninterrupted during construction. The first stage of construction would build just enough of the new bridge (the southbound shoulder and driving lane and part of the northbound lane) to safely carry both northbound and southbound traffic before removing the south end of the old bridge. Once the old bridge is out of the way, the rest of the new bridge (remainder of the northbound lane and shoulder and the bike lane) would be built and traffic would be shifted to the proper lane locations.

This alternative would meet the project needs and address the deficiencies outlined in "PURPOSE AND NEED FOR ACTION." It would provide a Missouri River crossing that is not deficient; meets MoDOT's standards for lane width, shoulders, and vehicle load; and safely accommodates bicyclists and pedestrians. Therefore, the Adjacent Upstream alternative will be retained for detailed analysis in this EA.

Adjacent Downstream The Adjacent Downstream Alternative would replace the existing, deficient bridge with a new two-lane bridge approximately 50 feet downstream from the current crossing.

- Would meet project needs and address deficiencies outlined in "PURPOSE AND NEED FOR ACTION"
- Would need less new right of way than Far Upstream, Far Downstream, and Adjacent Upstream alternatives
- Would maintain uninterrupted traffic on Route 47 during construction
- Not United States Coast Guard location preference for new bridge based on river's geometry and needs of river traffic
- Would remove existing, historic bridge

The Adjacent Downstream new bridge would be roughly the same length as the existing bridge, with the downstream levee controlling placement of the northern abutment. On the north end, this alternative would return to the existing alignment near the Charette Creek levee and Augusta Bottom Road. Reconnecting with the existing alignment would require either constructing a sharper curve or starting the curve on the bridge, which would increase the bridge's cost. South of the river, the Adjacent Downstream alternative would return to the existing Route 47 alignment between Missouri Avenue and First Street. Staged construction of the southern approach spans and the tie-in to the north would prevent interruption of Route 47 traffic during construction. The first stage of construction would build just enough of the new bridge (the bike lane and barrier, the northbound shoulder and driving lane, and part of the southbound lane) to safely carry both northbound and southbound traffic before removing the south end of the old bridge. Once the old bridge is out of the way, the rest of the new bridge (remainder of the southbound lane and shoulder) would be built and traffic would be shifted to the proper lane locations.

This alternative would meet the project needs and address the deficiencies outlined in "PURPOSE AND NEED FOR ACTION." It would provide a Missouri River crossing that is not deficient; meets MoDOT's standards for lane width, shoulders, and vehicle load; and safely accommodates bicyclists and

pedestrians. The Adjacent Downstream new bridge alternative will, therefore, be retained for detailed analysis in this EA.

Partial Replacement Plus Upstream Companion and Partial Replacement Plus Downstream Companion The Partial Replacement Plus Upstream Companion Alternative combines the partial replacement alternative with construction of a new companion structure immediately upstream. The Partial Replacement Plus Upstream Companion alternative would provide a new 26-foot roadway with two 11-foot northbound lanes and 2-foot shoulders on the existing piers. The new companion structure would carry two 12-foot southbound lanes and 10-foot shoulders, plus a separate bike lane.

The Partial Replacement Plus Downstream Companion Alternative combines the partial replacement alternative with construction of a new companion structure immediately downstream. The Partial Replacement Plus Downstream alternative would provide a new 26-foot roadway with two 11-foot southbound lanes and 2-foot shoulders on the existing piers. The new companion structure would carry two 12-foot northbound lanes and 10-foot shoulders, plus a separate bike lane.

Either of these alternatives

- 👍 Would meet project needs and address deficiencies outlined in Chapter 1: Purpose and Need
- 👍 Would need less new right of way than the Far Upstream and Far Downstream alternatives
- 👍 Would avoid traffic interruptions on Route 47 by maintaining traffic on existing bridge during new bridge's construction, then transferring traffic to completed new bridge before closing and reconstructing existing bridge
- 👍 Partial Replacement structure could last 50 years with regular maintenance of the existing piers and new bridge deck
- 👍 Would provide four lanes of capacity for possible future traffic demands, although Partial Replacement structure would have a narrower travel way than new companion bridge
- 👎 Would retain only the piers of the existing, historic bridge
- 👎 U.S. Coast Guard has concerns about increasing the number of navigational hazards in the river—additional piers for a New Companion bridge would add obstacles to river traffic

Compared with the existing crossing, the partial replacement bridge (northbound lanes for New Upstream Companion structure, southbound for New Downstream Companion) would have slightly increased roadway width and the overhead and lateral restraints of existing truss segments would be removed. The new companion bridge southbound lanes for New Upstream Companion structure, northbound for New Downstream Companion) would have standard-width lanes and shoulders and a separate bike lane.

The new companion bridge would have a life expectancy of many decades, perhaps a hundred years, thanks to modern designs and materials. The partial replacement of the existing bridge option would not be expected to last as long but when it reached the end of its life, all traffic could be moved to the newer structure and the old bridge demolished or the old bridge could be removed and a new companion structure provided. Maintenance needs on the partial replacement and the new companion bridges would be similar, mainly washing off the road salts every year to prevent absorption into the concrete and corrosion of the steel.

The major disadvantage of the two Partial Replacement Plus New Companion alternatives is their great cost, which is primarily from adding capacity beyond the current need. Because of their high cost and lack of advantages over the Adjacent Upstream and Adjacent Downstream alternatives, these alternatives will be eliminated from further consideration.

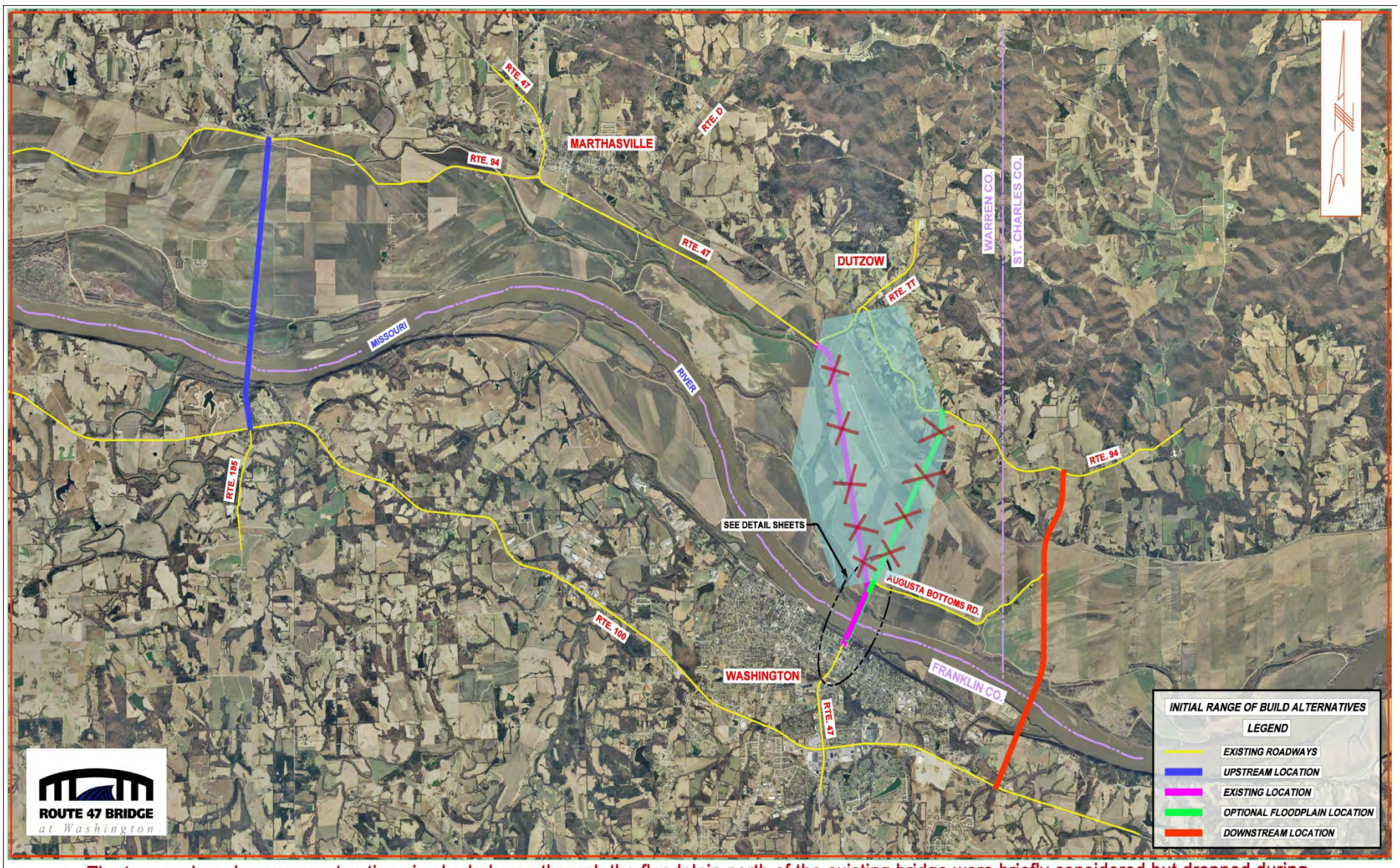
Alternatives Retained in this EA

The Adjacent Upstream and Adjacent Downstream Alternatives (shown in detail on page 24) will be retained and evaluated in detail in this EA along with the No-Build Alternative, which offers a baseline for evaluating the proposed build alternatives. The two adjacent alternatives are being retained because the public overwhelmingly favors a bridge that quickly ties back into the existing roadway and these alternatives would have fewer environmental and socioeconomic impacts than a bridge located farther upstream or downstream. A new bridge can be designed to meet state and national standards and will last longer than alternatives that involve partial replacement or rehabilitation. The two retained build alternatives would cost less and take less time to build than the Overlap Existing Alternative. Finally, unlike the Existing Location Alternative, the adjacent build alternatives would maintain a direct connection between the city of Washington and Route 47 north of the river during construction.

Both adjacent new bridge alternatives would accommodate bridge location, length, span arrangements, and embankment heights needed to meet current regulations as well as hydraulic and geometric design restrictions provided by the U.S. Coast Guard and the Missouri State Emergency Management Agency.

For either of the retained build alternatives, MoDOT will ensure that when the bridge is completed separate improvements to Route 47 between Dutzow and the Missouri River are in place to enhance safety for bicyclists between the KATY trail and the new bridge. The portion of MoDOT Job No J3P2194 (described in the conclusion of "PURPOSE AND NEED FOR ACTION") between Dutzow and the Missouri River will be accelerated so that the shoulders on each side of Route 47 are paved and marked for bicyclists and crossings for bike traffic are provided. MoDOT will also re-stripe the new Lake Creek bridge (MoDOT Job No. J3P2167, discussed in the conclusion of "PURPOSE AND NEED FOR ACTION" and scheduled for replacement in 2014) to designate a bicycle lane on each side continuous with the roadway shoulders. No separate pedestrian accommodations will be provided north of the Missouri River based on a lack of need and safety concerns.

This page intentionally blank



The two roadway improvement options in shaded area through the floodplain north of the existing bridge were briefly considered but dropped during development of the project's purpose and need. See Chapter 1: Purpose and Need.

INITIAL RANGE OF ALTERNATIVES DETAIL SHEETS

INITIAL RANGE OF ALTERNATIVES COMPARISON (table **continues on next page)**

Screening Factor	NO BUILD	RETAIN EXISTING BRIDGE				CONSTRUCT NEW BRIDGE					
	No Build	**Rehabilitation**	**Partial Replacement**	**Partial Replacement Plus New Upstream Companion Structure**	**Partial Replacement Plus New Downstream Companion Structure**	**New Bridge Existing Location**	**New Bridge Partially Overlapping Existing Location**	**New Bridge Upstream at Route 185**	**New Bridge Downstream 2 miles east**	**New Bridge Adjacent Upstream**	**New Bridge Adjacent Downstream**
Estimated Project Costs											
Construction costs (*rounded to nearest $1 million*)	$0*	$5 million	$22 million	$67 million	$67 million	$45 million	$49 million	$46 million	$68 million	$45 million	$45 million
Right-of-way costs (*rounded to nearest $100 thousand*)	$0	$0	$0	$600 thousand	$700 thousand	$0	$0	$500 thousand	$500 thousand	$600 thousand	$700 thousand
Total cost (*rounded to nearest $1 million*)	$0*	$5 million	$22 million	$68 million	$68 million	$45 million	$49 million	$47 million	$69 million	$46 million	$46 million
Public Input											
Public input (*supports, somewhat supports, doesn't support*)	doesn't support	doesn't support	somewhat supports	supports	supports	somewhat supports	supports	doesn't support	doesn't support	supports	supports
Engineering Considerations											
Roadway length (*miles*)	0	0	0	0.3 mile	0.3 mile	0.3 mile	0.3 mile	2.6 miles	2.8 miles	0.3 mile	0.3 mile
Right of Way (ROW) Considerations											
New ROW anticipated (*acres*)	none	none	none	3.3 acres	4.3 acres	none	3.3 acres	33.5 acres	41.1 acres	6.4 acres	4.3 acres
Existing ROW use (*acres*)	5.8 acres	5.8 acres	5.8 acres	5.8 acres	5.4 acres	5.8 acres	5.8 acres	0 acres	0 acres	5.8 acres	5.4 acres
Number/type potential displacements	none	none	none	1 residential	2 residential	none	1 residential	none	none	1 residential	2 residential
Potential Environmental Considerations											
Floodplain (*acres/lineal feet crossed*)	none	none	none	4.7 acres/ 2400 feet	3.4 acres/ 2400 feet	3.3 acres/ 2400 feet	3.3 acres/ 2400 feet	28.9 acres/ 12,122 feet	26.1 acres/ 10,124 feet	4.7 acres/ 2400 feet	3.4 acres/ 2400 feet
Farmland (*acres*)	none	none	none	4.7 acres	3.4 acres	3.3 acres	3.3 acres	29.2 acres	36.8 acres	4.7 acres	3.4 acres
Threatened/endangered species											
Pallid sturgeon (if "maybe," degree of impact depends on extent of in-stream disturbance)	none	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe
Forested habitat	none	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe
Migratory Bird Treaty Act ("for demo only"—potential for impact only during demolition of existing bridge)	maybe	maybe	maybe	maybe	maybe	for demo only	for demo only	for demo only	for demo only	for demo only	for demo only
Hazardous waste location	no	no	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe	maybe
Wetlands	no	maybe	maybe	yes	yes	yes	yes	yes	yes	yes	yes
Streams	no	maybe	maybe	yes	yes	yes	yes	yes	yes	yes	yes
Public parklands—temporary closures of Rotary Riverfront Trail/Washington Bikeway; Section 4(f) inapplicability determination required	no	no	no	yes	yes	yes	yes	no	no	yes	yes
Potential Socioeconomic/Community Considerations											
Travel time/distance (*similar to today, slightly improved, some benefit,*† *or improved access*)	similar to today	similar to today	slightly improved	improved access	improved access	improved access	improved access	some benefit†§	some benefit†§	improved access	improved access
Emergency services (*similar to today, slightly improved, some benefit,*† *or improved access*)	similar to today	similar to today	slightly improved	improved access	improved access	improved access	improved access	some benefit†§	some benefit†§	improved access	improved access
School district (*similar to today, slightly improved, some benefit,*† *or improved access*)	similar to today	similar to today	slightly improved	improved access	improved access	improved access	improved access	some benefit†§	some benefit†§	improved access	improved access

Screening Factor	NO BUILD	RETAIN EXISTING BRIDGE				CONSTRUCT NEW BRIDGE					
	No Build	Rehabilitation	Partial Replacement	Partial Replacement Plus New Upstream Companion Structure	Partial Replacement Plus New Downstream Companion Structure	New Bridge Existing Location	New Bridge Partially Overlapping Existing Location	New Bridge Upstream at Route 185	New Bridge Downstream 2 miles east	New Bridge Adjacent Upstream	New Bridge Adjacent Downstream
Airport (*similar to today, slightly improved, some benefit,*† *or improved access*)	similar to today	similar to today	slightly improved	improved access	improved access	improved access	improved access	some benefit†	some benefit†	improved access	improved access
Businesses/Employers (*similar to today, slightly improved, some benefit,*† *or improved access*)	similar to today	similar to today	slightly improved	improved access	improved access	improved access	improved access	some benefit†§	some benefit†§	improved access	improved access
Bicycle tourism access between KATY Trail and historic downtown Washington (*similar to today, some benefit,*† *or improved access*)	similar to today	similar to today	similar to today	improved access	improved access	improved access	improved access	some benefit†	some benefit†	improved access	improved access
Overall disruption to Washington community (*slight, moderate, or great*)	slight	moderate during construction	great during construction	slight	slight	great during construction	slight to moderate during construction	moderate to great long term	moderate to great long term	slight	slight
Potential Cultural Resource Considerations											
Archaeological sites	no	no	no	no	no	no	no	yes	yes	no	no
National Register of Historic Places (NRHP) eligible/Section 4(f) bridge	no adverse effect	effect depends on scope of rehabilitation	adverse effect	adverse effect	adverse effect	adverse effect	adverse effect	effect depends on disposition of historic bridge	effect depends on disposition of historic bridge	adverse effect	adverse effect
NRHP listed or eligible/Section 4(f) resources other than bridge	none	none	none	none	none	none	none	none	none	none	none
Cemeteries	none	none	none	none	none	none	none	1	none	none	none

*No Build would eventually deteriorate to a point where the existing bridge would require major rehabilitation to remain in service, at which time cost would be similar to Rehabilitation—approximately $5 million.

†"Some benefit" based on Washington as a destination. For example, new crossing at Route 185 may benefit those going to New Haven, etc.

§Degree of benefit depends on origin and destination.


ROUTE 47 BRIDGE
at Washington
MISSOURI RIVER
FLOW
ADJACENT UPSTREAM LOCATION
LEGEND
POTENTIAL AREA OF IMPACT
EXISTING ROW
STUDY CORRIDOR LIMITS


ROUTE 47 BRIDGE
at Washington
MISSOURI RIVER
FLOW
ADJACENT DOWNSTREAM LOCATION
LEGEND
POTENTIAL AREA OF IMPACT
EXISTING ROW
STUDY CORRIDOR LIMITS

PREFERRED ALTERNATIVE:

MoDOT has designated the adjacent upstream alternative as the Preferred Alternative to solve the transportation problems associated with the Route 47 Bridge. The preferred alternative would replace the existing, deficient bridge with a new two-lane bridge approximately 50 feet upstream from the current location. This alternative would include slight roadway realignment beyond the bridge limits to tie into existing Route 47. The preferred alternative would result in removal of the existing historic bridge after construction of the new structure.

The preferred alternative was identified through public and agency involvement along with assessment of socioeconomic and environmental consequences. Selection of an alternative will not be finalized until substantive comments from resource agencies and from the public hearing are fully evaluated and addressed.

HOW THE PROPOSED PROJECT WILL AFFECT THE FOLLOWING:

1) LAND USE

Current land use within the study corridor north of the river is agricultural, with mixed use south of the river in Washington. The area of the adjacent upstream alternative in Washington is presently zoned R-1B, subject to single-family residential use. The area of the adjacent downstream alternative is zoned C-1 for limited commercial uses such as offices and retail facilities.

The no-build alternative would have no impact on existing land uses or on land-use policies and decisions within the study area. The two build alternatives, located to either side of the existing bridge, would have similar impacts to land use. Both would have limited impacts to agricultural land at the northern end of the bridge and to existing residential use at the southern end. The difference between them is very minor, with little to recommend one over the other.

Neither build alternative—the preferred, adjacent upstream and the adjacent downstream—nor the no-build alternative is expected to result in zoning changes. Although some changes to current land use would occur with the proposed project, no long-term effects are anticipated. With either build alternative, future land-use decisions would most likely be the same. No adverse impacts to land use are anticipated.

2) PRIME AND UNIQUE FARMLAND

There is a long history of farming in the project vicinity, with Franklin and Warren Counties together producing approximately $81 million in agricultural revenue. The average farm size in Warren County is 203 acres; in Franklin County it is 150 acres. Row crops within the project limits are a source of agricultural income to area farmers.

Recognizing the importance of protecting farmland from conversion to non-agricultural uses, Congress passed the Farmland Protection Policy Act (FPPA) in 1981. Before a federal project or federally funded program can use farmland, the farmland that would be affected must be assessed in a collaborative process with the Natural Resources Conservation Service (NRCS). NRCS classifies farmland as prime, unique, or of statewide or local importance based on soil type. If the project would convert any prime, unique, statewide, or locally important farmland to non-agricultural uses in excess of parameters developed by NRCS, then the federal agency must take measures to minimize farmland impact.

Prime farmland has the best combination of physical and chemical characteristics to produce normal crops with less human labor and less assistance from pesticides and fertilizer than farmland of statewide or local importance. Unique farmland is used for the production of specific high-value food items such as nuts and certain fruit or vegetables; it usually has the special combination of soil characteristics, moisture,

and location needed to produce high quality and high yields. Statewide or locally important farmland is designated by state or local agencies for the production of crops in a specific area but is not of national significance. The Route 47 study area has both prime and unique farmland.

The Warren County portions of the adjacent upstream and adjacent downstream alternatives were evaluated, using the Farmland Conversion Impact Rating Form SCS-CPA-106 (See Appendix A). The preferred, adjacent upstream alternative would need approximately 4.7 acres of new right of way in Warren County; the adjacent downstream alternative would require about 3.4 acres. The total conversion impact ratings for the upstream and downstream alternatives were 56 points and 109 points respectively, well below the 160-point threshold NRCS established for consideration of farmland protection. Any small variation of the alternatives that might occur during detailed design is unlikely to differ significantly from this evaluation.

The project area is not protected from conversion by any state, local government, or private nonprofit policy or program. Any project impacts to on-farm investments, such as water diversion systems or terracing, will be minimized as design is further refined. After project completion, any farms with uneconomic remnants (parcels of land that can no longer be farmed) will be compensated at prevailing market rates. All farm support services are available to the area and will not be negatively impacted by the project. The project will be fully compatible with existing agriculture.

Past correspondence with the NRCS indicates that they do not regard temporary easements as conversions of farmland. Therefore, any temporary easements such as might be required for the contractor's staging area with either build alternative will not be further evaluated for farmland impact. All new right of way or permanent easement that would be needed In Franklin County is within the City of Washington and meets the FPPA's definition of "land committed to other uses." Thus it does not need to be evaluated for farmland conversion.

3) COMMUNITY IMPACTS

Washington, the largest community between St. Louis and Jefferson City, is a thriving city that has a growing population and expanding business opportunities. It is the regional center for shopping and medical services. Washington also has numerous churches, growing industry, and both public and parochial schools. The existing Route 47 bridge brings people directly into the heart of Washington, with easy access to the historic and tourist-attractive area of the city. The city of Washington has six historic districts and over thirty buildings that are listed on the National Register of Historic Places. Many of the buildings retain the feeling of a nineteenth-century Missouri river town and many have been adapted to modern uses such as restaurants, antique stores, businesses, galleries, offices, and residences. Additional historic buildings are available for rehabilitation and can be used to promote Washington's vitality.

Population of Washington, MO
1990—10,704
2000—13,243
2008—14,392
(U.S. Census Bureau)

With Washington's location near the center of Missouri's growing wine industry, capitalizing on "wine tourism" offers great potential for the city to attract visitors and patrons for local businesses. Resources such as the corn cob pipe factory building have potential to be developed into tourist destinations. Replacing the deteriorating bridge with an adjacent modern bridge and the publicity generated by its completion can only help local businesses and industry.

The racial makeup of the 63090 Zip Code area (Washington) at the 2000 census was 98.1% White, 0.6% Black or African American, 0.1% Native American or Alaska Native, 0.4% Asian, less than 0.1% Pacific Islander, 0.2% from other races, and 0.5% from two or more races. The population of Hispanic or Latino of any race was 0.6%. The median income for a household in the Washington area was $48,394 and the median income for a family was $56,819. About 2.4% of families and 4.2% of the population were below the poverty line. There are no residents within the project corridor in Warren County.

Since both proposed new bridge alternatives are adjacent to the existing bridge, no changes are anticipated to neighborhoods or community cohesion, travel patterns and accessibility, community

facilities, or to any special groups such as elderly, disabled, minority, and transit-dependent persons. There would be few social impacts. Because of sub-optimal traffic flow and increased engine-idling time, the no-build alternative has potential to diminish air quality and increase airborne particulates during periods of bridge maintenance, peak traffic flows, vehicle breakdowns with the absence of shoulders, and temporary lane closures for passage of over-sized vehicles.

The socioeconomic impact assessment is based on data primarily obtained from the most recent U.S. Census of Population and Housing. Supplemental data was obtained from the City of Washington, East West Gateway Council of Govenments, Franklin and Warren Counties, local and regional land use plans, development plans, and discussion with local officials.

Economic Growth And Development

Neither of the build alternatives would have any permanent, adverse impact on economic growth and development nor would either alternative negatively impact the region's competitive position. A new bridge would increase travel efficiency and reliability, thus improving the community's position for economic growth and development. The no-build alternative may have negative economic consequences. Avoidance of the narrow and obsolete bridge at Washington in favor of newer and perceptually safer bridges may cause potential visitors to bypass Washington altogether, thus reducing the number of outside dollars spent within the community.

Neither build alternative is anticipated to cause negative impacts on economic development trends and viability, employment opportunities, highway-dependent businesses, existing and planned business development; or tax revenues.

Pedestrian and Bicycle Traffic

Section 652.5 Policy of 23 CFR 652--PEDESTRIAN AND BICYCLE ACCOMMODATIONS AND PROJECTS directs that the safe accommodation of pedestrians and bicyclists be given full consideration during the development and construction of federal-aid highway projects. Both build alternatives, adjacent upstream and adjacent downstream, would provide a protected lane for bicyclists and pedestrians. In addition, MoDOT will ensure that, when the new bridge is completed, separate improvements to Route 47 between Dutzow and the Missouri River are in place to enhance safety for bicyclists between the KATY trail and the new bridge. This will be accomplished by accelerating the portion of MoDOT Job No J3P2194 (described in the conclusion of "PURPOSE AND NEED FOR ACTION") between Dutzow and the Missouri River so that the shoulders on each side of Route 47 are paved and marked for bicyclists and crossings for bike traffic are provided. MoDOT will also re-stripe the new Lake Creek bridge (MoDOT Job No. J3P2167, scheduled for replacement in 2014 and described in the conclusion of "PURPOSE AND NEED FOR ACTION") to designate a bicycle lane on each side continuous with the roadway shoulders. No separate pedestrian accommodations will be provided north of the Missouri River based on a lack of need and safety concerns.

The proposed construction of a new bridge with barrier-separated accommodation for bicyclists and pedestrians along with separate improvements to Route 47 to enhance safety for bicyclists between the KATY trail and the new bridge would increase revenue for existing businesses and may lead to the creation of new companies catering to the needs of the bicycling public. The ability for Washington to draw visitors from the Katy Trail located approximately three miles north of the city would be an additional benefit of a new Route 47 bridge. There is some bicycle traffic on Route 47 from the Marthasville, Dutzow, and Augusta trailheads to Washington presently but the lack of safe bicycle accommodation on the existing bridge undoubtedly discourages many potential bicycle tourists from visiting Washington.

The new bridge's protected bicycle/pedestrian lane would also link to Washington's trail system and afford opportunities to visit the city's parks. The city and Trailnet began working together in early 2009 to create a master plan for a bicycle and pedestrian network. A community meeting to discuss the Bikeable Walkable Community Plan was held on September 10, 2009, and future meetings are planned. The Washington Bikeway Map is shown in Figure 5.

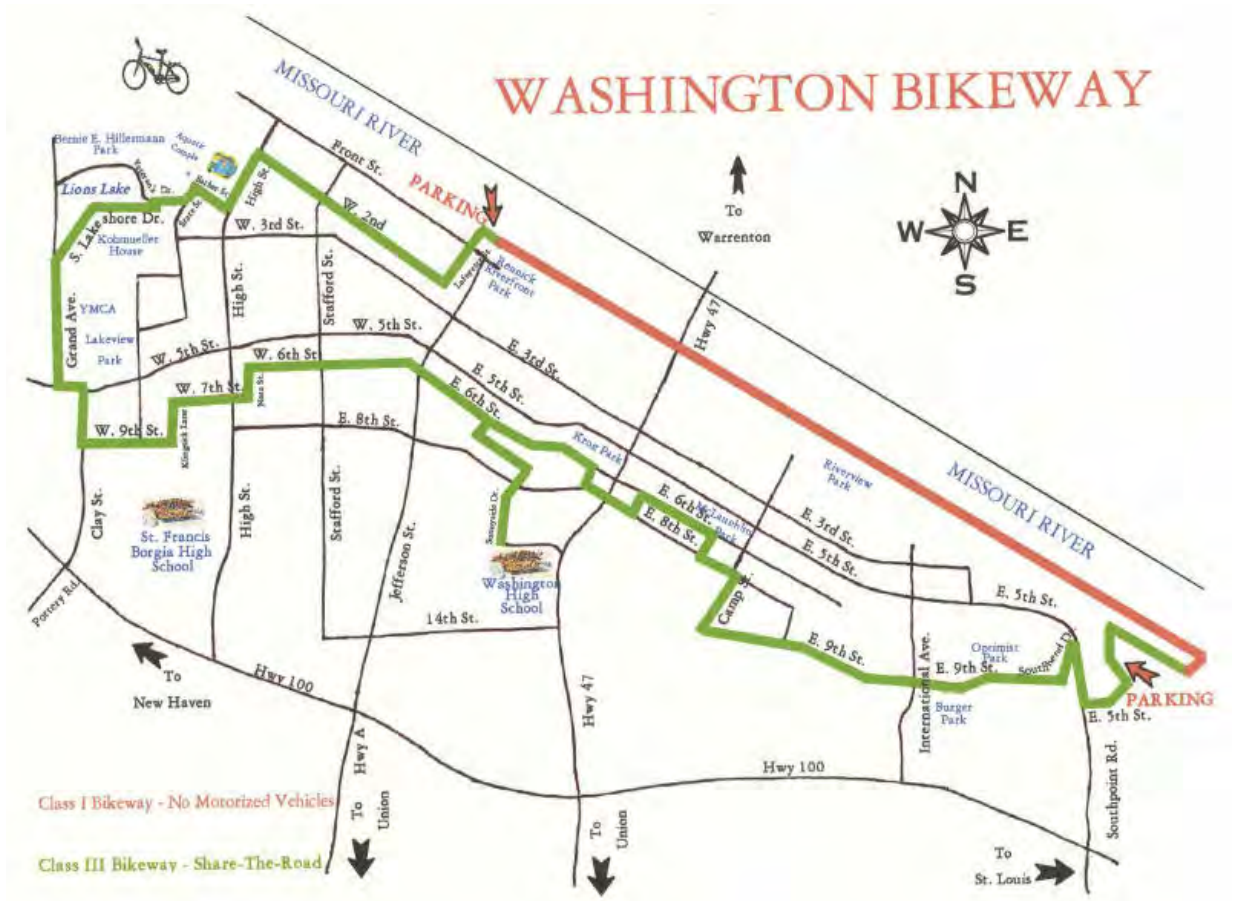


Figure 5. City of Washington's Bikeway Map

Current sidewalks within MoDOT right of way will be retained. In accordance with the Americans with Disabilities Act of 1990, any sidewalks that are disturbed as part of the project will be upgraded to current ADA standards. The shared use path on the bridge will also meet current ADA standards.

3a) RIGHT-OF-WAY ACQUISITION AND EASEMENTS

New, permanent right of way would be needed for the roadway north of the river in Warren County. The bridge over the river would be accommodated by a U.S. Coast Guard permit. South of the river in Franklin County, the bridge would require permanent easements from the Union Pacific Railroad as well as from the City of Washington (to span the park). New, permanent right of way would be needed to tie the new roadway alignment back into the existing roadway between the Missouri River and First Street. If any additional temporary easements are needed to provide contractor access for machinery and personnel, impacts will be addressed as the bridge and roadway details are finalized.

The preferred (adjacent upstream) alternative would require 6.4 acres of new right of way, impacting 12 parcels, and would use an additional 5.8 acres of existing right of way (see Table 4). The majority of this area is undeveloped or agricultural land north of the river in Warren County. The preferred alternative would require one residential displacement south of the river in Washington. The adjacent downstream alternative would need 4.3 acres of new right of way, impacting 8 parcels, and would use an additional 5.4 acres of existing right of way. It would require two residential displacements in Washington. MoDOT will acquire all properties needed for this project in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended (Uniform Act; 42 U.S.C 4601), and other regulations and policies as appropriate.

Table 4. Right-of-Way Impacts

MEASURE	PREFERRED (ADJACENT UPSTREAM) ALTERNATIVE	ADJACENT DOWNSTREAM ALTERNATIVE	NO-BUILD ALTERNATIVE
Number of parcels impacted	12	8	0
Residential relocations	1	2	0
Commercial relocations	0	0	0
New right of way used	6.4 acres	4.3 acres	0
Existing right of way used	5.8 acres	5.4 acres	5.8 acres
Right-of-Way cost	$476,000	$634,000	0

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended , as well as Missouri state laws, requires that just compensation be paid to the owner(s) of private property taken for public use. The Uniform Act is carried out without discrimination and in compliance with Title VI (the Civil Rights Act of 1964), the President's Executive Order on Environmental Justice, and the Americans with Disabilities Act. MoDOT will provide relocation services to all impacted households without discrimination under guidance of the Uniform Act.

An appraisal of fair market value is the basis for determining just compensation to be offered the owner for property to be acquired. The Uniform Act defines an appraisal as a written statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information. MoDOT will give fair market compensation to individuals who are partially or totally displaced by this project, as the Uniform Act requires.

The Uniform Act further requires that comparable, decent, safe, and sanitary replacement housing within a person's financial means be made available before that person may be displaced. MoDOT also offers a relocation assistance program, and both MoDOT and FHWA policies require that no one can be relocated until at least one comparable replacement residence has been offered. The new residence must be similar to the existing residence, affordable to the individual, safe, decent, and sanitary. Relocation and compensation are made without discrimination based on race, color, national origin, religion, and age. The MoDOT's relocation program is designed to provide uniform and equitable treatment for those persons who are displaced from their residences, businesses, or farms.

3b) ENVIRONMENTAL JUSTICE

Title VI of the 1964 Civil Rights Act prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance. Title VI seeks to ensure that all groups and individuals have the right to access and participate in the transportation decision-making process.

Executive Order 12898, issued in 1994, directs federal agencies to take steps to ensure that minority or low-income neighborhoods are not subjected to disproportionate project impacts. Disproportionate adverse effects are those either mainly affecting a minority and/or low-income population or that the minority and/or low-income population will bear and that are recognizably more severe or of greater significance than the adverse effect that the non-minority and/or non-low-income population will bear.

Environmental justice seeks to:

- avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- ensure full and fair treatment of all people and their involvement in the transportation decision-making process regardless of race, color, national origin, age, or income.

- prevent the denial of, reduction in, or significant delay in benefits received by minority and low-income populations.

Project impacts such as health risks, loss of neighborhood cohesion, excessive noise, reduced mobility, or loss of residence are considered and efforts are made to avoid or minimize these issues. If negative impacts cannot be resolved though avoidance or minimization, they may be mitigated through such solutions as sound walls or designing alternative methods of access to avoid isolating communities or important elements within a community.

The U.S. Census of Population and Housing is conducted every 10 years and the most recent census data available as this EA was prepared is from 2000. The census provides detailed information on the nation's social, household, racial, demographic, and economic composition. The 2000 census recorded racial information at the census Block level, whereas information on poverty and disabilities was recorded at the much larger Block Group level, which in some cases can cover several miles and contains a nationwide average of 39 blocks.

Census Tracts, Block Groups, and Blocks

Census data is broken down to geographic areas that include the nation, state, counties, cities, and divisions within cities.

- The **Census Tract** is a geographic unit for which detailed data are tabulated. The Census Tract is divided into Block Groups and, sometimes, individual Blocks.
- A **Block Group** is made up of a number of city blocks that are combined for reporting purposes.
- Some data within the city of Washington is tabulated at the **Block** level, composed of individual city blocks.

The majority of the Franklin County census blocks within the project area had no minority residents during the 2000 census. The residents of Block # 1027 in Washington are described as 100% African American; however, this is based on a population of only two residents. The majority of the residents in the project area are identified as Caucasian, with less than 2% minority identified as African American. This is consistent with the general make-up of Washington (specifically the 63090 zip code area) that is composed of 0.6% African-American, 0.6% Hispanic, 0.4% Asian, 0.1% Native American or Alaska Native, 0.5% two or more races, and 0% Native Hawaiian or Other Pacific Islander. See Table 5 for additional demographic information on the project area (Figure 6 depicts locations of Census Block Groups and Blocks).

The percentage of families within the larger block groups whose income falls below the poverty level is at or below that found across the county and state. The percentage of residents listed as having a disability is also lower than that listed for the county and state.

The preferred (adjacent upstream) alternative would displace one residence in census block 1001. The adjacent downstream alternative would require two residential displacements in census block 2003. Neither build alternative would cause disproportionate impacts to any low-income or minority populations.

Table 5. Affected Environment Demographic Data

MEASURE	FRANKLIN COUNTY CENSUS TRACT 8002.01							
	Block Group 2		Block Group 1					
Census Block #	2001	2003	1000	1001	1025	1026	1028	1027
Population total	0	34	0	138	32	8	40	2
Racial characteristics—persons who are:								
White alone	0	34	0	135	32	8	40	0
Black or African American alone	0	0	0	2	0	0	0	2
Two or more races	0	0	0	1	0	0	0	0

Note: There are no residents within the project corridor in Warren County.
Source: U.S. Census, 2000

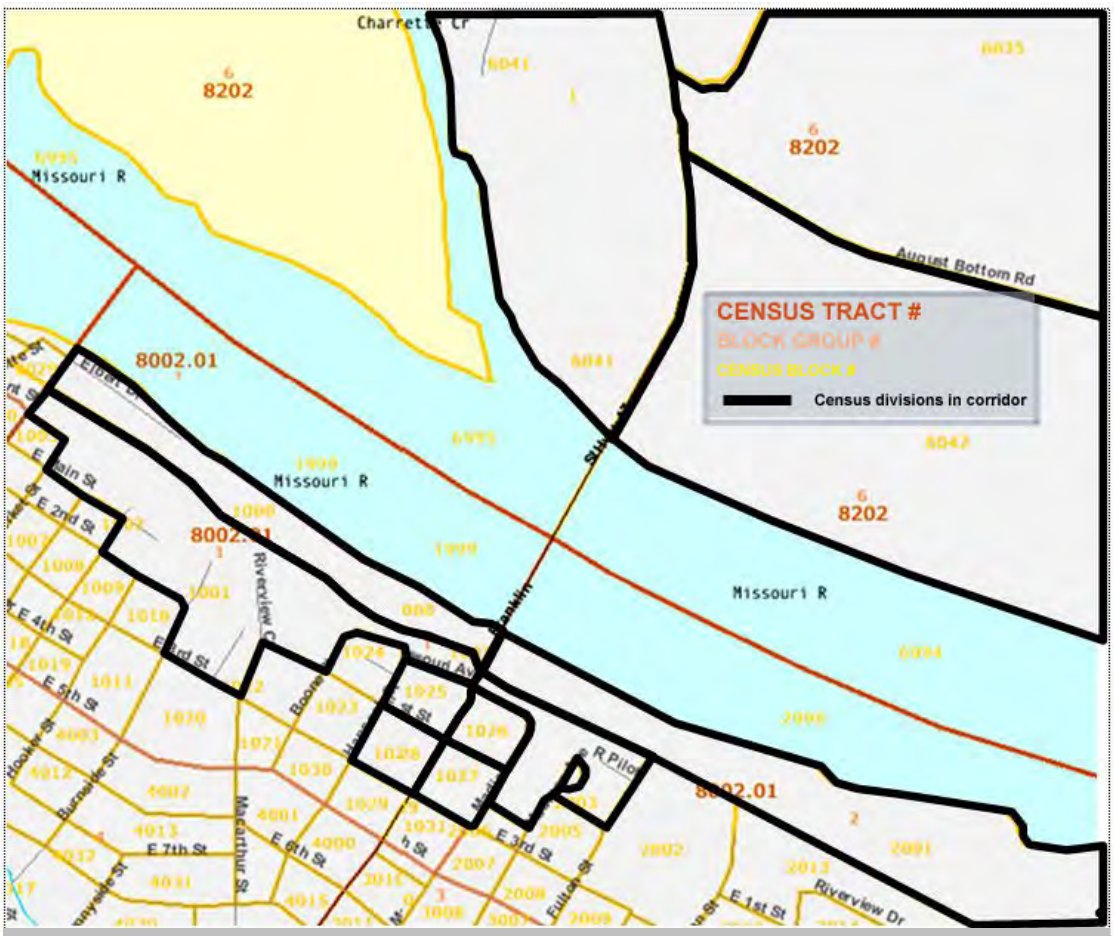


Figure 6. Census Map of Project Area

No disproportionate number of any protected minority or low-income group will be affected by the replacement of the bridge. No established low-income units or other housing complexes associated with government assistance would be displaced. No minority neighborhoods, business districts, or business clusters catering to any particular group of minorities would be displaced. Since there are no identified statistically significant concentrations of minorities or low-income persons in the area and the demographic profile mirrors that of Washington (specifically the 63090 zip code area), any such impacts are considered to be evenly, or at least reasonably, distributed throughout the project area.

3c) PUBLIC SERVICES

The existing Route 47 bridge is just a few blocks away from the largest hospital in the area. St. John's Mercy Hospital is an acute-care hospital offering comprehensive medical, surgical, obstetric, and pediatric services. St. John's is the only Level III Trauma Center between St. Louis and Jefferson City and serves residents both north and south of the river—from Franklin, Gasconade, Crawford, St. Charles, and Warren counties.

The Washington Fire District and fire districts in Warren and St. Charles Counties have a mutual aid agreement. The only ladder truck in the area is housed in Washington. A new bridge, with shoulders to accommodate disabled vehicles, would enhance emergency services as well as trips for both routine and acute medical care by improving travel efficiency and reliability at the Missouri River crossing.

The Washington School District is also located on both sides of the Missouri River and Route 47 provides

direct access to the Washington Regional Airport, which is used by industries located in Washington and Franklin County on a daily basis.

Although temporary disruptions in travel patterns and travel time may occur during construction, the long-term benefits of a new bridge should far outweigh short-term impacts. Overall, either build alternative would benefit access to public services by eliminating delays from traffic stoppages to accommodate oversized vehicles and agricultural equipment and decreasing closures due to maintenance. With the no-build alternative, delays would continue and closures for maintenance would increase over time.

3d) COMMUNITY COHESION

Since both considered new bridge alternatives are adjacent to the existing bridge, no changes are anticipated to neighborhoods or community cohesion, travel patterns and accessibility, community facilities, or to any special groups such as elderly, disabled, minority, and transit-dependent persons.

Conclusion

Neither the preferred (adjacent upstream) alternative nor the adjacent downstream alternative is anticipated to result in any long-term negative effects within the city of Washington. Local traffic patterns may be disrupted during construction and there may be short-term, localized impacts to noise and air quality, but inconvenience to residents and the traveling public will be minimized. MoDOT will continue to work with community and area residents to aid in identifying possible impacts as well as solutions associated with the proposed project. Washington and the surrounding region will benefit from a new bridge improving travel efficiency and reliability at the Missouri River crossing. In addition, both local and visiting bicyclists will benefit from the new bridge's protected bicycle/pedestrian accommodation in combination with the separate project to improve Route 47 between the bridge and the KATY Trail for bicycle travelers. The no-build alternative may have negative social and economic consequences.

4) WATER QUALITY

Water quality is defined for a particular body of water by comparing the physical, chemical, and biological characteristics of the water with a set of standards. The U.S. Environmental Protection Agency (EPA) sets water quality standards based on what the water is being used for. Some uses are drinking, swimming, and keeping fish and other water animals alive.

The Missouri River, wetlands, and ground water are the water resources in the project area that could experience water quality impacts. Missouri River water quality is slightly lower than state goals for aquatic life in the area. However, the EPA's Index of Watershed Indicators (October 1998) states that it is unlikely to cause aquatic life to decline. The city of Washington and other nearby communities that could be affected by project impacts to water quality draw their drinking water from deep underground wells, not from the Missouri River.

Potential water quality impacts from the no-build alternative would be associated with operating (bridge runoff) and maintaining the existing bridge. The build alternatives' potential impacts to water quality would be associated with constructing, operating, and maintaining a new Route 47 bridge over the Missouri River.

Bridge construction at the river's edge makes it possible for soil to wash into the Missouri River. Over time, increased amounts of soil washed into the river can damage the river ecosystem by lowering oxygen levels and covering food sources and fish spawning areas. Soil and rock washed away around bridge piers can change the river bottom, affecting those species that use the bottom for food or habitat. Because construction projects disturb large areas of land, thus increasing the possibility of erosion, they have potential to cause environmental harm. The Clean Water Act (CWA) requires construction sites to put controls in place to prevent pollution from being discharged with stormwater into nearby waterways.

Without on-site pollution controls, sediment-laden runoff from construction sites could flow directly to the nearest waterway and degrade water quality. In addition, stormwater could pick up other pollutants such as concrete washout, paint, used oil, pesticides, solvents, or other debris and the polluted runoff could harm or kill fish and wildlife, degrade aquatic habitat, and affect drinking water quality.

The Missouri Department of Natural Resources (MDNR) regulates the control of runoff from land disturbance and issues a permit for the work to MoDOT, although the contractor is responsible for complying with the permit conditions. To protect water quality and reduce impacts during and after construction, MoDOT will comply with MDNR's stormwater regulations (found at 10 CSR 20-6.010), which are intended to prevent soil from leaving the construction site. These regulations require erosion control measures to be put in place when land clearing begins on the project. In accordance with the National Pollutant Discharge Elimination System (NPDES) requirements of the CWA, MoDOT operates under the provisions of Missouri State Operating Permit No. MO-R 100xxx, effective May 31, 2007, a general permit issued for road construction projects statewide. This permit, included in Appendix A, requires using erosion control measures and limits the amount of pollutants that can leave a job site.

MoDOT will implement its Pollution Prevention Plan to prevent or minimize adverse impacts to streams, water courses, lakes, ponds, or other water impoundments within and adjacent to the project area. This MDNR-approved plan is a component of MoDOT's five-year MDNR-issued stormwater permit and was designed to reduce suspended solids, turbidity, and downstream sedimentation that may degrade water quality and adversely impact aquatic life. The plan provides for temporary erosion and sediment control measures that will be included within construction contract specifications.

Erosion and sediment controls may include a combination of ditch checks, silt fence, berms, sediment basins, temporary and permanent seeding, slope drains, etc. MoDOT's best management practices for selecting and using these various measures relate to the topography and the type of work being done. Best management practices are generally applied when land disturbance activities include construction of ditches, slopes, and bridge slopes.

Preventing water quality impacts on a major bridge project presents some slightly different challenges than a road construction project. Although erosion control during construction of the roadway approaches is important, special attention must be given to work in the river itself. Any project that involves discharge into navigable waters of the U.S. requires a Section 401 Water Quality Certification from MDNR that is linked to the COE issuance of a CWA Section 404 permit. This project will require obtaining a Section 401 water quality certification to ensure that the proposed activity does not exceed state water quality standards. All construction activities will comply with the existing rules and regulations of governmental agencies having jurisdiction over streams and water supplies in the area.

Operating and maintaining a highway can adversely affect water quality, vegetation, and associated aquatic life if stormwater runoff washes chemical pollutants from the roadway surface to the river during normal roadway operation. These pollutants come from motor vehicles as well as roadway deicing salts. Pollutants from vehicles can include grease and petroleum from lubricant spills or leaks, antifreeze and hydraulic fluid, and zinc, which is used in tires and motor oil.

The water quality effects from such pollutants would be greatest at locations where stormwater runoff directly enters waterways. Generally the amount of pollutants would be low volume and would have only a localized impact, at most. Based on the amount of traffic traveling over the Route 47 bridge and highway daily, nationwide Federal Highway Administration studies indicate that pollutants in highway runoff are not present in amounts great enough to harm water quality. MoDOT will design ditches and stormwater runoff areas so that stormwater or road surface pollutants that run off the highway have limited effects on water quality.

5) WETLANDS AND WATERS OF THE U.S.

Wetlands are defined (*Federal Register*, 1982) as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do

support, a prevalence of vegetation typically adapted for life in saturated soil condition." Wetlands serve a variety of beneficial uses, such as floodwater retention, groundwater recharge, and providing essential fish and wildlife habitat. Executive Order 11990 (Wetlands Protection) established a no-net-loss of national wetlands policy and requires that projects using federal funds avoid the destruction or modification of wetlands wherever possible. Missouri's Executive Order 96-03 calls for similar wetland protection at the state level.

As described in the preceding section, "4) WATER QUALITY," Section 404 of the Clean Water Act (CWA) authorizes the U.S. Army Corps of Engineers (COE) to regulate impacts to wetlands and waters of the United States through a permitting process. Waters of the U.S. is an inclusive term that covers streams, rivers, wetlands, and other aquatic sites that are under the COE's jurisdiction. The Missouri Department of Natural Resources (MDNR) administers the parallel Section 401 certification process. This certification generally requires that several water quality best management practices (detailed in preceding section, "4) WATER QUALITY") be followed. If permanent impacts are greater than one-tenth of an acre, mitigation for impacts is generally required as a part of the permit. The COE also administers Section 10 of the Rivers and Harbors Act, which controls construction activities in navigable waters of the U.S. The act primarily applies to the navigation channel of the river. Any work in the river triggers Section 10, which generally allows only the absolute minimum of temporary obstruction to the navigable channel and requires that there be no permanent impacts to the channel.

National Wetland Inventory (NWI) maps, United States Geological Survey (USGS) topographical maps, and field survey to define wetland boundaries were used to assess potential impacts for the proposed build alternatives. Permanent impacts to waters of the U.S. are expected to be limited to placement of bridge piers in the Missouri River, a Section 10 water. Temporary impacts might result from cofferdams, haul roads, construction of a land-based staging area for contractor use, and any dredging needed to facilitate installation of the new bridge. Dredge spoil (sediment that is mechanically removed from the bottom of the river for pier placement and to facilitate bridge work) may be placed back into the Missouri River or removed by barge for disposal in a non-jurisdictional area. A Section 10 Letter of Permission, for temporary impacts to the navigable channel, is anticipated for this project.

In Warren County there is a very small wetland depression at the base of the levee, just outside the right of way on the downstream side of the existing bridge (see Figure 7). The preferred (adjacent upstream) alternative will not impact this feature, although the possibility of minor, temporary impacts from the adjacent downstream alternative cannot be ruled out. South of the river, wetland impacts, if any are unavoidable, are expected to be limited to temporary impacts to an old borrow ditch between the Rotary Riverfront Trail and the railroad tracks in Washington. These potential impacts would be associated with temporary access to the construction area and would be roughly equal for either build alternative. Temporary impacts of this nature are job specific and are determined by the contractor. Demolition of the existing bridge will result in temporary impacts to the river itself and possibly to the wetland on this wetland feature as well.

The no-build is the least intrusive alternative. The preferred alternative is anticipated to result in less than 0.1 acre of permanent impacts to wetlands/waters of the U.S. This level of impact should qualify for Nationwide Permit #14, which covers linear transportation projects with minimal impacts to wetlands and/or waters of the U.S. However, if the dredge spoil is redeposited in the Missouri River, the project might require an Individual Permit, used to authorize a project with more than 0.5 acre of permanent impacts to wetlands/waters of the U.S.

Figure 7. Route 47 Wetland Locations

6) NAVIGABLE WATERWAYS

The Route 47 Bridge at Washington crosses the Missouri River, which is a navigable waterway. The U.S. Coast Guard (USCG) is responsible for maintaining a navigation channel in the Missouri River. This

project will require a Section 9 Bridge permit from the USCG. A Section 9 Bridge Permit is the Coast Guard document approving the location and plans of bridges over a commercially navigable waterway in accordance with all applicable federal laws.

The COE Kansas City District is responsible for operations and maintenance activities on the Missouri River. The new bridge piers for either build alternative would closely match the current pier locations and the existing navigational clearance will be maintained.

In 2008, the latest year of reporting, an estimated 5,374,000 tons of commodities were barged up and down the Missouri River between Kansas City and the confluence with the Mississippi River at St. Louis (Missouri River Data for 1999 to 2008, http://www.ndc.iwr.usace.army.mil/wcsc/pdf/wcusmvgc08.pdf). The tonnage of commodities transported on the river during this period peaked at 9,295,000 tons in 2001, with the 2008 tonnage the lowest in a declining trend of total tonnage carried on the river. Petroleum, chemicals (including fertilizers), aggregates (soil, sand, gravel, and rock), manufactured goods, and farm products are the commodities transported, with aggregates making up the bulk of those—5,199,000 of the total 5,374,000 tons. The average barge on the Missouri holds 1,500 tons, so approximately 3,583 barges were on the river in 2008 during the April 1 to December 1 navigation season.

Construction of either build alternative would be conducted so as not to unreasonably interfere with free navigation of the waterway or impair the present navigable depths. The navigation channel is on the south side of the river through the Washington Bend area. The navigation channel at the existing bridge is within the second span from the south bank, with 463 feet of horizontal clearance (navigation channel) between the bridge piers of this span. The contractor's erection scheme and erection falsework would provide adequate horizontal clearance within the navigation channel span to allow safe passage of river traffic during erection of the superstructure. A temporary reduction in navigation channel width is anticipated but will require USCG review and approval. This reduced navigation clearance during construction, if allowed by the USCG, would only be required for the short amount of time needed to erect the girders within the navigation channel span. The contractor's falsework would be removed promptly to restore the full width of the navigation channel span. Neither of the build alternatives would affect the location of the navigation channel. The USCG has expressed a preference for the adjacent upstream (preferred) location from a navigation perspective. Because the river bends left almost immediately downstream of the existing bridge, locating a new bridge upstream would enable tow pilots to more easily navigate the bend and the wing dikes. Visibility at the bridge is approximately two miles upstream (west) and three miles downstream (east), providing adequate visibility between barges and the bridge area.

Either build alternative would involve demolition of the existing bridge, with potential impact to river way users and Missouri River commerce associated with blocking navigation through the span for a short period of time. The spans will be dropped into the river and then salvaged. Since demolition of the existing bridge will occur after the new bridge opens, it is possible that demolition could be timed to occur outside the navigation season. If the existing bridge is demolished during the supported navigation season, commercial use of the river in the vicinity of the bridge would be slowed during demolition, but use of the navigation channel would only be restricted for a 24-hour period while the span is salvaged. Since the USCG monitors the demolition on site to provide a safe environment during span blasting and salvage, this operation is anticipated to have minimal impact on through, commercial traffic on the river.

Recreational use of the river near the bridge may be reduced both during construction and demolition activities. Recreational users will most likely avoid the construction site for safety concerns. However, their travel in the vicinity of the bridge will not be impeded any more than commercial traffic.

7) FLOODPLAINS

Floodplains are the low lands adjoining the channel of a river, stream, or watercourse—or adjoining the shore of an ocean, lake, or other body of standing water—that have been or may be inundated by flood water. Floodplains provide a number of important functions in the natural environment—creating wildlife habitat, providing temporary storage of flood water, preventing heavy erosion caused by fast-moving water, recharging and protecting groundwater, providing a vegetative buffer to filter contaminants, and accommodating the natural movement of streams. Executive Order 11988—Floodplain Management,

Federal Highway Administration (FHWA) policy and procedures in 23 CFR 650, and other federal floodplain management guidelines direct agencies to evaluate floodplain impacts for proposed actions. Engineering analyses of floodplain impacts will be conducted during the project's design to avoid and reduce impacts wherever possible.

Floodplains can be described by the frequency of flooding that occurs. With Executive Order 11988, the base, or one percent annual chance, flood was formally adopted as a standard for use by all federal agencies. The base flood is the flood that has a one percent chance of being equaled or exceeded each year. Thus, the base flood can occur more than once in a relatively short period of time. The base flood is commonly labeled the "one percent flood" and often inappropriately referred to as the "100-year" flood. Larger floods may, and often have, occurred but the one percent flood is the generally accepted regulatory standard. Figure 8 shows a typical floodplain diagram.

The National Flood Insurance Program (NFIP) uses the base flood as the standard for floodplain management and to determine the need for flood insurance. When available, NFIP flood hazard boundary maps and flood insurance studies for the project area are used to determine the limits of the base floodplain and the extent of encroachment (an action within the limits of the base floodplain). The base floodplain is the area of one percent flood hazard within a county or community—that is, the area in which the flood has a one percent chance of being equaled or exceeded in any given year.

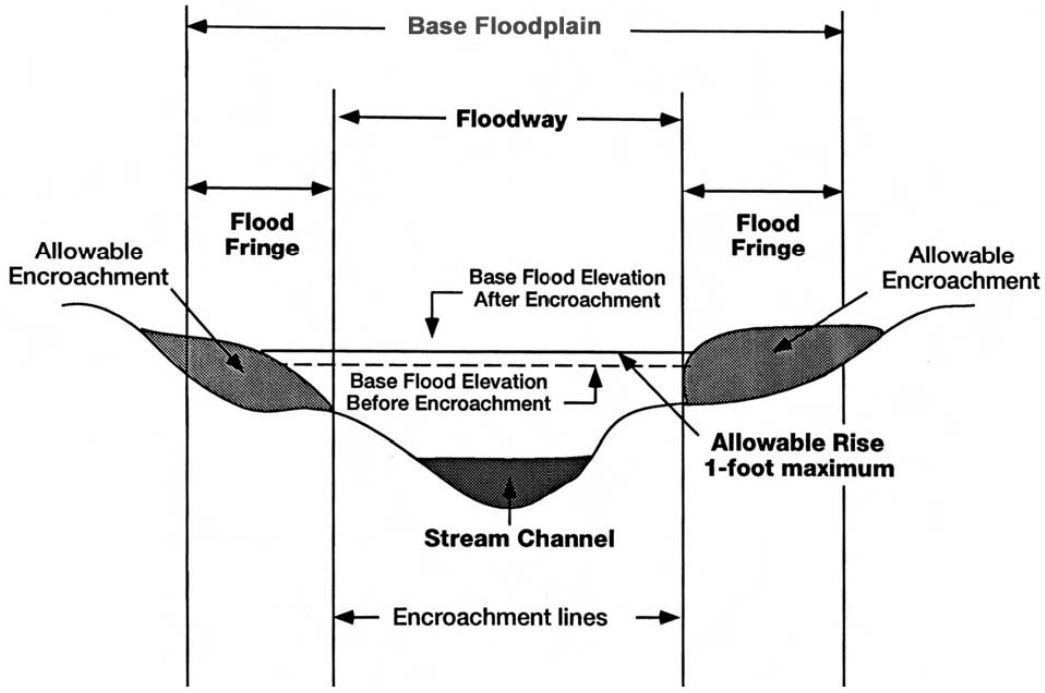


Figure 8. Diagram of Typical Floodplain

The regulatory floodway is the area of a stream or river channel that must be kept open to convey floodwaters from the base flood without increasing the height of the flood more than a certain amount. Federal Emergency Management Agency (FEMA) restrictions do not allow projects to cause any rise in the regulatory floodway and no more than a one-foot cumulative rise may result from all projects in the base floodplain. The Missouri State Emergency Management Agency (SEMA) issues floodplain development permits for projects involving the State of Missouri. For projects proposed within regulatory floodways, a "no-rise" certificate, if applicable, must be obtained before a permit is issued.

NFIP Flood Hazard Boundary Maps are available for the City of Washington and for Franklin and Warren

Counties. The Missouri River base floodplain extends from the northern limit of the Route 47 study corridor in Warren County to approximately 325 feet into the northern edge of Washington's city limits. No new right of way or easement would be required in the area north of Augusta Bottom Road. From the northern tie-in near Augusta Bottom Road to the southern tie-in in Washington, both build alternatives as well as the existing roadway cross roughly 3800 feet of base floodplain, approximately 1400 feet of which is regulatory floodway.

A detailed hydraulic analysis has been performed; the base flood elevation at the existing bridge is 493.5 feet above sea level, as identified in the current COE study. The preferred, adjacent upstream alternative would require an estimated 4.7 acres of new right of way in Warren County south of Augusta Bottom Road, and the adjacent downstream alternative would need about 3.4 acres. All of this right of way is within the base floodplain. Either build alternative will require a floodplain development permit and "no-rise" certification.

Bridges are designed to span as much of the base floodplain and regulatory floodway as possible, thus serving a dual role—bridges minimize construction impacts in the floodplain while also reducing disturbance of wetlands. Both proposed Route 47 build alternatives would construct a new bridge next to the existing bridge, thus minimizing any additional floodplain impact. Since the new bridge and roadway approaches would replace the existing bridge and its roadway approaches, it is not anticipated that the project would support any additional incompatible floodplain development. With the build alternatives located adjacent to existing Route 47, there would be minimal, if any, additional impact to the base floodplain and regulatory floodway following completion of construction and removal of the existing Route 47 bridge and roadway approaches.

FEMA Buyout Properties

The Flood Disaster Protection Act of 1973, as amended by the Disaster Relief and Emergency Assistance Act of 1988 (The Stafford Act), identified the use of disaster relief funds under Section 404 for the Hazard Mitigation Grant Program (HMGP), including the acquisition and relocation of flood damaged property. The Volkmer Bill further expanded the use of HMGP funds to "buy out" flood damaged property affected by the Great Flood of 1993. The FEMA has jurisdiction over these buyout properties.

Although there are a number of FEMA buyout properties in the City of Washington, they are located primarily east and south of the project area and will not be affected. There are no FEMA buyout properties within the project limits.

8) WILD AND SCENIC RIVERS

The Wild and Scenic Rivers Act, signed into law October 2, 1968, (P.L. 90-542) was intended to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Passage of the act created the National Wild and Scenic Rivers System, with eight rivers or river segments initially designated as components of the system and 27 rivers authorized for study as potential components. Subsequently, 195 rivers or river segments have been added to the system (203 total).

Among the eight rivers initially designated a part of the National System was a 44.4-mile section of the Eleven Point River in Missouri (extending downstream from Thomasville to State Highway 142). The Gasconade River (265 miles) was among the 27 rivers authorized for study. The Bureau of Outdoor Recreation's study report transmitted to Congress on May 23, 1977, recommended state preservation of the Gasconade River.

There are no streams or rivers within the project area that are either part of the system or under study for designation to the system. Therefore, the proposed project would not impact any part of the National Wild and Scenic Rivers System or potential candidates to the system.

9) AIR QUALITY

As required by the Clean Air Act (last amended in 1990), EPA has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, called "criteria" pollutants. They are listed in Table 6. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, milligrams per cubic meter of air (mg/m3), and micrograms per cubic meter of air (µg/m3). The Clean Air Act established two types of national air quality standards for pollutants considered harmful to public health and the environment. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Table 6. National Ambient Air Quality Standards

POLLUTANT	PRIMARY STANDARDS		SECONDARY STANDARDS	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour [1]	none	
	35 ppm (40 mg/m^3)	1-hour [1]		
Lead	0.15 µg/m^3 [2]	rolling 3-month average	same as primary	
	1.5 µg/m^3	quarterly average	same as primary	
Nitrogen Dioxide	53 ppb [3]	Annual (Arithmetic Average)	same as primary	
	100 ppb	1-hour [4]	none	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour [5]	same as primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual [6] (Arithmetic Average)	same as primary	
	35 µg/m^3	24-hour [7]	same as primary	
Ozone	0.075 ppm (2008 standard)	8-hour [8]	same as primary	
	0.08 ppm (1997 standard)	8-hour [9]	same as primary	
	0.12 ppm	1-hour [10]	same as primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour [1]
	0.14 ppm	24-hour [1]		

(1) Not to be exceeded more than once per year.

(2) Final rule signed October 15, 2008.

(3) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

(5) Not to be exceeded more than once per year on average over 3 years.

(6) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

(7) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

(9) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

EPA is in the process of reconsidering these standards (set in March 2008).

(10) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

The proposed project is in an area where the State Implementation Plan (SIP) requires transportation control measures. The St. Louis metropolitan area is classified as a "non-attainment" area for ozone (O_3) and fine particulate matter ($PM_{2.5}$). This means that current air quality conditions are not in compliance with the National Ambient Air Quality Standards (NAAQS) for the aforementioned pollutant. The study area is classified as an "attainment" or "unclassifiable" area for sulfur dioxide, particulate matter, and carbon monoxide. This means that current air quality conditions are in compliance with the NAAQS for the aforementioned pollutants.

The Route 47 project has been determined not "regionally significant" for the purposes of regional emissions analysis by interagency consultation. Therefore, no air quality analysis is required.

10) NOISE

MoDOT's noise policy is derived from the Federal Highway Administration's (FHWA) noise policy. These policies require considering potential noise impacts for Type I projects. Type I projects are those that involve construction of new highways or new alignments, lane additions, or significant changes to vertical or horizontal alignments of existing facilities. A change in vertical or horizontal alignment is considered significant if it causes highway noise to increase by three decibels or more. Normally, halving the distance between a noise source (the roadway) and a noise receiver (such as a residence) will cause a three decibel increase in noise level.

Changes in horizontal alignment from this project would be very minimal. Either of the proposed build alternatives would tie back into the existing alignment very shortly after touchdown on the south (Franklin County) bank of the Missouri River, shifting the travel lanes only slightly from their existing alignment. This project does not qualify as a Type I project and will therefore not be further evaluated for noise impacts.

11) THREATENED AND ENDANGERED SPECIES

MoDOT environmental staff initiated early coordination with the U.S. Fish and Wildlife Service (FWS) and Missouri Department of Conservation (MDC) to address species-specific impacts through scoping meetings, official reviews of preliminary information in this document, and reference to the MDC Heritage Database. MoDOT staff reviewed aerial photography and topographic maps and used driving surveys of the project area, information from the environmental appraisal conducted for the Route 47 Missouri River Bridge rehabilitation project, and on-site field surveys for wildlife habitat to determine the project's affected environment and evaluate environmental consequences of the no-build and two new bridge alternatives, located either immediately upstream or downstream from the existing Route 47 bridge.

Endangered Species Act

- Mandates federal protection for species listed nationally as **endangered**, **threatened**, or **candidate** for listing.
- Federally designated **critical habitat** has been officially identified as critical for the species' protection or survival and is afforded federal protection.

Migratory Bird Treaty Act confers federal protection on migratory birds.

State-listed species are labeled "endangered" at the state level. State-designated critical habitat is identified by the state as important for the protection of state-listed species.

From north (Warren County) to south (Franklin County), habitat types within the Route 47 affected environment include areas of:

- agricultural fields extending northward from the floodplain forest north of the river in Warren County
- mature floodplain forest with associated wetlands on the northern and

southern (with a city park trail running through) banks of the river

- the Missouri River itself
- an in-stream dike field (shallow water aquatic habitat) behind an "L-shaped" rock revetment on the south side of the river
- a railroad corridor under the existing bridge between the southern bank of the Missouri River and the city of Washington
- urban development (city of Washington, MO)

The agricultural land, railroad corridor, and urban development could all provide habitat for common species of plants, birds, insects, amphibians, reptiles, and some small mammals. Although such common species are an important component of the natural environment, any impacts to these species are a secondary focus of this evaluation. Impacts from either proposed build alternative are not anticipated to have any lasting impacts on populations of these species. These types of common plants and animals occupy a wide range of habitats and do not have specific needs for communities or natural areas that would be consider rare or sensitive. Typically, common species do not need buffers from development or disturbance in order to thrive or recover from short-term impacts.

Aquatic features such as streams, rivers, and wetlands or terrestrial communities such as caves, glades, prairies, forests and riparian (or streamside) corridors are some areas that might provide habitat for sensitive plant and animal species. Although some vegetated areas near roadsides and railroad corridors could provide habitat for rare plants, there are no such records or indications of the presence of any of those species near the project area. There are also no caves, glades, or prairies in the affected environment for this project. There are confirmed wetlands in the floodplain forested areas on the south and north banks of the Missouri River.

Forested wetlands and forested riparian corridors can also provide habitat for migratory song birds and amphibians that need the diversity of cover, moisture, understory and canopy structure, and the buffering protection of large forest blocks. Riparian corridors, rivers, and streams provide not only habitat for localized populations of plants and animals but also a migration pathway between areas of more suitable habitat. Fish species can migrate upstream and downstream through less suitable conditions to areas with deeper channel or shallow water habitats and a diversity of shoreline or streambed features. Terrestrial species may use the cover of forest along a stream or riverbank for travelling to and from foraging and reproductive habitat.

Potentially suitable habitat for less common species of plants and animals in the project area is concentrated around the existing bridge in the floodplain forest, wetlands, and the Missouri River. There are virtually no differences in potential impacts to the natural environment from the preferred (adjacent upstream) and the adjacent downstream alternatives.

Bald Eagles

Bald eagles, *Haliaeetus leucocephalus*, were removed from the endangered species list in 2007 and have also been removed from the state endangered list based on recovery and climbing population numbers. However, this species is still federally protected. The Migratory Bird Treaty Act, and more specifically, the Bald and Golden Eagle Protection Act are the main vehicles of federal protection for bald eagles, their eggs, nests, and nesting habitat. In Missouri, mated pairs return to nest and mate around December, usually incubating eggs by mid-February, and typically have one to two nestlings by the beginning of April. Eaglets leave the nest (fledge) sometime in June or July. Bald eagles are most sensitive to human disturbance during courtship and nest building early in the breeding season, but eggs and nestlings are still very vulnerable until young eagles are ready to leave the nest (National Bald Eagle Management Guidelines, FWS, May 2007).

Site visits were conducted in December 2007, September 2009, and January 2010 for the 2009 bridge rehabilitation as well as to evaluate wildlife habitat for this EA. No bald eagle nests were observed in or near the study corridor on any of these visits. There is a record of a known eagle nest a little more than two miles downstream from the project area near a park trailhead at the City of Washington sewer plant.

There is only one entry for the MDC Heritage Database from December 2002 for this location. MoDOT has not yet confirmed presence/absence of the nest or current activity. However, the proposed project area is well outside any potential protection zones for this nest should it prove to be active. Therefore, no impacts to that resource are anticipated. Although there are few examples of riparian forest trees in this reach of the Missouri River that could serve as suitable nesting habitat, none of these trees are in the project footprint for either of the build alternatives and they will not be affected by new bridge construction or demolition of the existing bridge. There are no anticipated environmental impacts to bald eagles. Additional site visits will be conducted to update information for this possible resource during the project's design phase.

Pallid Sturgeon

The distribution of pallid sturgeon (*Scaphirhynchus albus*) in Missouri encompasses the Mississippi River downstream from the Missouri River confluence, the Missouri River, and several major tributaries. This species uses a variety of habitats during the course of a year. Records were obtained (2010) from the MDC heritage database and the U.S. Geological Survey-Columbia Environmental Research Center pallid sturgeon program. There are several records of pallid sturgeon within eight miles upstream and downstream (between river miles 75.7 and 59.2) of the project area (the existing Route 47 bridge is at approximately river mile 67.6). These records are from spring (spawning season) 2007 and summer (after spawning) 2005–2009. One capture from summer 2007 was within 1000 feet downstream of the existing bridge.

As project development proceeds, MoDOT will obtain a habitat assessment of the existing streambed (via a gridded depth sounding study, as used for consultation with FWS on other Missouri River bridge projects since 2006). This basic survey will provide an idea of the gradient in depths and clues to features such as shoals (possibly due to presence of the mouth of a Missouri River side channel just upstream from the existing bridge), sandbars, shallow water habitat, and effects of the L-shaped revetment on the southern bank right at the bridge. Such features are all areas that pallid sturgeon could use during spawning and overwintering. MoDOT will also obtain updated records during the design phase of the project and consult with FWS as appropriate for considerations to avoid impacts to pallid sturgeon and any suitable spawning/over-wintering habitat.

MoDOT will evaluate project impacts in the floodplain and in the Missouri River during the design phase. Impacts analysis will cover temporary and permanent impacts from construction and demolition on pallid sturgeon and any suitable habitat in the project area, taking into account the methods and duration of disturbance. Most likely, there will be modifications to the existing L-shaped dike along the right descending bank. These impacts will be addressed with the U.S. Army Corps of Engineers, U.S. Coast Guard, and U.S. Fish and Wildlife Service. Most of the possible environmental consequences described here are temporary in nature. Although it can be assumed that pallid sturgeon migrate and/or drift through the area, it is not anticipated that there will be lasting effects that change the nature or type of habitat currently available for pallid sturgeon in the project impact area.

Gray and Indiana Bats

Gray bats (*Myotis grisescens*) use caves year-round for hibernation, giving birth, and raising young. The species uses stream and river corridors, lake shores, and spring/wetland areas to travel to and from caves and for feeding at night.

Aside from cave habitats, riparian corridors provide natural cover or visual shelter that benefits gray bats. Mature vegetation along streams provides cover from would-be predators as well as habitat diversity for insects, the prey of all bats in Missouri. Removing mature vegetation from streams the bats use as travel/foraging corridors and near caves they inhabit could be detrimental to their success. Although the Missouri River floodplain at this location is forested, it is already altered by the presence of the existing Route 47 bridge, a city park trail, the water treatment facility, and a railroad line. After construction, roughly 30 acres of intact floodplain forest will remain within 1,000 feet of the bridge upstream and downstream and on both banks.

Indiana bats (*Myotis sodalis*) follow a similar annual cycle to gray bats, with separate hibernation and

maternity habitats and swarming activity near both during transition in the spring and fall. However, during the summer breeding season, Indiana bats use forest habitat for maternity and bachelor colonies instead of maternity caves. Suitable Indiana bat summer habitat consists of living, damaged, or dead trees with slabs of sloughing bark, splits, or even cavities.

There are no known hibernacula or maternity resources for either species within five miles of the project area. In fact, the nearest known resources (MDC Heritage database) for these species are a gray bat maternity cave over 10 miles away on the Bourbeuse River in central Franklin County and an Indiana bat hibernaculum over 20 miles away in southern St. Louis County. There could, however, be suitable roosting habitat for Indiana bats in almost any forested part of the state with the right maternity roost characteristics. In January 2010, a MoDOT ecologist conducted a field habitat assessment of the floodplain forest that would encompass the impact area for either the preferred, adjacent upstream or adjacent downstream new bridge alternatives. Although the forest is mature, there are no potential Indiana bat summer roost trees currently present in the project impact area. This area will be re-evaluated during the design phase and if suitable roost trees need to be removed for construction, MoDOT will only allow clearing of potentially suitable roost habitat between November 1 and March 31. If potentially suitable roost trees must be cleared during the April 1 to October 31 Indiana bat maternity season, additional field surveys and possible informal consultation with the FWS may be needed.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) protects nesting birds in their summer reproductive and foraging habitat. This may include large forest blocks, grassland-nesting area, floodplain nesting sites, and any nesting location used by migratory birds. Transportation projects that affect bridges during migratory bird breeding season should be assessed for impact to migratory bird species such as swallows that may be using the bridges as a nesting site; the MBTA protects colonial nesting sites formed on bridges by certain species.

MoDOT has consulted with several state and federal agencies, leading to a general agreement that the breeding season for swallows that may use bridges as nesting habitat (mainly cliff swallows) occurs between April 15 and July 15. To comply with the MBTA, measures can be taken to prevent or exclude migratory birds from nesting on parts of the bridge where construction will occur. Exclusionary measures physically block the birds from nesting in work areas on the bridge during the breeding season. Measures may include removing existing nests prior to breeding season, maintaining a "nest-free" condition during work in the breeding season by installing netting or screens to cover the area and prevent birds from building nests, or being constantly vigilant to remove nests as they are being built at least every couple of days. Other measures as identified could be used to discourage activity and nest building on bridges during the breeding season could be employed.

During the 2009 Route 47 bridge rehabilitation project, screen panels were installed to prevent swallows from nesting on the bridge piers where construction would take place during the breeding season. These panels were left on the bridge after the rehabilitation was completed. Currently, MoDOT plans to leave the exclusionary screens in place on the existing Route 47 bridge until it is demolished following construction of a new bridge. If necessary, additional measures will be taken and/or seasonal restrictions followed prior to demolition to avoid conflict with the MBTA.

State Endangered Species

Lake Sturgeon The MDC lists the lake sturgeon (*Acipenser fulvescens*) as endangered. This species is very similar in life history to the federally endangered pallid sturgeon and habitat requirements and conditions for spawning, migration, and over wintering are assumed to be very similar. Multiple individuals of this species were recorded approximately 10 miles downstream from the proposed project area in January 2004 and September 2005. A habitat assessment to determine suitability of existing habitat for use by pallid sturgeon and any resulting conditions that apply to demolition and in-stream construction activities would also apply to the protection of lake sturgeon.

Flathead Chub The flathead chub (*Platygobio gracillis*) is a small, non-game fish species that occurs in several Missouri River locations and side channels. There is a record of this species from over seven

miles upstream near the mouth of Kochs Creek (Peers Slough). Although it is possible that this species would travel through the project area, there are no expected negative impacts from the construction of this project.

12) HISTORIC AND ARCHAEOLOGICAL SITES

Cultural resources are the physical remains of human activity. They can include archaeological sites, buildings, structures, and objects that show evidence of human activity. Before a federal agency approves spending money or issues a permit or license for a project, Section 106 of the National Historic Preservation Act of 1966 requires the agency to consider how the project would affect historic properties. Section 106 defines historic properties as resources eligible for listing on the National Register of Historic Places (NRHP). The agency must involve the State Historic Preservation Office and other consulting parties in the Section 106 process for the project.

The ***National Register of Historic Places (NRHP)*** is the official list of buildings, structures, objects, sites, and districts that are significant in American history, architecture, archaeology, engineering, and culture. An eligible resource is significant at the national, state, or local level and also must be:

- associated with events significant to the broad patterns of our history; or
- associated with significant persons; or
- significant for its design or construction; or
- provide important information about our history or pre-history.

Section 106 encourages, but does not require, the preservation of historic properties. When adverse effects on historic properties are unavoidable, those adverse effects must be mitigated. A Memorandum of Agreement (MOA) is prepared specifying the mitigation measures that will be completed. The MOA is legally binding on all signing parties.

Adverse effects are changes that damage the character-defining feature of a historic property. Some examples of common adverse effects on MoDOT projects include demolition, alteration of significant features, and introduction of new elements that detract from the historic property.

Section 4(f) of the Department of Transportation Act of 1966 (discussed in greater detail in the next section, "13) PUBLIC LANDS & POTENTIAL SECTION 4(f)/SECTION 6(f) PROPERTIES") also protects historic sites. Federally funded actions cannot impact Section 4(f) eligible sites unless there is no feasible and prudent way to avoid the site.

To comply with Section 106 and Section 4(f), MoDOT first identifies the cultural resources present and then evaluates those resources to determine whether any are eligible for listing on the NRHP. MoDOT makes every reasonable effort to avoid impacts to NRHP-eligible properties. MoDOT staff review previous cultural resource surveys to determine what resources already have been identified in the project area before conducting a survey.

Previous Surveys

A statewide bridge survey was completed in 1996 (Fraser, Clayton B., 1996, "The Missouri Historic Bridge Inventory: Draft Inventory Report" 5 Vols. Missouri Department of Transportation Project BR-NBIH (6). Loveland Colorado: Fraserdesign, Inc.). The Washington Bridge (K0969) was determined to be eligible for listing on the NRHP as a good example of a large-scale truss bridge on an important crossing of the Missouri River.

Three architectural surveys were previously conducted near the build alternatives. No historic buildings were previously identified within the alternatives, although one survey included resources within the alternatives. Thomason & Stiritz's 1992 survey identified one building, 821 East First, within the area of potential effects (APE) for the build alternatives. Located at the corner of 1st Street and Madison (Figure 9, Architectural Resource 7), it was determined to be not eligible for listing on the NRHP.

The ***area of potential effects (APE)*** is the geographical area or areas where a project may, directly or indirectly, cause changes in the character or use of any historic properties that may be present. The APE is influenced by the scale and nature of the project. Different kinds of effects have different APEs—for example, there is a different APE for archaeological resources than for architectural resources.

Figure 9. Location of Architectural Resources Identified by MoDOT Survey

Nine archaeological surveys were conducted previously, with two archaeological sites identified. Two of the nine previous surveys conducted, one in 1999 and one in 2005, were near the proposed build alternatives. Neither of these surveys identified archaeological sites eligible for listing on the NRHP.

Route 47 Survey Results

The cultural resource survey results for this project were recorded in a report—*Cultural Resources Survey, Warren and Franklin Counties, Route 47 Bridge Project, MoDOT Job Number J3P2155*—that was submitted to the State Historic Preservation Office (SHPO) for review and comment. The SHPO concurred in a February 26, 2010, letter with MoDOT's recommendations about eligibility of resources and project effect on those resources. A copy of the SHPO letter is located in Appendix A. The survey results are summarized below.

Route 47 Bridge The Route 47 Bridge was built in 1934–36 and is a superlative example of a large-scale truss bridge constructed at an important Missouri River crossing. Bridge K0969 is a steel, five-span rigid-connected cantilever through truss with two Warren deck truss and two steel deck girder approach spans. The bridge is 2,562 feet long with a roadway width of 22 feet. It is eligible for the NRHP under Criterion C for significance in engineering and possibly Criterion A for significance in transportation.

Both proposed build alternatives—the preferred, adjacent upstream and the adjacent downstream—would require removal of the bridge, thus having an "adverse effect" on those qualities that make the bridge eligible for listing in the NRHP. The no-build alternative would have "no adverse effect" on the historic bridge. This EA includes a draft MOA detailing the mitigation measures that MoDOT will complete before the bridge is removed. The MOA also identifies how any unanticipated discoveries would be handled.

Architecture The architectural survey used an APE of the project footprint plus 100 feet on the north side of the river and 50 feet on the south side of the river to allow consideration of both direct and indirect project effects. All architectural resources within the APE were identified and those built before 1970 were photographed. All resources were identified on project maps and included in the survey results, regardless of age.

A National Register Multiple Property Documentation Form (MPDF), the *Historic Resources of Washington, Missouri,* was prepared for the City of Washington and was accepted by the NRHP in 2000. This form sets requirements for buildings in Washington to be considered eligible for the NRHP.

The architectural survey identified nine properties with buildings within the APE for the build alternatives, summarized in Table 7. Three of these properties had buildings constructed after 1970, Architectural Resources 1, 2, and 9. Five of the remaining properties (Architectural Resources 3, 5, 6, 7, and 8) had buildings that were constructed in the early to mid-twentieth century, were common architectural styles, or had been altered. These eight properties did not meet NRHP age requirements, have significance in local history, or meet the eligibility requirements set in the *Historic Resources of Washington, Missouri MPDF*. Figure 9 (previous page) shows the locations of the resources.

Table 7. Results of Architectural Survey

Architectural Resource (AR)	Description	Eligibility Assessment
1	Butler buildings & grain bins	not eligible
2	Ranch style house	not eligible
3	circa 1950, Ranch style house	not eligible
4	circa 1868 and 1917, brick I-house form house	not eligible
5	circa 1965, Minimal Traditional house	not eligible

6	circa 1955, brick Four Square form house	not eligible
7	circa 1940, Colonial Revival style house	not eligible
8	circa 1940, Colonial Revival style house	not eligible
9	commercial building	not eligible

Architectural Resource 4 (the Schymos House) required additional study to determine its age, significance, and integrity. It is a two-story, I-house form building with brick and aluminum siding, asphalt shingle gable roof, and a "U" shape plan. The house has an asymmetrical window pattern that is not characteristic of the I-house form. The house's stone foundation is different under the southwest corner of the house than the main façade. An 1869 birdseye map of Washington shows a house in the location of this property; however, the window patterns do not match the existing house. Part of the house shown on the map may have been incorporated into the existing house, likely in the southwest corner, or the existing house may have been constructed completely in 1917.

Architectural Resource 4—the Schymos House

After the historical research into the Schymos House, the property was evaluated against the historic contexts and property types identified in the *Historic Resources of Washington, Missouri MPDF*. There were two historic contexts the property could be associated with—Early Development and German Immigration 1839–1870 and Assimilation and Twentieth Century Development 1905–1950—and the building property type I-house, a sub-type of the Neoclassical Styles.

Although part of the house may have been constructed as early as 1868, based on available information it was hard to determine just which parts of the house might be from that early construction date. Therefore it was determined the house did not represent the Early Development and German Immigration 1839–1870 context. The registration requirements for the Neoclassical Styles property types require a building to be a good representative of the style and exhibit sufficient integrity to be easily recognizable to the period of significance. The Schymos house was constructed later than the examples of Neoclassical Style houses that have been listed on the NRHP in Washington and is not a good representative example

of an I-house form. In addition, without considerable research into the history of the property the construction date of the house could not be determined because of the anachronistic architectural style. For all of these reasons the Schymos house was recommended as not eligible for the NRHP. The SHPO concurred with that recommendation; however, they asked that archival quality photographs be taken before demolition of the building if the selected alternative requires the house to be demolished.

Archaeology The United States Army Corps of Engineers (COE) map *Abandoned Shipwrecks on Missouri River Channel Maps of 1879 and 1954* (COE 2000) shows the location of the river channel as it was mapped in 1879 and 1954. The map shows that north of the river the entire area of the floodplain that would be affected by construction of the bridge and associated roadway was part of the active channel in 1879. Since the soils formation in this area occurred between 1879 and 1954, it will not contain prehistoric or early historic archaeological sites. The map data was field verified by excavating a series of deep tests with a 6-inch diameter manual bucket auger and screening the excavated soil for cultural artifacts. No prehistoric artifacts were encountered in any of the auger tests.

One test in the adjacent downstream alternative yielded a small amount of charcoal, burnt brick fragments, and a piece of burnt clay. An additional eight tests were excavated near these finds. No additional cultural material was found and the presence of water-worn pebbles indicates that the charcoal, brick, and burnt clay in the positive unit were washed in during flooding. South of the river, the land below the bluff was also deposited between 1879 and 1954. The area has been severely disturbed and does not have intact archaeological sites. The bluff top has been extensively disturbed by road and residential construction, landscaping, and the placement of utilities. Shovel testing and coring with an Oakfield probe confirmed that the area was highly disturbed by the growth of the city of Washington.

Two shipwrecks, the Ben West and the Mae Bryan, occurred near the proposed bridge locations. The Ben West, a side-wheel steamship built in 1849 sank near Washington on August 10, 1855, while carrying a cargo of lumber from St. Louis to Lexington, Missouri. Various locations reported for the Ben West sinking include west of the preferred (adjacent upstream) alternative, near Washington, in Augusta Bottoms below Washington, and downstream from the project at South Point. Although the location of the sinking is uncertain, no evidence suggests that it is in the footprint of the proposed new bridge at Washington.

The Mae Bryan, a center-wheel ferry that provided many years of service at Washington, was reported to have sunk at Washington in 1898. After the ferry service became unprofitable, the boat was tied to shore near the Missouri Pacific depot and in 1898, the hull dried and the boat sank. A U.S. government dredge raised it in 1937, although the records are unclear as to its final disposition. Being raised by a dredge suggests that it was removed from Washington and the remains discarded elsewhere.

Summary

The SHPO concurred on February 26, 2010, with the MoDOT's Section 106 finding that the Route 47 Bridge K0969 is eligible for listing on the NRHP, the preferred alternative will have an "adverse effect" to the bridge, and that no other historic properties were identified in the area of potential effects (APE). A draft Memorandum of Agreement among the Federal Highway Administration, MoDOT, and SHPO on how MoDOT will mitigate the adverse effect to the Route 47 Bridge is included with this EA. An executed MOA will accompany the NEPA decision document.

13) PUBLIC LANDS & POTENTIAL SECTION 4(f)/SECTION 6(f) PROPERTIES

Section 4(f) is part of the Department of Transportation (DOT) Act of 1966 that was designed to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. A Section 4(f) eligible property must be publicly owned, except for historic sites, which could be either public or privately owned. Federally funded DOT actions cannot impact Section 4(f) eligible sites unless there is no feasible and prudent alternative.

Section 6(f) is part of the Land and Water Conservation Fund (LWCF) Act of 1965, which was designed to provide restrictions for public recreation facilities funded with LWCF money. The LWCF Act provides

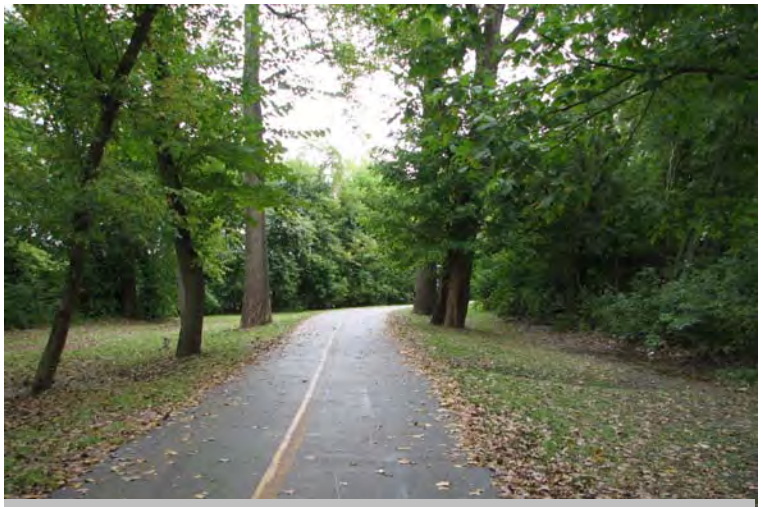
funds for the acquisition and development of public outdoor recreation facilities that could include community, county, and state parks, trails, fairgrounds, conservation areas, boat ramps, shooting ranges, etc. Facilities that are LWCF-assisted must be maintained for outdoor recreation in perpetuity and therefore require mitigation that includes replacement land of at least equal value and recreation utility.

The Katy Trail State Park, a publicly owned recreational property north of Route 47 in Warren County, is located outside the study area, approximately three miles from the bridge. Within the City of Washington, publicly owned properties with recreational components in the project vicinity include Rennick Riverfront Park at 1 Elbert Drive; the Washington Bikeway/Rotary Riverfront Trail, also listed at 1 Elbert Drive; Riverview Park at Riverview Drive and Westway Drive; Krog Memorial Park at 801 East Fifth Street, and McLaughlin Park at 1215 E. 6th Street.

The proposed project will affect the Washington Bikeway. Also known as the Rotary Riverfront Trail in the section bordering the Missouri River due to a private donation, this paved 12-mile long facility is owned by the City of Washington. This trail passes directly under the Route 47 Bridge. Although the recreational riverfront section of the trail is not open to motorized vehicles, the trail is also routed extensively through Washington's streets, where it shares the road with regular vehicular traffic.

Washington Bikeway on Route 47

To ensure public safety, the portion of the trail that passes under the bridge will be closed as a temporary easement when the affected area is under construction. Temporary easements are not subject to Section 4(f) provided that they meet certain conditions. The officially recognized entry to this part of the trail system is well west of the bridge, at Rennick Riverfront Park. The proposed project will not affect this entrance. The section of the trail that will be temporarily closed is not subject to Section 4(f) in this instance because such closure will:



Washington Bikeway/Rotary Riverfront Trail

- be of short duration and less than the time needed for construction of the project,
- result in no change of ownership or retention of long-term interests in the land for transportation purposes,
- not result in any adverse change to the activities, features, or attributes that are important to the purposes or functions that could qualify the resource for protection under Section 4(f), and
- include only a minor amount of land.

The City of Washington's Parks and Recreation Department is aware of the proposed action and is strongly in favor of the project (see Appendix A).

The Route 47 Missouri River Bridge, Bridge K0969, is a historic property. Since both considered build

alternatives—the preferred, adjacent upstream and the adjacent downstream—would have an "adverse effect" on the bridge, a programmatic Section 4(f) evaluation will be included with the NEPA decision document.

There are no other Section 4(f) or Section 6(f) issues associated with this project.

14) HAZARDOUS WASTE SITES

MoDOT environmental staff conducted a records review and on-site inspection for the project area. The following sources were searched for potential hazardous and solid waste concerns: Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); National Response Center Hotline data base; Missouri Department of Natural Resources (MDNR) Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri, Fiscal Year 2009; MDNR Missouri Hazardous Waste Treatment, Storage, and Disposal Facilities List; MDNR Solid Waste Facilities List; MDNR Underground Storage Tank (UST) database; Center for Agricultural, Resource and Environmental Systems; and Missouri Petroleum Storage Tank Insurance Fund database.

Based on the sources reviewed and the on-site visit, no sites were found within the project area. The potential to encounter wastes from sites unknown to MoDOT should always be a consideration. Any previously unknown sites that are found during project construction will be handled in accordance with federal and state laws and regulations.

If regulated solid or hazardous wastes are found during construction activities, the MoDOT construction inspector will direct the contractor to cease work at the suspect site. The construction inspector will contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the construction office and the contractor will develop a plan for sampling, remediation and continuation of project construction. Independent consulting, analytical and remediation services will be contracted if necessary. The Missouri Department of Natural Resources will be contacted for coordination and approval of required activities.

There will be no lead paint removal from the superstructure prior to demolition. Any major bridge work or demolition requires asbestos inspection and notification and demolition notice to MDNR. MoDOT conducted an asbestos inspection for the 2009 bridge rehabilitation project and no materials containing asbestos were found.

15) CONSTRUCTION IMPACTS

During construction of either proposed build alternative, the preferred (adjacent upstream) alternative or the adjacent downstream alternative, there would be some short-term, temporary adverse impacts near the proposed action, including noise, dust, and pollutants discharged by construction equipment as well as impacts to motorized and non-motorized traffic and to businesses in the area. Although it would be virtually impossible to totally avoid the kinds of short-term impacts typically associated with the construction phase of a highway project, generally these are among the most readily mitigated impacts. Pollution control measures outlined in the Missouri Standard Specifications for Highway Construction will be used to minimize impacts associated with the construction of any alternative; these measures pertain to air, noise, and water pollution as well as traffic control (e.g., detours) and safety measures. Best management practices will be employed to minimize or mitigate potential impacts.

Although the no-build alternative would not involve construction, over time it would require maintenance activities on the existing bridge, with traffic stoppages and idling of vehicles because of lane closures being the most notable impacts. Even routine maintenance of the existing, narrow bridge can be expected to cause a greater impact than maintenance of the wider build alternatives. Since this type of work necessarily disrupts traffic whenever one lane on the bridge is blocked, reduced traffic flow/increased travel time can be expected to exceed that for maintenance of the build alternatives. Short-term impacts such as noise, dust, and pollutant discharges from maintenance activities associated with the no-build would be mitigated in a similar manner to those from the build alternatives.

Air Quality

Air quality concerns associated with bridge construction typically arise from the operation of construction equipment such as barges and cranes. Similarly, equipment such as bulldozers, haul trucks, and pavers are used in the construction of the roadways that approach the bridge. All of these types of equipment use diesel engines that put out exhaust gases similar to those from commercial river barges and over-the-road trucks. The level of contaminants in the exhaust can vary greatly depending on the condition of the equipment, thus making it important to keep equipment in good operating condition. Emissions from construction equipment will be controlled in accordance with emission standards prescribed under state and federal regulations.

Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) will be removed from the project, burned, or otherwise disposed of by the contractor. Burning of trees and brush that were cleared from the construction area is another potential air quality concern. Any burning, when permitted, will be conducted in accordance with applicable local laws and state regulations. Contractors are no longer allowed to burn construction debris such as plywood or cardboard containers, and they must monitor their brush fires. Man-made waste must be hauled to a landfill, so the smoke generated by this activity is little different from that of a natural forest fire.

Contractors must comply with all federal, state, and local laws and regulations. They must also work within the requirements of their operating permits issued through the Missouri Department of Natural Resources. Air quality during construction will be protected to generally accepted levels through project site monitoring and enforcement of these various requirements.

Under dry conditions, heavy traffic or strong winds can cause dust from the soil itself to become airborne (fugitive dust), resulting in air quality impacts. Contractors are required to control this fugitive dust to keep it from leaving the project limits, just as they must make efforts to control soil particles that stormwater tends to carry away. This is typically accomplished by watering the ground during dry periods to keep the dust down.

Noise

Probably the most noticeable noise generated during construction of a bridge comes from the pile driving operation. The bridge would likely incorporate piling in the foundation designs for the bridge piers that rest on land, on both sides of the river. Driving pile is much like ringing a bell, in that the sound travels long distances. The pile being driven in on both the north side of the river and the south side would probably be heard very well along the river front in Washington. For this reason as well as the hospital located nearby, MoDOT will prohibit pile driving at night. In any case, this activity would be short in duration, lasting days or weeks until the work was completed.

Other less obtrusive noise from the operation of equipment such as cranes, bulldozers, and trucks could also be expected. This type of noise tends to blend in more with the normal sounds of a city, especially a city such as Washington with significant amounts of truck traffic traveling through. To reduce the impacts of construction noise, MoDOT has special provisions in the construction contract requiring that all contractors comply with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Construction equipment will be required to have mufflers constructed in accordance with the equipment manufacturer's specifications.

Use of explosives could be expected for demolition of the trusses and bridge piers. These blasts would be expected to be limited in number and will be scheduled for day-time occurrence to avoid disrupting residential and hospital night-time quiet.

Protected Habitat

The Missouri River corridor provides habitat for a number of species of animals that have federal and state protection. Certain trees offer roosting opportunities for the federally endangered Indiana bat in the summer. Suitable roosting trees will be removed during the period between November 1 and March 31 to

avoid possible direct impacts to Indiana bats during the summer maternity season. If potentially suitable roost trees must be cleared during the April 1 to October 31 Indiana bat maternity season, additional field surveys and possible informal consultation with the FWS may be necessary.

Pallid sturgeon migrate through the entire Missouri River system, using different habitats for spawning, feeding, nursery, and over-wintering areas. Temporary construction impacts, duration, and size are unknown at this point. Demolition of the existing bridge will occur after construction of the new bridge is complete. MoDOT will evaluate project impacts in the floodplain and in the Missouri River as well as the potential for dredging and its associated impacts, if necessary, during the design phase. The habitat diversity of the impact area for construction of either build alternative and demolition of the existing bridge is unknown at this time. If necessary, conditions will be placed in the construction contract to avoid negatively impacting pallid and lake sturgeon by temporary and permanent construction impacts.

.

Swallows often nest on bridges during the spring and summer breeding season. In Missouri, it is generally accepted that swallow nests could be occupied between April 15 and July 15. If any are found nesting on the existing bridge, exclusionary measures will be used and seasonal restrictions will be followed to avoid conflicts with the Migratory Bird Treaty Act. Screen panels installed to prevent swallows from nesting on the existing Route 47 bridge piers before the 2009 rehabilitation project were left on the bridge after the project was completed and MoDOT plans to leave the exclusionary screens on the bridge until it is demolished following construction of a new bridge. If necessary, additional measures will be taken and/or seasonal restrictions followed prior to demolition to avoid conflict with the MBTA.

Water Quality

Preventing water quality impacts on a major bridge project presents some slightly different challenges than a road construction project. Controlling erosion during construction of the roadway approaches is certainly important but work in the river itself must be given special attention. Bridge construction uses barges and when the water level drops too low, the river must be dredged to deepen the channel so the barges can maneuver. The dredged material must then be disposed in some manner. In the past, the U.S. Army Corps of Engineers (COE) has allowed dredged material to be returned to the river.

The Missouri Department of Natural Resources (MDNR) regulates the control of runoff from land disturbance and issues a permit for the work to MoDOT, not to the contractor. Erosion control measures must be put in place as land clearing begins. As discussed earlier in “4) WATER QUALITY,” MoDOT's Pollution Prevention Plan provides for temporary erosion and sediment control measures that will be included within construction contract specifications. Careful refueling practices will limit spills of gasoline and diesel fuels. Oil spills can be minimized by frequent checks of construction equipment.

Traffic Control/Safety

One of a contractor’s first tasks on a construction job is to set up traffic control, that is, the warning signs, channelizers, and barricades needed to keep traffic safely in the right place and out of the way of the contractor’s operations. On a bridge project over a navigable river such as this, river traffic is a concern in addition to highway traffic. The proposed project would require controlling not only river and highway traffic, but railroad and pedestrian traffic as well. Some disruption is inevitable; however, minimizing it and planning ahead for its impact is key to a successful project.

Constructing a new bridge near the old one would have some impact on traffic in the immediate area as the contractor’s forces work around the project site. Vehicles bringing materials in and out would add to the existing traffic. A Traffic Management Plan (TMP) will be developed during project design. A TMP lays out a set of coordinated traffic management strategies to manage the work zone impacts. Proposed strategies for managing traffic on this project include staging construction to impact traffic as little as possible, conducting active public information and outreach, scheduling high-impact work for hours of off-peak traffic, installing temporary traffic control devices, and possibly enlisting the help of law enforcement, if necessary.

Barges floating in the river would be used throughout the bridge construction work. The river’s navigation channel would need to be kept clear during the navigation season. It is anticipated that river traffic would

only be halted if demolition of the old bridge was done during the navigation season. MoDOT will coordinate with the United States Coast Guard to schedule the time and duration of any closures. Materials for the bridge would have to be loaded onto barges and brought by river to the north shore, where there is enough open ground between the end of the proposed bridge and the river bank to load and unload material such as concrete and steel. Using this location would reduce temporary impacts to the developed park area on the south side of the river.

The existing Route 47 bridge and both proposed build alternatives cross over Rennick Riverfront Park and the Washington Bikeway/Rotary Riverfront Trail. MoDOT would likely close a portion of the park and walking trail during construction of the bridge piers on the south side of the river to allow working room and to protect people from falling objects. Such closure would only be temporary and the affected area of the park would be reopened upon completion of the work. The City of Washington, which owns the park, has indicated a willingness to allow this.

Staged construction would be used to tie the new bridge into the existing Route 47 alignment. Just enough of the new bridge (the southbound shoulder and driving lane and part of the northbound lane for the adjacent upstream alternative or the bike/ped lane, northbound shoulder and driving lane, and part of the southbound lane for the adjacent downstream alternative) would be constructed to safely carry two-way traffic before the south end of the old bridge is demolished. Once enough of the old bridge is removed, the remainder of the south end of the new bridge and roadway (rest of the northbound lane, shoulder, and bike/ped lane for adjacent upstream or rest of the southbound lane and shoulder for adjacent downstream) would be completed and traffic would be shifted to the proper lane locations. The northern tie-in would be handled similarly, with only the roadway needing to be built in stages. It is expected that some day- (or night-) time lane closures would be needed to make the tie-ins, but MoDOT will require the contractor to flag traffic during these times and to keep back-ups to a minimum.

Prior to each week's scheduled work, MoDOT will send a news release out to local newspapers and radio stations giving local commuters information about construction activities that could impact their daily travels. MoDOT also publishes construction-related news releases and information on its web site at www.modot.org for those who have Internet access. Work zone impacts and issues would vary through the different stages of construction, making these timely announcements a valuable part of the Traffic Management Plan.

Railroad

The Union Pacific Railroad runs approximately 40 trains per day on their tracks that pass under the existing bridge (and both proposed new bridge locations) near the southern riverbank. The bridge contractor will coordinate with the railroad to schedule setting girders and handling other materials over the railroad tracks, to avoid interrupting train traffic. It is not anticipated that rail traffic would be impacted by construction, although company flagmen will be on-site whenever there is active construction on railroad right-of-way. Construction of bridge piers nearby would require flaggers during construction operations. All flagging costs would be borne by MoDOT.

Utilities

Several utilities on or near the existing Missouri River bridge may be impacted by the eventual removal of the historic bridge. Various utilities are located either within or outside the right of way off either end of the bridge. L3 Communications has a fiber optic communications line carried under the bridge deck and the City of Washington Schools has a fiber optic line carried through one of the bridge rails. Ameren runs a power line over the top of the bridge and MoDOT runs an electrical service line through the bridge rails to power the navigation and street lights on the bridge.

The owners of the two private communications lines and the power lines already attached to the bridge will be given the opportunity to attach to the new bridge, through conduits either embedded in the rail or suspended under the bridge deck. There will be costs associated with the attachments, however, and the utilities would be required to pay for the conduits and for future maintenance.

Ameren, Missouri Natural Gas, SBC, and Sprint serve area customers through facilities near the bridge

approaches. To avoid impacts, these lines will need adjustment before construction. Details of utility disposition will be determined during project design. Lines outside the existing right of way will be moved at MoDOT's cost. Under the agreement allowing utilities on MoDOT's right of way, the utilities will bear the cost of relocating lines currently on the right of way. MoDOT's utility engineers and representatives of the utilities will work out details of individual utility adjustments on a case-by-case basis.

16) OTHER

There are no other additional impacts to consider.

WILL THE PROPOSED PROJECT RESULT IN ANY CONTROVERSY? YES [ ] NO [X]
(If yes explain):

Although any project offers potential for controversy, community involvement and comments from three public meetings held between June 2008 and December 2009 have indicated desire and support for a new bridge. MoDOT has attempted to keep the public involved and informed during the NEPA process and no controversy has been voiced as yet.

COMMENTS AND COORDINATION*:*

A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) was published in the *Federal Register* April 22, 2008. Both the National Environmental Policy Act (NEPA) and Section 6002 of the 2005 federal transportation reauthorization bill require opportunities for the public as well as federal, state, and local governmental agencies to comment and provide information about proposed federal-aid projects. Section 6002, which applies to all transportation projects requiring an EIS, established additional requirements for the environmental review process, including the preparation of a Coordination Plan for Agency and Public Involvement, a project-specific plan that identifies how input from agencies and the public will be solicited and considered. Because MoDOT and FHWA originally initiated an EIS for the Route 47 project, a coordination plan was prepared. A coordination plan is not required with an Environmental Assessment (EA).

The Route 47 coordination plan outlined how MoDOT would communicate information about the Route 47 EIS to agencies and to the public to actively encourage comment throughout the study process. The plan identified public meetings as well as agency collaboration points at which specific information would be provided for review and comment by the public or by participating state and federal agencies. Much of the identified coordination with the public and agencies had already occurred before the decision was made to rescind the Notice of Intent to prepare an EIS and develop an EA for a bridge replacement only. Therefore, coordination that occurred during the initial stages of EIS development is summarized here. All written communications referenced in this section are included in the appendices. Table 8 (page 61) documents significant project coordination milestones.

Early Agency Coordination

Project information packets, an invitation to attend an interagency scoping meeting for the Route 47 Bridge EIS, and requests to accept cooperating or participating status were sent on May 12, 2008, to the following agencies and tribal governments: COE–Kansas City District, COE–St. Louis District, USCG, U.S. Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), U.S. Fish and Wildlife Service (FWS), NPS, Natural Resources Conservation Service (NRCS), Missouri Department of Conservation (MDC), Missouri Department of Natural Resources (MDNR), Missouri State Emergency Management Agency (SEMA), Boonslick Regional Planning Commission, East-West Gateway Council of Governments, Warren County, Franklin County, City of Washington, City of Marthasville, Choctaw Nation of Oklahoma, Delaware Nation of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Indian Tribe of Oklahoma, Miami Tribe of Oklahoma, Osage Nation of Oklahoma, Sac and Fox of the Missouri in Kansas and Nebraska, Sac and Fox Nation of Oklahoma, and Sac and Fox Tribe of the Mississippi in Iowa. Sample cover letters are included in the

appendices.

The U.S. Coast Guard (USCG) agreed to serve as a Cooperating Agency for the project in a letter dated May 22, 2008. The agency stated that the EIS should contain "data on the number, size and types of vessels currently using the waterway" and that information "should be compared with past and projected future trends on the use of the waterway." The requested information is included in "6) NAVIGABLE WATERWAYS" of this EA.

The U.S. Army Corps of Engineers (COE) Kansas City District agreed to serve as a Cooperating Agency for the project in a letter dated May 29, 2008.

The National Park Service (NPS) staff at Lewis and Clark National Historic Trail contacted FHWA by telephone April 28, 2008, concerning the NOI. The NPS voiced concern about the location of a new Missouri River bridge and potential impacts to the historic trail. The agency provided comments in a letter of May 22, 2008, stating, "Realignment of the roadway and/or bridge should avoid impacts to wetland and riparian habitats. . . Efforts to restore or reconstruct wetland areas should be a component of the improvement plan regardless of whether or not there is additional loss of wetlands due to construction activities." The NPS also pointed out the need for coordination with the FWS to limit impacts to pallid sturgeon or its habitat. MoDOT is coordinating with the appropriate resource agencies concerning potential impacts to wetlands and protected species.

The Warren County Commission accepted participating agency status for the EIS by letter of June 3, 2008.

The FAA declined to be a participating agency for the EIS in a June 5, 2008, e-mail.

In a letter dated June 6, 2008, the EPA accepted participating agency status in the development of the EIS.

A June 27, 2008, postcard response from the NPS declined to accept participating agency status for the EIS.

The Osage Nation accepted consulting party status for the EIS in a letter of July 28, 2008, and expressed an interest in attending any future scoping meetings.

The MDNR agreed to be a participating agency on the EIS in a letter of September 29, 2009.

Interagency Scoping Meeting

An interagency scoping meeting for the Route 47 Bridge EIS was held at the FHWA office in Jefferson City on May 28, 2008. A presentation of the project was given at the meeting and a draft coordination plan was handed out. Agency representatives were invited to ask questions and provide input on the project. The agencies that attended the scoping meeting were COE–Kansas City District, COE–St. Louis District, EPA, MDNR, SEMA, FHWA, and MoDOT.

During the scoping meeting, EPA staff stated that mapping and verifying jurisdictional waters should be completed early in the process along with updated floodplain mapping along both the Missouri River and Charrette Creek. EPA commented that they would be particularly interested in how MoDOT documents the indirect impacts of construction in the Missouri River floodplain for the EIS. In addition, the cumulative effects analysis should take into account any construction that disrupts the natural flood protection function of the floodplain. EPA suggested evaluating less traditional approaches to transportation design as a means of tempering or mitigating the impact of transportation structures in sensitive areas such as river floodplains.

An MDNR employee mentioned possible steamboat ship wrecks and a historic building owner in the project corridor. The EIS should also include corridors other than the existing alignment.

The COE–St. Louis District representative stated that the Kansas City District would handle this project for the COE.

EPA e-mailed (June 5, 2008) comments on the draft coordination plan distributed at the scoping meeting. The comments concerned the purpose and need, EPA's responsibilities under Section 309 of the Clean Air Act, and the issue of agency "support" at each collaboration point.

Additional Coordination

MoDOT contacted the SEMA by letter of January 23, 2009, to officially notify the agency of MoDOT's intent to replace the bridge within the next 5 to 10 years and request guidance on SEMA requirements for the hydraulic design of the new structure needed to meet No-Rise Certification criteria and obtain approval of the Floodplain Development Permit application. Additional information was requested regarding flood elevation discrepancies between the current 1999 FEMA Flood Insurance Study for Warren County and the 2003 COE Missouri River Hydraulic Analysis and advice on which hydraulic study to use for the hydraulic design of the new structure. SEMA replied to MoDOT's request in a letter dated February 5, 2009, stating that they considered the Upper Mississippi River System Flow Frequency Study (UMRSFFS) as the best available data at this time and would support and encourage its use in completing a no-rise certificate. The agency also stated that an update to the Flood Insurance Study (FIS) could occur within the next 5 years and most surely would include adding the UMRSFFS to the FIS. SEMA stated they did not have any concerns with the discrepancies in flood elevations.

In a letter of January 27, 2009, to the USCG, MoDOT requested advice on the minimum clearance requirements for the navigational channel for a new bridge and whether any change from the present centerline of navigational channel location would be needed. MoDOT also asked for the specific water surface elevation to be used for the required minimum vertical clearance. The USCG responded in a letter dated March 9, 2009, with information on horizontal and vertical navigation clearances and navigation span pier placement.

Meeting with USCG

MoDOT staff met with the USCG at their St. Louis office on April 2, 2009, to discuss the project. A project description and overview along with the known environmental and cultural resources were presented to Coast Guard staff.

The USCG expressed an expectation that, regardless of the build alternative selected, after construction is completed there will be only one structure in the river. The Coast Guard staff noted that the right descending span of the right descending bank is the crucial navigational point for clearance. The span between piers 4 and 5 is the most critical since it is a well established navigational location. The vertical clearance at this span for tows was discussed regarding the 2% flow line and its relation to the elevation of the lowest point of the bridge structure.

The USCG stated their preference for an upstream location primarily from a navigation perspective since the river bends left almost immediately downstream of the existing bridge. An upstream location would allow tow pilots the ability to more easily navigate the bend and the wing dikes.

A letter from the USCG, dated May 4, 2009, summarized navigational requirements relating to pier location for the navigation span, auxiliary span, and elevation for a new bridge discussed at the April 2 meeting. Those were that "the new span's piers must align with those of the existing navigation span and its low steel elevation shall be a minimum of 540.3 feet, mean sea level." The letter recalled the discussion that the low steel elevation of the new bridge outside of the navigation span may be reduced to a lower elevation than the existing structure. In addition, the letter clarified that further investigation revealed there is no official, established, or maintained navigation channel through the auxiliary span. As such there will be no requirement for the replacement bridge to match the auxiliary span of the existing bridge. Finally the USCG reiterated their understanding that the old bridge will no longer be used and will therefore be removed. They stated that they would have to review a bridge demolition plan for specific removal conditions and requirements, but generally a 24-hour period is allowed to clear the navigation channel and remove piers to a predetermined elevation.

A June 3, 2009, letter from the USCG referred to a May 26, 2009, email regarding low steel elevation requirements for the bridge. The June letter mentioned the agency's May 4 letter to MoDOT concerning the determination during the April 2 meeting that because of discrepancies in accuracy of the two percent flowline at the project site, low steel elevation of the new bridge would have to match that of the existing bridge (540.3 feet mean sea level). The USCG stated that after careful review and consideration they would "allow the proposed bridge to have a low steel elevation of 533.0 feet mean sea level (1929 datum) in the navigation span."

Agency Collaboration Point 1

For the first collaboration point in the Route 47 EIS environmental review process, materials were mailed to a number of resource agencies on October 27, 2009. The package included a draft purpose and need statement, maps displaying the initial alternatives considered, and the draft coordination plan for agency, tribal, and public involvement on the EIS. The collaboration point 1 materials were sent to following agencies: USCG, COE–Kansas City District, EPA, Federal Emergency Management Agency (FEMA), FWS, NRCS, MDC, MDNR, SEMA, City of Washington, and Warren County. A package of materials described above was also provided to the Osage Nation of Oklahoma in response to the tribe's request to consult during the EIS development. See appendices for sample cover letters and all agency responses.

A letter from the COE dated December 4, 2009, expressed that agency's concurrence with the Purpose and Need and Initial Range of Alternatives provided at Collaboration Point 1. The agency recommended completing wetland delineations to help narrow the range of alternatives. MoDOT generally uses GIS, in combination with National Wetland Inventory (NWI), aerial, and topographic mapping for preliminary screening of alternatives. The results of the wetland GIS analysis are used to compare/contrast impacts and provide the tools necessary to facilitate the decision-making process. Per previous coordination with the COE, MoDOT completes wetland delineations only for the preferred alternative on EISs and, for EAs, completes the delineation of the selected alternative post-NEPA, when access to properties is obtained.

In an e-mail response dated November 30, 2009, EPA recommended modifying the project purpose statement from ". . . provide a safe and efficient Route 47 Missouri River crossing for the long term" to "provide a safe and efficient Missouri River crossing for the long term" so as to not limit the project evaluation and range of alternatives to preselect a connection to existing Route 47 at its present or a nearby crossing location. The agency suggested that the listing of needs "should exclude remedies, approaches or alternatives (i.e., wording using 'address', 'improve', 'maintain', 'preserve', 'provide')." Additional information was requested on the identified safety need for the project.

EPA voiced concern about eliminating floodplain options before completing the purpose and need statement, questioned whether the No-Build option included the removal of the existing bridge with no replacement, and stated that the DEIS should describe when and why alternatives were eliminated from further consideration. EPA called attention to the need for information on roadway modifications for any of the existing or other corridors identified that might cause direct and indirect impacts to the floodplain environment. Additional comments were provided on the revised coordination plan. MoDOT responded to EPA's comments via a December 14, 2009, e-mail.

The FWS requested (11/27/09 e-mail) and was granted (11/30/09 e-mail) a 15-day extension to comment. In a December 4, 2009, e-mail the agency asked whether constructing a bridge above the floodplain using a pier or pillar design was considered as an alternative and, if so, why it was eliminated. MoDOT's December 9, 2009, e-mail response is included in the appendices.

The FWS commented on the Collaboration Point 1 materials by e-mail on December 14, 2009. The FWS recommended that "the Purpose also include an acknowledgement that the project should also be consistent with the natural habitats and functions of the Missouri River and floodplain within the project area." Additionally, the agency stated, "Project alternatives should be developed that would avoid losses to wetlands, forests, and nearshore habitats. If possible, construction activities (e.g., tree clearing) should take place outside the most sensitive seasons (i.e., nesting, roosting)." The FWS noted the importance of the Missouri River and floodplain to bald eagles and recommended "retaining mature trees wherever

possible in the project area, particularly near the shoreline, and establishing a native riparian buffer zone where vegetation is currently sparse" to reduce the loss of bald eagle habitat. Lastly, the agency provided information on the pallid sturgeon, Indiana bat, and gray bat with recommendations on avoiding impacts to these species. MoDOT responded to the FWS comments in a March 9, 2010 e-mail.

The MDNR responded by letter on November 30, 2009, expressing appreciation that alternatives are being evaluated before the bridge is a critical safety issue and that an elevated roadway option through the floodplain was eliminated from further consideration. The agency noted looking forward to greater detail in future documents of how "alternatives would meet the needs of KATY Trail users, both on the bridge itself and on Highway 47 north of the river."

A November 16, 2009, letter from Warren County stated a desire for "one lane construction at a time for the bridge, or a bypass system be put in place because of the amount of traffic the bridge handles at any one time." The Warren County Commission also voiced "great concern" about inconvenience to schools, hospital, residents, emergency response, etc. MoDOT recognizes the Warren County Commission's concerns about the effects that a complete closure of the Washington bridge river crossing would have on its users and commits to constructing the new bridge in a manner that will allow for virtually uninterrupted traffic.

Agency Collaboration Point 2

MoDOT advised the agencies by e-mail update December 10, 2009, that Collaboration Point 2 information would be provided in January 2010, after the public had an opportunity to comment on alternatives proposed to be carried forward for detailed analysis.

The EPA commented via a December 14, 2009, e-mail on MoDOT's project status update. The agency expressed concern that "the information provided in the 'Initial Range of Alternatives Screening Results' matrix describing the screening factors as they are applied to each of the current alternatives is not detailed enough to support the conclusions described in the 'Preliminary Screening Highlights Potential Alternatives to Be Retained for Detailed Analysis.'" An additional concern was expressed "that we have proceeded to the second collaboration point without knowing your final determination regarding project 'purpose and need.'" The "ALTERNATIVES CONSIDERED" section of this EA describes each of the alternatives considered during the early stages of project development and discusses the reasons that various alternatives were not carried forward for detailed analysis. EPA's concern about finalizing project 'purpose and need' was addressed in MoDOT's December 14, 2009, e-mail response to EPA's November 30, 2009, comments on Collaboration Point 1.

Materials for the second collaboration point in the Route 47 EIS environmental review process were sent to agencies on January 22, 2010. The information included a summary of the alternatives retained for detailed analysis in the environmental document with a description of the alternatives and a discussion as to their ability to meet the purpose and need, the initial alternatives screening results used to determine which of the initial alternatives would be retained, location maps of the alternatives retained for detailed analysis, revised purpose and need statement with substantial changes, revised coordination plan with changes, methodologies to be used for impact assessment and level of detail needed for analysis of each alternative, maps showing the footprint of the project alternatives, and the draft coordination plan for agency, tribal, and public involvement on the EIS.

The collaboration point 2 materials were sent to USCG, COE–Kansas City District, EPA, FEMA, FWS, NRCS, MDC, MDNR, SEMA, City of Washington, and Warren County. The materials were also provided to the Osage Nation of Oklahoma in response to the tribe's request to consult during the EIS development. Sample cover letters are included in the appendices along with any agency responses. A January 26, 2010, e-mail was sent to the agencies advising of an incorrect deadline for comments date contained in the mailing and stating the correct date of February.

The COE requested by letter of February 18, 2010, a two-week extension to review and comment on Collaboration Point 2. The request was granted via telephone call. The COE subsequently provided comments in a March 8, 2010, letter, recommending that MoDOT provide further explanation on the

analysis of the eleven initial alternatives. The agency pointed out that before a permit is issued a descriptive analysis will be required to show that "the least environmentally (aquatic) damaging, practible, alternative that meets . . . project purpose and need" was selected. Additionally, the COE repeated their previous suggestion that a wetland delineation of the project site be completed. This EA discusses in detail under "ALTERNATIVES CONSIDERED" the reasons each of the initial alternatives were either dropped from detailed consideration or carried forward for evaluation in this document. As stated previously (Agency Collaboration Point 1, letter from the COE dated December 4, 2009), MoDOT will complete a wetland delineation of the selected alternative when access to properties is obtained.

EPA commented on the second collaboration point in a letter dated February 26, 2010. The agency objected to the change in the project purpose statement, considering it to be narrower than the previous purpose statement and not supporting a robust range of alternatives. EPA stated that the purpose statement as proposed would "implicitly eliminate many alternatives, including your 'no action' alternative. . . . As currently proposed, the project's purpose statement precludes selection of MoDOT's 'no build' alternative and, therefore, this alternative is not a 'real' alternative for public evaluation." The agency also commented on the lack of "detail necessary to support a reduction in the range of alternatives" in the materials provided and recommended that MoDOT "expand its justification for the elimination of alternatives from further analysis in the EIS." MoDOT and the FHWA agree with the EPA that correctly defining the purpose and identifying the needs for a considered transportation project is crucial to developing an appropriate range of initial alternatives. Without a well-defined, well-established, and well-justified purpose and need, it becomes difficult, if not impossible, to determine the range of reasonable and prudent alternatives to study.

Scoping and design for the 2009 bridge rehabilitation was added to MoDOT's Statewide Transportation Improvement Program (STIP) in May 2007. Following the August 1, 2007, I-35 bridge collapse in Minneapolis, MoDOT inspected the bridge and closed it for structural repairs a few days later. The Minnesota tragedy raised public concern about bridge safety in Missouri, and in September 2007, the Missouri Highway 47 Bridge Committee (citizens' group to promote a new bridge) formed to focus attention on the deteriorating condition of the existing Route 47 bridge. Scoping for an EIS and Location Study was added to the STIP and in February 2008 the first draft of the purpose and need (P&N) statement was developed, primarily based on information from the 2002 Route 47 Major Transportation Investment Analysis (MTIA). As additional information was obtained and analyzed, the statement was modified. The November 2008 version identified the primary purpose as "replace the deficient bridge over the Missouri River." In May 2009, MoDOT expanded the P&N to the broader "provide a safe and efficient Route 47 crossing over the Missouri River for the long term." Early on, safety was highlighted as a need but when data was analyzed and did not show a safety problem, it was removed from the project needs. Maintaining flexibility to modify P&N as additional information is obtained or situations change is crucial to ensuring that the alternatives considered are responsive to the transportation needs. FHWA and MoDOT as the lead agencies for the proposed project, after considering public input and comments from participating agencies, ultimately decided that it was appropriate to revert to the originally identified purpose of replacing the Route 47 bridge.

The FWS commented in a February 26, 2010, e-mail, pointing out an incorrect statement regarding the timing of consultation with the FWS as described in the Route 47 Bridge EIS, Impact Assessment Methodologies. MoDOT agrees with the FWS that "analyzing project effects to federally listed species is a critical element of an adequate NEPA analysis for a major federal construction project." MoDOT's analysis of impacts to federally protected resources began during initiation of the NEPA process and continues through to commitment of resources and construction. The Missouri Department of Conservation (MDC) Heritage Database and other available sources of information were used to determine whether there are any known locations of federal and/or state listed threatened or endangered species or designated critical habitat within the project area. Site visits and surveys were conducted to confirm the presence or absence and quality of potentially suitable habitat for federal trust resources. A qualified biologist walked portions of the preferred alternative corridor on several occasions to identify areas where sensitive species and habitats might occur. Potential impacts to protected species or habitats have been evaluated and recommended actions, or conservation measures, to avoid negative impacts will be included in the final document and carried forward through the design and construction

phases of the project. Evaluations of suitable habitat and species surveys, if needed, will be repeated during the design phase, at which time any additional avoidance recommendations and conservation measures can be incorporated. If Section 7 consultation is necessary, it will be completed prior to irretrievable commitment of resources and construction.

The Osage Nation requested (2/25/10 telephone call) detailed information regarding MoDOT's archaeological field investigations in the Missouri River bottom. MoDOT provided by letter of February 25, 2010, a copy of the formal cultural resources report that was submitted to the SHPO. On March 1, 2010, the Osage Nation requested additional time to review and comment on the results of the archaeological field investigations. In a letter of April 12, 2010, the Osage Nation stated concurrence "that the proposed FHWA Missouri Department of Transportation Route 47 Bridge Replacement in Warren and Franklin counties, Missouri will not adversely effect properties of cultural or sacred significance to the Osage Nation." The Osage stated that tribe has no preference with regard to the remaining project alternatives. The letter further stated "The Osage Nation concurs that as a part of the scoping process MoDOT fulfilled NHPA and NEPA compliance by consulting with the Osage Nation Historic Preservation Office in regard to the proposed project referenced as FHWA Missouri Department of Transportation Route 47 Bridge Replacement in Warren and Franklin counties, Missouri." In conclusion, the Osage asked that work cease immediately and the Osage Nation Historic Preservation Office be contacted if artifacts or human remains are discovered during project construction. It is MoDOT's policy to stop any ground-disturbing activities if human remains or potentially significant archaeological deposits are encountered. If either situation were to occur, MoDOT and FHWA would notify and consult with all federally recognized tribes that have expressed an interest in the project area.

The MDNR provided comments in a February 24, 2010, letter, commending MoDOT for including protected bicycle/pedestrian lanes on the new bridge. The agency pointed out that both alternatives would have similar environmental impacts, including potential to impact wetlands and a small amount of farmland, with cultural resources impact yet to be evaluated.

EIS Rescission/Preparation of EA

On April 12, 2010, a letter was sent to the USCG, COE, EPA, FWS, FEMA, NRCS, MDNR, MDC, SEMA, Warren County, and the Osage Nation of Oklahoma. The letter briefly summarized project history and reasons for changing the project scope and stated that a decision had been made to rescind the Notice of Intent and prepare an Environmental Assessment for reduced scope and termini. Follow-up telephone messages were left for the COE and USCG, which are both cooperating agencies for the EA. No comments were received about the change in NEPA documentation.

A Notice to Rescind the Notice of Intent to prepare an Environmental Impact Statement was published in the *Federal Register* June 1, 2010 (see Appendix A).

Preliminary EA

Copies of the preliminary EA were provided to both cooperating agencies—the COE and the USCG—as well as to EPA, FWS, and MDNR per their request to review the preliminary DEIS before the decision was made to prepare an EA. Their responses are included in the appendices.

The USCG stated in a letter of September 29, 2010, that the agency had reviewed the preliminary EA. The USCG also indicated the expectation that MoDOT will provide a Section 401 Water Quality Certification, a Section 106 Memorandum of Agreement, and the approved EA when the application for a bridge permit is submitted.

In a letter of October 14, 2010, the COE restated a previous comment that the EA included a sufficient number of available project alternatives for consideration. The agency recommended specifically defining why an alternative is not practicable beyond stating that it does not meet the needs or address specified deficiencies and noted that many of the eliminated alternatives did not include environmental assessment. Lastly, the COE listed additional information that will be required for a final permit determination.

MoDOT discussed with the COE reviewer the recommendation to specify why the alternatives not carried through the EA are not practicable. This information is now included under "REQUIRED PERMITS" (page 70, Table 9) for ready availability should it be determined that an individual Section 404 permit is needed. Eight of the 11 initial alternatives were found to be not practicable under Section 404(b)1 and were not carried forward for detailed analysis in the EA. Regarding the noted lack of environmental assessment for eliminated alternatives, a qualitative comparison of potential environmental, socioeconomic/community, and cultural resource considerations for the initial alternatives is provided on pages 22-23. MoDOT and FHWA NEPA documents provide a detailed environmental analysis of the alternatives that are retained for further evaluation, while those alternatives that are considered initially but not carried forward as viable solutions to the defined project needs are generally analyzed at a screening level only.

The FWS offered comments on their review of the preliminary EA in an October 6, 2010, e-mail, stating that the document "adequately characterizes in general the anticipated effects to fish and wildlife resources" from the proposed bridge replacement. The agency recommended the stated period for clearing potential Indiana bat roost trees to avoid direct take of bats should be revised to read November 1 to April 1. The EA was revised accordingly.

An October 8, 2010, e-mail from the EPA restated previous agency comments about the narrow definition of project purpose and the resulting limitations on alternatives evaluated, noting that the issue became moot as a result of the reduction in scope of the project. The EPA clarified that the agency did not disagree with the identification of the preferred alternative and further stated the preliminary EA "clearly demonstrates the need for improved access across the Missouri River in Warren and Franklin Counties, the benefits to many users of this improved access and . . . the minimal impact to the environment."

Finally, the EPA suggested that the EA "more completely characterize any potential hazards to the river resulting from demolition and salvage of the current bridge as well as any appropriate mitigation measures" and noted that "demolition should be scheduled for conditions of lower river flows and outside the reproductive and migrational season for pallid sturgeon to lessen the impact of this aspect of the project." The USGG conducts on-site monitoring of bridge demolition and salvage activities on major rivers to ensure complete removal of debris. Additionally, a MoDOT biologist will do an assessment of fish mortality related to the demolition. Temporary impacts from construction/demolition river access will be mitigated by restoring affected areas to pre-construction conditions. The second concern is already addressed, both in "SUMMARY OF IMPACTED RESOURCES: 6) THREATENED AND ENDANGERED SPECIES" and in "COMMITMENTS." MoDOT will obtain a habitat assessment for the pallid sturgeon and lake sturgeon to ascertain potential impacts and will evaluate project impacts in the floodplain and in the Missouri River during the design phase of the project. Impacts analysis will cover temporary and permanent impacts from construction and demolition on pallid sturgeon and any suitable habitat in the project area, taking into account the methods and duration of disturbance. MoDOT will also consult with FWS as appropriate regarding considerations to avoid impacts to pallid sturgeon and any suitable spawning/over-wintering habitat.

MDNR confirmed in an October 25, 2010, e-mail that the agency had no additional comments on the EA.

Table 8. Key Project Milestones

ACTIVITY	COMPLETION DATE
Notice of Intent to prepare an EIS published in Federal Register	April 22, 2008
Invitation letter sent to potential cooperating and participating agencies	May 12, 2008
Letter sent to American Indian tribes Inviting them to become Section 106 consulting parties	May 13, 2008
Interagency scoping meeting	May 28, 2008

Public meeting—solicit ideas for replacing the deteriorating bridge and improving Route 47 reliability north of the river during flooding by adding lanes across the floodplain	June 3, 2008
Refine project purpose and need	ongoing
Public meeting—get input on alternatives that were eliminated and alternatives that are still being considered	Nov. 21, 2008
Collaboration Point 1—revised draft purpose and need sent to participating agencies for review and comment	October 2009
Public meeting—seek comment on the two alternatives MoDOT is focusing on; show how some early alternatives were screened out	Dec. 15, 2009
Collaboration Point 2—initial alternative screening results, alternatives retained for detailed analysis, revised purpose and need sent to participating agencies for review and comment	Jan 22, 2010
Notice rescinding Notice of Intent to prepare an EIS published in Federal Register	June 1, 2010
Preliminary EA sent to cooperating agencies and FHWA for review	Sept. 10, 2010
Future project activities/Estimated completion dates	
EA approved	*December 2010*
EA Notice of Availability	*December 2010*
Public hearing	*January 2011*
NEPA decision document	*March 2011*

Coordination with the Public

MoDOT held a series of public meetings—June 3, 2008, November 20, 2008, and December 15, 2009—to provide information about the proposed project and obtain comment from interested parties. The 2008 meetings were advertised in the Warren County Record, the Washington Missourian, and the Marthasville Record. In addition, a news release was submitted to the three newspapers as well as to several radio stations and MoDOT e-update (email) subscribers. The November meeting was further promoted by posting flyers of the advertisement at all polling places in Washington for the November 4th election, and St. John's Mercy Hospital made oversized posters advertising the meeting for each entrance. The Northeast District and the St. Louis District worked together to promote the meetings.

The 2009 meeting was advertised in the Warren County Record and the Washington Missourian and an e-update was sent to 225 subscribers of the Route 47 Bridge project informing them of the meeting and virtual, on-line meeting.

June 3, 2008, Public Meeting and Comments

The June 3, 2008, meeting was held at the City Hall in Washington, with 26 people attending to view displays, visit with knowledgeable staff, ask questions, and submit comments. The MoDOT project manager gave a brief presentation summarizing the purpose of an environmental impact statement and explaining the process. Those in attendance were invited to share comments that evening or online at www.modot.org/northeast.

All displays and material from the public meeting were posted on the web pages, including the opportunity to submit a comment, the advertisement, and the news release. Participants who provided their email addresses were added to the project e-update subscription.

Comments voiced at this public meeting mostly supported keeping the bridge where it is because of medical and emergency services, schools, business interests, industrial infrastructure and jobs, and the airport. Medical and educational services are built around the existing bridge site. At the same time, concern was expressed about bringing traffic over a four-lane bridge (with higher speed expectations) so

close to the hospital.

One attendee voiced strong support for keeping the bridge in its present location but rerouting Route 47 through the floodplain on new location to the east extending directly to Route 94 east of Dutzow, stating that there would be no need for Augusta Bottom Road if Route 47 connected with Route 94 at the suggested location. He pointed out that recent development had occurred around Route 94 in the area suggested for the relocated Route 47 tie-in and thus relocating 47 there would really open up the area to increased new development.

Comments regarding placement of a new bridge east or west side of the existing bridge were mixed, with the additional idea of rehabbing the old bridge and adding a new bridge next to it to provide four lanes. One person suggested rehabbing the old bridge and building a new one from Route 47/94 at Marthasville across the river to Route 100 to take some traffic off the city streets. Another commented that the new bridge should be built to the east into St. Charles County for those who use the Augusta Bottoms Rd. A couple of people suggested using Route 185 as a location for a new river crossing.

Many commented that it was vital to maintain a crossing during construction and that a separate (protected) bike/ped facility is needed both across the bridge and to the KATY Trail.

The input form also included a question about improving Route 47 on the north side of the river. There were comments that it was very important to improve the reliability of Route 47 north of the river to make it available for development. One suggestion was to build an elevated roadway, like Page Ave. extension.

One miscellaneous comment concerned a need for a connector route between I-70 and I-44 and that 47 would be an excellent choice.

MoDOT received three written comments from the first public meeting:

1) A new bridge is important, prefer east side of existing bridge if a new one is built, and reliability of Route 47 is very important.
2) The new bridge should be built adjacent to the existing bridge and follow the MTIA study that was completed in 2002; prefer east side of existing bridge if a new one is built, reliability of Route 47 is very important, and a separate pedestrian/bicycle lane is needed.
3) Moving the bridge should not be an option—Washington industry, infrastructure, and services are built around the bridge (medical, schools, etc.), would be far too destructive to the move the bridge away from city; prefer west side of the existing bridge; reliability of Route 47 is very important; need something across the river bottom so it can become available for development.

November 20, 2008, Public Meeting and Comments

The second public meeting was held November 20, 2008, at St. John's Mercy Hospital in Washington, and 44 people attended to view displays, visit with knowledgeable staff, ask questions, and submit comments regarding alternatives that had been eliminated and those that were still being considered for the project. A handout was also available with information about the bridge rehabilitation that would occur in 2009. The Highway 47 Bridge Committee met with the MoDOT project manager prior to the public meeting and the group highly encouraged the project team to consider a four-lane bridge as an alternative.

All displays and material from the public meeting were posted on the web pages, including the opportunity to submit a comment, the advertisement, and the news release. Participants who provided their email addresses were added to the project e-update subscription.

Fifteen written comments were submitted representing a range of opinions. Some, including personal letters from the Washington Chamber of Commerce and the Economic Development Corporation, suggested a four-lane bridge; others wanted to see the bridge replaced with a new bridge on either side

of the existing bridge; still others wanted a new bridge to replace the old one in the existing location. A couple of comments wanted bicycle/pedestrian accommodation on the new bridge. One comment pointed out that the bridge is a vital link to the community.

Comments in favor of building a new bridge include: 1) a new bridge is needed, in the same place and build it in stages—not a repaired bridge; 2) replace existing bridge with higher capacity structure, new bridge overlapping existing bridge with staged construction; 3) new bridge with four lanes at current location; 4) new bridge without partial reconstruction and with options to expand to four lanes; 5) build a new one next to existing bridge—definitely need a new bridge; 6) new bridge, needs bike path and shoulder option, up or downstream but do not touch Krog cemetery; 7) new bridge immediately upstream from present structure; and 8) four-lane bridge downstream.

A few comments supported keeping the existing bridge and building a new companion bridge: 1) build a second bridge and keep the old one, new bridge downstream; 2) need an additional bridge between Highway 40 and Washington, between Augusta and St. Albans—repair existing bridge; and 3) current bridge is adequate—losing the historic bridge would be a great loss to the city, the bridge is part of Washington's history and should be able to be seen from the downtown area. If something must be done, a companion bridge downstream seems most appropriate.

Within two weeks of the meeting, a letter was personally sent to each person who shared written comments.

December 15, 2009, Public Meeting and Comments

The third public meeting was held at the Washington West Elementary School in Washington on December 15, 2009. Forty-four people attended the meeting, including about 25 members of the local Route 47 Bridge Committee, which held a separate meeting before the start of the public meeting. At the bridge committee meeting, MoDOT staff explained the criteria used to screen the initial alternatives and copies of the screening results table were also made available to the public. A Virtual Public Meeting was held via Internet from December 15 until December 18. There were 165 visitors to the virtual meeting web page during that time period.

A handout was provided both at the public meeting and on-line for the virtual meeting. Displays on view at the public meeting included “How are we narrowing our options,” “Environmental,” “What will happen next,” and a map of the two alternatives MoDOT is focusing on (adjacent upstream and adjacent downstream). MoDOT staff from the St. Louis district, northeast district, and central office were available to answer questions.

Five written comments each were received from the traditional public meeting and the virtual meeting. Three comments supported the upstream bridge location and three supported the downstream bridge location. Three other comments related to the need for a new bridge and safety concerns. One comment supported putting the bridge on either side, but asked we include an upgrade to Augusta Bottoms Road. Another comment encouraged building a four-lane bridge, and another wanted to ensure we had a bike/ped path regardless of width.

September 21, 2010, Meeting with Bridge Committee

Representatives from MoDOT gave a presentation on the status of the NEPA process at the Highway 47 Bridge Committee meeting in Washington on September 21, 2010. The presentation included a review of the preliminary EA environmental and cultural findings and impacts, the preferred alternative, the next steps in the NEPA process, and information on memorializing the existing historic bridge once a new bridge is built. The MoDOT representatives discussed the EIS downgrade to an EA, the development of project purpose and need, the progression of the alternatives from the initial range to the alternatives carried through the EA, and finally MoDOT’s preferred alternative. The potential project impacts were also discussed.

Probably the newest and most interesting information to the committee was the advertisement of the bridge for adaptive reuse and possible uses for all or part of the bridge. Examples of previous uses from

other historic bridges were provided to the group. The committee was very receptive to the information presented and had many questions through the course of the presentation, especially regarding the physical details of the bridge. They were also very interested in the information on possible alternative uses for the historic bridge or parts of it.

SUMMARY OF IMPACTED RESOURCES:

1) FARMLAND IMPACTS

The Preferred, Adjacent Upstream alternative would need approximately 4.7 acres of new right of way in Warren County; the Adjacent Downstream alternative would require about 3.4 acres. The total conversion impact ratings for the upstream and downstream alternatives were 56 points and 109 points respectively, well below the 160-point threshold NRCS established for consideration of farmland protection. Any small variation of the alternatives that might occur during detailed design is unlikely to differ significantly from this evaluation. The project will be fully compatible with existing agriculture

2) COMMUNITY IMPACTS

Although temporary disruptions in travel patterns and travel time may occur during construction, the long-term benefits of a new bridge should far outweigh short-term impacts. Neither the Preferred (Adjacent Upstream) alternative nor the Adjacent Downstream alternative is anticipated to result in any long-term negative effects within the city of Washington. MoDOT will continue to work with community and area residents to minimize inconvenience to residents and the traveling public during construction.

Over the long term, both Washington and the surrounding region are expected to benefit from a new bridge. Both build alternatives would benefit travel efficiency and reliability at the Missouri River crossing by eliminating delays from traffic stoppages for oversized vehicles and agricultural equipment and by decreasing maintenance-related closures. In addition, local and visiting bicyclists will benefit from the structure's protected bicycle/pedestrian accommodation in combination with the separate project to improve Route 47 between the new bridge and the KATY Trail for bicycle travelers.

Right-of-way Acquisition and Easements

New, permanent right of way is needed for the roadway north of the river in Warren County. The bridge over the river is accommodated by a U.S. Coast Guard permit. South of the river in Franklin County, the bridge will require permanent easements from the Union Pacific Railroad as well as from the City of Washington (to span the park). New, permanent right of way will be needed to tie the new roadway alignment back into the existing roadway between the Missouri River and First Street.

The Preferred (Adjacent Upstream) alternative would require 6.4 acres of new right of way, impacting 12 parcels, and would use an additional 5.8 acres of existing right of way. The majority of this area is undeveloped or agricultural land north of the river in Warren County. The Preferred alternative would require one residential displacement south of the river in Washington. The Adjacent Downstream alternative would need 4.3 acres of new right of way, impacting 8 parcels, and would use an additional 5.4 acres of existing right of way. It would require two residential displacements in Washington.

If any additional temporary easements are needed to provide contractor access for machinery and personnel, impacts will be addressed as the bridge and roadway details are finalized.

3) WETLANDS AND WATERS OF THE U.S.

Permanent impacts to waters of the U.S. are expected to be limited to placement of bridge piers in the Missouri River. Work in the river falls under Section 10 of the Rivers and Harbors Act, which generally allows only the absolute minimum of temporary obstruction to the navigable channel and requires that

there be no permanent impacts to the channel.

The Adjacent Downstream alternative could cause minor, temporary impacts to a very small wetland depression at the base of the levee in Warren County, just outside the right of way on the downstream side of the existing bridge. The Preferred, Adjacent Upstream alternative would not impact this feature. If wetland impacts are unavoidable south of the river, each of the build alternatives could have roughly equal, temporary impacts on an old borrow ditch between the Rotary Riverfront Trail and the railroad tracks in Washington. Associated with temporary access to the construction area, job-specific impacts of this nature are determined by the contractor. Demolition of the existing bridge will result in temporary impacts to the river itself and possibly to the borrow ditch wetland as well.

The No-Build is the least intrusive alternative. The Preferred alternative is anticipated to have less than 0.1 acre of permanent impacts to wetlands/waters of the U.S.

4) NAVIGABLE WATERWAYS

Construction of either new bridge alternative would be conducted so as not to unreasonably interfere with free navigation of the waterway or impair the present navigable depths. A temporary reduction in navigation channel width is anticipated but will require USCG review and approval. This reduced navigation clearance during construction, if allowed by the USCG, would only be required for the short amount of time needed to erect the girders within the navigation channel span. The contractor's falsework would be removed promptly to restore the full width of the navigation channel span. Neither the Preferred, Adjacent Upstream alternative nor the Adjacent Downstream alternative would affect the location of the navigation channel. The USCG favors the adjacent upstream location (Preferred alternative) from a navigation perspective. Because the river bends left almost immediately downstream of the existing bridge, locating a new bridge upstream would enable tow pilots to more easily navigate the bend and the wing dikes.

Either build alternative would involve demolition of the existing bridge, with potential impact to river way users and Missouri River commerce associated with blocking navigation through the span for short period of time. The spans will be dropped into the river and then salvaged. If the existing bridge is demolished during the supported navigation season, commercial use of the river in the vicinity of the bridge would be slowed during demolition, but the use of the navigation channel would only be restricted for a 24-hour period while the span is salvaged. The U.S. Coast Guard monitors the demolition on site to provide a safe environment during the span blasting and salvage and this operation is anticipated to have minimal impact on through commercial traffic on the river.

Recreational use of the river near the bridge may be reduced both during construction and demolition activities, as recreational users will most likely avoid the construction site for safety concerns. However, their travel in the vicinity of the bridge will not be impeded any more than commercial traffic.

5) FLOODPLAIN IMPACTS

The Preferred, Adjacent Upstream alternative would require an estimated 4.7 acres of new right of way in Warren County south of Augusta Bottom Road, and the Adjacent Downstream alternative would need about 3.4 acres. All of this right of way is within the base floodplain. From the northern construction limit near Augusta Bottom Road to the southern limit in Washington, both build alternatives as well as the existing roadway cross roughly 3800 feet of base floodplain, of which approximately 1400 feet is regulatory floodway. With the build alternatives located adjacent to existing Route 47, there would be minimal, if any, additional impact to the base floodplain and regulatory floodway following completion of construction and removal of the existing Route 47 bridge and roadway approaches.

6) THREATENED AND ENDANGERED SPECIES

The species of concern for this project are the federally endangered pallid sturgeon (*Scaphirhynchus albus*), the state-endangered lake sturgeon (*Acipenser fulvescens*), the federally endangered Indiana bat

(*Myotis sodalis*), and federally protected migratory birds. There are virtually no differences in potential impacts to the natural environment from the Preferred, Adjacent Upstream and the Adjacent Downstream alternatives.

MoDOT will obtain a habitat assessment for the pallid sturgeon and lake sturgeon to ascertain potential impacts and will evaluate project impacts in the floodplain and in the Missouri River during the design phase of the project. Impacts analysis will cover temporary and permanent impacts from construction and demolition on pallid sturgeon and any suitable habitat in the project area, taking into account the methods and duration of disturbance. MoDOT will also consult with FWS as appropriate regarding considerations to avoid impacts to pallid sturgeon and any suitable spawning/over-wintering habitat.

No potential Indiana bat summer roost trees were present in the project impact area during a field habitat assessment In January 2010. This area will be re-evaluated during the design phase and if suitable roost trees need to be removed for construction, MoDOT will only allow clearing of potential roost habitat between November 1 and March 31. If potentially suitable roost trees must be cleared during the April 1 to October 31 Indiana bat maternity season, additional field surveys, and possible informal consultation with the FWS, may be necessary.

Screen panels installed to prevent swallows from nesting on the bridge piers during the 2009 bridge rehabilitation were left on the bridge after the project was completed. MoDOT plans to leave these exclusionary screens in place until the existing Route 47 bridge is demolished following construction of a new bridge. If necessary, additional measures will be taken and/or seasonal restrictions followed prior to demolition to avoid conflict with the MBTA.

7) HISTORIC AND ARCHAEOLOGICAL SITES

Both proposed build alternatives—the Preferred, Adjacent Upstream and the Adjacent Downstream—would require removal of the bridge, resulting in an “adverse effect” on those qualities that make the bridge eligible for listing in the NRHP. The No-Build alternative would have “no adverse effect” on the historic bridge. The SHPO concurred on February 26, 2010, with the MoDOT's Section 106 finding that the Route 47 Bridge K0969 is eligible for listing on the NRHP, the Preferred alternative will have an "adverse effect" on the bridge, and that no other historic properties were identified in the area of potential effects (APE). Missouri’s Historic Bridge Preservation Plan, which was formulated in consultation with the SHPO, does not identify the Route 47 Bridge at Washington as a bridge important for preservation. This EA includes a draft Memorandum of Agreement (MOA) among the Federal Highway Administration, MoDOT, and SHPO detailing the mitigation measures that MoDOT will complete before the bridge is removed. The MOA also identifies how any unanticipated discoveries would be handled. An executed MOA will accompany the NEPA decision document.

8) PUBLIC LANDS & POTENTIAL SECTION 4(f)/SECTION 6(f) PROPERTIES

The City of Washington’s Rotary Riverfront Trail, part of the Washington Bikeway, passes directly under the existing bridge and a portion of the trail in the area of the bridge will be closed as a temporary easement to ensure public safety during construction activities. Project construction will not affect the official entry to this part of the trail system.

Under certain specified conditions, temporary easements are not subject to Section 4(f). The temporary closure of a section of the trail is not subject to Section 4(f). The City of Washington’s Parks and Recreation Department is aware of the proposed action and is strongly in favor of the project.

The Route 47 Missouri River bridge at Washington (Bridge No. K0969) is a historic resource protected under Section 4(f). A programmatic Section 4(f) evaluation will accompany the NEPA decision document because the Preferred alternative will have an "adverse effect" on the NRHP-eligible bridge.

There are no other Section 4(f) or Section 6(f) issues associated with this project.

9) CONSTRUCTION IMPACTS

Construction of either proposed build alternative would result in some short-term, temporary adverse impacts near the proposed action, including noise, dust, and pollutants discharged by construction equipment as well as impacts to motorized and non-motorized traffic and to businesses in the area. Generally these kinds of short-term impacts are among the most readily mitigated impacts. Pollution control measures outlined in the Missouri Standard Specifications for Highway Construction will be used to minimize impacts associated with the construction of any alternative; these measures pertain to air, noise, and water pollution as well as traffic control (e.g., detours) and safety measures. Best management practices will be employed to minimize or mitigate potential impacts.

Over time, the No-Build alternative would require maintenance activities on the existing bridge, with resultant traffic stoppages and idling of vehicles because of lane closures. Since even routine maintenance would necessarily disrupt traffic whenever one lane on the bridge is blocked, reduced traffic flow/increased travel time can be expected. Short-term impacts such as noise, dust, and pollutant discharges from maintenance activities associated with the no-build would be mitigated in a similar manner to those from the build alternatives.

Contractors must comply with all federal, state, and local laws and regulations. They must also work within the requirements of their operating permits issued through the Missouri Department of Natural Resources. Air quality during construction will be protected to generally accepted levels through project site monitoring and enforcement of these various requirements.

To reduce the impacts of construction noise, MoDOT has special provisions in the construction contract requiring that all contractors comply with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Construction equipment will be required to have mufflers constructed in accordance with the equipment manufacturer's specifications.

If the foundation design for the new bridge requires pile driving, MoDOT will prohibit such activity during the night. Demolition of the trusses and bridge piers will involve the use of explosives. Blasts are expected to be limited in number and will be scheduled for day-time occurrence to avoid disrupting residential and hospital night-time quiet.

The Missouri River corridor provides habitat for a number of species of animals that have federal and state protection. Suitable roosting trees for the federally endangered Indiana bat will be removed during the period between November 1 and March 31 to avoid possible direct impacts to Indiana bats during the summer maternity season. If potentially suitable roost trees must be cleared during the April 1 to October 31 Indiana bat maternity season, additional field surveys, and possible informal consultation with the FWS, may be needed.

Pallid sturgeon migrate through the entire Missouri River system, using different habitats for spawning, feeding, nursery, and over-wintering areas. The habitat diversity of the impact area for construction of either build alternative and demolition of the existing bridge is unknown at this time. If necessary, conditions will be followed to avoid negatively impacting pallid and lake sturgeon by temporary and permanent construction impacts.

In Missouri, it is generally accepted that swallow nests could be occupied between April 15 and July 15. If any swallows are found nesting on the existing bridge, exclusionary measures will be used and seasonal restrictions will be followed to avoid conflicts with the Migratory Bird Treaty Act. Screen panels installed to prevent swallows from nesting on the existing Route 47 bridge piers before the 2009 rehabilitation project were left on the bridge after the project was completed and MoDOT plans to leave the exclusionary screens on the bridge until it is demolished following construction of a new bridge. If necessary, additional measures will be taken and/or seasonal restrictions followed prior to demolition to avoid conflict with the MBTA.

The Missouri Department of Natural Resources (MDNR) regulates the control of runoff from land disturbance. Erosion control measures must be put in place as land clearing begins. MoDOT's Pollution Prevention Plan provides for temporary erosion and sediment control measures that will be included within construction contract specifications. Careful refueling practices will limit spills of gasoline and diesel fuels. Oil spills can be minimized by frequent checks of construction equipment.

A Traffic Management Plan (TMP) to manage the work zone impacts will be developed during project design. A TMP lays out a set of coordinated traffic management strategies. Traffic management strategies for this project could include staging construction to impact traffic as little as possible, conducting active public information and outreach, scheduling high-impact work for hours of off-peak traffic, installing temporary traffic control devices, and possibly enlisting the help of law enforcement, if necessary.

It is expected that some day- (or night-) time lane closures will be needed to tie the new bridge into the existing Route 47 alignment, but MoDOT will require the contractor to flag traffic during these times and to keep back-ups to a minimum.

MoDOT will send a weekly news release out to local newspapers and radio stations giving local commuters information about construction activities that could impact their daily travels. MoDOT also publishes construction-related news releases and information on its web site at www.modot.org for those who have Internet access.

Barges on the river will be used throughout the bridge construction. It is anticipated that river traffic would only be halted if the old bridge is demolished during the navigation season. MoDOT will coordinate with the United States Coast Guard to schedule the time and duration of any closures.

MoDOT would likely close a portion of the Rennick Riverfront Park and the Washington Bikeway/Rotary Riverfront Trail during construction of the bridge piers on the south side of the river to allow working room and to protect people from falling objects. Such closure would only be temporary and the affected area of the park would be reopened upon completion of the work. The City of Washington, which owns the park, has indicated a willingness to allow this.

The Union Pacific Railroad (UP) also passes under the existing and proposed bridges on the south side of the river and runs approximately 40 trains per day on their tracks. MoDOT will coordinate with the railroad to work around their train schedule. Construction of bridge piers nearby would require flaggers during construction operations. All flagging costs would be borne by MoDOT. To avoid interrupting train traffic, the bridge contractor will coordinate with the railroad to schedule setting girders and handling other materials over the railroad tracks. It is not anticipated that rail traffic would be impacted by construction, although company flagmen will be on-site whenever there is active construction on railroad right-of-way.

Several utilities on or near the existing Missouri River bridge may be impacted by the eventual removal of the historic bridge. The owners of the two private communications lines and the power lines already attached to the bridge will be given the opportunity to attach to the new bridge, through conduits either embedded in the rail or suspended under the bridge deck. There will be costs associated with the attachments, however, and the utilities would be required to pay for the conduits and for future maintenance.

Ameren, Missouri Natural Gas, SBC, and Sprint serve area customers through facilities near the bridge approaches. To avoid impacts, these lines will need adjustment before construction. Details of utility disposition will be determined during project design. Lines outside the existing right of way will be moved at MoDOT’s cost. Under the agreement allowing utilities on MoDOT’s right of way, the utilities will bear the cost of relocating lines currently on the right of way. MoDOT’s utility engineers and representatives of the utilities will work out details of individual utility adjustments on a case-by-case basis.

REQUIRED PERMITS:

Either the Preferred (Adjacent Upstream) alternative or the Adjacent Downstream alternative would require "no-rise" certification and a Missouri State Emergency Management Agency (SEMA) floodplain development permit.

Permitting for this project is at the discretion of the U.S. Coast Guard (USCG) and the Missouri State Regulatory Office of the U.S. Army Corps of Engineers (COE). Construction of the preferred alternative would require a USCG Section 9 of the Rivers and Harbors Act of 1899 Bridge Permit.

Construction activities in the Missouri River are anticipated to require a COE Section 10 of the Rivers and Harbors Act Letter of Permission for temporary impacts to the navigable channel.

Permanent impacts to wetlands/waters of the U.S. are anticipated to be less than 0.1 acre. This level of impact should qualify for Nationwide Permit #14. However, if the dredge spoil is redeposited in the Missouri River, the project might require Individual Permit authorization.

Table 9. Initial Alternatives Determined Not Practicable under Section 404(b)1

ALTERNATIVE	REASONS NOT PRACTICABLE
Rehabilitation	would not replace the aged and deteriorating bridge, correct the existing bridge's deficiencies, or provide safe accommodation for bicyclists and pedestrians
Partial Replacement	would require complete closure of the bridge for up to 12 months, would not provide full-width shoulders to remove disabled vehicles from the traffic lanes, and would not provide safe accommodation for bicyclists and pedestrians
Existing Location	would require lengthy detour during three-year construction period, with accompanying adverse socioeconomic impacts to the region far outweighing the benefits of the existing location
Overlap Existing	construction not feasible from a technical standpoint
Far Upstream	would require substantial adverse travel and would have great environmental impact
Far Downstream	would have great environmental impact and much higher project cost
Partial Replacement + Upstream Companion	would have much higher project cost
Partial Replacement + Downstream Companion	would have much higher project cost

Although MoDOT is statutorily exempt from individual Section 401 certification on nationwide permits, the USCG will require MoDOT to obtain Section 401 certification to complete the Section 9 Permit application regardless of the type of Section 404 permit needed.

Construction of either new bridge alternative would be conducted so as not to unreasonably interfere with free navigation of the waterway or impair the present navigable depths. A temporary reduction in navigation channel width is anticipated but will require USCG review and approval.

COMMITMENTS:

The Adjacent Upstream and Adjacent Downstream Alternatives retained and evaluated in detail in this EA have identical commitments identified in this document. The following is a compiled list of MoDOT's proposed project commitments:

- A new two-lane bridge will replace the deficient bridge and allow adequate room to add up to two additional lanes if the amount of traffic using the bridge justifies additional lanes in the future. The new bridge wil be approximately 50 feet upstream or downstream from the current location.

- The new bridge will provide two 12-foot travel lanes and 10-foot shoulders to allow maneuvering room during emergencies and removal of disabled vehicles from the travel lanes.

- Consistent with other Missouri River bridges in the state, the new bridge will include a protected lane for bicyclists and pedestrians. A concrete barrier will separate the eight-foot-wide lane from vehicular traffic. The new bridge design will allow future relocation of the bicycle/pedestrian lane if additional traffic capacity is needed.

- MoDOT will ensure that, when the new bridge is completed, separate improvements to Route 47 between Dutzow and the Missouri River are in place to enhance safety for bicyclists between the KATY trail and the bridge. The portion of MoDOT Job No J3P2194 between Dutzow and the Missouri River will be accelerated so that the shoulders on Route 47 are paved and marked for bicyclists and crossings for bike traffic are provided. MoDOT will also re-stripe the new Lake Creek bridge (MoDOT Job No. J3P2167, scheduled for 2014 replacement) to designate a bicycle lane on each side continuous with the roadway shoulders. No separate pedestrian accommodations will be provided north of the Missouri River.

- The constructed bridge will meet MoDOT's standards for lane width, shoulders, and vehicular load.

- The existing bridge will be removed after construction of the new bridge.

- Staging construction of the southern approach spans and the tie-in to the north will allow Route 47 traffic to remain uninterrupted during construction.

- After project completion, any farms with uneconomic remnants (parcels of land that can no longer be farmed) will be compensated at prevailing market rates.

- MoDOT will acquire all properties needed for this project in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended (Uniform Act; 42 U.S.C 4601), and other regulations and policies as appropriate. If any additional temporary easements are needed to provide contractor access for machinery and personnel, impacts will be addressed as the bridge and roadway details are finalized.

- MoDOT will provide relocation services to all impacted households without discrimination under guidance of the Uniform Act.

- MoDOT will give fair market compensation to individuals who are partially or totally displaced by this project, as the Uniform Act requires.

- MoDOT will implement its Pollution Prevention Plan to prevent or minimize adverse impacts to streams, water courses, lakes, ponds, or other water impoundments within and adjacent to the project area.

- Construction will be conducted so as not to unreasonably interfere with free navigation of the

waterway or impair the present navigable depths.

- All construction activities will comply with the existing rules and regulations of governmental agencies having jurisdiction over streams and water supplies in the area.

- MoDOT will design ditches and stormwater runoff areas so that stormwater or road surface pollutants that run off the highway have limited effects on water quality.

- If the existing bridge is demolished during the supported navigation season, commercial use of the river in the vicinity of the bridge would be slowed during demolition, but use of the navigation channel will only be restricted for a 24-hour period while the span is salvaged.

- As project development proceeds, MoDOT will obtain a habitat assessment of the existing streambed (via a gridded depth sounding study, as used for consultation with FWS on other Missouri River bridge projects since 2006). This basic survey will provide an idea of the gradient in depths and clues to features such as shoals (possibly due to presence of the mouth of a Missouri River side channel just upstream from the existing bridge), sandbars, shallow water habitat, and effects of the L-shaped revetment on the southern bank right at the bridge. MoDOT will also obtain updated records during the design phase of the project and consult with FWS as appropriate for considerations to avoid impacts to pallid sturgeon and any suitable spawning/over-wintering habitat.

- MoDOT will evaluate project impacts in the floodplain and in the Missouri River during the design phase. Impacts analysis will cover temporary and permanent impacts from construction and demolition on pallid sturgeon and any suitable habitat in the project area, taking into account the methods and duration of disturbance.

- Although the forest is mature, there are no potential Indiana bat summer roost trees currently present in the project impact area. This area will be re-evaluated during the design phase and if suitable roost trees need to be removed for construction, MoDOT will only allow clearing of potentially suitable roost habitat between November 1 and March 31.

- During the 2009 Route 47 bridge rehabilitation project, screen panels were installed to prevent swallows from nesting on the bridge piers where construction would take place during the breeding season. These panels were left on the bridge after the rehabilitation was completed. Currently, MoDOT plans to leave the exclusionary screens in place on the existing Route 47 bridge until it is demolished following construction of a new bridge. If the panels are removed or they are not completely effective, additional measures will be taken and/or seasonal restrictions followed prior to demolition to avoid conflict with the Migratory Bird Treaty Act.

- MoDOT will implement mitigation agreed upon in the Memorandum of Agreement among the Federal Highway Administration, MoDOT, and SHPO to address the adverse effect to the Route 47 Bridge.

- To ensure public safety, the portion of the trail that passes under the bridge will be closed as a temporary easement when the affected area is under construction.

- Any previously unknown hazardous waste sites that are found during project construction will be handled in accordance with federal and state laws and regulations. If regulated solid or hazardous wastes are found during construction activities, the MoDOT construction inspector will direct the contractor to cease work at the suspect site. The construction inspector will contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the construction office and the contractor will develop a plan for sampling, remediation, and continuation of project construction. Independent consulting, analytical and remediation services will be contracted if necessary. The Missouri Department of Natural Resources will be contacted for coordination and approval of required activities.

- There will be no lead paint removal from the superstructure prior to demolition.

- A Traffic Management Plan (TMP) will be developed during project design. A TMP lays out a set of coordinated traffic management strategies to manage the work zone impacts

- Pollution control measures outlined in the Missouri Standard Specifications for Highway Construction will be used to minimize impacts associated with the construction of any alternative; these measures pertain to air, noise, and water pollution as well as traffic control (e.g., detours) and safety measures. Best management practices will be employed to minimize or mitigate potential impacts.

- Emissions from construction equipment will be controlled in accordance with emission standards prescribed under state and federal regulations.

- Air quality during construction will be protected to generally accepted levels through project site monitoring and enforcement of these various requirements.

- The pile being driven in on both the north side of the river and the south side would probably be heard very well along the riverfront in Washington. For this reason as well as the hospital located nearby, MoDOT will prohibit pile driving at night

- Use of explosives could be expected for demolition of the trusses and bridge piers. These blasts would be expected to be limited in number and will be scheduled for daytime occurrence.

- Prior to each week's scheduled work, MoDOT will send a news release out to local newspapers and radio stations giving local commuters information about construction activities that could impact their daily travels.

- It is expected that some day- or night-time lane closures would be needed to make the tie-ins, but MoDOT will require the contractor to flag traffic during these times and to keep back-ups to a minimum.

- Construction of bridge piers nearby the railroad will require flaggers for trains during construction operations. All flagging costs will be borne by MoDOT.

- MoDOT's utility engineers and representatives of the utilities will work out details of individual utility adjustments on a case-by-case basis.

Attachments (following Appendices):

(1) Programmatic Section 4(f) Evaluation
(2) Memorandum of Agreement for Mitigation of Adverse Effects
(3) Information To Accompany the Memorandum of Agreement

This page intentionally blank