

**Callaway County Connector
(Callaway County, Missouri)**

MoDOT Job Number J5P2161

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**

Date of Approval

For FHWA

Title

Date of Approval

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The Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) are proposing to construct the Callaway County Connector between U.S. 54 and Route CC in Callaway County, Missouri. The Callaway County Connector would provide a roadway designed to current standards to improve access, reliability, and safety of travel across Callaway County.

October 2012

Draft Environmental Assessment





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Purpose and Need

Chapter 1: Purpose and Need for the Study and Potential Future Action

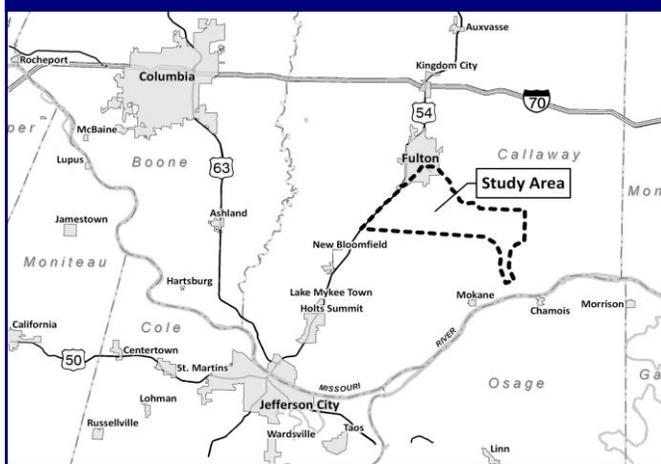
This chapter discusses why the Callaway County Connector Study is being completed and why an Environmental Assessment is being prepared. It also provides a description of the study area and the purpose of improving transportation facilities to address current and projected transportation needs within southern Callaway County.

What is an Environmental Assessment and why is this study being prepared?

The purpose of the Callaway County Connector Study is to identify current and future transportation needs within the study area and to identify transportation improvements that would address these needs. Before major highway projects can be constructed, a study to determine the need for and the effects of the proposed actions on the human and natural environment is required by the National Environmental Policy Act (NEPA) if the project requires a federal action or uses federal funds. The Federal Highway Administration (FHWA) has provided guidance that the Callaway County Connector Study should be conducted as an Environmental Assessment (EA) if FHWA program funding will be pursued. The NEPA process looks at the impacts of various alternatives, including improvements to existing roads, construction of new roads, and leaving roads the way they are (i.e., No Action). The process of preparing an EA includes opportunities for the public to voice their opinion at various times during the study. Selection of a preferred alternative will not be finalized until FHWA issues a Finding of No Significant Impact (FONSI) or determines that the preparation of an Environmental Impact Statement (EIS) is appropriate.

an Environmental Impact Statement (EIS) is appropriate.

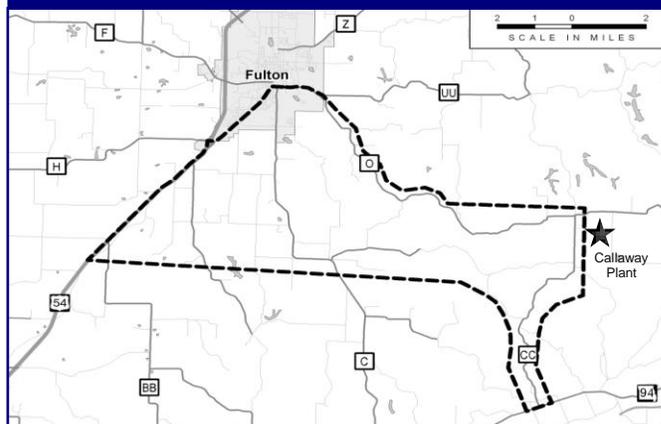
Figure 1-1: General Study Area Location



Where is the study area?

The Callaway County Connector study area is located in southeastern Callaway County, Missouri (**Figure 1-1**). The study area extends from Route 54 near the City of Fulton to Route CC near the Ameren Missouri Callaway Plant (Callaway Plant). The study area continues south along Route CC, terminating at the junction with Route 94 near Steedman.

Figure 1-2: Study Area



The Callaway County Connector study area is approximately 16 miles long from east to west and five miles wide along Route 54, narrowing as it moves to the east toward the Callaway Plant. The north study area boundary roughly follows Route O between Fulton and Route CC (**Figure 1-2**).

The EA includes an evaluation of the existing roadway system within the study area and development of alternative routes to connect Route 54 and Route CC. The study area boundary represents logical starting and



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ending points to address the transportation needs within southeastern Callaway County.

How was the study area boundary determined?

Travel into southeastern Callaway County was analyzed from the outset of the study to determine who the primary travelers in the region are and their destinations. The primary groups traveling in the county include workers commuting to and from the Callaway Plant and local residents who live in the study area and travel to and from Fulton, the commerce hub for the County. Additional factors considered in determining the limits of the study area included anticipated local and regional growth in population and commerce, the ability of the existing roadway system to respond to current and planned travel demand, and how roads in the area connect with each other and the major highways in Callaway County.

Options to provide a connection to either I-70 (to the north) or Route 94 (to the south) were considered during delineation of the study area. These options were removed from further consideration because they would not address long-term safety and access needs within the study area and would benefit only a small percentage of motorists who travel within southeastern Callaway County.

The study area also encompasses logical ending and beginning points for consideration of a transportation improvement project. To be considered a reasonable alternative and to be carried forward for detailed evaluation, an alternative must span the study area, providing a connection between Route 54/Business Route 54 on the west and Route CC/Route 94 on the east. Route 54 provides connection to the I-70 corridor to the north and Jefferson City to the south. Both Route 54 and Route 94 cross the center of the state and provide access to major population, education, and employment centers. Improvement concepts that do not span the entire study area may have logical termini at an internal crossroad, but may not fully satisfy the transportation needs within the study area. The concepts considered must also have independent utility, providing a standalone solution to address the area's transportation needs. Each concept must provide direct transportation and safety benefits, regardless of whether or not any improvements are ever made to the other roadways, including Route 54.

As the largest non-governmental employer in the study area, the Callaway Plant's workforce characteristics were examined to determine the workers' county of residence. Forty-nine percent of the Callaway Plant's permanent full-time staff live in Callaway County, with 22 percent living in Cole County, 16 percent in Boone County, and the remaining percentage living in other surrounding counties. Residents from Boone and Callaway Counties use Route 54 and Route O as their primary routes of travel, with Cole County residents using Route 94 to Route CC as their primary travel route. Cole County residents can elect to use Route 54 to Fulton as an alternate route of travel at an additional travel distance of five miles.

Who is leading the Callaway County Connector Study?

The study is being developed by Ameren Missouri, FHWA, and the Missouri Department of Transportation (MoDOT). FHWA and MoDOT are the designated governmental lead agencies for this study due to their role of providing oversight of the state transportation system in Missouri. FHWA is responsible for the content and accuracy of the EA and to ensure the study process follows federal regulations and standards. MoDOT owns and maintains the roadways that will be reviewed as part of this study, including Route C, Route O, Route CC, and Route 94. The study is being developed under the leadership of FHWA to preserve the eligibility to use federal-aid highway funds for improvements in the future.



Ameren Missouri is involved due to the location of its existing Callaway Plant and the future plant expansion that may occur as part of their planning process. Plant expansion would result in an increased workforce and an increase in material delivery traffic volumes, thus influencing local and regional travel and commerce. The study is being funded by Ameren Missouri to develop an understanding of the condition of the existing roadway system in southeastern Callaway County, determine the transportation needs under current and future travel conditions, and identify what roadway system alternatives could be considered to address these needs.

Why are transportation improvements in Callaway County necessary?

The population within southeastern Callaway County, as well as throughout the entire region, relies on the local roadway network to earn a living, educate their children, and access their homes. In order to conduct these activities, the residents need to have a safe, accessible, and reliable roadway network. The following transportation needs have been identified and will be addressed by this study.

- **Safety** –A number of existing roadway features do not meet current MoDOT roadway design standards. Inadequate sight distances along curves and at driveway entrances, roadway grades and the horizontal alignment, existing travel lane widths and lack of shoulders, and the volume of current traffic along narrow roadways contribute to crash rates that are higher than the statewide average. The volume of traffic projected to be operating along the narrow roadways may contribute to an even higher crash rate.
- **Access from Route 54 to the east** – The existing county roadway system does not provide direct connectivity between Route 54 and Route CC/Route 94. The existing roadway system is comprised of narrow, winding two-lane roadways that follow ridgelines and valleys. Travel times across the southeastern portion of the county are high due to the reduced travel speeds required to negotiate the rolling roadway alignment. Access to the study area to and from Route 54 is provided along existing routes that connect through congested areas of Fulton. This congestion contributes to increased travel times for local travelers as well as for through travelers to Columbia, Jefferson City, and other regional population, education, and employment centers. On a daily basis approximately 600 workers use Route 54 and Route O to access the Callaway Plant.
- **Reliability of the county’s roadway system** – The existing roadways are narrow and winding; many without shoulders. Large trucks transporting heavy farm and manufacturing equipment, grain and livestock vehicles, and maintenance equipment for the Callaway Plant contribute to the deterioration of the roadway pavement. As traffic volumes increase as forecast, including the heavy truck traffic that will be associated with the planned Callaway Plant expansion, additional wear and tear will be placed on roadways not designed to convey that volume, type, and size of vehicles.
- **Access during floods** – Flood events along the Missouri River and the large tributaries that flow through the southeast portion of Callaway County inundate roadways during the spring and summer, including Route 94. Access to homes and businesses along with access to the area by emergency vehicles is hampered by flooded roadways. Because of the rural character of the area and the condition of other local roadways, detour routes are difficult to identify and use to facilitate access and travel during flood events.



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What factors influence safe travel within the study area?

An indicator of roadway safety is the crash rate.¹ For analysis purposes, crash (or accident) rates for local roadways are compared to the statewide average crash rate for similar types of roadways over the same period of time. Crashes are also categorized by the type of crash - vehicles out of control, left turn collisions, rear-end collisions – which can indicate what type of roadway conditions may need to be improved.

The statewide crash rate describes the number of crashes that have occurred per 100-million vehicle miles traveled over a specific period of time, usually a window of five consecutive years. As an example, the 2007 statewide average crash rate (203) for rural two lane highways was based on the total number of crashes that occurred on similar roadways within the state from 2002 through 2006 per 100-million vehicle miles traveled. The crash rates for the study area routes were calculated using the same method. As depicted in **Figure 1-3**, Route O experienced a crash rate higher than the statewide average crash rate in 2005, 2006, 2007, and 2008, as did Route C in 2005, 2006, 2007, 2008, and 2009, and Route D in 2009 (MoDOT and Highway Patrol, 2009; Burns & McDonnell analysis, 2009). Substantially higher crash rates were recorded in 2004 as well and may be attributable to a temporary increase in the number of contract workers at the Callaway Plant making site preparations for a major plant modification that was completed in 2005.

As depicted in **Figure 1-4**, the majority of the vehicle crashes occurring within the study area involve out of control vehicles, followed by rear-end collisions and collisions with deer (MoDOT and Highway Patrol, 2009; Burns & McDonnell analysis, 2009). Out-of-control (O/C) and rear-end crashes can be related to the extensive number of curves and the hilly terrain within the study area. These crashes are the result

Figure 1-3: Crash Rate Summary

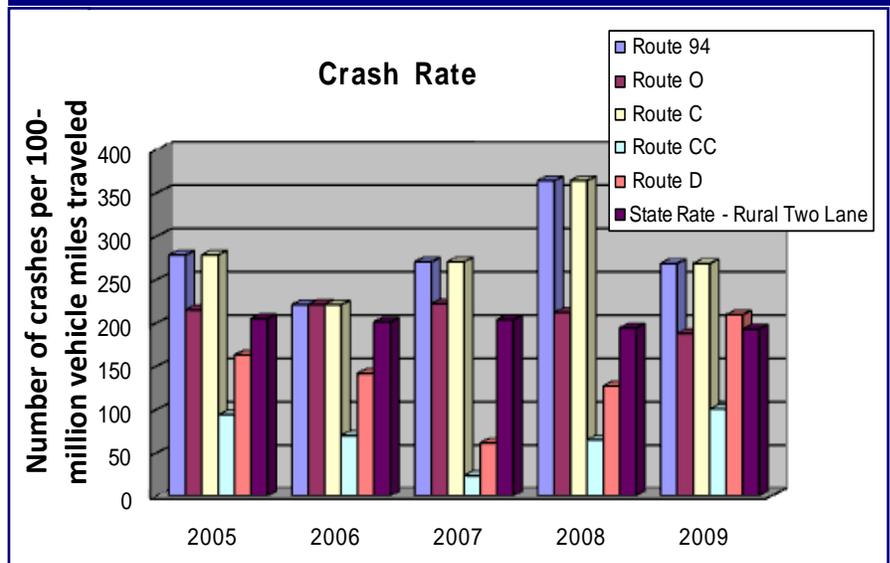
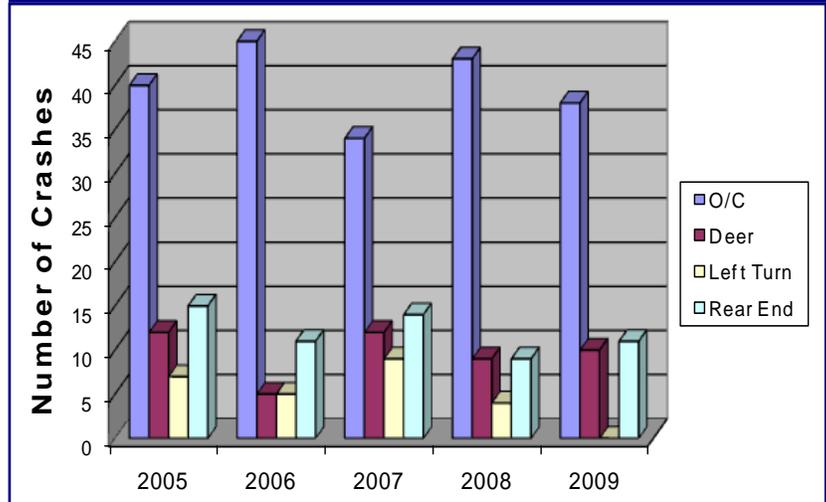


Figure 1-4: Crash Classification for Rural Routes in the Study Area



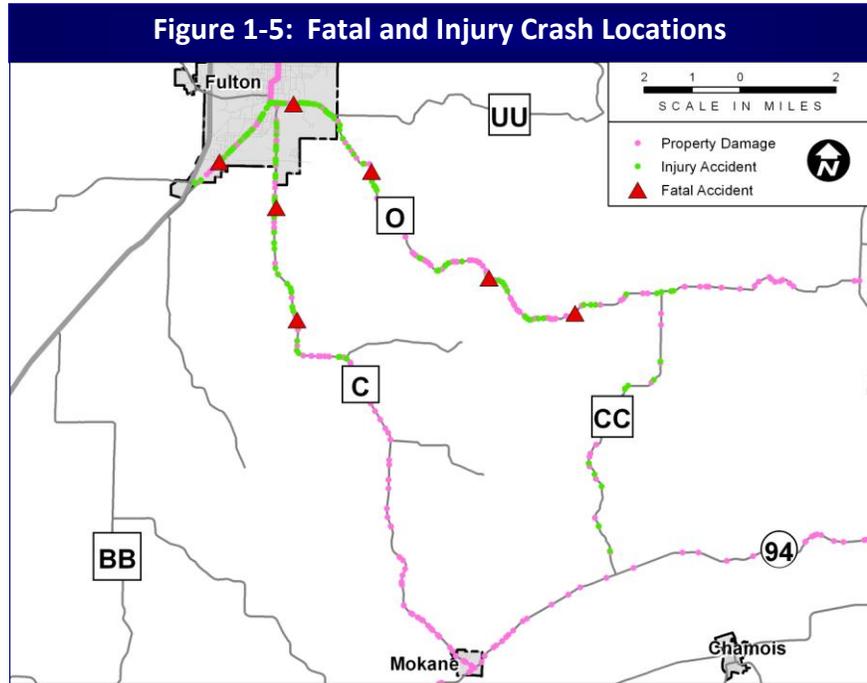
¹ Crash statistics and safety data summarized or presented in this chapter are protected under federal law. See **Appendix A**.



of shortened sight distances and some drivers' inability to react appropriately to the varying terrain and road conditions. Collisions with deer are indicative of the rural and wooded nature of the study area.

In addition to being categorized by type, crashes are also recorded as resulting in a fatality, personal injury, or only property damage. The incidence of fatal, injury, and only property damage crashes is scattered across the study area.

Figure 1-5 illustrates locations where the highest incidences of these types of crashes have occurred since 1998 (MoDOT and Highway Patrol, 2009; Burns & McDonnell analysis, 2009). As an example, from 2005 through 2009, 116 crashes resulting in fatalities, injuries, and/or only property damage were reported along Route O.



During the same period, 169 crashes resulting in fatalities, injuries, and/or only property damage were reported along Route C. Nearly 15 percent of these reported crashes along Routes O and C occurred within the urban limits of Fulton.

The 2008-2009 average daily traffic volumes (ADT) within the study area range from approximately 12,000 vehicles per day (vpd) along Route 54 to 1,419 vpd along Route CC (HNTB Existing Traffic Conditions Report, May 15, 2009). Routes C and O currently carry approximately 3,225 vpd and 2,760 vpd, respectively. Current traffic volumes are comprised of four percent heavy trucks, with that percentage forecast to remain steady through the design year 2037. ADT through the study area is anticipated to grow at approximately 0.07 percent based upon current trends without expansion at the Callaway Plant or any changes to the roadway network. Projected ADT's would range from 14,469 vpd on Route 54 to 1,737 vpd along Route CC by 2037. Projections for Route C and O would increase to 3,921 and 3,355, respectively.

Design Year
The future year used to estimate the probable traffic volume for which a highway project is designed, typically 20 to 30 years into the future.

Based on forecasted growth within the area, including the planned Callaway Plant expansion, traffic volumes along Routes O and CC are forecast to grow to 16,750 vpd and 11,400 vpd, respectively, by 2037 (HNTB analysis, 2010). The planned Callaway Plant expansion (forecast to occur between 2017 and 2022 for the purpose of this study) would introduce additional traffic, including heavy trucks, to an existing roadway system incapable of adequately handling the existing and forecast levels of background (i.e., everyday) traffic. Traffic volumes along Routes O and CC are forecast to increase to 35,200 vpd and 26,410 vpd during peak plant construction. The additional construction truck traffic may contribute to increased congestion and delays, especially along Route 54 and the Route H/Business Route 54 access points for Route C and O, as the trucks with their oversized and



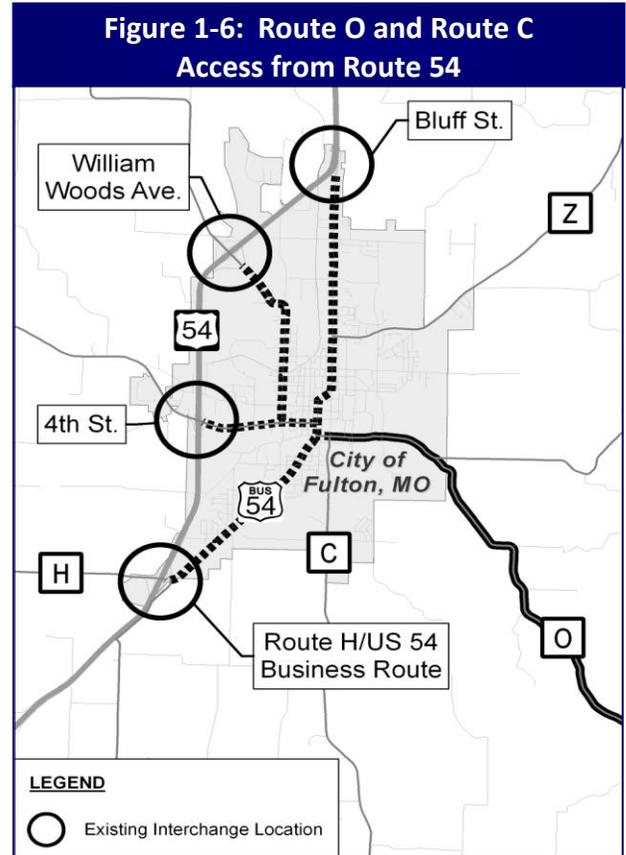
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heavy loads navigate the local street network through Fulton on their way to the Callaway Plant. The existing study area road network would have difficulty handling the additional construction truck traffic. Maneuvering large and oversized construction trucks along the narrow, winding roads may contribute to additional crashes involving motorists unprepared to encounter the large vehicles and having no shoulder area on which to pull over to avoid the oncoming traffic. The slow-moving construction traffic may also contribute to increased passing by local travelers which could also lead to an increase in head-on crashes.

What role does Route 54 play in providing access to southeastern Callaway County?

Route 54, as one of the two major highways in Callaway County, is an important commercial corridor within the study area. Access to Route 54 from the study area is provided indirectly by way of Route H/Business Route 54 and Routes C and O (Figure 1-6). The Route H/Business Route 54 interchange just south of Fulton provides the most direct access to Route 54 from the study area, minimizing the number of turning movements and maintaining travel along state designated roadways. Other existing interchanges along Route 54 - 4th Street, William Woods Avenue, and Bluff Street - provide access to Routes C and O by way of these local roadways.

Regardless of which Route 54 interchange is used, vehicles accessing the study area via Routes C or O are required to travel along local streets within the City of Fulton. Workers along with maintenance and construction equipment traveling to the Callaway Plant use the same routes navigating along city streets.



Route O / Business Route 54 Intersection

Route C and Route O function as both state highways and city streets within the City of Fulton. Travelers whose ultimate destination is within the study area must navigate these routes and the numerous intersections, property driveways, public sidewalks, and accesses to public park and school properties that border each route. The majority of the Callaway Plant’s workforce accesses the study area by way of Routes C and O. These routes are also the only routes available to transport goods to and from the study area including machinery and materials used at the Callaway Plant for maintenance and the planned plant expansion. Use of these



roads will continue to force highway users through the Fulton community and cause commercial traffic to maneuver through tight turning areas.

Travel times within the study area are also indicative of existing roadway conditions. Average travel times across the study area range from 21.2 minutes from Route O/Route CC to Route 54 (approximately 15.1 miles) to 31.3 minutes from Route CC/Route 94 to Route 54 (approximately 27.5 miles).

The average posted speed limit within the study area is 45 MPH, but many curves and steep grades are posted at 25 MPH, contributing to long travel times. As traffic volumes increase and the proposed Callaway Plant expansion commences, travel times will lengthen to accommodate the increased number of vehicles and heavy trucks along the roadways.



Route O East of Business Route 54

What influence does the Callaway Plant have on traffic in southeastern Callaway County?

The Callaway Plant is a major contributor to the local economy, providing more than 800 full-time jobs. Every 18 months, an additional 1,000 contract employees are needed to conduct plant refueling and maintenance activities.

Ameren Missouri submitted a license application to Federal regulators to preserve the option of expanding their power generating capability at the Callaway Plant. Ameren Missouri has requested that the license application review process be suspended at this time due to economic conditions. However, Ameren Missouri continues to plan for plant expansion as a prime element in addressing the region's power needs in the future. Once economic conditions improve, Ameren Missouri would complete the license application process and move forward with efforts to expand power generating capability at the Callaway Plant. Construction of a second unit at the Callaway Plant would take approximately 68 months to complete, during which most of the construction materials would be delivered by heavy trucks. During the nine-month peak period of construction, the workforce at the plant is anticipated to reach 3,950 workers (Ameren Missouri, 2009).

For the majority of the remaining construction period, more than 3,000 construction workers are anticipated to be onsite every day. Up to 50 incoming deliveries of construction equipment and materials are anticipated per day, resulting in an additional 80 to 100 daily heavy truck trips along local roadways.

These truck deliveries along with approximately 71 percent of the construction workforce will be required to travel daily through Fulton to access the Callaway Plant from Route 54, which will

The routine transport of materials and travel by plant workers can be met by the existing county roadway system. However, during the construction of the planned Callaway Plant expansion, daily trips by up to 3,950 workers and 80 to 100 heavy trucks will contribute to increased travel times and place additional wear and tear on the existing roadway pavement.



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contribute to congestion and travel delay for all local and through travelers in the study area. The truck deliveries will lead to pavements deteriorating at an accelerated rate, requiring increased roadway maintenance during the construction period.

In contrast, when Callaway Plant Unit 1 began construction in October 1975, rail service was available along what is now Katy Trail State Park, along Route 94 near the Missouri River. Rail service enabled large quantities of construction materials to be delivered to the site with minimal impact on the existing roadway system. Because rail service is no longer available, the local street and highway network would be the only feasible means for transporting workers and equipment during the planned plant expansion construction period.

Upon completion of the planned Callaway Plant expansion, Ameren Missouri anticipates that 363 additional full-time employees may be needed, bringing the total number of employees at the Callaway Plant to more than 1,150 people. Also, the planned expansion will increase the frequency of the refueling and maintenance cycle activities from occurring every 18 months to every 9 months.

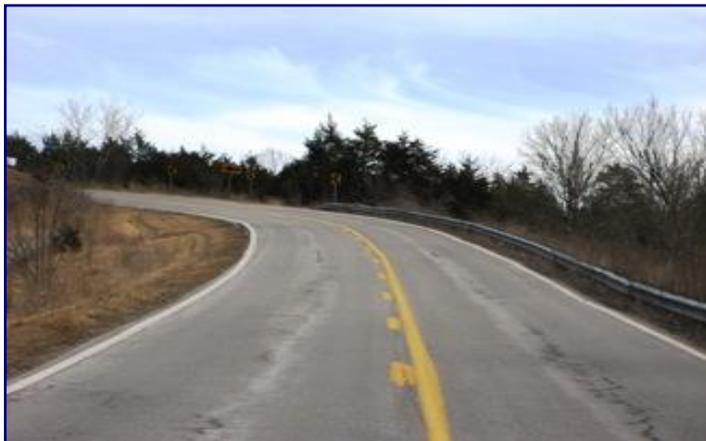
What features affect the reliability of the existing roadway system?

Roadways in this area were developed more than 50 years ago to accommodate fewer and lighter vehicles traveling at lower speeds. At that time, Route C, Route O, and Route CC were constructed to follow the natural terrain. As a result, these roadways feature numerous curves and hills that can be safely traveled at 40 MPH or less, with many requiring motorists to reduce their speed to less than 25 MPH.



Route O Speed Advisory Sign

The existing pavement was constructed using the gravel roadbeds already in place. These roadways were primarily developed in the 1950's as part of a program in which MoDOT assumed responsibility for thousands of miles of county roads. The initial road construction consisted of building up the roadbed using oiled gravel, followed by capping of the underlying gravel bed with numerous layers of asphalt. This construction technique has held up moderately well provided that the primary travel is by car or light truck.



Steep Grade near Auxvasse Stream Crossing

As vehicle designs have changed and trucks carry larger loads, the stability and endurance of the roadway surface has decreased. As traffic volumes have increased, including a higher percentage of heavy trucks, road surface damage has accelerated increasing the short- and long-term costs of roadway maintenance. With the projected increase in future traffic volumes, the percentage of heavy trucks currently using the routes, and the size and volume of heavy and oversized trucks forecast to use the roadways during the planned Callaway Plant expansion, the



existing roadway pavement may deteriorate at an increased rate requiring additional maintenance and/or reconstruction. These maintenance and reconstruction activities would involve potential temporary road closures and detours, contributing to increased travel times and delay.

What issues need to be resolved to improve access during flood events?

Because of the natural terrain and proximity of Route 94 to the Missouri River, access from the Jefferson City area to southeastern Callaway County is occasionally unavailable during periods of high water within the Missouri River Basin. Route 94 runs parallel to the Missouri River floodplain and is periodically closed when backwater from the river flows into local streams. With the exception of 1994 and 1995, Route 94 was closed at multiple locations due to flooding from three to 12 days per year (MoDOT Road Closure Tables, 2009). During the 1994-1995 record flood events that occurred along the Missouri River, Route 94 was closed for 18 days in 1994 and for 35 days in 1995. MoDOT records also indicate that Route O near the Auxvasse River has been impassable during flooding events from one to two days for multiple periods from 1993 through 2008. In 2008, Route 94 was closed to traffic for periods ranging from two to six days requiring motorists to use Route 54 into Fulton for access into the study area.

What is the purpose of improving the roadway network in southeastern Callaway County?

The purpose of improving the roadway network in southeastern Callaway County is to provide safe and reliable travel within the study area along roadways that provide adequate access and capacity to accommodate existing and forecast transportation demand.

U.S. Census data indicates that Callaway County’s population grew at a rate of 6.6 percent during the last decade. With continued population growth, the number of cars on the road and the vehicle miles traveled will continue to increase. Without improving the horizontal and vertical alignment of area roadways or providing better sight distances at intersections, the number of crashes could increase as roadway usage rises. If the planned Callaway Plant expansion occurs, additional traffic and increased heavy truck volumes will occur contributing to additional travel delays, potential crashes, and roadway maintenance costs. Roadway improvements could decrease travel times across the study area to an average of 14 minutes, compared to travel times of 21 to 31 minutes under existing conditions. Without upgrading the roadway system to accommodate the forecast increase in heavy truck traffic, roadway maintenance costs will continue to increase to keep roadways open and in operation.

A future connection from the study area to I-70 would also improve access and could potentially open up the eastern portion of the County for more development. Although a connection with I-70 does not address the access, safety, and reliability needs within the study area, it may be considered in the future to address access and economic vitality issues within the eastern part of the county. Because a connection with I-70 does not meet the immediate transportation needs within the study area, it is not being considered as a viable alternative and is not carried forward for detailed evaluation.

Without roadway system improvements, Route C and Route O will continue to serve as the primary access from Fulton into the study area. Use of these roads will continue to force through travelers and truck traffic through the Fulton community, causing them to maneuver through urban intersections and tight turning areas. An improved roadway system would provide better direct access to southeastern Callaway County, improve roadway continuity, remove through traffic from local county roadways, and limit the amount of congestion along roadways within Fulton.



Purpose and Need

Without improvement, roadway closures during flood events would continue to result in unreliable access throughout the area. Flooding of the Missouri River will continue to force the closure of Route 94 and hamper the reliability of the transportation system to serve the study area. With no additional roadway options, travelers from Jefferson City and areas to the south will have to rely on Route 54 and the existing highway connections through Fulton to access residences and businesses in southeastern Callaway County. Improvements to the existing roadway system could be constructed over time as funding becomes available. The decision of where and when projects could occur and which needs are a priority for Callaway County would be made by MoDOT in consultation with their local planning partners.



Alternatives

Chapter 2: Alternatives

This chapter provides a description of the alternatives considered to satisfy the transportation needs within the study area. It also describes the process used to develop and evaluate alternatives. The alternative development and evaluation process involved looking at the existing roadway system in southeastern Callaway County and identifying routes where safety, access, and roadway reliability could be enhanced between Route 54 near Fulton and Route CC near the Callaway Plant. The study area was divided into four sections based on the existing roadway network and topographic features. Initial roadway alignment concepts were developed within each section and then reviewed through a screening process to determine the most viable concepts. The most viable concepts were then linked together to create alternatives that would address the purpose and need of the study.

How were government agencies involved in the study process?

Government agencies, including federal and state regulatory and reviewing agencies, as well as local government entities, have been involved throughout the study process. Agency coordination included both correspondence as well as meetings, with the purpose of providing study information to the agencies, gathering information on known environmental constraints within the study area, and identifying any issues or concerns that should be addressed during the study. Native American Tribes that may be affiliated with properties of cultural or religious significance were also contacted to seek their input on the potential future action. Additional information describing the agency and tribal coordination process is provided in Chapter 4. Copies of agency and tribal correspondence are included in **Appendix G**.

How was the public involved in the study process?

Citizens have been invited to attend several public open houses and meetings held during the study. Open houses were held to discuss the study process with citizens and to gain input on ideas for potential transportation improvements. The public was invited to submit comments, which were considered in the development of alternatives and in the selection of a Preferred Alternative. Additional information describing the public open houses is provided in Chapter 4. Copies of comments received from the public are included in **Appendix C**.

**Callaway County Connector
Outreach Efforts**

Agency Scoping Meeting
February 17, 2009

Public Open House, Fulton City Hall
April 29, 2009

Public Officials Briefing and Public Open House, Westminster College
June 4, 2009

Online Public Open House
June 4-18, 2009
August 20 - September 31, 2009

Public Meeting, Callaway Plant
September 10, 2009

Fulton Economic Development Board Meeting
September 16, 2009

Fulton City Council Presentation
September 22, 2009

Missouri Department of Conservation Meeting
February 10, 2010



Alternatives

What roadway improvement concepts have been looked at to address the transportation needs within the study area?

No-Build Alternative

NEPA requires consideration of the No-Build Alternative throughout the entire study process for comparison against all other alternatives. Under the No-Build Alternative, existing roadways would be left as they currently are, with the exception of scheduled maintenance activities and programmed minor improvements (e.g., pavement resurfacing, signage upgrades, shoulder stabilization, etc.) under the discretion of MoDOT and Callaway County, as funding is made available.

The No-Build Alternative would not address the long-term transportation needs within the county; it would not widen existing roads, it would not improve roadway shoulders, and it would not address existing vertical and horizontal curves. The No-Build Alternative also would not accommodate increased traffic for the proposed Callaway Plant expansion. Although not always reasonable, feasible, prudent, or practicable, the No-Build Alternative is an alternative under NEPA and serves as the baseline for the evaluation of future conditions and impacts resulting from a proposed action.

The alternatives developed and reviewed to address the transportation needs within the study area included:

- **No-Build** – leave the existing roadway system in the condition it is today.
- **Improve Existing Roads** – what can be done to make sections of the existing roadway system better – eliminate curves, widen the pavement, add shoulders, etc.?
- **Construct New Roads** – where would be the best location for a new roadway and what type of road should it be?

Build Alternatives

Several concepts were developed for improving existing roadways and for constructing new roadways. The proposed concepts are based on a two-lane rural highway cross-section, providing two 12-foot wide travel lanes and 8-foot-wide shoulders on each side of the two-lane road. To upgrade existing sections of roadway, a 50 MPH design speed would be used to guide the roadway design. For all new sections of roadway, a 60 MPH design speed would be used. Improve Existing Roadway Concepts were reviewed initially to see if the transportation needs could be met by only improving existing roadways. Then New Roadway Concepts were developed to connect across the entire study area and to fill in sections between where existing roadways could be improved. The following paragraphs describe the process for developing and selecting the best build concept to improve the existing roadway system and the best concept to construct a new roadway.

Concepts to Improve the Existing Roadway System:

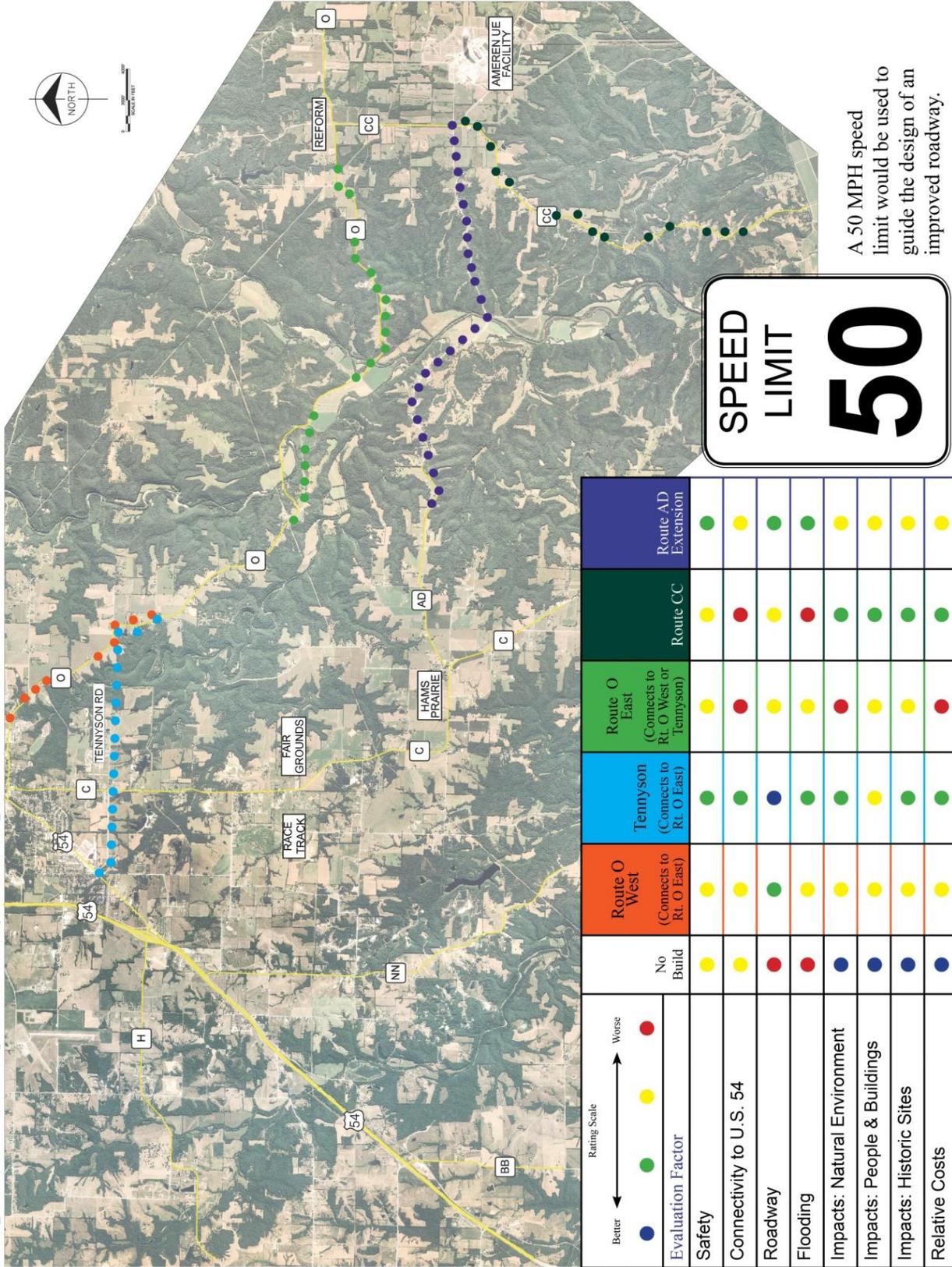
What concepts were developed for improving existing roadways?

The characteristics of the existing roadway system were reviewed to determine if improvements could be made to existing roads to address the transportation needs within the study area. Roadway reconstruction was evaluated for sections of five roadways within the study area - Tennyson Road, Route CC, Route AD, and east and west sections of Route O. **Figure 2-1** illustrates the roadway sections considered for reconstruction. Each dotted line represents a 500-foot wide corridor within which roadway reconstruction could occur, allowing enough room for existing vertical and/or horizontal curves to be modified. In addition to reconstructing certain roadway sections, the remaining roadways could be considered for minor improvements such as resurfacing, minor lane widening, or adding shoulders where existing right-of-way widths would allow. A 50 MPH speed limit would be used to guide the design of the improvements to the existing roadway system.



Figure 2-1: Improve Existing Roadway Concepts

Improve Existing Roadway Concepts





Alternatives

How were the concepts for improving the existing roadway system evaluated?

Based on input received during the April 29, 2009, public open house, improving the existing roadway system was carried forward as an alternative to constructing a new roadway. Roadway sections suitable for improvement were identified based on public input and the evaluation of technical and environmental data. As a result of this analysis, five different concepts were developed for improving existing roadways. Each concept was then evaluated based on various criteria, including engineering considerations, cost, environmental impacts, and how well the improvement satisfied the study area's transportation needs (**Figure 2-2**).

The concepts were given a general rating from better (blue) to worse (red) for each of the evaluation criteria, and then weighed against what would happen if there were no improvements, as would occur under the No-Build Alternative. The concepts for improving existing roadways and the ratings for each were presented to the public at the June 4, 2009, open house and the subsequent online open house. During these events, the public reviewed and commented on the proposed improvements and were given the opportunity to state a preference for one or more of the Improve Existing Roadway Concepts.

Concepts to Construct a New Roadway:

What initial concepts were developed to construct a new roadway?

An initial set of concepts was developed for a potential new roadway to be constructed across the study area. The study area was divided into four sections (i.e., West, West-Central, Central, and East) with initial roadway concepts developed within each section. Concepts within each consecutive section would then be combined to create a new roadway alternative that could span the study area from east (Route 54 or Business Route) to west (Route CC). Several starting points from Route 54 were identified which would require construction of a new interchange (see **Figure 2-3** and **Figure 2-4**). The dotted lines on the map are conceptual and represent a 500-foot wide corridor, within which a new roadway would be constructed. A 60 MPH speed limit would be used to guide design of the new roadway concepts.

How were the initial concepts for a new roadway evaluated?

The initial concepts for a new roadway were developed based on engineering feasibility and in consideration of environmental features and public input. Technical and environmental data were collected for the study area, including environmental constraints identified through agency scoping and coordination efforts. To the extent practicable, the new roadway concepts were developed to avoid these constraints. Public input obtained during the April 29, 2009, open house, regarding transportation needs, project goals, and information on environmental and cultural resources, also was considered in developing the New Roadway Concepts. The New Roadway Concepts were evaluated using the same criteria as the Improve Existing Roadway Concepts. The New Roadway Concepts and the ratings for each were presented to the public at the June 4, 2009, open house and the subsequent online open house.

Figure 2-2: Roadway Evaluation Criteria

	Safety
	Connectivity to U.S. 54
	Roadway
	Flooding
	Natural Environment
	People and Buildings
	Historic Sites
	Relative Costs

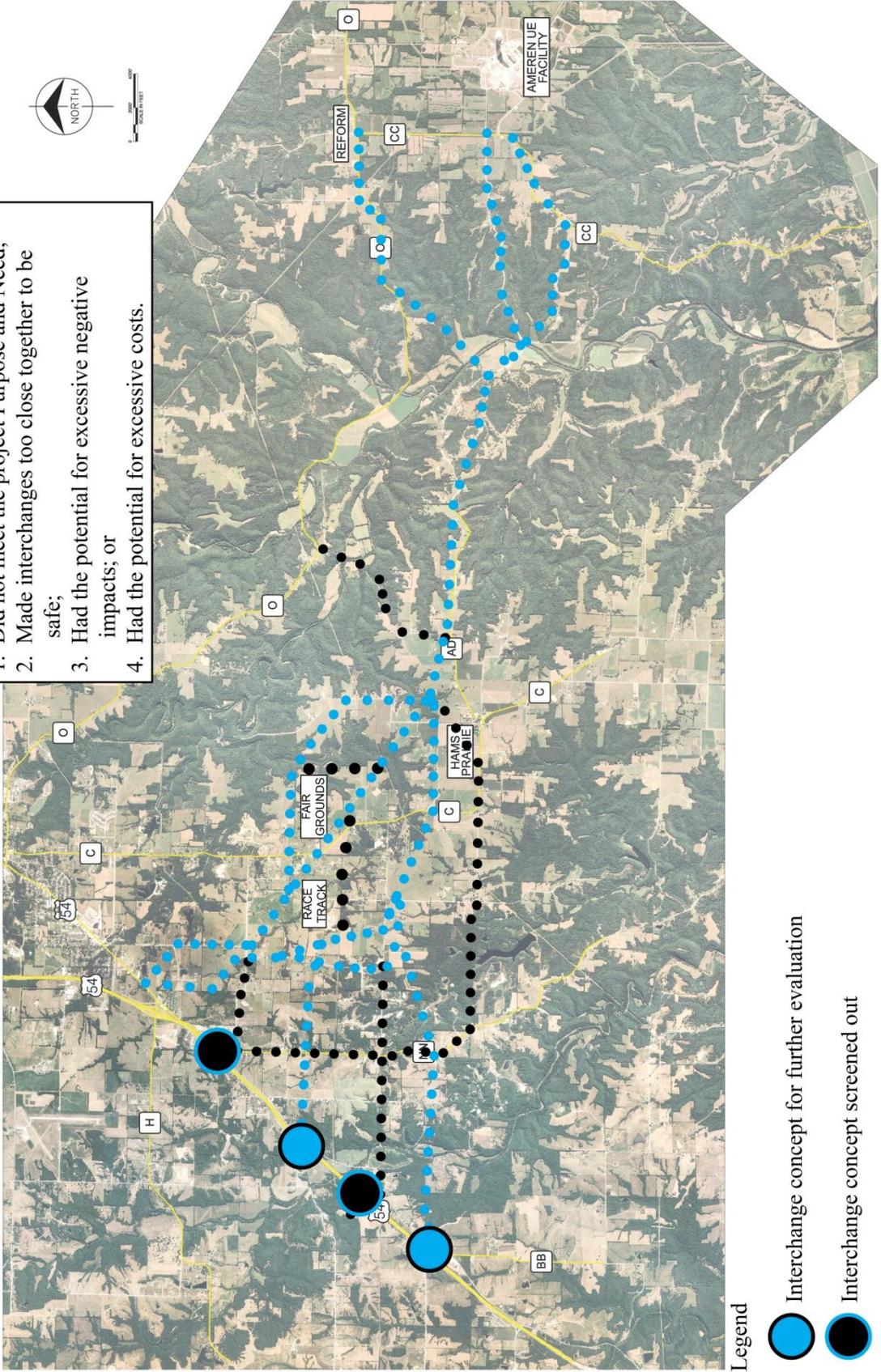


Figure 2-3: Initial Roadway Concepts Developed and Those Removed From Further Consideration

Some of the initial concepts considered have been screened out because they:

1. Did not meet the project Purpose and Need;
2. Made interchanges too close together to be safe;
3. Had the potential for excessive negative impacts; or
4. Had the potential for excessive costs.

Initial Concepts for New Roadway



Legend

- Interchange concept for further evaluation
- Interchange concept screened out
- New roadway concept for further evaluation
- New roadway concept screened out



Which initial concepts were removed from further consideration?

Some of the initial concepts for construction of a new roadway were removed from further consideration because they (1) did not meet the transportation needs within the study area, (2) would result in less than standard interchange spacing along Highway 54, (3) would potentially result in excessive impacts to the environment or to private property, and/or (4) could not be constructed for a reasonable cost. **Figure 2-3** displays the initial concepts that were eliminated from further consideration.

Which concepts were selected for further study?

Improve Existing Roadway Concepts:

The best concept for improving the existing roadway system is to upgrade and extend Tennyson Road to Route O (light blue concept shown on **Figure 2-1**). Tennyson Road would be improved from Business Route 54 to where it dead-ends east of County Road 409. From this point, the road would be extended to Route O, east of Fulton. The Tennyson Road concept would minimize impacts to properties and farmland, while providing the best access and connections to Fulton. The extension of Tennyson Road could be combined with improvements noted as Route O East to provide an upgraded roadway system to service the study area. Additional improvements along Route O in sections that are left in place would include pavement stabilization and minimal shoulder widening.

Although the Tennyson Road Concept combined with Route O East improvements would provide improved access and roadway conditions, the resulting improvements would not adequately meet the study needs for system reliability. The Tennyson Road Concept would not improve the reliability of the overall roadway system and lacks the ability to support the transport of goods and people between major population and employment centers. Additionally, improvements along Route O East would involve existing roadway segments that traverse very rugged terrain. Rebuilding segments of Route O would be viable from an engineering standard but would be costly, particularly when viewed in comparison to constructing a new roadway in the region. For these reasons, the Tennyson Road Concept is not carried forward for detailed evaluation in the EA.

**Selection Criteria:
Roadway Concepts Selected for
Further Study**

Meets Purpose and Need

- Makes travel safer
- Improves access to/from Highway 54
- Updates the roadway system
- Improves access during floods

Environmental Impacts

- Natural environment
- People and property
- Historic and archeological sites

Relative Construction Costs

Public Comment

New Roadway Concepts:

As depicted in **Figure 2-4**, the New Roadway Concepts would be linked together to span the study area. The selection of the best concepts to provide a new roadway followed the same evaluation process for selection of the Improve Existing Roadway Concepts. Each concept was given a general rating from better to worse for each of the evaluation criteria, and then weighed against what would happen if there were no improvements, as would occur under the No-Build Alternative. The concepts were also presented as part of a Public Open House held on June 4, 2009, at which time attendees were asked to provide feedback and rankings on each concept.

Segments West 2, West-Central 4, and East 3 shown in **Figure 2-4** were eliminated from further evaluation by the study team prior to entering the next phase of the process which would link



Alternatives

together the segments to form a continuous route. The decision to eliminate West 2 and West-Central 4 were a result of public response, potentially significant impacts to homes and property, and higher construction costs. The decision to eliminate East 3 was a result of coordination with the Department of Conservation on impact to their resources in the region, higher than originally anticipated construction costs due to the local terrain, and lack of support by the public.

Based on this evaluation and consideration of the public input received, the best concepts were selected and linked together to form two potential routes for a new roadway, identified for preliminary review as the northern route and southern route. Linking the selected new roadway concepts together provides a well-functioning roadway supported by the members of the public who attended the various outreach sessions. The linked segments provide a roadway that spans the study area and connects at logical termini.

Northern route – The northern route is composed of roadway concepts West 3, West-Central 3, Central 1, and East 1.

- **West 3 Concept** – This concept provides a facility with the potential to serve a large number of users. West 3 would use the existing access point along Business Route 54 making it cost effective, and would reduce travel times in comparison to the other West Concepts. West 3 was well supported by Fulton residents and Fulton city officials. West 3 would require fewer residential relocations and would have less impact to prime farmland, forestland, streams, and wetlands compared to the other West Concepts. West 3 would have more floodplain impacts compared to West 2 and West 4, although West 3 has less total stream impacts and some of the floodplain impacts could likely be avoided during final design.
- **West-Central 3 Concept** – This concept would provide a roadway built to current design standards while minimizing impacts to properties and residences. West-Central 3 would have the highest number of potential commercial relocations compared to the other West-Central Concepts; however, West-Central 3 would have the fewest number of potential residential relocations. The proposed roadway would be constructed along a new alignment and would provide access to the fairgrounds located near Route C. West-Central 3 was viewed by the public as providing the safest and most accessible route within this portion of the study area. West-Central 3 would have more stream, floodplain, and wetland impacts compared to West-Central 1 and West-Central 2, but it would provide the shortest route to connect West 3 and Central 1 and would have fewer impacts than West-Central 4. As a result, the overall stream and wetland impacts would be less for the northern route compared to the southern route. Furthermore, West-Central 3 would have the least prime farmland impacts of all the West-Central Concepts and would have no impacts to public drinking water wells.
- **Central 1 Concept** – Central 1 was the only concept developed and evaluated within the Central segment of the study area. The western portion of this concept would upgrade a section of Route AD with a section of roadway constructed on new alignment to the east. Upgrading Route AD combined with providing a new roadway within this segment would improve safety and minimize impacts to environmental features.
- **East 1 Concept** – East 1 would connect to Central 1, cross Auxvasse Creek at a new location, and then follow a new alignment to the northeast to tie into Route O, and then follow Route O to intersect with Route CC. East 1 also avoids crossing through the large contiguous block of MDC property located at the east end of the study area. East 1 would improve a portion of Route O near Route C, and connects at the existing intersection of Routes O and CC



providing a logical terminus while facilitating future roadway improvements that could connect to I-70, as the need arises. East 1 uses the portion of Route CC that was improved in the 1980's and meets the desired criteria for both geometry and pavement width. East 1 would have the greatest wetland impacts of all three East Concepts; however, as part of the Preferred Alternative, there would be fewer overall wetland impacts compared to the Southern Alternative. East 1 would also avoid crossing the MDC-owned Hams Prairie Access, and, as such, it is preferred by MDC over East 2. East 1 could potentially affect four protected species due to the Auxvasse creek crossing and impacts to forested and riparian habitat; however, all of the East Concepts would require crossing Auxvasse Creek and would be similar in terms of habitat impacts.

Southern route – The southern route is composed of roadway concepts West 1, portions of West-Central 1 and 2, Central 1, and East 2.

- **West 1 Concept** – This option, which includes a new access point to US 54, received higher rankings in many of the project goal categories. The new connection point to US 54 and the low density of access points gave West 1 higher rankings in both connectivity and safety. West 1 received moderate public support overall and particularly strong support from residents of Holts Summit and Jefferson City. A drawback of West 1 includes the amount of travel demand draw that could be expected from the Fulton area. In general, motorists will almost always choose a route based upon travel time. West 1 would require 7.2 minutes of additional travel as compared to West 3 for motorists in the Fulton area. Also, because West 1 is the longest of all the West Concepts, it would have greater impacts to prime farmland, forestland, streams, floodplains, and wetlands.
- **West-Central 1 and 2 Concepts** – The Southern Alternative utilizes portions of the West-Central 1 and West-Central 2 Concepts to connect West 1 to Central 1. The proposed roadway would primarily be constructed along new alignment. This alignment would result in a higher number of residential relocations compared to West-Central 3. Both West-Central 1 and West-Central 2 would have fewer stream, floodplain, and wetland impacts compared to the other West-Central Concepts.
- **Central 1 Concept** – As discussed earlier, Central 1 was the only concept developed and evaluated within the Central segment of the study area.
- **East 2 Concept** – East 2 would connect to Central 1, cross Auxvasse Creek at a new location, and then follow County Road 428 to intersect with Route CC. East 2 received a high ranking due to public support for a more direct route to the Callaway Plant, specifically from Ameren Missouri employees. Of all the East Concepts, East 2 would have the least impact to prime farmland, forestland, streams, and wetlands, because it is the shortest in length. However, East 2 would cross Hams Prairie Access and impact this publicly owned property. Additional drawbacks of this concept include potential impacts to homes and property along County Road 428.

How would a new roadway impact future traffic flow through the study area?

A traffic study was performed for intersections where a new roadway would intersect major routes or at locations expected to serve traffic

Level of Service (LOS)

LOS is a qualitative measure to describe the operational characteristics of traffic flow. Letters A through F are used to denote LOS, with LOS A being the most favorable driving condition and F the least desirable condition. MoDOT considers a LOS D or better as acceptable during peak hours for unsignalized intersections, such as those located within the study area.



Alternatives

related to potential construction at the Callaway Plant (**Appendix D**). Traffic operations were evaluated to determine the peak number of vehicles that would be traveling through these intersections and the impact the traffic would have on congestion and delay, represented by Level of Service (LOS).

As summarized in **Table 2-1**, LOS was determined for major intersections in the years 2017 and 2037, with and without construction of a new roadway. For the purposes of evaluation, peak construction at the Callaway Plant was assumed to occur during the year 2017, and the year 2037 is the design year for the proposed roadway improvements. The timing of peak plant construction is subject to change pending project permitting and financing. However, the results of the traffic analysis would be typical for any construction year.

Table 2-1: Level of Service (LOS) Comparison					
Intersection	Level of Service				
	Existing	2017 No-Build	2017 Build	2037 No-Build	2037 Build
Bus-54/Route H & US-54 SB Ramp	A (A)*	A (A)	E (B)	A (A)	B (A)
Bus-54/Route H & US-54 NB Ramp	A (A)	A (A)	A (A)	A (A)	A (A)
Bus-54 & New Road Segments West 3 and West 4	N/A	N/A	C (F)	N/A	A (B)
Route CC & New Road Segment East 2 (Existing CR 428)	A (A)	F (F)	E (D)	A (A)	A (A)
Route O & Route CC (New Road Segment East 1)	A (A)	D (F)	C (B)	C (B)	C (B)

*AM Level of Service (PM Level of Service)

With or without construction of a new roadway, LOS is anticipated to be at an E or F at many locations in 2017, the designated peak construction year, due to the large influx of short-term workers commuting to the Callaway Plant. Localized improvements, such as the use of temporary traffic signals or construction of dedicated turning lanes, will be needed at some of the existing intersections (i.e., along Route CC) to further improve traffic flow and LOS along with construction of a new roadway.

In the 2037 design year, operating conditions at all of the intersections will be at a LOS C or a above, with or without construction of a new roadway. Localized improvements, such as dedicated turn lanes, may be needed to improve traffic flow at intersections near the Callaway Plant.

Recommendations

Based on the roadway concept development and evaluation process described in this chapter, the No-Build and two build alternatives are carried forward for detailed evaluation and comparison in this EA. The study team has designated the northern route, comprised of roadway concepts West 3, West-Central 3, Central 1, and East 1, as the Preferred Alternative (**Figure 2-5**). The southern route,



which is comprised of roadway concepts West 1, portions of West-Central 1 and 2, Central 1, and East 2, is designated as the Southern Alternative for evaluation in this EA (**Figure 2-5**).

The northern route has been designated as the Preferred Alternative by the study team, because it would:

- Provide a safer travel environment by creating a new roadway that is designed to current MoDOT roadway design standards in an area of Callaway County that has a number of existing roads with sharp curves and steep grades
- Create a more direct access route from Route 54 into southeastern Callaway County with its connection to Business 54 near the Route 54/Route H interchange
- Provide a more reliable roadway system in Callaway County that could accommodate an increase in traffic volumes and an increase in heavy truck traffic that would be required for the planned Callaway Plant expansion
- Facilitate access and travel through southeastern Callaway County during flood events

Table 2-2 shows the impacts anticipated as a result of each new roadway concept and shows the total impacts anticipated as a result of the Preferred and Southern Alternatives.



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Table 2-2: Summary of Impacts

	Units	West				West-Central				Central	East			Preferred Alternative Total ¹	Southern Alternative Total
		1	2	3	4	1	2	3	4	1	1	2	3		
Length	Miles	3.84	2.25	1.48	1.50	5.11	4.68	3.87	4.55	2.93	3.64	3.10	3.67	11.92	12.94
Right of Way	Acres	237	141	94	95	314	288	239	268	182	225	192	227	727	801
Travel Time	relative to today	Some Benefit	Improved	Best Option	More Improved	Some Benefit	Some Benefit	Best Option	Improved	Best Option	Improved	Best Option	Improved	Best Option	Some Benefit
Emergency Services	relative to today	Some Benefit	Some Benefit	Improved	Improved	Some Benefit	Some Benefit	Improved	Some Benefit	Improved	Some Benefit	Improved	Some Benefit	Improved	Some Benefit
Potential Residential Relocations	No.	5	8	3	3	8	6	2	7	7	8	14	7	20	29
Potential Commercial Relocations	No.	0	0	0	0	0	0	2	0	1	0	1	1	3	2
Prime Farmland	Acres	192	134	94	93	297	284	215	238	133	177	137	170	607	647
Forested Land	Acres	103	34	8	1	44	21	28	37	58	88	73	89	181	258
Length of streams within corridor	Feet	4,294	2,670	1,456	2,582	1,253	567	1,495	2,029	1,426	2,732	1,065	2,785	7,109	8,605
Floodplain	Acres	10	0	6	0	0	0	8	7	0	19	21	32	33	31
Wetlands	Acres	1.6	1.1	0	0.1	0.5	1.7	1.9	2.5	1.4	2.2	1.1	5.1	5.5	6.3
Public Drinking Water Wells	No.	0	0	1	0	1	1	0	0	0	1	0	0	2	0
NRHP Eligible Resources²	No.													2	3
Archaeological Sites	No.	0	0	1	0	0	0	0	1	0	2	5	3	3	5
Threatened/Endangered Species³	Species	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB	IB, GB, BS, WSM	IB, GB, BS, WSM			
Hazardous Waste Locations	No.	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Public Lands	No.	0	0	0	0	0	0	0	0	0	1	2	2	1	2
Receivers Affected by Noise⁴	No.													37	41
Estimated Costs⁵:															
Construction	Million dollars (2011)	14.6	11.6	2.9	2.9	13.0	11.9	8.9	10.6	6.7	8.5	8.2	8.6	27.1	37.8
Right of Way & Relocation		0.6	0.4	0.1	0.1	0.9	0.8	0.7	0.8	0.3	0.4	1.0	0.4	1.6	2.5
Engineering & Construction Admin.		2.2	1.7	0.4	0.4	2.0	1.8	1.4	1.6	1.0	1.4	1.2	1.3	4.1	5.7
Total		17.4	13.7	3.4	3.4	15.9	14.5	11.0	13.0	8.0	10.3	10.4	10.3	32.8	46.0

¹Totals for the Preferred Alternative may not equal the sum of the data for the individual segments West 3, West-Central 3, Central 1, and East 1 because of the way the individual segments have been delineated to provide comparison with corresponding segments

²Based on the architectural survey conducted for the Preferred and Southern Alternatives; not all roadway concept segments were surveyed

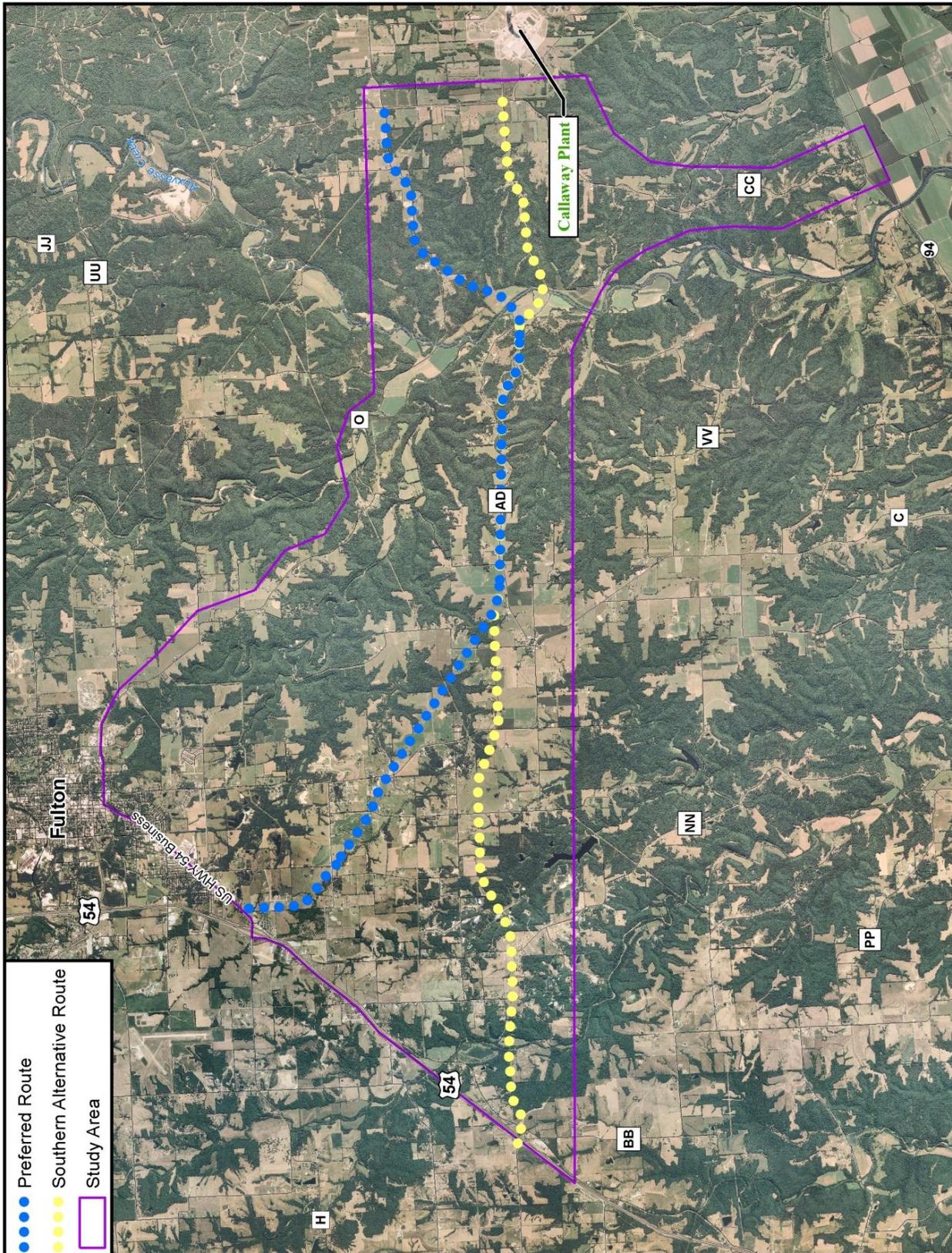
³Potential to affect these species (IB=Indiana bat; GB=gray bat; BS=blacknose shiner; WSM=western silvery minnow)

⁴Based on the noise analysis conducted for the Preferred and Southern Alternatives; not all roadway concept segments were analyzed

⁵Costs as reported in this table have been rounded to the nearest 0.1 million; more detailed cost information is provided in Appendix D



Figure 2-5: Preferred and Southern Alternatives





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Impacts on the Environment

Chapter 3: Impacts on the Environment

This chapter of the EA provides an overview of the existing environment and an analysis of the environmental impacts that would result from implementation of the No-Build, Preferred, or Southern Alternatives described in Chapter 2. An environmental impact or effect is defined as a modification or change in the existing environment brought about by the action taken. Effects can be direct, indirect or cumulative, and can be temporary (short-term) or permanent (long-term). Effects can vary in degree, ranging from only a slight discernible change to a major change in the environment. Measures to minimize harm and/or mitigate project impacts are also discussed, where appropriate.

For the purposes of this study, the No-Build Alternative would leave existing roadways as they currently are, with the exception of scheduled maintenance activities and programmed minor improvements (e.g., pavement resurfacing, signage upgrades, shoulder stabilization, etc.) under the discretion of MoDOT and Callaway County, as funding is made available. The No-Build Alternative would have no direct impacts to the environment but would allow limited access during flood events. The No-Build Alternative does not meet the needs and purpose for making transportation improvements within the study area, as described in Chapter 1, but is retained as a baseline for comparison with the Preferred and Southern Alternatives.

The Preferred and Southern Alternatives combine the construction of new roadways on new location with the reconstruction of roadways on their existing or near existing alignment. Linking these roadway segments together provides an updated roadway that spans the study area and is constructed to current MoDOT design standards.

What are the different types of impacts?

Direct impacts are caused by the construction of the project – an example would be filling a wetland to accommodate construction of a roadway. Indirect impacts also are caused by the project but are later in time or farther removed in distance than direct impacts. An example of indirect impacts would be the development of a gas station at an interchange. The direct impact is the conversion of farmland to roadway pavement and the interchange, but the indirect impact is the development of the land around the interchange after the roadway project is completed. The development of the land and construction of the gas station are not directly caused by the road construction, but occur indirectly because of the change brought about by the road improvement.

Cumulative impacts are impacts on the environment resulting from the incremental impact of the project when added to other past, present, and reasonably foreseeable future projects regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. An example of cumulative impacts: in the 1940s and 1950s land was cleared of trees to construct the Route O. More land and trees would need to be cleared to build new roads and to reconstruct other roads.

Land Use

What are the existing land uses in the study area?

The study area extends across unincorporated Callaway County. A small portion of the northwest corner of the study area includes part of the City of Fulton. Commercial and industrial development



Impacts on the Environment

within the study area is concentrated in and around Fulton and along Highway 54 and Business Route 54. There also are several state-supported confinement facilities located in Fulton along Route O. Small, unincorporated communities, such as Steedman and Hams Prairie, dot the study area. Agricultural uses and natural forest and grassland areas dominate the landscape with residences and businesses scattered through the study area. The Callaway Plant occupies a large tract of land on the eastern edge of the study area, with a portion of that property managed as part of the Reform Conservation Area by the Missouri Department of Natural Resources (MDNR). In addition, there are several publicly owned and/or managed lands, including the Reform Auxvasse Natural Area, Hams Prairie Access, a small segment of Katy Trail State Park, and a portion of the Mark Twain National Forest.

How is land use in the study area regulated?

Callaway County does not have a comprehensive plan or zoning ordinance governing development within the unincorporated portions of the county. Land use and development within the City of Fulton is regulated by the *Fulton Master Development Plan* and the city's *Zoning Ordinance* (City of Fulton, 1982, 1994).

How would the alternatives affect existing land uses?

No-Build Alternative – The No-Build Alternative would not require acquisition of right-of-way and would not directly alter existing land use patterns.

Preferred and Southern Alternatives – The Preferred and Southern Alternatives would result in the acquisition of additional right-of-way, which would directly affect existing agricultural, residential, and commercial land uses. The majority of the acquired land would include cropland, pasture, woodland, and otherwise undeveloped land. Impacts to residential land uses would primarily occur in those areas where the existing roadway would be improved or the new roadway would be constructed in close proximity to an existing roadway. Impacts to commercial land uses are very limited and would include properties near the project's tie in point to Business Route 54. The Callaway County Fairgrounds are located within the 500-foot wide corridor for the Preferred Alternative. Direct land use impacts to the fairgrounds would be avoided once the final alignment is determined, and the new roadway could be configured to enhance access to the fairgrounds.

Construction of the Preferred Alternative may also contribute to indirect, long-term land use changes. Induced development, especially commercial development, might occur along the new highway in areas that are currently agricultural or undeveloped. Such development would likely occur along the portions of the proposed route near Business Route 54.

Are the alternatives consistent with local land use plans?

No-Build Alternative – The No-Build Alternative would not conflict with local zoning and comprehensive land use plans.

Preferred Alternative – A small segment of the Preferred Alternative, where it connects with Business Route 54, is located within the Fulton city limits. Properties in this area are zoned Agricultural (A-1), Residential (R-1), Commercial (C-2), and Planned Commercial (C-3). The Preferred Alternative would not impact the continued use of these surrounding land uses in conformance with the current zoning, but may require acquisition of parts of certain parcels. If the Preferred Alternative would induce commercial development in the future, those areas zoned A-1 and R-1 would need to be rezoned to accommodate commercial uses. The Preferred Alternative would not conflict with the goals established in the *Fulton Master Development Plan*.



Southern Alternative – The Southern Alternative is located entirely within unincorporated Callaway County, which does not have land use plans.

Social and Economic Impacts

Various socioeconomic issues must be taken into consideration in analyzing the impacts of a new or upgraded roadway. The social and economic characteristics within the study area include the size of the population and how it has changed over time, the diversity of the population including race, ethnicity, and income, trends in housing growth and ownership, numbers and types of jobs, income and economic indicators, and the availability of public facilities and services.

Who lives in the study area?

The study area lies within Callaway County, which had an estimated population of 43,188 persons in 2008. The City of Fulton, with a population of 12,707 persons in 2008, is the largest population center within Callaway County. Several small incorporated areas, including Auxvasse, Holts Summit, Kingdom City, Lake Mykee Town, Mokane, and New Bloomfield, are located within Callaway County. Jefferson City, the state capitol of Missouri, and the City of Columbia are both within 25 miles of the study area. **Table 3-1** provides population data and illustrates the historic growth of the County’s population. Callaway County and the City of Fulton experienced moderate growth, 24.3 and 20.9 percent, respectively, between 1990 and 2000, with growth slowing slightly between 2000 and 2008 to 5.9 and 4.8 percent, respectively. The cities of Columbia and Jefferson City, which serve as major education and employment centers for the residents of Callaway County, also experienced growth during the same time periods.

Table 3-1: Population Growth of Surrounding Communities					
	Population			% Change	
	1990	2000	2008	1990 to 2000	2000 to 2008
Callaway County	32,809	40,766	43,188	24.3%	5.9%
City/Town					
Auxvasse	821	901	NA	9.7%	NA
Columbia	69,101	84,531	94,754	22.3%	12.1%
Fulton	10,033	12,128	12,707	20.9%	4.8%
Holts Summit	2,292	2,935	NA	28.1%	NA
Jefferson City	35,481	39,636	42,230	11.7%	6.5%
Kingdom City	112	121	NA	8.0%	NA
Lake Mykee Town	257	326	NA	26.8%	NA
Mokane	186	188	NA	1.1%	NA
New Bloomfield	480	599	NA	24.8%	NA

Source: U.S. Census Bureau 1990, 2000 and 2006-2008

According to U.S. Census Bureau data from 2000, the population within Callaway County is comprised of 91.5 percent white and 5.7 percent black/African American. As depicted in **Figure 3-1** and **Table 3-2**, the population within the census block groups included in the study area also has a similar racial composition, with the exception of Census Tract 9703 of Block Group 5 (southeast of Fulton), which is comprised of 70.9 percent white and 27.4 percent black/African American. The county and the study area have very small Hispanic populations.



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Figure 3-1: Census Block Groups

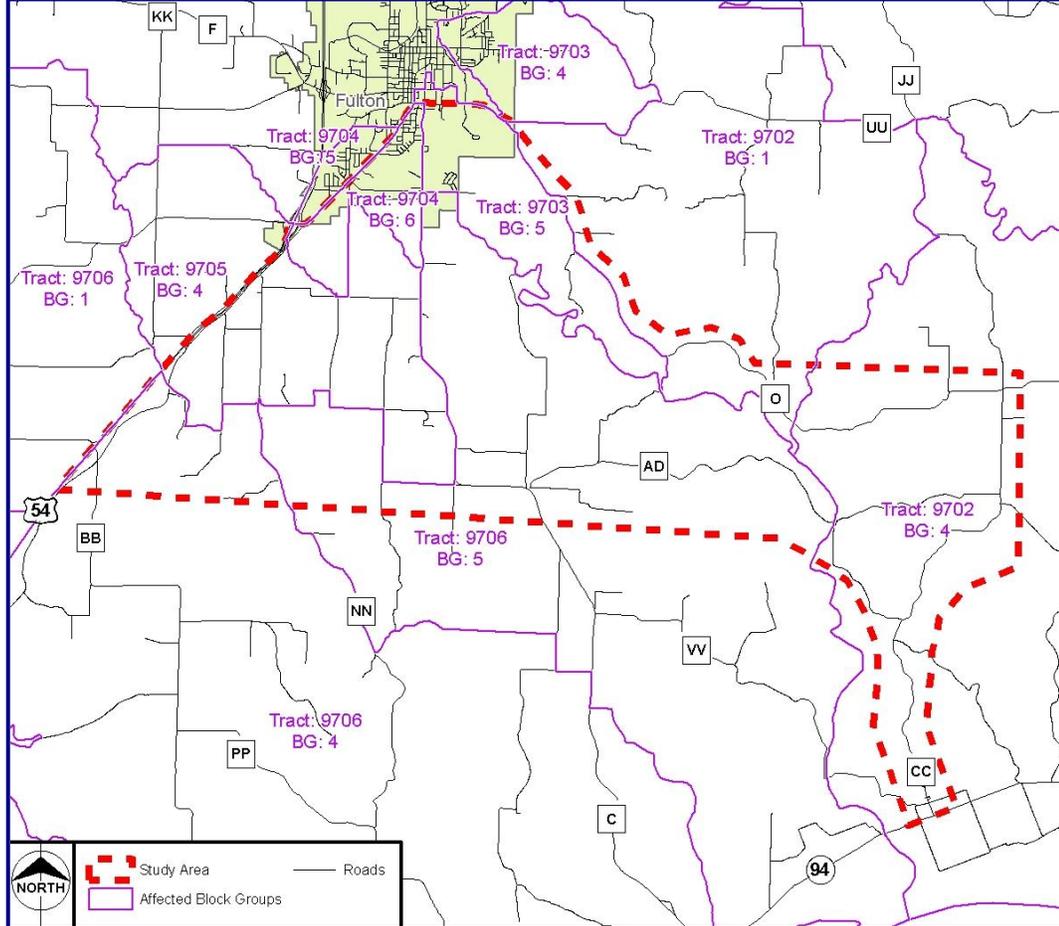


Table 3-2: Population by Race

	Total Population	White	African American	American Indian	Asian	Other	Hispanic
Callaway County	40,766	91.8%	5.7%	0.5%	0.5%	1.5%	0.9%
Block Groups							
CT 9702, BG 1*	943	97.1%	1.9%	0.1%	0.1%	0.7%	1.5%
CT 9702, BG 4	988	96.9%	0.1%	1.6%	0.1%	1.3%	0.9%
CT 9703, BG 4	1,273	94.0%	4.3%	0.2%	0.5%	0.9%	0.7%
CT 9703, BG 5	3,064	70.9%	27.4%	0.4%	0.3%	1.0%	0.9%
CT 9704, BG 5	1,157	91.9%	5.4%	0.2%	1.6%	1.0%	1.0%
CT 9704, BG 6	1,080	91.3%	5.0%	0.7%	0.5%	2.5%	0.8%
CT 9705, BG 4	1,059	94.2%	1.3%	0.3%	2.2%	2.0%	0.3%
CT 9706, BG 1	1,246	96.0%	1.4%	0.5%	0.4%	1.8%	0.2%
CT 9706, BG 4	1,929	97.9%	0.6%	0.6%	0.1%	0.8%	0.2%
CT 9706, BG 5	906	99.2%	0.3%	0.1%	0.1%	0.2%	0.1%

Source: U.S. Census Bureau 2000

*CT (census tract), BG (census block group)



What are the economic characteristics of the study area?

The economic characteristics of residents in the study area are described in terms of income levels, unemployment, home values, and home ownership. **Table 3-3** and **Table 3-4** provide a summary of household income, unemployment, poverty rates, housing values, and the percentage of owner-occupied housing units within the study area. Overall, property values in the study area have increased between 1999 and 2008; while the recent recession has contributed to an increase in the unemployment rate and the percentage of the population living below the poverty level.

	Median Household Income		Unemployment Rate		% Below Poverty	
	1999	2008	1999	2008	1999	2008
State of Missouri	\$37,934	\$46,408	2.8%	6.3%	11.7%	13.4%
Callaway County	\$39,110	\$48,174	2.6%	4.8%	8.5%	12%
Study Area*	\$39,535	NA	2.6%	NA	8.5%	NA

Source: U.S. Census Bureau 2000 and 2006-2008
 *average values for the study area calculated from the 2000 Census; Census Tracts (CT)/Block Groups (BG): CT9702/BG1, CT9702/BG4, CT9703/BG4, CT9703/BG5, CT9704/BG5, CT9704/BG6, CT9705/BG4, CT9706/BG1, CT9706/BG4, CT9706/BG5

In 1999, the median household income within the study area averaged \$39,535 compared to the median household income within Callaway County of \$39,110 and the State of Missouri of \$37,934. The majority of employed Callaway County residents work in education/health fields, retail trade, public administration, manufacturing, and construction. Major employers located in Fulton include: Westminster College, William Wood University, Missouri School for the Deaf, Sinclair Research Center (University of Missouri), Fulton State Hospital, Dollar General Distribution, and Merial (animal health and nutrition). Other employers including the Callaway Plant, State of Missouri (Jefferson City and Columbia), and the University of Missouri (Columbia) provide jobs for study area residents.

	Median Housing Values		Owner-Occupied Housing	
	1999	2008	1999	2008
State of Missouri	\$89,900	\$141,500	70.3%	70.5%
Callaway County	\$85,800	NA	76.8%	75.5%
Study Area*	\$84,380	NA	68.2%	NA

Source: U.S. Census Bureau 2000 and 2006-2008
 *average values for the study area calculated from the 2000 Census

The majority of study area residents live in single-family homes (70.6 percent), with 8.74 percent living in multi-family housing. There are a large number of mobile homes in Callaway County, comprising 21.7 percent of the county’s housing units compared to 20.2 percent within the study area. In 1999, the percentage of owner-occupied housing within the study area at 68.2 percent was slightly lower than within Callaway County (76.8 percent).

What public services and facilities are available to study area residents?

Public and emergency services are provided throughout the study area. Callaway County Emergency Medical Services (EMS), fire, and sheriff’s offices provide emergency response throughout the county. County staff also monitors flood events and work with state and federal staff located in Jefferson City to develop and implement evacuation plans during flood events. The study area encompasses two school districts. The majority of the study area lies within the South Callaway County R-II School District, which is comprised of an elementary, middle, and high school located in Mokane. The Fulton Public School System encompasses the far northwest portion of the study area with all of its schools located within the City of Fulton.



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There are a number of churches, cemeteries, and two daycare facilities within the study area in addition to the Callaway County Fairgrounds (7217 State Route C, Fulton MO 65251). The fairgrounds are the home of the Callaway County Fair and local 4H activities. There are several publicly owned or managed lands within the study area, including the Reform Conservation Area, the Reform Auxvasse Natural Area, Hams Prairie Access, and a portion of the Mark Twain National Forest. Katy Trail State Park, which follows the abandoned rail line near the Missouri River, borders the study area near the southern end of Route CC.

How would the alternatives affect residents within the study area?

No-Build Alternative – No direct changes in population, property values, or public services would result from the No-Build Alternative. Access to public facilities, education, and employment centers would continue to be the same. Population growth and employment would continue to follow existing trends. Because no new right-of-way is required to implement the No-Build Alternative, no relocations of homes, businesses, or public facilities would be required.

Preferred and Southern Alternatives – The Preferred and Southern Alternatives should have minimal impact on the residents within the study area. The routes used to access businesses, homes, and public facilities may change with construction of the new roadway. Access would be maintained to all properties during construction either by using existing roads, portions of the new road, or use of temporary roads. Construction of the new roadway would not change the racial make-up, distribution, size, or character of the study area population. Temporary jobs associated with construction of the road and the future expansion of the Callaway Plant would be available to local residents. Businesses located in Fulton and Mokane may see an increase in revenues from the sale of goods and materials used to construct the road and from the sale of goods and services that support the workforce for the roadway project. The Preferred and Southern Alternatives would potentially relocate homes and businesses. Relocations are discussed further below.

Environmental Justice

What is environmental justice?

The concept of environmental justice is based on Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, age, and national origin in programs and activities receiving federal financial assistance.

Environmental justice concerns may arise from human health or environmental effects of a transportation project on either minority or low-income populations. The need to identify environmental justice issues is stated in Executive Order 12898 (EO), entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*. The EO states that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” A Presidential Memorandum accompanying the EO directed agencies to incorporate environmental justice concerns in their NEPA processes and practices. In 1997, the U.S. Department of Transportation (DOT) issued the *DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations* to summarize and expand upon the requirements of the EO.

For the analysis of environmental justice, minority persons are defined as any person who is African American, Hispanic, Asian, American Indian or Alaskan Native, or Native Hawaiian or Other Pacific Islander. Low income persons are defined as a person whose household income is at or below the



U.S. Department of Health and Human Services (HHS) poverty guidelines (i.e., \$22,050 for a family of four in 2010).

What minority and low-income populations live in the study area?

Environmental justice issues are identified by determining whether minority or low-income populations are present in the study area. Council on Environmental Quality (CEQ) guidance states that minority populations should be identified when the percentage of minority residents in the affected area exceeds 50 percent or is meaningfully greater than the percentage of minority residents in the general population (CEQ, 1997). If the minority population of the study area exceeds the county level by more than ten percent, it is considered to be “meaningfully greater” for the purposes of this study.

The CEQ guidance also states that the low-income populations should be identified based on poverty thresholds as reported by the U.S. Census Bureau. If the poverty rate of the population within the study area exceeds the county poverty rate by more than ten percent, it is considered to be an area of environmental justice concern for the purposes of this analysis.

Based on 2000 census data, one of the census block groups in the study area has a minority population that exceeds the percentage of minority residents in the county by more than ten percent. In Block Group 5 of Census Tract 9703, 27.4 percent of the population is African American, compared to 5.7 percent for the county. Based on 2000 census data, none of the census block groups in the study area exceed the county poverty level by more than ten percent.

What are the effects of each alternative on environmental justice populations?

No-Build Alternative – Because no new right-of-way is required to implement the No-Build Alternative, no businesses, homes, or public facilities would be relocated. The No-Build Alternative would not have a disproportionate impact on minority or low-income populations.

Preferred and Southern Alternatives – No minority or low-income populations were identified within the 500-foot wide corridor used to determine the potential impacts of the Preferred or Southern Alternatives. The corridors for the Preferred and Southern Alternatives do not affect Block Group 5 of Census Tract 9703, and therefore avoids impacts to the identified minority population.

Impacts from the Preferred and Southern Alternatives would be similar for all groups regardless of the demographic or socioeconomic characteristics of the community. In the event minority and/or low-income households are displaced by the Preferred Alternative, MoDOT would provide purchasing and relocation assistance and advisory services, as required under the Uniform Relocation Act (described in the following section), for any member of the community whose property is needed for the project. MoDOT would inform individuals, businesses, and non-profit organizations of the impacts of the project on their property. All residents of the study corridor, including minorities and lower income groups, would benefit from positive impacts of an improved local roadway network including: relief of local traffic congestion, increased safety, potential job creation, and improved economic conditions for businesses.

Relocations

What relocations are required for the alternatives considered?

Relocations would only be necessary if the new right-of-way required for an alternative directly affected a home or business.



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No-Build Alternative – Because no new right-of-way is required to implement the No-Build Alternative, no businesses, homes, or public facilities would be relocated under the No-Build Alternative.

Preferred and Southern Alternatives – For the purpose of this EA, a 500-foot wide corridor was used to determine the potential impacts of the Preferred and Southern Alternatives. Twenty residences and three businesses are located within the 500-foot wide corridor for the Preferred Alternative, and twenty-nine residences and two businesses are located within the 500-foot wide corridor for the Southern Alternative. Some of these residences and business could require relocation to accommodate the proposed roadway improvements, depending on the final alignment and the footprint of the new right-of-way required. However, it is likely that as the alignment is refined through the design process, many of these relocations could be avoided.

The number of relocations identified for the alternatives represents the worst-case scenario within the entire 500-foot width of the project corridor. For the purposes of this study, if the corridor crossed over the residence or very near the structure it was counted as a relocation. As the project proceeds through further design, there may be opportunities to reduce the number of relocations created by either the Preferred or Southern Alternative. It may also be possible, because of the rural nature of the study area, to reconstruct homes on their current land parcel, or in the case of a mobile home, move the home to another location.

Potential residential relocations associated with the Preferred and Southern Alternatives consist of single-family homes which are representative of the overall housing stock within the study area. It is anticipated that these potential relocations all would be owner occupied. Review of the census data indicates that the potential residential relocations could include a very small percentage of minority and low-income households.

What happens if all or part of my property is purchased for construction of the Preferred or Southern Alternative?

MoDOT will compensate homeowners that are relocated and provide assistance with the relocation process. All relocation assistance would be provided in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended (49 CFR Part 24). Resources would be made available without discrimination to all residential and business owners who are relocated. Under the requirements of the Uniform Act, no relocations can occur until it is shown that comparable housing is available in the area for the purpose of relocating residents. Replacement housing must be similar both in type and price range. Typically, community facilities that are relocated by a project require rebuilding rather than relocation.

The Uniform Act, as well as Missouri state laws, requires that just compensation be paid to the owner of private property taken for public use. The appraisal of fair market value is the basis for determining just compensation to be offered the owner for the property to be acquired.

What is an appraisal?

An appraisal is defined in the Uniform Act (49 CFR Part 24) as a written statement independently and impartially prepared by a qualified appraiser. The appraisal sets 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.

Any relocated owner-occupant or tenant of a dwelling who qualifies as a relocated person is entitled to payment of his or her actual moving and related expenses, as MoDOT determines to be reasonable



and necessary. A relocated owner-occupant who has occupied a relocated dwelling for at least 180 days is also eligible to receive up to \$22,500 for a replacement housing payment. This payment includes the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the relocation dwelling, increased interest costs, and incidental costs. A relocated owner-occupant who has occupied a relocated dwelling for at least 90 days but less than 180 days and a tenant who has occupied a relocated dwelling for at least 90 days, is entitled to a payment not to exceed \$5,250 for either rental or down payment assistance.

Any relocated business, farm operation, or nonprofit organization that qualifies as a relocated person is entitled to payment of their actual moving and related expenses, as MoDOT determines to be reasonable and necessary. In addition, a business, farm, or nonprofit organization may be eligible to receive a payment not to exceed \$10,000 for expenses incurred in reestablishing their business, farm, or nonprofit organization at a replacement site.

A relocated business may be eligible to choose to receive a fixed payment instead of the payment for actual moving expenses and related expenses, and actual reasonable reestablishment expenses. The payment amount for this entitlement alternative is based on the average net earnings of the business. This fixed payment amount cannot be less than \$1,000 or more than \$20,000.

If I have to move, is housing available in the study area?

There are numerous rural residential homes and vacant land parcels for sale within Callaway County that would be comparable to the properties displaced by the Preferred or Southern Alternative. Depending on the type of impact to a parcel, if the parcel is large enough, the house or mobile home could be relocated in the existing parcel. Each property would be dealt with on a case-by-case basis.

Noise Impacts

Vehicle noise is a combination of noise produced by the engine, exhaust, and tires. Heavier traffic volumes, higher speeds, and greater numbers of trucks all increase the loudness of traffic noise. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels (dB). However, the human ear does not respond to all frequencies that compose sound. For this reason, traffic-noise levels are typically calculated in A-weighted decibels (dBA). A-weighting de-emphasizes lower frequency sounds below 1,000 hertz (1 kHz) and higher frequency sounds (above 4 kHz). A-weighting is the measure most used for traffic and environmental noise throughout the world, as it provides a high degree of correlation with human annoyance and health effects.

In addition to noise varying in frequency, noise intensity fluctuates with time. The equivalent sound level (Leq) is the equivalent steady-state sound level of which, in a stated period, contains the same acoustical energy as the time-varying sound level during the same period. The Leq (h) is the energy-average of the A-weighted sound levels occurring during a 1-hour period, in decibels (i.e., a 1-hour Leq). The effects of noise on people can be listed in three general categories: (1) subjective effects of annoyance, nuisance, and dissatisfaction; (2) interference with activities such as speech, sleep, and learning, and (3) physiological effects such as startling and hearing loss.

With regard to increases in dBA, knowledge of the following relationships will be helpful in understanding this topic:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside the laboratory, a 3-dBA change is considered a just-perceivable difference.



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- A 10-dBA increase is subjectively heard as approximately a doubling in loudness.

The FHWA has determined noise abatement criteria (NAC) for different land uses which is expressed as dBA-Leq(h) as shown in **Table 3-5**. For the purpose of traffic noise analysis, land uses of properties located adjacent to transportation improvements are classified according to human activities that occur or are expected to occur within the property boundaries. Residences, schools, churches, libraries, hospitals, recreational areas, and parks experience an impact from traffic noise when the NAC of 67 dBA is approached or exceeded. According to *MoDOT's Traffic Noise Policy*, a noise receiver is considered impacted if the predicted noise level approaches, equals, or exceeds the FHWA's NAC, or if the future predicted noise levels exceed existing noise levels by 15 dBA. The noise level is considered "approached" if it is one (1) dBA below the NAC. Consequently, traffic-noise impacts for residential and public use buildings or outdoor recreational areas would occur whenever peak-hour noise levels exceed 66 dBA or when they are 15 dBA higher than existing conditions.

Table 3-5: FHWA Noise Abatement Criteria		
Activity Category	L _{eq} Noise Level (dBA)	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties, or activities not included in categories A or B above.
D	---	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: FHWA

What are the noise impacts of the alternatives?

Existing noise levels were measured at five representative locations within the corridor of the Preferred Alternative. Using FHWA's Traffic Noise Model (TNM), representative receivers were identified and then modeled to predict estimated peak hour traffic noise levels for the design year 2037 for the No-Build, Preferred, and Southern Alternatives. To determine the potential impacts from noise resulting from future traffic volumes for the alternatives, the future 66-dBA contour was plotted along the existing and proposed roadway alignments to determine how many sensitive noise receivers would be located within the 66-dBA noise contour. The results of the noise analysis are summarized in **Table 3-6** for the design year 2037. The detailed noise analysis is included in **Appendix E**.



No-Build Alternative – The receivers affected by future traffic noise under the No-Build Alternative are located very close to existing roads. Due to their close proximity to a road and the rural and scattered nature of the homes within the study area, mitigation for noise impacts (in the form of noise barriers or vegetation and earthen berms) is not reasonable or practicable.

Table 3-6: Number of Receivers Affected by Noise – No-Build, Preferred, and Southern Alternatives

	No-Build Alternative (2037)	Preferred Alternative (2037)	Southern Alternative (2037)
Number of receivers that would exceed 66-dBA	4	7	7
Number of receivers that would experience an increase of 15-dBA or more over existing noise levels	0	14	14
Number of receivers that would exceed 66-dBA and experience an increase of 15-dBA or more	5	16	20
Total Receivers Affected	9	37	41

Source: Burns & McDonnell 2010

Preferred and Southern Alternatives –

The receivers affected by future traffic noise under the Preferred and Southern Alternatives also are located very close to existing roads. As the design of the Callaway County Connector continues, some of the affected receivers may be located within the proposed right-of-way required for the project, and therefore could be displaced. As design of the Callaway County Connector continues, the alignment may be shifted in some locations away from some of the affected receivers, resulting in noise levels less than the levels modeled at this time.

Various noise abatement options were considered for the affected receivers, such as moving the road farther away from receivers, reducing the operating speed and/or grade of the road, purchasing land to create a buffer zone, and construction of noise barriers (e.g., noise walls or earthen berms). A noise barrier analysis was performed for those sensitive receivers that are expected to be impacted by the construction of both the Preferred and Southern Alternatives. Due to the rural nature of the project area and the cost per benefitted receiver, none of the designed barriers were determined to be reasonable per the MoDOT Traffic Noise Policy.

Air Quality

What is the existing air quality in the study area?

The Clean Air Act (CAA) protects and enhances the quality of the nation's air by regulating stationary and mobile sources of air emissions. The federal government established the National Ambient Air Quality Standards (NAAQS) to protect public health, safety, and welfare from known or anticipated effects of six criteria pollutants: sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, ozone, and lead. In addition to these pollutants, the State of Missouri established additional criteria for hydrogen sulfide and sulfuric acid.

All counties in Missouri, with the exception of Franklin, Jefferson, St. Charles, and St. Louis counties, are currently in attainment for all NAAQS. The State of Missouri monitors air pollutants known to affect people's health through a network of 33 monitoring locations positioned around the state. The nearest active air monitor is located in Mark Twain State Park in Monroe County,



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approximately 45 miles to the north of the study area. This air monitor station tracks the presence of various air pollutants including sulfur dioxide, ozone, and inhalable particulate matter.

What impacts would the project have on air quality?

Vehicle exhaust can contribute four of the six criteria pollutants: ozone, carbon monoxide, particulate matter, and nitrogen dioxide to the air. Conformity of transportation projects with the NAAQS, as required by the CAA, ensures that federally funded or approved transportation plans, programs, and projects conform to the air quality objectives established in a State Implementation Plan. MoDOT is responsible for implementing the transportation conformity regulations in nonattainment and maintenance areas designated by the Environmental Protection Agency (EPA). Because Callaway County is located in a non-classified area as defined by EPA, the transportation conformity requirements of the CAA do not apply to this proposed action. The Preferred, Southern, and No-Build Alternatives would generate very minimal levels of air pollutants. The Preferred or Southern Alternative would make travel more efficient; therefore it would decrease vehicle emissions over the No-Build Alternative. For these reasons, no further analysis is required.

Farmland Impacts

What are the characteristics of agriculture in Missouri and Callaway County?

Based on the 2007 Census of Agriculture, 66 percent (29,026,573 acres) of the total land area in the State of Missouri is farmland, with an average farm size of 269 acres (USDA, 2009). Missouri ranked 12th in the U.S. in total value of agricultural products sold (\$7.5 billion), with crop sales accounting for 47 percent and livestock sales accounting for 53 percent.

In Callaway County, 60 percent (322,929 acres) of the total land area is farmland (USDA, 2009). The average farm size in Callaway County (215 acres) is slightly smaller in comparison to the state. The county ranked 44th of 114 counties in Missouri for total value of agricultural products sold (\$69,263,000), 42 percent of which was crop sales and 58 percent of which was livestock sales.

How is farmland classified?

Prime farmland, as defined by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), is land that has been determined to have the best combination of physical and chemical properties for agricultural production and is available for farming (NRCS, 2009c). In addition to prime farmland, land may be classified as farmland of statewide importance, as determined by the state.

In Callaway County, 14 soils are classified as prime farmland, 6 soils are prime farmland if drained, 4 soils are prime farmland if protected from flooding or not frequently flooded during the growing season, and 33 soils are classified as farmland of statewide importance. These general soil areas are depicted for the study area in **Figure 3-2**.

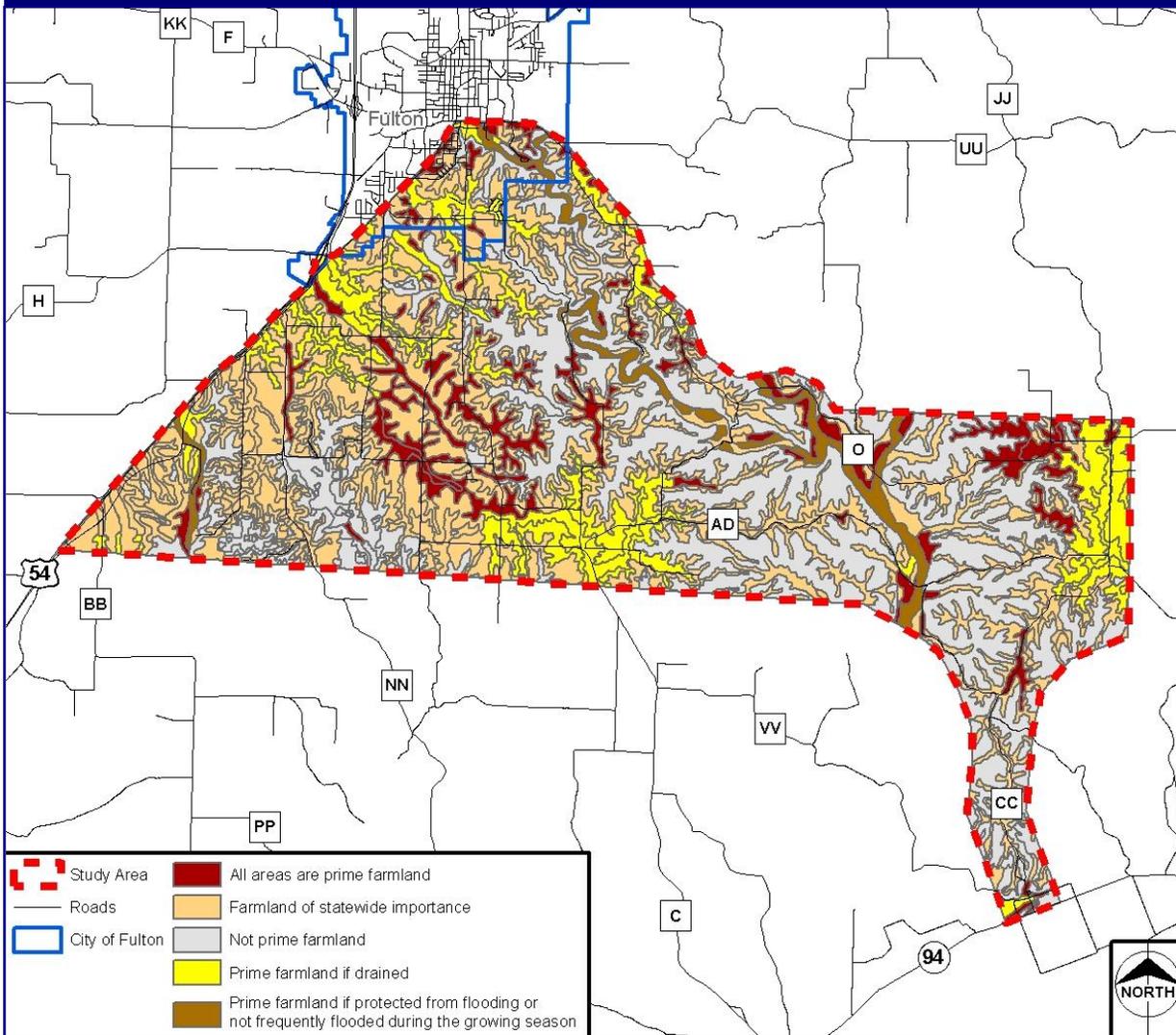
How is farmland impact evaluated?

Federal agencies have a mandate under the Farmland Protection Policy Act (FPPA) to minimize unnecessary and irreversible conversion of farmland to nonagricultural uses. To comply with the FPPA, federal agencies must evaluate the relative effect development projects have on farmland. This assessment is a collaborative process with the NRCS and is done using the Farmland Conversion Impact Rating Form for Corridor Type Projects (NRCS-CPA-106 Form). The higher the rating, the better suited the location is for agriculture. A rating of 220 or above requires the evaluation of three



alternatives, a rating between 160 and 220 requires the evaluation of two alternatives, and a rating below 160 does not require evaluation of an alternative (NRCS, 2010).

Figure 3-2: Prime Farmland Soils



How will farmland be impacted by the alternatives?

No-Build Alternative – The No-Build Alternative would not require acquisition of right-of-way and would not impact prime farmland.

Preferred and Southern Alternatives – The Preferred and Southern Alternatives have been evaluated in coordination with the NRCS using the NRCS-CPA-106 Form. The entire 500-foot wide corridor was evaluated for impacts, although the actual construction right-of-way would affect a smaller area. Of the 727 acres that encompass the corridor for the Preferred Alternative, a total of 607 acres consist of prime, statewide, and other important soils (**Table 3-7**). For the Southern Alternative, 647 acres of the total 801 acres consist of prime, statewide, and other important soils.

Completion of the NRCS-CPA-106 Form resulted in a total impact rating of 149 points for the Preferred Alternative and 148 points for the Southern Alternative, which are both below the 160-point threshold established by NRCS for consideration of alternatives that would impact less farmland (see



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Appendix F for completed form). Neither the Preferred Alternative nor Southern Alternative is expected to result in significant impacts to prime farmland, and neither would significantly affect overall agricultural production in Callaway County.

Unavoidable impacts to on-farm investments and parcel severance could result from construction of the Preferred or Southern Alternative. Efforts to avoid or minimize such impacts would be considered during the design process. Owners would be compensated for uneconomical remnants if they result from the project.

Farmland Classification	Preferred Alternative	Southern Alternative
Prime or other important farmland (acres)	607	647
All areas are prime farmland	131	72
Farmland of statewide importance	317	464
Prime farmland if drained	148	101
Prime farmland if protected from flooding or not frequently flooded during the growing season	10	10
Not prime farmland (acres)	120	154
Total area within 500-foot wide corridor (acres)	727	801

Source: NRCS 2009c

Natural Resources

Vegetation

What types of vegetation are found in the study area?

The study area lies within the River Hills ecoregion, which is dominated by forested river slopes and bluffs. Land cover in the area includes row crops, improved pasture, and mixed hardwood forests (Chapman et al., 2002). The Reform Conservation Area, a public use area located east of the study area, contains a diversity of land types, including open land, forest and woodlands, and a portion of the Missouri River floodplain.

Vegetation types in the study area consisted of maintained lawns, cultivated and uncultivated agricultural fields, tree lines along roads and in open fields, riparian corridors, forested areas in the eastern portion of the study area, and palustrine emergent wetland vegetation along pond edges.

Major or dominant vegetative communities include: riparian forests dominated by American elm (*Ulmus Americana*), sycamore (*Platanus occidentalis*), and roughleaf dogwood (*Cornus drummondii*); oak-hickory forests dominated by northern red oak (*Quercus rubra*), white oak (*Quercus alba*), hickory (*Carya* spp.), and Eastern red cedar (*Juniperus virginiana*); mixed successional woodland and old pastures dominated by Northern red oak, American elm, coralberry (*Symphoricarpos orbiculatus*), and poison ivy (*Toxicodendron radicans*). Cultivated fields and pastures dominated by tall fescue (*Festuca arundinacea*), brome (*Bromus inornis*), broomsedge bluestem (*Andropogon virginicus*), goldenrod (*Solidago* spp.), and milkweed (*Asclepias* spp.) also dot the landscape.

Noxious weeds are identified plant species that encroach upon agriculture, cause problems with human health, or degrade the environment. Measures to control the spread of noxious weeds are required by law due to their detrimental effects. Eleven species are state-listed as noxious weeds in Missouri, all of which are introduced species (Fishel et al., 2002; MDNR, 2009a). Multiflora rose (*Rosa multiflora*) and Johnson grass (*Sorghum halapense*) have been observed in the vicinity



(UniStar, 2008). The entire study area for the current project has not received specific surveys for upland, wetland, and noxious plants species, thus there remains the possibility of other state-listed noxious weeds in the study area.

What are the potential impacts to vegetation as a result of the alternatives considered?

No-Build Alternative – Because no right-of-way would be acquired, the No-Build Alternative would not affect large areas of undisturbed vegetation. Continuation of planned maintenance activities could involve the disturbance of small areas of vegetation to maintain shoulders, ditches, and the use of chemicals to control weeds around signs and guardrails.

Preferred and Southern Alternatives – Grading and vegetation clearing would take place within the proposed construction limits. The Southern Alternative would result in more impacts to forested lands as compared to the Preferred Alternative, as there are an estimated 181 acres of forested lands within the 500-foot-wide corridor for the Preferred Alternative and 258 acres for the Southern Alternative. Construction activities generally result in vegetation removal, increased trampling of vegetation, erosion, soil compaction, and sedimentation; any of which could result in adverse effects to vegetation communities. Areas disturbed for construction but not covered by pavement or other roadway improvements would be revegetated to minimize soil erosion and the establishment of weedy plant species. Areas currently under the jurisdiction of the MDC would be revegetated to native species through coordination with the MDC, depending on the management plan for the area. Stormwater management and other best management practices (BMPs) proposed to manage cleared areas during construction are described in the Construction Impacts Section.

Fugitive dust, which is dust not emitted from a definable point source, poses a potential impact to local plant communities during project construction, operation, and future maintenance because it interferes with plant growth by shading plant cells. Construction equipment, travel on existing and newly constructed gravel access roads, and soil disturbance are all sources of fugitive dust. Alteration of existing drainages and drainage patterns pre- and post-construction may alter water availability for some vegetation communities. Noxious weeds can be spread from unwashed construction equipment, vehicles transporting noxious weed-inoculated soil or plant materials into un-infested areas, or from transfer of topsoil inoculated with noxious weeds. Mitigation measures to avoid the introduction or spread of noxious weeds would include requiring that construction equipment and vehicles are free of soil and debris before entering the construction area.

Wildlife and Fisheries

What types of wildlife and fisheries are found in the study area?

The terrestrial habitats in this area support a variety of resident and migratory wildlife species. Wildlife use habitat within the study area for numerous reasons depending on the life stage and needs of the individual species.

Some of the larger mammals likely found within the study area include bobcat (*Lynx rufus*), coyote (*Canis latrans*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and white-tailed deer (*Odocoileus virginianus*). Mammals use a variety of habitats including cultivated agricultural fields, field edges, pastureland, forested areas, and drainages. Several species of bats (*Myotis* spp.) and smaller mammals are likely found within the study area as well (Schwartz and Schwartz, 1981). The study area also contains habitat suitable for many species of reptiles and amphibians. Some common species that may occur in the study area include American toad (*Bufo americanus*), bullfrog (*Lithobates catesbeiana*), common snapping turtle (*Chelydra serpentina*), Eastern hognose snake (*Heterodon platirhinos*), and tiger salamander



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(*Ambystoma tigrinum*). Amphibian and reptile species are likely to be found in a variety of habitats, including wetland areas, ponds, glades, riparian corridors, forested areas, and agricultural areas (Briggler and Johnson, 2004, 2006, 2008).

Avian groups commonly found in the study area using the forests, edge habitat, and open spaces include neotropical migrants, waterfowl, raptors, game species, and some shorebirds. Common species to the study area include American robin (*Turdus migratorius*), eastern meadowlark (*Sturnella magna*), killdeer (*Charadrius vociferus*), northern cardinal (*Cardinalis cardinalis*), red-tailed hawk (*Buteo jamaicensis*), and wild turkey (*Meleagris gallopavo*). Many other bird species inhabit the area at varying times of the year, including songbirds and migratory waterfowl species (National Geographic Society, 1987; Poole, 2005).

Many species of fish are found within the study area. Water bodies located in and around the study area include streams such as Auxvasse Creek, Logan Creek, and Mud Creek as well as unnamed tributaries. These creeks all feed into the Missouri River, located south of the study area. The Middle River is present in the southwest portion of the study area. There are many farm ponds located within the study area as well. Common species likely found in streams within the study area include creek chub (*Semotilus atromaculatus*), orangethroat darter (*Etheostoma spectabile*), redbfin shiner (*Lythrurus umbratilis*), and slender madtom (*Noturus exilis*). Common gamefish species occurring in the study area include bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), and largemouth bass (*Micropterus salmoides*) (UniStar, 2008; Pflieger, 1997).

How would the alternatives impact wildlife and fisheries?

No-Build Alternative – The No-Build Alternative would not require right-of-way to be acquired and would not affect wildlife or fisheries habitat.

Preferred and Southern Alternatives – The Preferred and Southern Alternatives would result in temporary and permanent impacts to terrestrial habitat along the route. Grading and clearing of existing vegetation and habitat would take place within the proposed limits of construction. These areas are currently forested, in agricultural use, or abandoned fields and used by a variety of the identified wildlife species. As design of the roadway progresses, the alignment may be modified to minimize the amount of forested area crossed to reduce the tree-covered area needing to be cleared. The large mammal species present would be displaced by construction activities. These are generally adaptable species, and population numbers are not likely to be significantly impacted by the construction or operation of the project.

The small mammals as well as amphibian and reptile species present may experience minor isolated mortalities due to an inability to escape construction. Habitat alterations would result in the relocation of these species to the surrounding areas. The effects of habitat fragmentation on population changes and mortality of small mammals, amphibians, and reptiles has been studied in great detail (Bayne and Hobson, 1998; Debinski and Holt, 2000; Semlitsch and Bodie, 2003). The study area has existing roads that have been in use for decades. Operation of the project will not result in a new significant permanent impact to mammal, amphibian, and reptile species in the area.

The bird species in the area will experience minimal habitat losses and alterations. Temporary and permanent impacts to birds would be minimal as a result of the project.

The aquatic resources would experience temporary and permanent impacts as a result of the project. Streams crossed by the project corridor would be spanned, and MoDOT BMPs would be implemented throughout the corridor to minimize temporary impacts. Ponds that are within the right-



of-way would be removed, resulting in a permanent impact to these isolated aquatic resources. Fish species at the population level would not experience temporary or permanent impacts as a result of the project.

The principal game species within the study area include northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaida macroura*), squirrel (*Sciurus* spp.), waterfowl, white-tailed deer, and wild turkey. In addition, there are trapping opportunities for small mammals. These species are adaptable to minimal human interaction and there are numerous existing roads in the area. There would not be significant impacts to these species as a result of construction of the project. White-tailed deer may experience an increase in deer-vehicle collisions with an increase in operational speeds on the new roadway. Noticeable impacts to game species are not anticipated.

Threatened and Endangered Species and Unique Natural Communities

The Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531-1544) directs all federal agencies to use their existing authorities to conserve species listed as threatened and endangered, in consultation with the U.S. Fish and Wildlife Service (USFWS). The goal is to ensure that their actions do not jeopardize the listed species or destroy or adversely modify critical habitat. The Missouri Endangered Species Law (MO ST 252.240) protects any species listed for protection by the Missouri Department of Conservation (MDC) and species listed by the USFWS in the State of Missouri. Additional protected resources in Missouri include natural communities or areas of unique habitat as indicated by MDC.

County-level information available online was accessed from MDC and the USFWS in addition to a study-area-specific Missouri Natural Heritage Database inquiry to determine what listed species have the potential to occur in the study area (**Appendix B**). Information from all three of these sources was used to determine the potential impacts to threatened or endangered species.

How would the alternatives affect species that are federally or state-listed as threatened or endangered?

Seven federally or state-listed species were identified that have the potential to occur within Callaway County or the study area (**Table 3-8**). In addition, four species of conservation concern have the potential to occur within the study area (**Table 3-8**). Species of conservation

Table 3-8: Federally and State-Listed Species Potentially Occurring in Callaway County or the Study Area

Common Name	Scientific Name	State Rank/ State Status	Federal Status
Blacknose shiner ¹	<i>Notropis heterolepis</i>	S2	
Flathead chub	<i>Platygobio gracilis</i>	S1/Endangered ²	
Gray bat ¹	<i>Myotis grisescens</i>	S3/Endangered ²	Endangered
Indiana bat	<i>Myotis sodalis</i>	S1/Endangered	Endangered
Lake sturgeon	<i>Acipenser fulvescens</i>	S1/Endangered ²	
Pallid sturgeon	<i>Scaphirhynchus albus</i>	S1/Endangered ²	Endangered
Running buffalo clover	<i>Trifolium stoloniferum</i>	S1/Endangered ²	Endangered
Topeka shiner ¹	<i>Notropis topeka</i>	S1/Endangered	Endangered
Umbrella flatsedge ¹	<i>Cyperus diandrus</i>	S1	
Western silvery minnow ¹	<i>Hybognathus argyritis</i>	S2	
Yellow false mallow ¹	<i>Malvastrum hispidum</i>	S3	

Source: MDC county-level list (MDC, 2012); USFWS county-level list (USFWS, 2012); Missouri Natural Heritage Database inquiry for the Callaway County Connector study area (Brown, 2009)
¹Record of species included in Missouri Natural Heritage Database inquiry for the Callaway County Connector study area
²State-listed as endangered for Callaway County, Missouri



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concern have a designated state-level numeric rank of relative endangerment: S1 is critically imperiled, S2 is imperiled, S3 is vulnerable, S4 is apparently secure, and S5 is secure (MDC, 2010). A more detailed description of suitable habitat for these species and a discussion of known or likely occurrences of these species within the study area are included in **Appendix B**.

No-Build Alternative – The No-Build Alternative would have no effect on federally listed or state-listed species, their habitats, or unique natural communities.

Preferred and Southern Alternatives – Both the Preferred and Southern Alternatives have the potential to affect four of the protected species identified as a concern within the study area, including the Indiana bat, gray bat, blacknose shiner, and western silvery minnow.

Forested areas within the 500-foot-wide corridor for the Preferred and Southern Alternatives may contain suitable roosting habitat for the Indiana bat. Surveys will be conducted for suitable Indiana bat roosting habitat along the project corridor during the design phase of the project, as advised by USFWS (Scott, 2009). If surveys indicate that suitable Indiana bat habitat is present within the project corridor, further coordination with USFWS would be required prior to construction. Removal of potentially suitable roost trees would be limited to a fall and winter timeframe to avoid potential impacts to Indiana bats on summer maternity and swarming habitat.

Neither the Preferred nor Southern Alternative would impact any known bat caves. There is a recorded gray bat capture site within one mile of the Southern Alternative, and there is the potential for the Southern Alternative to have an indirect impact on this species by removing potential foraging habitat along the Middle River. There is the potential for both alternatives to have an indirect impact on the gray bat by removing potential foraging habitat along other streams in the study area.

Both the blacknose shiner and western silvery minnow have been known to inhabit Auxvasse Creek. The Preferred and Southern Alternatives would cross this stream, and, therefore, there is the potential for both alternatives to have indirect impacts to these species by impacting water quality and riparian habitat. Impacts to Auxvasse Creek and other waterways will be temporary during construction, and MoDOT will comply with MDNR’s stormwater regulations and implement its Stormwater Pollution Prevention Plan (SWPPP).

Would the alternatives impact any unique natural communities?

The State of Missouri also includes numerous unique habitat and community types that contain characteristics, micro-ecosystems, and species diversity that are considered to be important and rare by MDC. Three sensitive natural communities were recorded within the study area (**Table 3-9**). These include dolomite glade, dry-mesic sandstone forest, and dry limestone/dolomite woodland.

Common Name	Private or Public Area	State Rank
Dolomite glade	Private	S3
Dry limestone/dolomite woodland	Private/Public	S3
Dry-mesic sandstone forest	Private	S3

Source: Missouri Natural Heritage Database inquiry for the Callaway County Connector study area (Brown, 2009)

The high quality status of the terrestrial natural communities is often a result of topography, geology and soils, land use, preservation, human access, and natural processes. The plant and animal communities within these areas may be unique relative to the surrounding



environments in terms of species diversity and abundance (MDC, 2010). These areas are frequently where threatened, endangered, and other sensitive terrestrial species are documented. A state ranking system is used for these areas, similar to the state ranking system for species.

A more detailed description of these unique natural communities is included in **Appendix B**.

The No-Build, Preferred, or Southern Alternative would not impact the unique natural communities identified within the study area. The Preferred and Southern Alternatives have been routed to avoid these areas.

Geologic Resources

What are the typical geologic features of the study area and surrounding region?

The study area encompasses Major Land Resource Area (MLRA) region M, which is part of the Central Mississippi Valley Wooded Slopes, Western Part, MLRA 115B (NRCS, 2009b).

Local soil deposits are underlain by three bedrock systems: Mississippian, Ordovician, and Pennsylvanian. The Mississippian System, the most extensive, includes cherty dolostone and limestone. The Ordovician System is the most common in more dissected areas and consists mostly of sandstone, dolostone, and limestone. Bedrock outcrops are common on the bluffs along the Mississippi River and its major tributaries and at the base of steep slopes along minor streams and valleys. Karst areas have formed where Mississippian or Ordovician limestone is located near the surface.

Many limestone and dolomite quarries are located throughout the MLRA. Mineral industries in Callaway County include crushed stone, construction sand and gravel, and refractory clay (MDC, 2001). Callaway County is also within an area of past and present coal mining.

Based on GIS data for locations of active industrial mineral mines in Missouri, which are permitted with MDNR, there are two active clay plants located within the study area. Additional GIS data for mines, occurrences, and prospects in Missouri indicates that there are records for 58 various mines within the study area, which include 51 clay pits, three limestone quarries, one sand and gravel quarry, and three coal mines. The majority of these mines are indicated to be past producers and are no longer active.

The study area is located outside of the New Madrid Seismic Zone, a seismically active fault system in southeastern Missouri (USGS, 2009). Earthquakes may be felt in the study area, but impacts from large earthquakes, including landslides, ground failures, and resulting roadway or bridge damage, in this area would not be likely.

How would the alternatives impact geologic resources?

No-Build Alternative – The No-Build Alternative would not require acquisition of right-of-way and would not impact mineral resources or unique geological features. Impacts resulting from geological hazards, such as earthquakes, are unlikely in this area.

Preferred and Southern Alternative – There are no areas of geological importance within the region of influence of the Preferred or Southern Alternative. The alternatives are located in an area not considered to be seismically active. While a few historic earthquake epicenters are located near the study area, the potential for strong ground motion from an earthquake is unlikely. Landslides rarely occur in the region because of the general low relief. As such, landslide-prone areas were not identified within the 500-foot wide corridor for the Preferred or Southern Alternative. Karst



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formations are not present within the project corridors; therefore, the potential for sinkhole development, usually associated with karst, is unlikely.

Neither the Preferred Alternative nor the Southern Alternative would affect the two active clay plants identified within the study area. There are two former surface clay mines located within the 500-foot corridor for the Preferred Alternative. The site of one of the former clay mines is located near the intersection of Route C and County Road 403, and the other is located near the intersection of County Road 418 and County Road 409. There is one former surface clay mine located within the 500-foot corridor for the Southern Alternative. It is located at the intersection of County Roads 409 and 418. Aerial photography indicates that these mines have likely been abandoned for a long time. Two of the sites are located in an area currently in agricultural production, and one is located in a wooded area. None of the remaining clay pits, limestone quarries, sand and gravel quarries, or coal mines that were identified within the study area are located within the 500-foot corridor for the Preferred or Southern Alternative.

In summary, there would be no significant impacts to mineral resources, unique geological features or impacts resulting from geological hazards from the construction of the Preferred or Southern Alternative.

Soils

What are the characteristics of the soils found within the study area?

The soils characteristic of the study area are well suited to growing crops, forests, and grasslands. Many of the soils contain a high proportion of clay that is highly susceptible to shrink-swell cycles caused by varying wet and dry conditions. The soils range from very shallow along ridge tops to very deep and poorly drained in valleys and are moderately erodible.

How would the alternatives impact soils?

No-Build Alternative – The No-Build Alternative would not require acquisition of right-of-way and would not impact soils.

Preferred and Southern Alternatives – The Preferred and Southern Alternatives would require excavating soils to construct highway components. The total area within the 500-foot wide corridor is 727 acres for the Preferred Alternative and 801 acres for the Southern Alternative. For the purpose of this assessment, it is assumed that the entire 500-foot wide corridor would be disturbed. However, the actual construction right-of-way, which will be further refined during the design process, would be smaller.

The Construction Impacts Section of this EA provides a description of the BMPs that would need to be implemented during construction to minimize erosion and sedimentation of receiving streams. A description of farmland soils was presented in the Farmland Impacts section.

Water Resources

Why are water resources important?

Water resources - aquifers (groundwater), rivers and streams, floodplains, and wetlands - provide essential biological functions in the natural environment. Aquifers filter impurities and serve as a source of drinking water. Streams support animal and plant community types and are an integral part of the hydrologic cycle. Wetlands provide water storage and energy dissipation during storm events and promote the cycling of nutrients including removal of pollutants and retention of minerals.



Floodplains along streams and rivers work in tandem with wetlands to store and dissipate flood flows and provide additional wildlife habitat. In addition to these functions, public water resources provide aesthetic benefits and recreational opportunities including fishing, hunting, and canoeing.

The CWA requires an evaluation of every project to determine whether the project could have a negative impact on any waters of the U.S. including wetlands, streams, ponds, and special aquatic sites. Section 404 of the CWA requires that all federal, state, and public entities obtain a permit from the U.S. Army Corps of Engineers (USACE) before placing dredged or fill materials into waters of the U.S. Section 401 of the CWA requires that water quality certifications be obtained from the state water quality agency (MDNR) for any activity that results in the discharge of materials into jurisdictional wetlands and waters of the U.S.

Groundwater

What groundwater resources are found in the study area?

Aquifers located under southern Callaway County are associated with Mississippian, Ordovician and Cambrian sandstone and limestone. Groundwater flows from higher elevations where recharge occurs down to the lower stream valleys. Beneath the study area, a shallow aquifer exists to about 80 feet below the surface. This layer includes both Mississippian rocks and glacial deposits from the Quaternary Period. Below this aquifer lies a confining unit, or aquitard, that is about 250 feet thick. Below the aquitard lies the Cambrian-Ordovician aquifer, which is about 1500 feet thick (UniStar, 2008).

The Mississippian, Ordovician and Cambrian sandstone and limestone rocks typically yield from 15 to 500 gallons per minute of potable water, depending on the depth and type of rock. The study area is also located south of the freshwater-salinewater transition zone, meaning that aquifers in the study area are far less mineralized than aquifers in northern Missouri and waters extracted from them do not require extensive treatment. These aquifers are used to support drinking water, irrigation, and industrial uses within the County (MDNR, 2002).

Will public drinking water wells be affected by the alternatives?

The Safe Drinking Water Act Amendments of 1996 requires the MDNR to monitor potential contamination sources in areas that might affect a public drinking water source. The area around the well monitored for potential contamination sources is called a Ground Source Water Inventory Area (SWIA). There are six SWIAs within the study area, including three associated with City of Fulton public water supply wells and two associated with Callaway County Public Water Supply District (PWSD) #2 wells. The other SWIA is associated with a well for a mobile home park. These wells and SWIAs are listed in **Table 3-10**.

No-Build Alternative – No roadway improvements would be made; therefore, none of the existing drinking water wells or their respective SWIAs would be affected.

Preferred and Southern Alternatives – No SWIAs would be crossed by the Southern Alternative. The Preferred Alternative crosses two SWIAs, one located along the western portion of the project corridor and one located at the eastern end of the corridor. Well 13641 is an active SWIA for Callaway County Public Water Supply District (PWSD) #2 with a 2640-foot radius. The 500-foot wide corridor for the Preferred Alternative crosses through the outer limits of the 2640-foot radius on the northeast portion of the SWIA. The SWIA for Well 13589 (PWSD #2) overlaps the existing intersection of Route O and Route CC at the eastern end of the corridor. Improvement of this portion



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of Route O would not affect the well and should not introduce contaminants into its associated SWIA.

No wellhead protection areas are known to exist within the study area. If Well 13641, Well 13589, or another public water supply well would be compromised by construction, the well would be properly closed and the public water supply district would be provided a new supply source at a different location. No surface water sources of public water supply are found within the study area. If encountered, abandoned wells will be plugged in accordance with 10 CSR 23-3.110, as this is standard operating procedure. Wellheads that are avoided by the corridor, but remain in close proximity to the construction footprint would be protected using silt fences, diversion ditches, and other BMPs to divert surface runoff from these areas.

Table 3-10: Wells and Associated SWIAs within Study Area

MDNR Well ID Number	Owner Well Number	Ownership	Use	SWIA Radius
14065	#5	City of Fulton	Public water supply	2,640'
14064	#8	City of Fulton	Public water supply	2,640'
14063	#7	City of Fulton	Public water supply	2,640'
13641	#6	Callaway County PWSD #2	Public water supply	2,640'
13589	#5	Callaway County PWSD #2	Public water supply	2,640'
13293	#1	Scotchman Place Mobile Home Park	Public/Mobile home park	2,640'

Source: CARES 2010

Rivers and Streams

What rivers and streams are found in the study area?

The study area is located within the Lower Missouri-Moreau watershed of the Missouri River basin. Within the study area, surface waters generally flow to the south/southeast, eventually flowing into the Missouri River located south of the study area. The Missouri River at this location flows generally from west to east. There are no designated Wild and Scenic Rivers, and no Nationwide Rivers Inventory streams within the study area.

Surface water resources within the study area include Middle River, Snyder Creek, and several streams that flow into Auxvasse Creek, including Youngs Creek, Stinson Creek, Crow's Fork Creek, Cow Creek, and Halls Creek (**Figure 3-3**). Auxvasse Creek, as well as the Middle River, eventually flow into the Missouri River. Numerous unnamed intermittent and ephemeral streams, farm



Auxvasse Creek

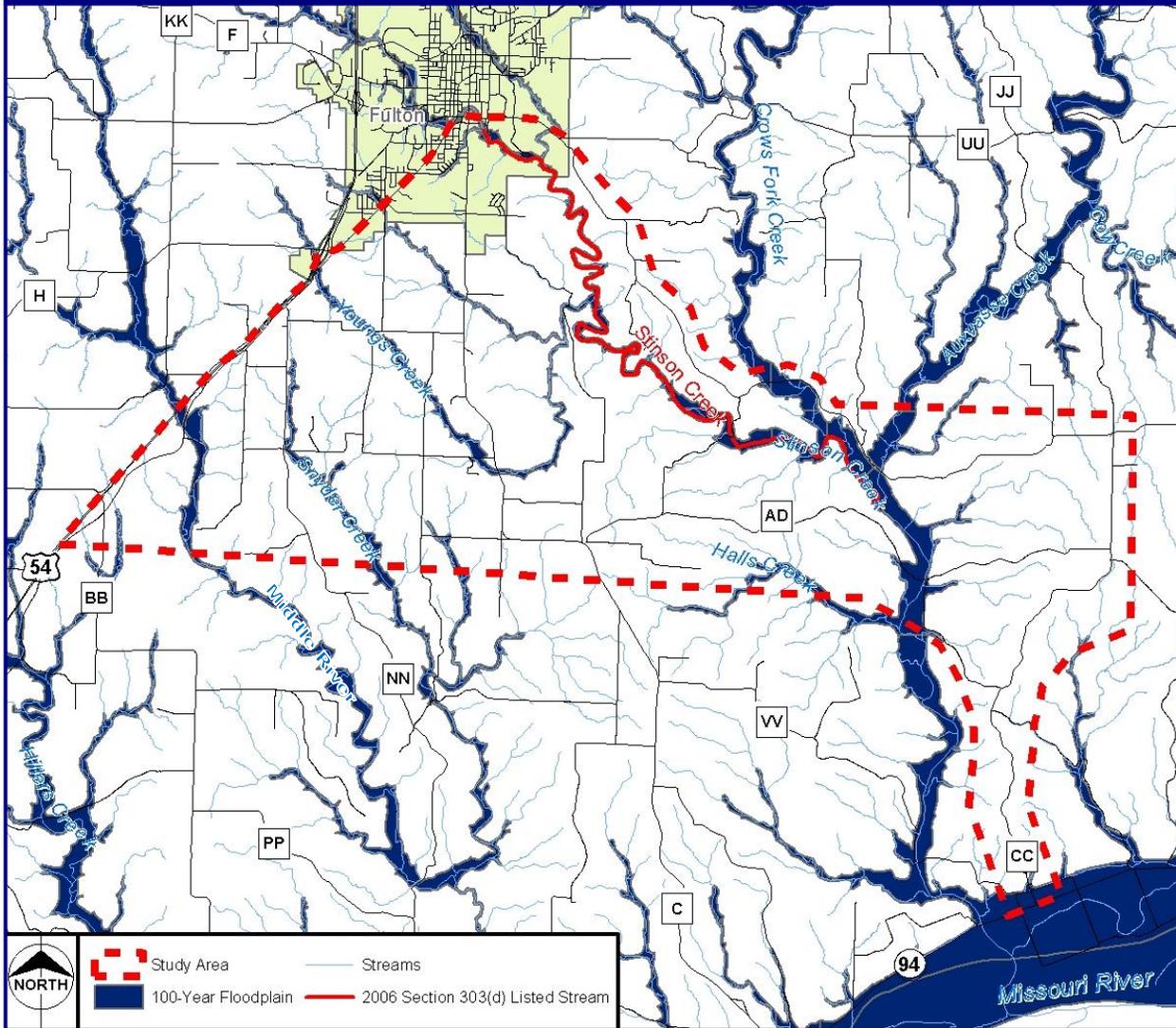


ponds, and wetlands are also common in the study area.

What impacts would the alternatives have on streams?

All regulated stream impacts are those that take place below the designated ordinary high water mark (OHWM). The OHWM is a line along the stream bank established by fluctuations in the water level that leaves a clear limit, ledge, or marking where the visual character of the soil, vegetation, and/or presence of litter or debris is decidedly different below and above the line. When fill material or structures (i.e., culverts or bridge piers) are placed below the OHWM, the impacts of that action are authorized under a Section 404 Permit issued by the USACE.

Figure 3-3: Streams and Floodplains



No-Build Alternative – With implementation of the No-Build Alternative, no roadway improvements would be made and no new right-of-way would be acquired that would potentially affect streams, rivers, and ponds within the study area. Existing bridges and culverts at road crossings of Stinson Creek, Crow’s Fork Creek, Cow Creek, Youngs Creek, Halls Creek, and Auxvasse Creek would remain as they are today, with only regular planned maintenance activities conducted as part of the No-Build Alternative.



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Preferred and Southern Alternatives – The 500-foot wide corridor for the Preferred Alternative crosses nine streams, including Youngs Creek, Auxvasse Creek, and tributaries to Youngs Creek, Cow Creek, Auxvasse Creek, and Stinson Creek. The corridor directly or longitudinally crosses two of the streams more than one time, due to the meandering nature of the streams, as summarized in Table 3-11.

The 500-foot wide corridor for the Southern Alternative directly or longitudinally crosses 13 streams, including Auxvasse Creek, Middle River, and tributaries to Stinson Creek, Auxvasse Creek, Hillers Creek, Middle River, and Snyder Creek. The corridor crosses one of the streams more than one time, due to the meandering nature of the stream (**Figure 3-5**).

Table 3-11: Stream Crossings within Preferred and Southern Alternative Corridors				
Stream Name	Preferred Corridor # of Crossings	Preferred Corridor Total Stream Length	Southern Corridor # of Crossings	Southern Corridor Total Stream Length
Trib. 1 to Youngs Creek	1	560	0	0
Trib. 2 to Youngs Creek	1	554	0	0
Youngs Creek	6	1,197	0	0
Trib. 1 to Stinson Creek	1	595	1	522
Trib. 2 to Stinson Creek	1	45	1	45
Trib. 1 to Auxvasse Creek	3	2,358	3	1,426
Auxvasse Creek	1	503	1	520
Trib. 2 to Auxvasse Creek	1	629	1	545
Trib. 1 to Cow Creek	1	667	0	0
Trib. 1 to Hillers Creek	0	0	1	707
Trib. 1 to Middle River	0	0	1	660
Trib. 2 to Middle River	0	0	1	853
Middle River	0	0	1	503
Trib. 3 to Middle River	0	0	1	509
Trib. 1 to Snyder Creek	0	0	1	528
Trib. 2 to Snyder Creek	0	0	1	693
Trib. 3 to Snyder Creek	0	0	1	560

The total length of intermittent and perennial streams within the project corridor is approximately 7,109 linear feet for the Preferred Alternative and 8,605 linear feet for the Southern Alternative. Stream data from the Center for Applied Research and Environmental Systems was used to calculate the length of each stream within the 500-foot wide corridors of the Preferred and Southern Alternatives. Not all stream segments identified within the 500-foot wide corridor would be affected by construction of the alternatives. Actual stream impacts would be determined during final design. For those that are a longitudinal encroachment, impact could likely be avoided. Bridges would be constructed over larger streams and floodplains including Auxvasse Creek, while culverts would be



installed at smaller stream crossings. Where the Preferred and Southern Alternatives cross existing culverts and bridges, these structures would most likely be replaced in-kind. The method of crossing at each stream will be determined during final design. Appropriate hydraulic analyses would be conducted to determine the correct size and location of each new bridge and culvert structure. Upon completion of final design and prior to initiating construction, Section 404 permits under the CWA would be obtained for those water crossings where impacts to the stream and associated wetlands are unavoidable. The degree of mitigation required for the unavoidable stream impacts would be determined using the State of Missouri Stream Mitigation Method (MSMM) through coordination with the USACE and MDNR.

Floodplains

What is the 100-year floodplain and regulatory floodway?

Floodplains are low-lying, flat or nearly flat areas of land adjacent to rivers, streams, and other water courses, that are periodically inundated with water due to natural events. The floodway consists of the river/stream channel and the immediately adjacent areas that carry the flood flows, usually with a strong current.

When available, flood hazard boundary maps, produced by the Federal Emergency Management Agency (FEMA) under their National Flood Insurance Program, are used to determine the limits of the 100-year (base) floodplain and the extent of possible floodplain encroachment. The regulatory floodway must be kept free from encroachment so the 100-year flood discharge can be carried without increasing the elevation of the base flood flow more than a specified amount. FEMA has mandated that projects can cause no rise in the regulatory floodway, and no more than a one-foot cumulative rise for all projects within the 100-year floodplain. For projects that involve the state of Missouri, the State Emergency Management Agency (SEMA) issues floodplain development permits. In the case of projects proposed within regulatory floodways, a “no-rise” certificate, if applicable, would be obtained prior to issuance of a permit.

Portions of the study area are located within the 100-year floodplain of the Missouri River and associated tributaries. During flood events, roadways throughout the area, including Route 94, have been inundated and access to homes and businesses has been impacted.

How are floodplains beneficial?

In natural systems, floodplains provide a number of important functions by creating wildlife habitat, providing temporary storage of flood water, preventing heavy erosion caused by fast moving water, recharging and protecting groundwater, supporting vegetative buffers to filter contaminants, and accommodating the natural movement of stream flows. Floodplains store excess water during floods and slow down the speed of the flowing water which protects areas farther downstream. Slower water velocities help reduce erosion and allow sediments in the water to settle, often providing nutrients to fertile floodplains.

Executive Order 11988, *Floodplain Management*, directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are to provide public notice of proposed actions in floodplains and make a finding that there is no practicable alternative before taking action that would encroach on a 100-year floodplain. U.S. Department of Transportation (DOT) Order 5650.2, *Floodplain Management and Protection*, outlines DOT policies and procedures for implementing E.O. 11988.



Impacts on the Environment

What impacts would the alternatives have on floodplains?

Within the study area, 100-year floodplains are mapped along the Middle River, Snyder Creek, Youngs Creek, Stinson Creek, Crow's Fork Creek, Halls Creek, Auxvasse Creek, and the Missouri River (see **Figure 3-3**).

No-Build Alternative – Because no new right-of-way would be required, existing floodplains would not be affected. Maintenance of bridges and culverts along existing roadways would continue and would not encroach on the floodplains. Alternate access for travelers affected by road closures during seasonal flooding events would not be improved.

Preferred and Southern Alternatives – According to FEMA's 100-year flood zone maps, the Preferred Alternative crosses floodplains associated with Youngs Creek and Auxvasse Creek. Based on the 500-foot wide corridor for the Preferred Alternative, a total of approximately 33 acres of 100-year floodplain could be affected. The 500-foot wide corridor for the Preferred Alternative parallels the Young's Creek floodplain and crosses the floodplain at six different locations, for a total impact of approximately 14 acres. Within the eastern half of the corridor, the Preferred Alternative crosses the Auxvasse Creek floodplain at one location, with an impact of approximately 19 acres.

The Southern Alternative crosses floodplains associated with Auxvasse Creek, Snyder Creek, and Middle River. Based on the 500-foot wide corridor for the Southern Alternative, a total of approximately 31 acres of 100-year floodplain could be affected. Within the western half of the corridor, the Southern Alternative crosses the Middle River floodplain and the Snyder Creek floodplain at one location each, with an impact of approximately six and four acres, respectively. The eastern end of the Southern Alternative crosses the Auxvasse Creek floodplain at one location, with an impact of approximately 21 acres.

As final design of the project continues, bridges would most likely be used to span the channel and floodplain associated with Auxvasse Creek, Youngs Creek, Middle River, and Snyder Creek. The placement of bridge abutments and/or bridge piers would be determined to minimize impacts within the floodplain. Hydraulic analyses would be conducted as part of the roadway design process to determine the impact of bridge and culvert placements on the flood flows and storage area available within the floodplain. A floodplain development permit and, if necessary, a Conditional Letter of Map Revision (CLOMR) would be completed to authorize floodplain impacts. Mitigation in terms of providing additional compensatory storage along with wetland and other habitat restoration may be required, depending on the type and magnitude of the impacts.

Construction of either the Preferred or Southern Alternatives would facilitate access and travel through southeastern Callaway County during seasonal flooding events. Access in the study area for travelers that use Route 94 would continue to be affected by road closures during flooding events for both the Preferred and Southern Alternatives.

Are there any FEMA buyout properties within the study area?

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 under Section 404 to "buyout" flood damaged property, which had been affected by the Great Flood of 1993.

There are numerous restrictions on these FEMA buyout properties. No structures or improvements may be erected on these properties unless they are open on all sides. The site shall be used only for



open space purposes, and shall stay in public ownership. These conditions and restrictions (among others), along with the right to enforce the same, are deemed to be covenants running with the land in perpetuity and are binding on subsequent successors, grantees, or assigns. Any decision involving these properties should take into consideration that 2-3 years is necessary to process an exemption from FEMA to utilize them. This exemption would likely be a permanent easement rather than a transfer of property.

There are no FEMA buyout properties within the 500-foot wide corridors for the Preferred or Southern Alternatives.

Wetlands

How were wetlands evaluated in the study area?

Section 404 of the CWA authorizes the USACE to issue permits for the discharge of dredged or fill material into wetlands and other waters of the United States. Wetlands are defined as *areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions* (USACE, 1987). All USACE-authorized activities in Missouri must obtain water quality certification pursuant to Section 401 of the CWA to ensure compliance with Missouri's water quality standards.

Wetlands are classified in accordance with the 1987 *U.S. Army Corps of Engineers Wetlands Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*. Wetlands are considered jurisdictional (fall under the permitting requirements of Section 404 of the CWA) if they meet all three of the following criteria:

- **Vegetation** – The prevalent vegetation consists of species that are typically adapted to inundated or saturated soil conditions.
- **Soil** – Soils have been classified as hydric, or that they possess visual characteristics that are associated with reduced soil conditions.
- **Hydrology** – The area is either inundated or saturated to the surface continually for at least five percent of the growing season in most years (50 percent probability of recurrence).

Common types of wetlands in Missouri include marshes, swamps, wet meadows, fens, and seeps (Epperson, 1992). These wetlands are very beneficial to the environment and provide homes to numerous plant and animal species, buffer stream banks against erosion, provide natural flood protection, improve water quality, protect adjacent water resources, and provide food and water for birds during migration and breeding seasons (MDNR, 2007).

A combination of data sources was reviewed to determine the type and location of streams, ponds, and potential wetland areas within the study area. USGS 7.5 minute quadrangle topographic maps, USFWS National Wetland Inventory (NWI) maps, and USDA soil survey data were reviewed prior to initiating a field review within the 500-foot wide corridor for the Preferred Alternative. According to these data sources, numerous small wetlands are scattered throughout the study area. The majority of them are classified as man-made farm ponds or palustrine unconsolidated bottom (PUB) wetlands. This wetland type is typically not considered jurisdictional under Section 404. Other wetlands classified as palustrine emergent (PEM), palustrine forested (PFO), and palustrine scrub-shrub (PSS) are associated with local streams. Based on the NWI data, the total area of wetlands present in the



Impacts on the Environment

study area is approximately 614 acres. Table 3-12 summarizes the wetland types, acreages, and characteristics of the wetlands located within the study area/corridors for the Preferred and Southern Alternatives.

Wetland Class	Wetland Description	Total Area (ac)			Location within Preferred and Southern Alternative Corridors	Characteristics
		Study Area ¹	Preferred Alternative ¹	Southern Alternative ¹		
PUB	pond	305	4	5	scattered throughout corridor	Farm ponds with average size of 0.5 acres
PEM	emergent	25	0	0		
PFO	forested	283	2	1	adjacent to Auxvasse Creek	Dominated by silver maple, box elder, eastern cottonwood, black willow, peach-leaved willow, Virginia wild rye, and giant ragweed.
PSS	scrub-shrub	0.6	0	0		Dominated by black willow, peach-leaved willow, sandbar willow, arrowhead, narrow-leaved cattail, and sedge species.
TOTAL:		614 ac	6 ac	6 ac		

¹Areas based on data taken from NWI maps.

Source: NWI Mapping, Kingdom City, Fulton, and Reform 7.5-minute Quadrangle Maps.

What potential wetland impacts would result from the alternatives?

No-Build Alternative – Because no new right-of-way would be required, existing wetlands would not be affected.

Preferred Alternative – According to NWI data for the study area, approximately 4 acres of ponds (PUB wetlands) and 2 acres of forested wetlands (PFO) are located within the 500-foot wide corridor for the Preferred Alternative (see **Figure 3-5** at end of section). The ponds are numerous, small ponds located throughout the entire corridor, while the forested wetlands are located along the western bank of the Auxvasse Creek.

During the March 2010 field visit, the existence of approximately 3 acres of NWI wetlands was verified within the Preferred Alternative corridor. Two NWI ponds, totaling 0.7 acre, have dried up or do not exist, and at least portions of the NWI forested wetlands along the Auxvasse Creek do not possess all of the characteristics necessary to be classified as jurisdictional wetlands by the USACE. Specifically, these areas lack hydrology and most likely hydric soils due to the steepness of the stream banks.

In addition, during the March 2010 field visit, one 0.5-acre pond was identified within the 500-foot wide corridor of the Preferred Alternative. The pond is located in the eastern half of the Preferred Alternative along Highway AD.

Southern Alternative – According to NWI data for the study area, approximately 5 acres of ponds



and one acre of forested wetlands are located within the 500-foot wide corridor for the Southern Alternative (**Figure 3-5**). The ponds are numerous, small ponds located throughout the entire corridor, while the forested wetlands are located along the western bank of the Auxvasse Creek. NWI wetlands within the Southern Alternative corridor have not been verified in the field.

Generally, the USACE classifies farm and field ponds as non-jurisdictional waters unless a connection to jurisdictional water is apparent. Accordingly, the majority of the ponds within the project corridors that could be disturbed by project activities would be classified as isolated and not as jurisdictional waters; therefore, no regulatory action would be required prior to their disturbance.

Executive Order 11990, *Protection of Wetlands*, requires each federal agency to minimize the destruction, loss, or degradation of wetlands when providing federally undertaken, financed, or assisted construction and improvements, as well as other activities. Each agency must avoid new construction located in wetlands unless no practicable alternatives to the proposed action exist, and the proposed action includes all practicable measures to minimize harm to wetlands that may result from the implementation of the action. In addition, DOT Order 5660.1A, *Preservation of the Nation's Wetlands*, sets forth DOT policy that transportation facilities should be planned, constructed, and operated to assure protection and enhancement of wetlands.

During the final design process, a Preliminary Jurisdictional Determination will be conducted and submitted to the USACE prior to initiating construction. At that time, MoDOT through consultation with resource agencies would submit an application to obtain a Section 404 Permit from the USACE for the placement of fill materials within jurisdictional areas that would result from construction of the Preferred or Southern Alternatives. During final design, the roadway alignment and final right-of-way footprint would be determined. This process would take into account the location of sensitive resources, including wetlands, to minimize, where reasonable and practicable, impacts and any required compensatory mitigation.

Only Practicable Alternative Finding – In accordance with Executive Order 11990, this project avoids to the extent possible long- and short-term adverse impacts associated with the destruction or modification of wetlands. The proposed action includes all practicable measures to minimize harm to wetlands that may result from such action. The selected alternative is anticipated to have less than six acres of permanent impact to waters of the U.S. FHWA has determined that the selected alternative comprises the least environmentally damaging practicable alternative that meets the project purpose.

If compensatory mitigation is required, what types would be expected?

Mitigation is required after avoidance and minimization have been accomplished for unavoidable impacts to streams and wetlands within the project corridor. Mitigation for wetlands is calculated using a ratio system. For instance, wetlands classified as emergent are generally required to be mitigated in the range of 1 to 3 times the impacted area, depending on the quality of the wetland. Ratios are subject to the discretion of the USACE and MDNR. More mitigation is typically required for higher quality wetlands and unique wetland types.

The amount of mitigation for stream impacts is determined using the State of Missouri Stream Mitigation Method (MSMM). The MSMM determines the amount of credits necessary to compensate for the unavoidable stream impacts. More stream mitigation is required when impacts fall within certain priority areas or higher order, larger, streams. An assessment method to calculate wetland impacts and mitigation that is similar to MSMM is currently under development by the five USACE districts in Missouri and other resource agencies, including MoDOT. This method may be



used for the proposed project if it is approved at the time of delineation.

Water Quality

What water quality issues are present within the study area?

Water quality is the physical, chemical, and biological characteristics of water in relationship to a set of standards. Water quality standards are created for different types of water bodies and water body locations per their desired use. The most common standards used to assess water quality relate to drinking water, safety of human contact, and for the health of ecosystems. Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify “impaired” waters that do not meet water quality standards and do not have adequate pollution controls. The 303(d) list allows state and federal agencies to monitor impaired waters that are not addressed by regular pollution control programs. Water quality standards protect the beneficial uses of water bodies for people, aquatic life, livestock, and wildlife. According to MDNR, Stinson Creek is the only 303(d) stream located within the study area. Stinson Creek, approximately nine miles long, originates to the northwest of Fulton and flows from northwest to southeast across the study area into Auxvasse Creek, south of Route O. Although Stinson Creek flows into Auxvasse Creek, the Auxvasse is not listed as a 303(d) stream. Stinson Creek has been listed as a 303(d) stream since 1994 due to the degradation of its water quality resulting from effluent from the Fulton Wastewater Treatment Plant. The poor water quality within Stinson Creek is due to low dissolved oxygen and the presence of organic sediment (MDNR, 2009).

How would the alternatives impact water quality?

No-Build Alternative – Continued roadway maintenance could result in the accidental spill or release of chemicals or compounds that negatively affect water quality. Land uses would not change, and agricultural applications of pesticides/herbicides would continue that could contribute to reduced water quality.

Preferred and Southern Alternatives – When evaluating potential impacts to ground and surface water quality, the excavation and exposure of soil during construction activities could cause sediment runoff during rain events. It is unlikely that construction within cultivated fields would contribute to additional sediment runoff, because such areas are continuously disturbed and BMPs would be used to prevent sediment from leaving the construction area. Thus, project impacts may be limited to areas within the project corridor that are uncultivated. A description of drinking water supplies and wellhead protection areas was presented in the Water Resources section. Construction of the Preferred or Southern Alternative would not contribute to the impairment of Stinson Creek.

Bicycle and Pedestrian Concerns

What is the extent of bicycle and pedestrian use within the study area?

There are two designated bicycle/pedestrian trails within the study area, the Stinson Creek Trail and the Katy Trail. The Stinson Creek Trail is located within the City of Fulton, and extends along Stinson Creek, in the northwest portion of the study area. The Katy Trail, which extends along the former Missouri-Kansas-Texas Railroad corridor, is located in the very southern portion of the study area along the Missouri River floodplain.



Stinson Creek Trail in Fulton



There is no regular recreational bicycle or pedestrian activity along roads within the study area. None of the roads have designated trails or bike lanes within the 500-foot wide corridor for the Preferred or Southern Alternative.

How would the alternatives affect bicyclists and pedestrians?

None of the alternatives would negatively affect bicycle or pedestrian use in the study area. The Preferred and Southern Alternatives would not impact the Stinson Creek Trail or the Katy Trail. The alternatives would provide an increased opportunity for bicycle and pedestrian use along the roadway shoulder. Using current MoDOT guidance, a rumble edge line would be placed immediately adjacent to the edge of the driving lane, allowing for seven feet of the roadway shoulder to be used.

Recreation

What recreational opportunities are located in the study area?

The study area consists of forested areas as well as open bottomland and agricultural fields. The topography in the eastern half of the study area is more rolling than in the western half, and also contains more forested area. There are many outdoor recreational opportunities in the region, with hunting, fishing, boating, biking, and camping being the preferred activities for locals and tourists.

Several creeks and smaller tributaries are found within the study area. Auxvasse Creek is the largest creek found within the study area. There are numerous small, privately-owned lakes and farm ponds scattered throughout the area. Fishing for game species such as largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalars punctatus*) is popular in the creeks and ponds in the area.

How would recreation be impacted by the project?

No-Build Alternative – The No-Build Alternative would not affect recreation within the study area. Access points to local and state-managed recreation and natural areas would remain the same.

Preferred and Southern Alternatives – Minor impacts to outdoor recreational areas are anticipated during construction of the Preferred or Southern Alternative. No impacts should occur to public parks and recreation areas within the city of Fulton. Direct impacts affecting access and noise in the vicinity of recreation areas would be temporary and of a relatively short duration.

Private properties used for hunting and fishing could be affected by the alignment of the Preferred or Southern Alternative. These properties could lose access or areas of good habitat for local game species. As described under the Natural Resources Section of this EA, clearing of woodland, brush, or grassland habitats that support game species would occur. Areas cleared for construction but not used directly for the improvements would be revegetated to native plant communities. Hunting and fishing in some areas could be restricted during construction of the new roadway. Neither the Preferred nor Southern Alternative should have a permanent or long-term effect on the hunting activities or the game species populations within the study area.

Public Lands

What public lands are located in the study area?

Public lands within the study area were identified in order to examine any potential impacts to Section 4(f) or Section 6(f) resources. Public lands identified in the study area include federal, state, and locally-owned or managed lands (**Figure 3-4**).



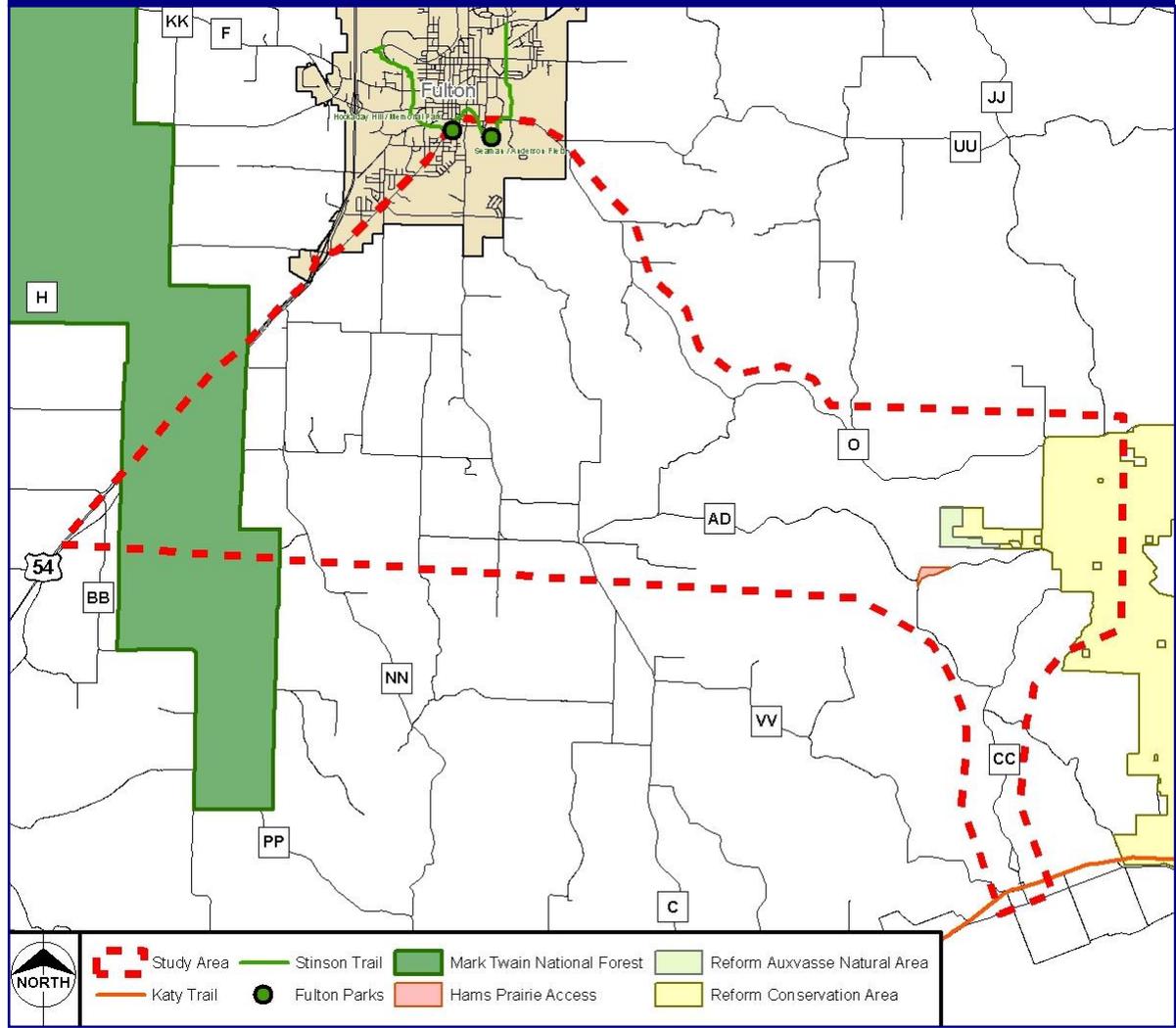
Impacts on the Environment

Federal lands providing recreational opportunities within the study area include the Mark Twain National Forest. A portion of the Mark Twain National Forest is located in the southwestern portion of the study area and provides outdoor recreational opportunities such as fishing, hunting, hiking, and wildlife watching (USFS, 2009). Not all of the property shown in **Figure 3-4** within the boundary of Mark Twain National Forest is publicly owned.

What is Section 4(f)?
 Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits the use of publicly owned parks, recreational areas, wildlife refuges, and significant historic sites unless it can be shown that there is no feasible and prudent alternative to the use of land from that property and all possible planning has been undertaken to minimize harm to the property resulting from such use.

What is Section 6(f)?
 Section 6(f) of the Land and Water Conservation Act (LWCF) concerns transportation projects that propose impacts to public recreation facilities that were funded with LWCF money. The Act prohibits the conversion of these facilities to a non-recreational use without the approval of the National Park Service.

Figure 3-4: Public Lands





Hams Prairie Public Fishing Access

State lands in the study area include one state park, one MDC-operated public fishing access, one MDC-owned and operated natural area, and one MDC-managed conservation area. A small segment of the Katy Trail State Park extends across the extreme southern portion of the study area. The Katy Trail is a popular hiking and biking trail built along the former corridor for the Missouri-Kansas-Texas Railroad (MDNR, 2008). The Hams Prairie Access is a 28-acre tract bordering Auxvasse Creek, located in the eastern portion of the study area. The Hams Prairie Access is a natural area that includes a public fishing access on Auxvasse Creek. The Auxvasse

Natural Area, which is owned and managed by MDC, consists of 110 acres and includes the largest dolomite glade system north of the Missouri River and provides habitat for over 220 native plant species. The Auxvasse Natural Area is located in the eastern portion of the study area adjacent to the Reform Conservation Area. The Reform Conservation Area includes approximately 7,000 acres of Ameren Missouri-owned property surrounding the Callaway Plant. The Reform Conservation Area is managed by MDC for Ameren Missouri and supports recreational activities such as hiking, fishing, hunting, and bird-watching (MDC, 2009).

Two local parks are present within the city limits of Fulton, including Hockaday Hill/Memorial Park and the Seaman Complex. The Hockaday Hill portion of Memorial Park is located on the east side of Business Route 54 on Hockaday Avenue and includes a picnic shelter, playground equipment, and access to the Stinson Creek Trail (City of Fulton, 2009). The Seaman Complex, which includes Anderson Field and Seaman Field, is located at the southeast intersection of State Street and 2nd Street (Route O) and is used for baseball and softball (City of Fulton, 2009).



Reform Conservation Area



Impacts on the Environment

How would the alternatives affect public lands?

No-Build Alternative – None of the public lands identified in the study area would be affected by the No-Build Alternative. There would be no impacts to Section 4(f) or Section 6(f) resources.

Preferred and Southern Alternatives – Neither of the alternatives would directly impact the Mark Twain National Forest, the Auxvasse Natural Area, or the City of Fulton parks (**Figure 3-5**). The western portion of the Southern Alternative would extend through the Mark Twain National Forest Cedar Creek Unit administrative boundary; however, no publicly owned lands would be crossed.

The Reform Conservation Area falls within the 500-foot wide corridor of both the Preferred and Southern Alternatives, but no impacts to Section 4(f) resources, such as campgrounds or trails, would result. The Hams Prairie Access falls within the 500-foot wide corridor of the Southern Alternative, but no impacts to Section 4(f) resources would result. Coordination with MDC took place to discuss the applicability of Section 4(f) to the Hams Prairie Access and to discuss shifting the alignment slightly to the north to avoid the property. Additional information on this coordination is included in Chapter 4 Comments and Coordination.

Ameren Missouri has provided a concurrence letter stating its support of the project and that no recreational facilities will be affected (see **Appendix G**). MDC has provided two letters addressing potential impacts to MDC properties (**Appendix G**). Based on the information provided by MDC in these letters and in meetings and discussions, it has been determined that no recreational facilities would be affected by the alternatives.

Impacts to significant historic sites protected under Section 4(f) would be determined prior to construction. There would be no impacts to Section 6(f) resources.

Cultural Resources

What are cultural resources?

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 (SHPO) and other consulting parties in the Section 106 process for the project.

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.

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.



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

Section 4(f) of the Department of Transportation Act of 1966, discussed in greater detail in the Public Lands section, also protects certain kinds of NRHP-eligible and listed historic sites. Federally funded actions cannot impact Section 4(f) eligible sites unless there is no reasonable 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.

What are the cultural resource concerns for the Preferred and Southern Alternatives?

An architectural survey was conducted of the structures along the 500-foot wide corridors for both the Preferred and Southern Alternatives. The architectural survey results for this project were recorded in a report – *Section 106 Phase I Structures Review, Callaway County Connector, Callaway County, Missouri, MoDOT Job Number J5P2161* – that was submitted to the State Historic Preservation Office (SHPO) for review and comment. The SHPO concurred in a November 30, 2011, 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 G**. The survey results are summarized below.

Following the public comment period on the EA and selection of a preferred alternative, an archaeological survey will be conducted for the preferred alternative only. The results will be submitted to the SHPO for review and concurrence.

What are the results of the architectural survey?

Five properties were identified that appear to be eligible for listing in the NRHP and that have the potential to be adversely affected by the alternatives:

Property 17/18 includes a two-story I-House and outbuildings that constitute a farm complex. Property 17/18 is crossed by the western segment of the Preferred Alternative, but the structures lie more than 500 feet beyond the edge of the 500-wide corridor.

Property 46/47, located just west of US 54, is considered a farm complex comprised of a one-story Craftsman-style house and a number of associated outbuildings. One of the outbuildings may be historic. The majority of the structures are located within the 500-wide corridor for the Southern Alternative.

Property 48 consists of a one-story main residence and association of outbuildings that constitute a farm complex. Although the residence has been modified, the outbuildings have retained their character, especially the large barn. The corridor for the Southern Alternative crosses the southwest corner of Property 48, but the structures lie just outside of the 500-foot wide corridor. Property 48 is located just west of and adjacent to US 54.

Property 40 consists of a one-and-a-half-story Craftsman-style house in good condition. The original features are extant. The outbuildings, some historic, are in poor condition, but associated with the house constitute a farm complex. Property 40 is crossed by the 500-wide corridor for the Southern



Impacts on the Environment

Alternative with the house and one shed located within the corridor. The remaining structures are located outside of the 500-foot wide corridor.

Property 152 consists of a two-story Gothic Revival residence and associated outbuildings. The house represents the best of the resources documented within the study area. While some of the original fenestration has been boarded up and an addition is evident at the rear, the house remains in good condition and is a representative example of a vanishing property type. The front portion of Property 152 is crossed by the 500-wide corridor for the Preferred Alternative. All of the structures lie outside of the corridor.

Visual Impacts

What visual qualities characterize the existing landscape?

The study area is located in the Outer Ozark Border ecoregion, which is characterized by deeply dissected hills and bluffs along rivers as well as relatively smooth plains (Nigh and Schroeder, 2002). The river hills in the area range in relief from 150 to 250 feet and are characterized by steep slopes and narrow valleys. Auxvasse Creek, which extends through the study area, flows within one of the area's largest valleys. The plains consist of relatively flat uplands, which are cut by deep valleys.

Landcover in the Outer Ozark Border ecoregion varies from cropland and pasture to densely wooded valleys. The relatively flat uplands and bottomlands contain pasture and scattered cropland with areas of dense hardwood thickets. Steeper slopes are primarily covered in second-growth timber and contain overgrown limestone or dolomite glades.

The study area is rural with farmsteads scattered throughout the area and small clusters of residences located along the roadways. There are two small communities within the study area, Hams Prairie at the intersection of Route C and Route AD and Steedman along Route CC. Residential and commercial development becomes more concentrated in and around the City of Fulton and along Highway 54.



Upland pasture within the study area



Wooded hills within the study area



What impact would the alternatives have on the existing visual landscape?

No-Build Alternative – The No-Build Alternative would not result in changes to the existing visual landscape.

Preferred and Southern Alternatives – The existing visual landscape would be affected by the Preferred or Southern Alternative with construction of a new roadway through areas of undeveloped cropland and pastureland. The alternatives would alter the landscape, especially where extensive earthen cuts and fills are required. Wooded areas would have to be cleared for new right-of-way and a new bridge would be constructed across Auxvasse Creek for either alternative. Visual impacts would be greatest to those residences located near the proposed alignment that would now have a view of a highway where they did not before.

Visual impacts would be less along portions of the alternatives built along existing roadways, such as along Route AD in the central portion of the Preferred Alternative corridor, along Route O in the eastern portion of the Preferred Alternative corridor, or along County Road 428 along the eastern portion of the Southern Alternative corridor. In these areas, visual impacts would primarily be a result of a wider right-of-way and additional pavement and from changes in topography as a result of grading and straightening of existing roadway curves.

Hazardous Waste Sites

What is hazardous waste?

Hazardous waste, as regulated by the Environmental Protection Agency (EPA), is defined as waste with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous waste can be liquid, sludge, solid or gas. Wastes are deemed hazardous if they are ignitable, corrosive, reactive, toxic or otherwise regulated at the state or federal level.

How were hazardous waste sites identified in the study area?

Federal and state data records were searched to determine the location of any known hazardous waste sites in the study area, including hazardous waste generators or handlers, sites of hazardous waste spills, Superfund sites, Brownfields sites, underground storage tanks (USTs), aboveground storage tanks (ASTs), solid waste facilities, and/or various other sites of concern.

What hazardous waste concerns were identified in the study area?

The data search identified 13 hazardous waste sites of concern within the study area. Of these sites, five are ASTs, five are USTs, one has reported emergency spills of hazardous substances, one was formerly listed as a Brownfields site, and one is a generator of hazardous waste.

Will the alternatives affect any hazardous waste sites of concern?

None of the alternative would affect identified hazardous waste sites of concern. No known sites of concern are located within the 500-foot wide corridor for the Preferred or Southern Alternatives.

What happens if an unknown hazardous waste site is discovered during construction?

If previously unknown hazardous wastes are identified, observed, or accidentally uncovered during construction, hazardous waste testing, remediation, and/or disposal would be conducted, as appropriate, in conformance with MDNR, EPA and Occupational Safety and Health Administration (OSHA) regulations.



Impacts on the Environment

Construction Impacts

What impacts would result from construction activities?

Construction activities associated with the Preferred or Southern Alternative would result in the following impacts.

Borrow and Waste Sites

Borrow sites may be selected that are outside the project footprint and therefore were not previously reviewed under this EA. If the appropriate quantity of borrow material for a project is available from several sources, MoDOT is required to specify the source from which the materials are to be obtained. MoDOT is responsible for ensuring that the contractor clears land disturbance areas for environmental concerns unless the necessary clearances have already been obtained, with the contractor providing documentation to the resident or liaison engineer. MoDOT would work with the selected contractor to identify and review all suitable borrow locations identified by the contractor. The guidelines outlined in MoDOT's *Local Public Agency Manual* for obtaining environmental clearance on borrow sites would be followed for this project.

Water Quality

By implementing the appropriate erosion and sediment control measures during construction, topsoil would be salvaged from the construction right-of-way and stockpiled for future use. Various BMPs would be specified within the design plans by the contractor to manage surface runoff and erosion during construction. These BMPs may include the use and installation of silt fence, sediment barriers, straw bales, erosion control blankets, and reseeding methods to prevent and minimize the discharge of pollutant- and sediment-laden runoff to surface waters and floodplains and subsequent impacts to groundwater and surface water quality. Stormwater runoff and erosion controls would be developed under the National Pollutant Discharge Elimination System (NPDES)/Stormwater Pollution Prevention Plan (SWPPP) permit requirements for construction activities. Soil contamination would be minimized by spill prevention, reporting, and cleanup practices required under MDNR and EPA regulations. Stockpiled soil materials not used as engineered fill or landscaping would be replaced on disturbed areas when construction has been completed, and disturbed areas would be repaired and reseeded.

Air Quality

During construction there will be a short-term and temporary increase in dust and PM in the air due to earthmoving activities and the movement of trucks and heavy construction equipment. Engine exhaust from heavy equipment would generate a small amount of SO₂, NO_x, and CO emissions. Contractors would be required to minimize fugitive dust by spraying water on exposed soil areas during construction and washing vehicles prior to leaving the construction area and traveling on public roadways. All contractors would be required to comply with all applicable state and federal air pollution regulations.

Noise

Construction activities would temporarily increase noise levels across areas in close proximity to the Preferred or Southern Alternative. During construction, the character, volume, and type of noise would vary depending on the construction activities taking place and the types of trucks, earthmoving equipment, generators, construction equipment, and paving equipment used at any one time. It is generally anticipated that construction activities would occur during both daytime and nighttime hours.



Excavation, earth moving, hauling, grading, bridge construction, and paving activities would be the main sources of construction noise. These impacts would be short-term and limited to the duration of the construction time period. Construction noise impacts would be minimized through the implementation of BMPs, including the use of mufflers on all heavy equipment.

Visual Impacts

Short-term visual impacts would occur during construction consisting of the removal of vegetation and pavement, excavation, presence of large construction equipment, storage of equipment and materials, signage and lighting, and the presence of fugitive dust. These impacts are anticipated to be temporary and would occur at different times throughout the construction process. Following construction, cleared areas would be revegetated and construction equipment, materials, signage, and lighting would be removed and the areas restored to their previous use or cover.

Utility Relocation

During construction, utilities would be relocated, as necessary. Utilities with potential to be impacted by the Preferred or Southern Alternative would include aboveground or underground electric transmission lines, water and sewer pipelines, gas pipelines, and telecommunication lines. Once the final location of the roadway is established within the corridor, utility relocations would be determined. Coordination with the utility companies would be made to ensure utility service to the local area is continued.

Traffic Control

Minor disruptions in traffic would occur during construction, primarily during intersection construction and construction along existing roadways. Disruptions may include reduced speeds, narrow lanes, and detours. Work zone impacts and issues would vary along the project corridor during construction. Traffic management plans would be developed and implemented to best serve the mobility and safety needs of road users, highway workers, businesses, and the community.

Permits

What permits are needed to construct the Preferred or Southern Alternative?

There are a number of permits that may be required to authorize certain impacts and construction activities associated with the Preferred or Southern Alternative. The type, number, and exact permitting process will be determined as the final design of the project is completed. No permits would be required for implementation of the No-Build Alternative.

Section 404 Permit – A Section 404 Permit would be obtained from the USACE Kansas City District to authorize the placement of fill material within jurisdictional wetlands and waters of the U.S. necessary to construct the proposed improvements. If mitigation is required, it will be addressed through on-going coordination as part of the permitting process.

Section 401 Water Quality Certification – In tandem with the Section 404 permit, a Section 401 Water Quality Certification would be requested through coordination with the USACE and the MDNR, the state Section 401 certifying agency.

Floodplain Development Permit – To authorize the placement of earthen fill and structures (e.g., bridge piers, culverts) within the 100-year floodplain, a floodplain development permit would be obtained from the SEMA. In the case of projects proposed within regulatory floodways, a “no-rise” certificate, if applicable, would be obtained prior to issuance of a permit.



Impacts on the Environment

Stormwater Discharge Permit for Construction – Provisions of the CWA and related state rules and regulations require stormwater permits where construction activities disturb areas greater than one acre. In accordance with the NPDES requirements of the CWA, MoDOT operates under the provisions of a general permit issued for road construction projects statewide. The permit stipulates that MoDOT will follow certain erosion control guidelines and install temporary and permanent erosion control measures. This permit applies only to land disturbance activities associated with construction projects on MoDOT right-of-way. A land disturbance permit would also be obtained from Callaway County prior to initiating construction activities. Both land disturbance permits would require preparation and implementation of a SWPPP.

Commitments

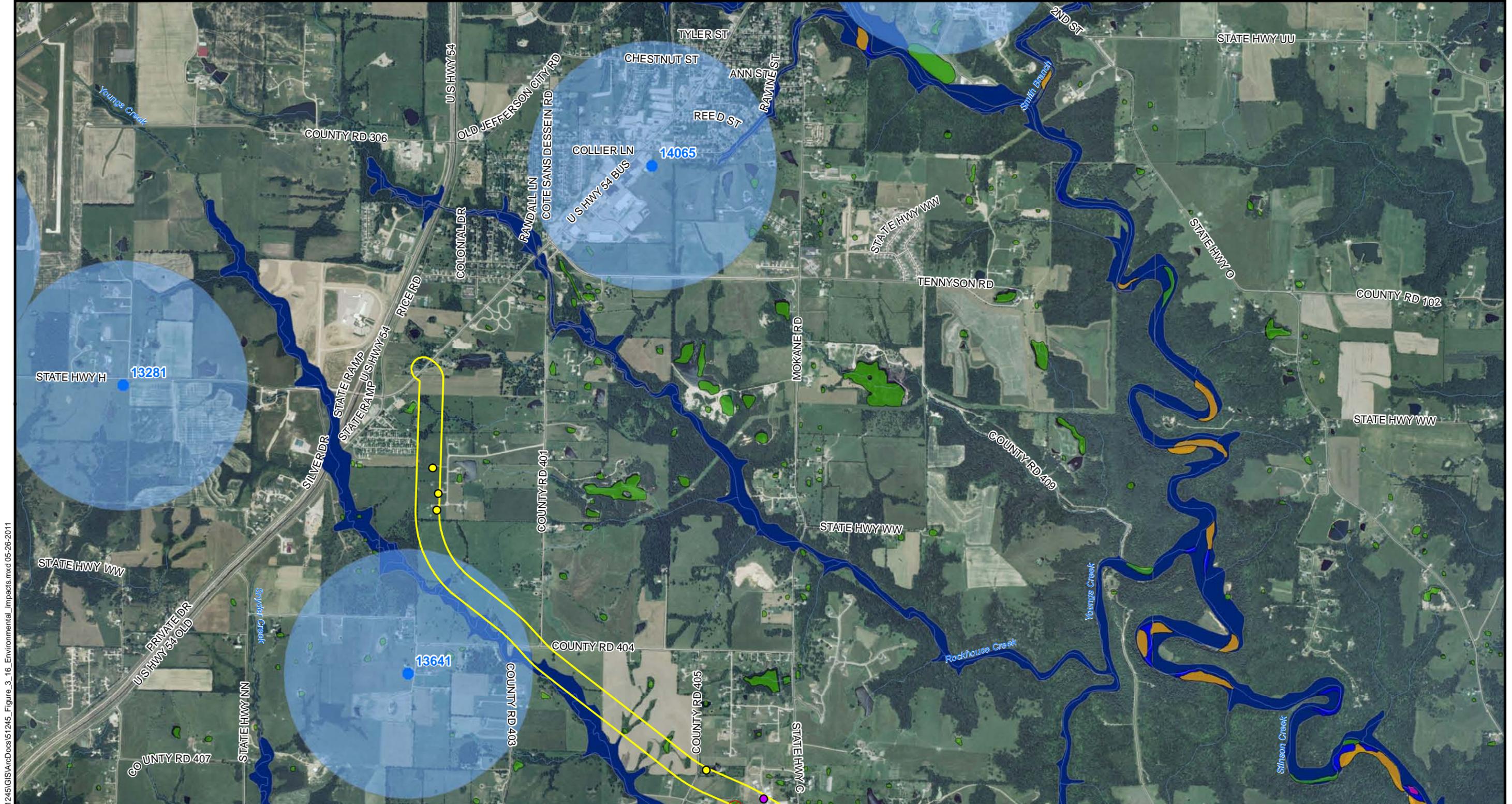
- MoDOT will comply with relocation procedures in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended (49 CFR Part 24).
- Surveys will be conducted for summer Indiana bat habitat along the project corridor prior to construction. If suitable habitat is identified along the project corridor, MoDOT will conduct further consultation with the USFWS to determine what measures can be implemented to eliminate or reduce the project impacts to this species.
- Surveys will be conducted during the growing season for running buffalo clover along the project corridor prior to construction. If running buffalo clover is identified along the project corridor, MoDOT will conduct further consultation with the USFWS to determine what measures can be implemented to eliminate or reduce project impacts to this species.
- MoDOT will comply with all requirements of the CWA for the construction of this project. This includes Section 401 Water Quality Certification, Section 402 NPDES, and Section 404 Permit for Dredged or Fill Material. The NPDES Permit requires the preparation and implementation of a SWPPP. The SWPPP will include all specifications and BMPs needed for control of erosion and sedimentation.
- The amount of mitigation for stream impacts will be determined using the MSMM.
- Following selection of a preferred alternative, a Phase I Archaeological Survey will be conducted for the preferred alternative.
- If hazardous materials are identified, observed or accidentally uncovered during construction, hazardous materials testing, remediation, and/or disposal will be conducted, as appropriate, in conformance with MDNR, EPA and OSHA regulations.
- A traffic management plan will be developed and implemented during construction to manage access within the study area. The traffic management plan will identify any detour routes required and will indicate the type and location of signage, signals, barriers, lighting, and flagmen as needed to implement the plan. MoDOT will coordinate construction activities, sequencing and traffic management plans with local fire, police, and emergency response services to minimize delays during the construction period.
- Utility relocations will comply with the requirements outlined in the Code of State Regulations, Division 10, Chapter 3 – Utility and Private Line Location and Relocation and will conform to 23 CFR Section 645A, which is the applicable federal regulation regarding utility relocation on federally funded highways.



- For borrow sites that may be selected that are outside of the project corridor and therefore were not addressed by the NEPA document or other environmental approvals for the project, the proposed sites of land disturbance will be cleared of environmental concerns under all applicable federal and state laws and regulations. These include but are not limited to the CWA; Section 4(f) of the Department of Transportation Act; the ESA; the National Historic Preservation Act; the FPPA; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; and RSMo Chapter 194, Section 194.400, Unmarked Human Burial Sites.



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Legend			
Preferred Alternate - (500 ft Corridor)	Well	NWI Wetlands Emergent	Non-NWI Wetlands
Southern Alternate - (500 ft Corridor)	SWIA	NWI Wetlands Forested	Non-Existent NWI Wetlands
Potential Residential Relocation	100-Year Floodplain	NWI Wetlands Scrub/Shrub	Public Lands
Potential Commercial Relocation	Streams	NWI Wetlands Pond	Reform Auxvasse Natural Area
	Roads	NWI Wetlands River or Stream	Reform Conservation Area
			Hams Prairie Access
			Mark Twain NF

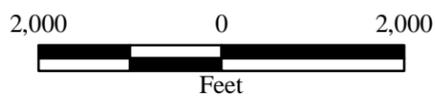
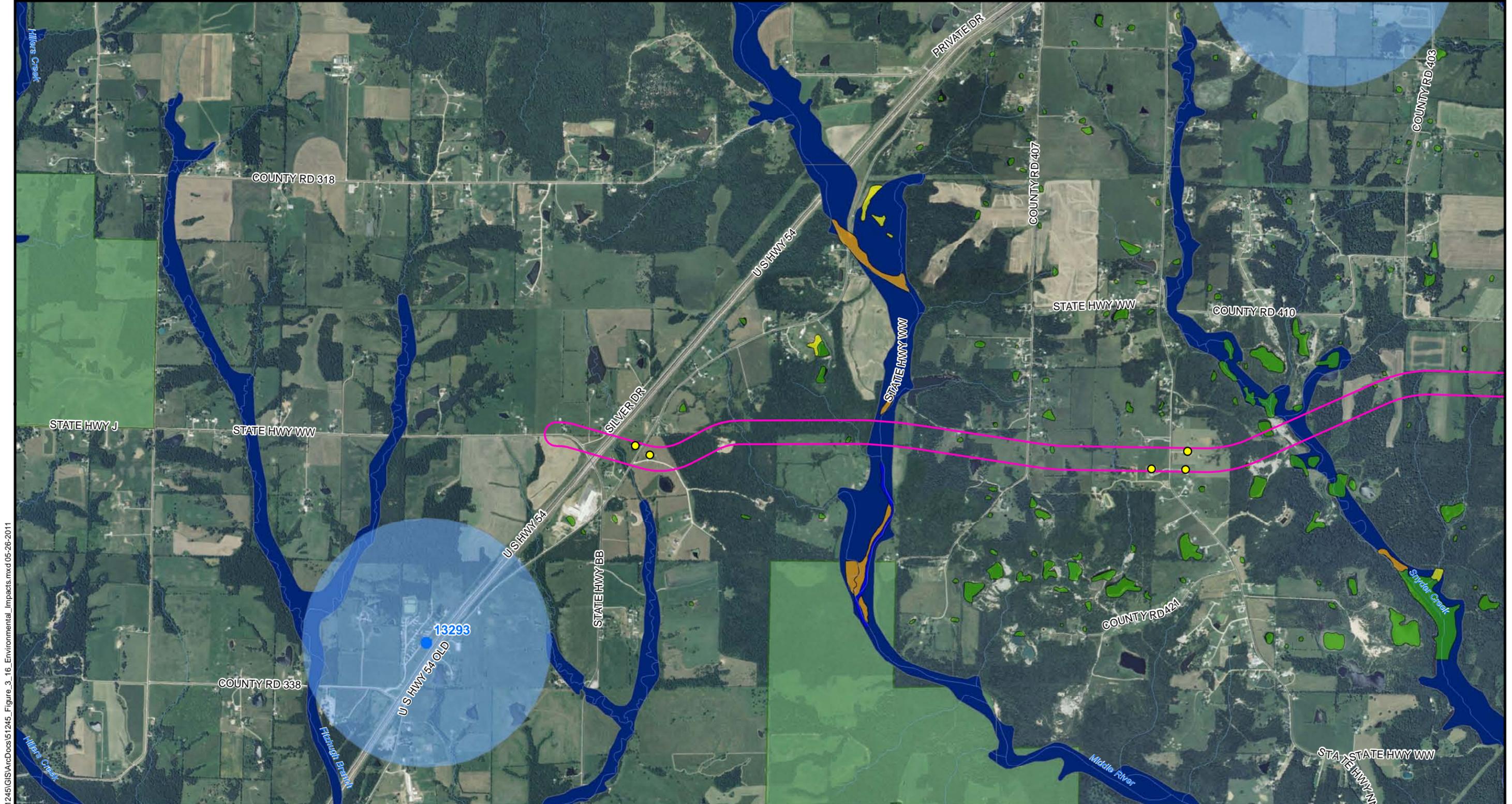


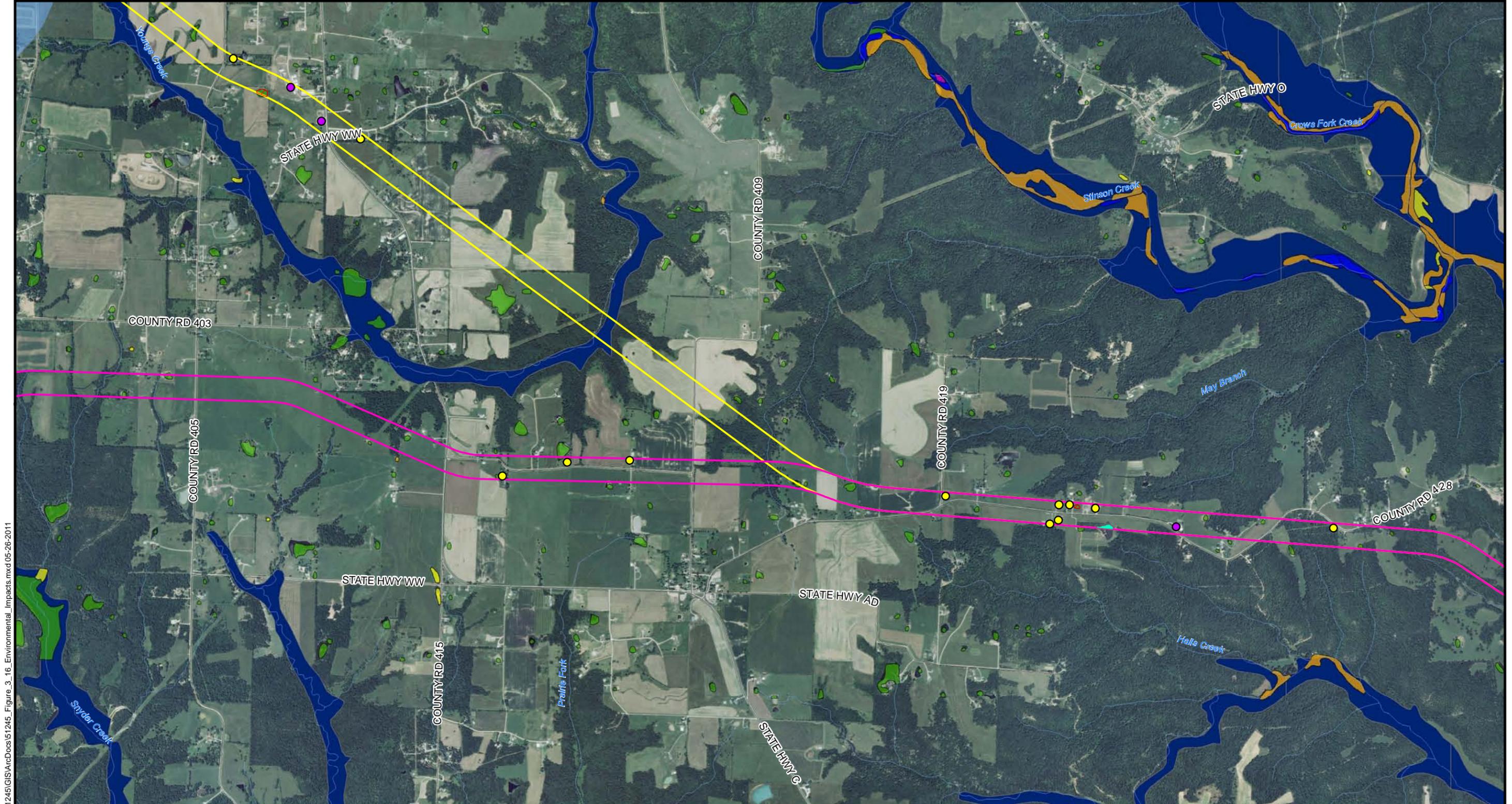
Figure 3-5
 Environmental Impacts
 Route Alternatives
 Callaway County Connector
 Callaway County, Missouri
 Map 1 of 4

Source: MSDis; CARES; NWI Wetlands; USDA NAIP 2009 Aerial Photography; Burns & McDonnell



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Legend <ul style="list-style-type: none"> Preferred Alternate - (500 ft Corridor) Southern Alternate - (500 ft Corridor) Potential Residential Relocation Potential Commercial Relocation Well SWIA 100-Year Floodplain Streams Roads 		NWI Wetlands <ul style="list-style-type: none"> Emergent Forested Scrub/Shrub Pond River or Stream 		<ul style="list-style-type: none"> Non-NWI Wetlands Non-Existent NWI Wetlands Public Lands <ul style="list-style-type: none"> Reform Auxvasse Natural Area Reform Conservation Area Hams Prairie Access Mark Twain NF 	
<p>Source: MSDis; CARES; NWI Wetlands; USDA NAIP 2009 Aerial Photography; Burns & McDonnell</p>		<p>2,000 0 2,000</p> <p>Feet</p>			
		<p>Figure 3-5 Environmental Impacts Route Alternatives Callaway County Connector Callaway County, Missouri Map 2 of 4</p>			



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|-----------------------------------------|---------------------|---------------------|------------------------------|
| Preferred Alternate - (500 ft Corridor) | Well | NWI Wetlands | Non-NWI Wetlands |
| Southern Alternate - (500 ft Corridor) | SWIA | Emergent | Non-Existent NWI Wetlands |
| Potential Residential Relocation | 100-Year Floodplain | Forested | Public Lands |
| Potential Commercial Relocation | Streams | Scrub/Shrub | Reform Auxvasse Natural Area |
| Roads | River or Stream | Pond | Reform Conservation Area |
| | | River or Stream | Hams Prairie Access |
| | | | Mark Twain NF |

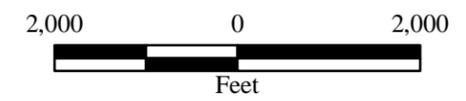
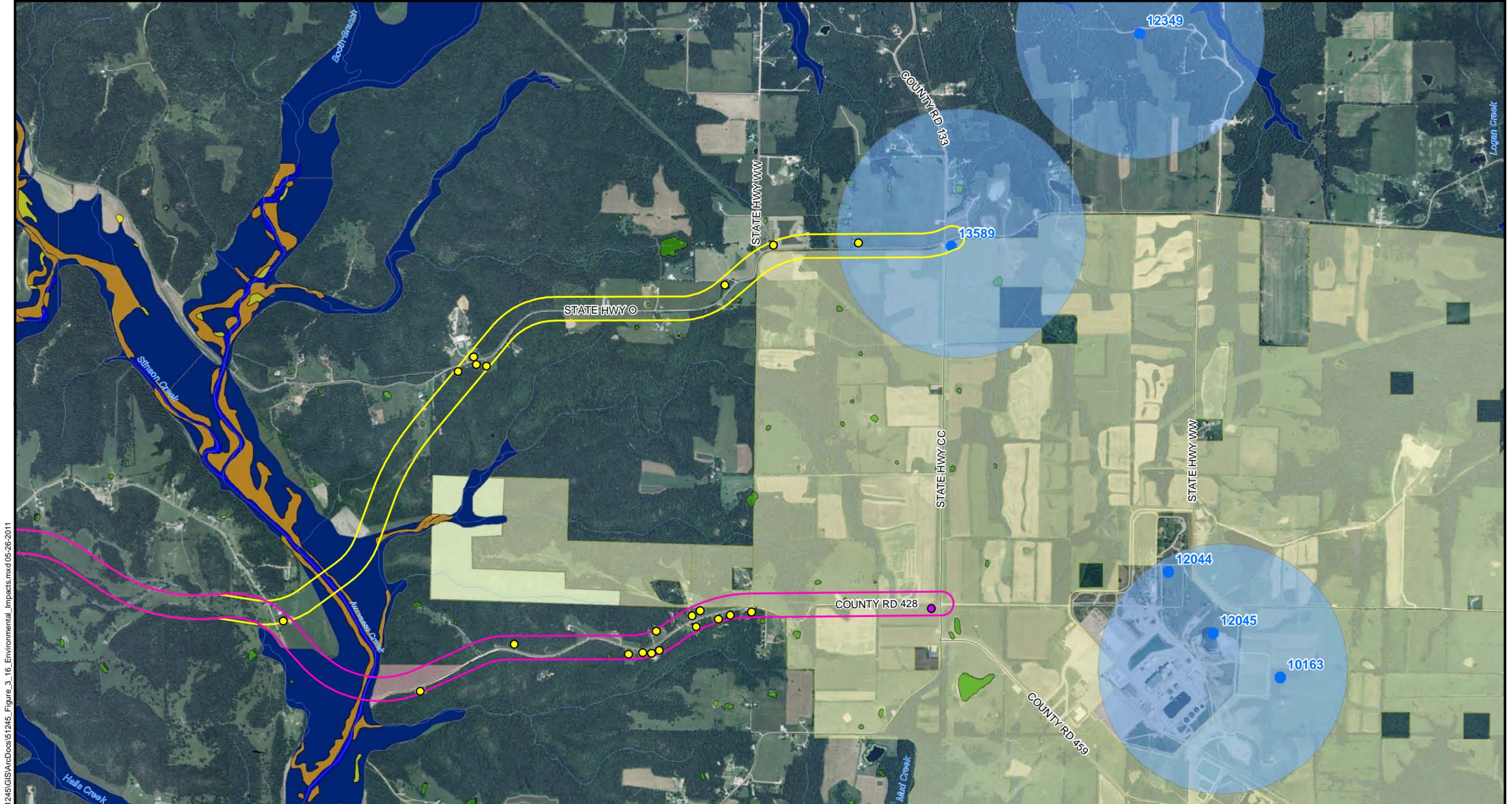


Figure 3-5
Environmental Impacts
Route Alternatives
Callaway County Connector
Callaway County, Missouri
Map 3 of 4

Source: MSDIS; CARES; NWI Wetlands; USDA NAIP 2009 Aerial Photography; Burns & McDonnell



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Legend

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|-----------------------------------------|---------------------|---------------------|------------------------------|
| Preferred Alternate - (500 ft Corridor) | Well | NWI Wetlands | Non-NWI Wetlands |
| Southern Alternate - (500 ft Corridor) | SWIA | Emergent | Non-Existent NWI Wetlands |
| Potential Residential Relocation | 100-Year Floodplain | Forested | Public Lands |
| Potential Commercial Relocation | Streams | Scrub/Shrub | Reform Auxvasse Natural Area |
| Roads | River or Stream | Pond | Reform Conservation Area |
| | | River or Stream | Hams Prairie Access |
| | | | Mark Twain NF |

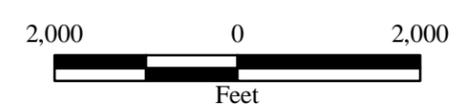


Figure 3-5
Environmental Impacts
Route Alternatives
Callaway County Connector
Callaway County, Missouri
Map 4 of 4

Source: MSDis; CARES; NWI Wetlands; USDA NAIP 2009 Aerial Photography; Burns & McDonnell



Comments and Coordination

Chapter 4: Comments and Coordination

The study process included coordination with local, state, and federal agencies with interests in the project with the purpose of gathering information and identifying issues or concerns. In order to maximize public participation and seek feedback on the EA, several public input opportunities were provided. This chapter describes both the agency coordination process and the efforts that were undertaken to engage the public and to encourage comment throughout the study process.

Agency Coordination

How were government agencies involved in the study process?

Agency Scoping – The following agencies were invited to participate in an agency scoping meeting on February 17, 2009: U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (EPA), Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS), Federal Emergency Management Agency (FEMA), Missouri State Emergency Management Agency (SEMA), Missouri Department of Natural Resources (MDNR), and Missouri Department of Conservation (MDC). Copies of the invitation letters are included in **Appendix G**. The purpose of the scoping meeting was to provide study information to the regulatory and reviewing agencies, gather information on known environmental constraints within the study area, and identify any issues or concerns that should be addressed during the study. Agencies in attendance at the scoping meeting included MDNR, MDC, and USACE in addition to FHWA and MoDOT. USFWS did not attend the scoping meeting, but instead submitted comments and study area information following the meeting. A copy of the USFWS letter is included in **Appendix B**.

Public Officials Coordination – Public officials from the State of Missouri, Callaway County, and the City of Fulton have been involved in the study process through meetings and the transmittal of correspondence to brief them on the study and to gather information on any issues or concerns they may have with regards to the study or the potential future action.

Tribal Coordination – Native American Tribes that may be affiliated with properties of cultural or religious significance were contacted to seek their input on the potential future action. Letters were sent from FHWA to the following Native American tribes inviting them to consult on the project: Choctaw Nation of Oklahoma, Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Nation, Miami Tribe of Oklahoma, Osage Nation of Oklahoma, Ponca Tribe of Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, Sac and Fox Nation of the Missouri in Kansas and Nebraska, and Sac and Fox Nation of Oklahoma. Copies of the letters are included in **Appendix G**.

Responses were received from the Kaw Nation and Osage Nation of Oklahoma (included in **Appendix G**). The Kaw Nation replied that it had no direct interest in the project because the study area is not in the Kaw Nation's known Historic or Pre-Historic Territory. The Osage Nation of Oklahoma requested that a cultural reconnaissance survey be conducted for the project and stated that they would review the cultural resource survey report.

Additional USACE Coordination – USACE requested a letter from MoDOT stating confirmation that the two proposed federal actions, the Callaway County Connector project and the Callaway Plant Unit 2 project, are separate and independent projects requiring separate environmental review under NEPA. This letter, dated March 6, 2009, is included in **Appendix G**.

Additional MDC Coordination – A meeting was held at MDC on February 10, 2010, in which representatives from Burns & McDonnell, Ameren Missouri, MoDOT, and MDC were in attendance.



Comments and Coordination

The purpose of the meeting was to review alternative concepts under consideration and to discuss the potential impacts they may have on MDC properties within the study area. As a follow-up to the meeting, MDC provided comments in a letter dated March 26, 2010 (included in **Appendix G**).

Public Involvement

What events were held to engage the public in the study process?

Public Open House, Fulton City Hall – A public open house was held on April 29, 2009. Forty-three members of the public, including local elected officials and public safety representatives, participated in the meeting. Displays were set up at the meeting explaining the EA process, study area, project schedule and other information. Four stations were set up and staffed by study team members with a map showing the study area and a flip chart. Meeting participants discussed their questions, concerns and ideas with the team members, who documented discussions on the maps and flip charts.



Public Officials Briefing and Public Open House, Westminster College – A public open house was held on June 4, 2009. Approximately 45 members of the public attended the meeting.



In addition, a briefing for public officials was held immediately prior to the public open house. Approximately eight public officials participated in the briefing. Displays at the meetings detailed the EA process, the study area, and the purpose and need for the study. Maps of proposed transportation improvements also were displayed, including a map of proposed improvements to the existing roadways and a map of proposed concepts for a new roadway. Meeting participants were provided the opportunity to fill out a comment form and identify a preference for one or more of the proposed improvement concepts.

Online Public Meeting – Between June 4th and June 18th and between August 20th and September 31st, the information and displays from the June 4th open house were posted on the MoDOT website. To ensure a two-way dialogue, visitors to the site were provided with the opportunity to fill out an online comment form. Together, the June 4th public meeting and the online meeting option generated more than 100 comments.

Public Meeting, Callaway Plant – An additional meeting was held on September 10, 2009, to present the information and displays from the June 4th open house. Approximately 40 members of the public attended the meeting.



Fulton Economic Development Board Meeting – A presentation was made to the Fulton Economic Development Board on September 16, 2009. The presentation provided an overview of the study progress and public involvement activities, presented the proposed concepts for transportation improvements, and provided an opportunity for the Board to ask questions.

Fulton City Council Presentation – A presentation was made before the Fulton City Council on September 22, 2009. The presentation provided an overview of the study progress and public involvement activities to the Council. Proposed concepts for improvements to the existing roadways and for a new roadway were presented. The Council was also given an opportunity to ask questions about the study.

What were the goals of the public involvement events?

The goals of the April 29th open house were to:

- Share general information about the study location and EA process.
- Share information about the Draft Purpose and Need for the EA.
- Document questions and concerns from the public about the study.
- Gain input on ideas for transportation improvements.
- Collect ideas about the purpose and need for the study and potential future action.

The goals of the June 4th open house and subsequent meetings were to:

- Share information about the EA process and the Purpose and Need for the EA.
- Provide an opportunity for the public to review and comment on the proposed transportation improvement concepts.
- Gain input on the evaluation criteria used to rank the proposed transportation improvement concepts.

Who were the target audiences for the events?

The target audiences for the events included potentially affected property owners, community leaders, and anyone with an interest in the project.

How were the public events publicized?

The April 29th and June 4th public meetings were publicized through the following means. Publicity generally occurred two weeks prior to the meeting.

- Press releases were sent to print and electronic media in the area, which included information about the project and the upcoming meeting.
- Invitation letters were mailed to local, state and federal public officials.
- Display ads were placed in the *Fulton Sun*.
- E-mail notices were sent to the Chamber of Commerce and to the project e-mail list.
- A meeting notice postcard was sent to the project mailing list.

Additional publicity included an article in the *Fulton Sun* highlighting the online public meeting and the opportunity for public comment. The meeting at the Callaway Plant was publicized internally at the plant.



Comments and Coordination

What were the primary comments and concerns identified through the public input opportunities?

Key comments and concerns identified at the April 29th open house included:

- The need for improved safety in the area, particularly on Route O
- Potential impacts to farms and homes
- Desire to improve the local roadway system
- Questions about the role of the Callaway Plant in the EA process

Key comments and concerns identified at the June 4th public open house, online meeting, and follow-up meetings, and through additional public input included:

- Impacts to properties
 - Splitting of properties
 - Impacts of additional traffic to properties
 - Safety impacts
 - Need for improvements
-



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Appendices

Appendices

Appendix A – Crash Data Disclaimer

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Appendix D – Alternative Selection Process, Traffic Study,
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Appendix A - Crash Data Disclaimer



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