
# Chapter 3

## Environmental Impacts

The study area covers nearly 47 miles and includes a wide variety of topographic and geologic settings. This area also includes four communities; Westphalia, Freeburg, Vienna, and Vichy, which are situated in large rural areas dominated by farmland, forested areas, and pastureland. In order to evaluate the potential environmental impacts accurately, two approaches were used. The first approach evaluates community impacts. For example, socioeconomic impacts, displacements, and hazardous waste issues are discussed for each of the four communities. The second approach evaluates impacts throughout the study corridor. For example, threatened and endangered species, water resources, farmland, and land use issues are discussed for the entire Route 63 corridor.

**What are the different types of impacts?**
Direct impacts are caused by the construction of the project, for example: a wetland filled to accommodate construction of a roadway.

Indirect impacts are caused by the project and are later in time or farther removed in distance than direct impacts, but are still "reasonably foreseeable." Consider the construction of a new highway on what is now farmland. With increased access to this rural area, developers build new residential developments, and new houses increase demand on water supplies. The construction of the homes and increased water consumption are not directly caused by road construction, but rather are indirect impacts.

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: homes were acquired for the original construction. This next improvement to the route would result in yet more homes being acquired.

## Community Impact Analysis

This section discusses the potential impacts to the communities of Westphalia, Freeburg, Vienna, and Vichy. A brief discussion of the methods used in the analysis is included prior to the description of the potential effects of the No-Build Alternative and the build alternatives. A map of the study corridor and alternatives are contained in Appendix C.

**How was an assessment of the communities developed?**
The study team used information from the United States Census Bureau, the Meramec Regional Planning Commission (MRPC), the National Agricultural Statistics Service (NASS), and other sources to develop a general profile of the residents in the study area. Information on income is displayed in the tables that follow in this section and in Appendix D.

What is a census block?
A census block is made up of one or more actual neighborhood blocks depending upon the density of the local population.

Census blocks provide the best available information concerning demographics. Due to the low population density in the area, the census blocks extend beyond the area being studied in for the Route 63 study.

The study team examined median household income and per capita income. Median household income is measured by taking all of the annual incomes reported to the United States Census by households in an area, and calculating the income level that half of the households are above and half of the households are below. To calculate per capita income, all of the incomes reported for an area are added and divided by the number of people in the area.

Site visits, meetings, and phone conversations with local officials, stakeholders, residents and business owners provided Community Impact information. Also input was provided through public meetings and discussions with the Route 63 Advisory Committee. A list of a majority of these meetings is included in Chapter 4 – Public Involvement.

**How would MoDOT and FHWA reduce and compensate for community impacts?**
Discussed in the following paragraphs are the potential impacts to residents and communities. If impacts to communities cannot be avoided, MoDOT and FHWA will minimize the impacts as much as possible. Some impacts would be mitigated if required by federal or state laws or regulations. During design MoDOT and FHWA would work with the community on measures to mitigate or compensate, as required by law, for the effects of the construction of a new Route 63. These laws include the Uniform Relocation Act, and those laws and regulations governing noise, water and air quality.

**Who lives in the study corridor?**
The study corridor consists of a 750-foot strip from the beginning point of the study, just south of the Route 50/Route 63 junction, to Vichy where the corridor narrows to 300 feet through town and then returns to a 750-foot corridor south of Vichy to the ending point of the study just north of Rolla (Appendix C).

With the exception of Westphalia, Freeburg, Vienna, and Vichy, the study corridor is largely rural in character and has low-density residential uses. Businesses in the corridor are a mixture of retail, construction, automotive dealerships, and professional offices. Most of these business types are located along existing Route 63. Other businesses are the numerous agriculture related enterprises, including farms of various sizes and incomes.

Using information obtained from the 2000 U. S. Census Bureau, the study team assessed the effects of the alternatives on this area. The eight census blocks that cover the majority of the study corridor are comprised of 10,313 inhabitants. The corridor population is growing at a healthy rate, which is a sign that traffic numbers would likely not decrease.

The counties and the city of Westphalia are exhibiting population growth rates near or greater than the overall growth rate for the state, 9.3 percent, for the same time frame. Westphalia's growth rate was particularly strong. It could be inferred that this growth rate could be attributed to its close proximity to Jefferson City, a major employment center with state government and various industries. Vienna exhibited slow growth, while Freeburg actually had a negative percentage.

Population trends for the study corridor are shown in Table 3.

Table 3. Community Population Trends

| | Osage | Maries | Phelps | City of Westphalia | City of Freeburg | City of Vienna |
|---|---|---|---|---|---|---|
| **1990** | 12,018 | 7,926 | 35,248 | 287 | 446 | 611 |
| **2000** | 13,062 | 8,903 | 39,825 | 320 | 423 | 628 |
| **1990 to 2000 Percent Change** | 8.7% | 12.3% | 13.0% | 11.5% | -5.2% | 2.8% |

**Source: 2000 U.S. Census Data**
No data available for Vichy

**How do the alternatives affect emergency services?**
Emergency services that would be affected by the construction of the Preferred Alternative include fire protection districts, county sheriff departments, and county ambulance districts.

The No-Build Alternative would not change any of the existing emergency access to the study corridor and would potentially result in increased response times because as traffic volumes increase on the existing system, so would congestion.

The Preferred Alternative would require the relocation of the volunteer fire department in Vichy and Alternative 2 might require the relocation of the Westphalia fire department depending on design constraints. The influence of all of the build alternatives will be changes in emergency access routes and improved response times.

**How would the alternatives affect residents?**
Residents have access to various service and retail establishments located in the study corridor, primarily within Westphalia, Freeburg, Vienna, and Vichy. These consist of gas stations, fast food restaurants, convenience stores, automotive dealerships, and small retail establishments. These businesses employ people who live directly in the city as well as those who live in adjoining locales. Employees commute from within the towns to the surrounding communities for work. Affects to these businesses may have consequences to the residents in the area; the relocation of Route 63 could change where people shop or eat.

Residential neighborhoods may also be affected. Transportation projects can impact neighborhoods by relocating residents, dividing the neighborhood, removing local businesses, and creating an atmosphere that discourages neighbors from interacting with each other. For example, the construction of a new, busy road can separate one part of a neighborhood from another. The removal of some homes in a neighborhood can separate friends and result in a smaller sized neighborhood.

The No-Build Alternative would not affect the neighborhoods or relocate any homes surrounding existing Route 63. As traffic congestion increases, living near Route 63 would be more difficult. Without improvements, local residents can expect greater traffic numbers leading to decreased safety and potentially increased noise. Increased traffic numbers on the existing highway would put pressure on local roads and would make it more difficult for local residents to access local businesses and the road would serve as a barrier from east to west for other facilities.

The Preferred Alternative would acquire a total of 27 residences and 15 businesses. Of these relocations, Westphalia has five residential and one commercial relocation, Freeburg has six residential and no commercial relocations, Vienna has one residential and no commercial relocations, and Vichy has the most relocations with 15 residential and 14 commercial.

In addition to the residential and commercial relocations, a combination fire station and community center would also be relocated in the Vichy area. Further, to avoid sensitive historical resources in Vichy, the widening would be to one side of the roadway. Therefore, the total residential and commercial relocations would be lessened when compared to widening on the existing alignment, which would have impacts to both the east and west sides.

The existing route through the communities of Westphalia, Freeburg, Vienna, and Vichy would undoubtedly become safer for local travelers and the public school bus service. This alternative would have potential noise and visual effects on residents now closer to the new highway.

Alternative 1 would relocate a total of 28 residences and two businesses. Of these relocations, Westphalia has 12 residential and two commercial relocations, Freeburg has seven residential and no commercial relocations, Vienna has eight residential and no commercial relocations and Vichy has the fewest relocations with only one residential and no commercial relocations. This alternative would not require the relocation of any community facilities.

Relocating Route 63 away from the existing alignment would also have some impact to businesses that have developed along the existing route. Limited access to the communities of Freeburg and Vienna would make it less likely that travelers would exit to access community businesses. The business impact study found in Appendix D shows that the effect should be modest to those businesses that are travel-oriented. Local residents would continue to have access to local businesses without any delays.

This alternative would also have potential noise and visual effects on residents now closer to the new highway.

Alternative 2 would relocate 38 residences and 33 businesses. This is the highest number of relocations of any of the build alternatives for the study corridor. Of these relocations, Westphalia has 14 residential and 19 commercial relocations, Freeburg has seven residential and no commercial relocations, Vienna has three residential and no commercial relocations, and Vichy has a total of 15 residential and 14 commercial relocations. It could possibly require the acquisition of the Lions Club building which serves as a community facility in Westphalia. With this alternative the existing route through Westphalia, Vichy, and other sections of Route 63 are widened. As such, when compared to the other build alternatives, relocations are higher and safe travel for local travelers and the public school bus service may be lessened as traffic increases on a widened facility through these areas.

What are Travel-Oriented Businesses? Travel oriented businesses include gas stations, restaurants, and hotels. Most travel-oriented businesses also serve local customers. Customers tend to shop at travel-oriented businesses because of their convenient location, not because they provide unique goods or services.

This alternative would also have greater construction impacts on residents than the Preferred Alternative, as it would use more of the existing alignment near established residences. Relocating Route 63 away from the existing alignment through Freeburg and Vienna would also have some impact to businesses that have developed along the existing route. The business impact study found in Appendix D shows that the effect should be modest to those businesses that are travel-oriented. Local residents would continue to have access to local businesses without any delays. This alternative would also have potential noise and visual impacts on residents now closer to the new highway.

**How would the alternatives affect community services and facilities?**
Community services and facilities serve the general public with regards to health, spiritual well-being, recreation, and entertainment. The alternatives would have little effect on community services. There are no community agencies located in the area and no community service providers would be relocated. Facilities and community services located in the study corridor include public and privately owned facilities, schools, and churches.

There are four privately owned properties with recreational facilities that are located in the study corridor. Westphalia contains two of these properties, the Knights of Columbus located north of Westphalia on the west side of Route 63 and the Westphalia Lions Club located within the city limits on the west side of Route 63. Both of these facilities serve as community centers for various events. Also located in the study corridor is the Freeburg Lions Club, located just south of Freeburg on the west side of Route 63 and the Visitation Inter-Parish School and Visitation Catholic Church in Vienna.

As well as privately owned properties located in the study corridor, there are also ten publicly owned properties. The two properties located near Westphalia are; the Dr. Bernard Bruns Access on the Maries River east of Westphalia, and Painted Rock Conservation Area located seven miles west of Westphalia on Route 133.

Three of these properties are located in the city of Freeburg and the surrounding area. The Msgr. Bernard S. Groner Memorial Park in Freeburg, the Freeburg tower site located on County Road 209, and Paydown River Access located down County Road 302 all have the potential to be impacted by the build alternatives.

In Vienna and the surrounding area there are four publicly owned properties. Two of these contain recreation facilities: Vienna Park, which contains a community center called the Youth Building is located on the east side of Route 63, and the Vienna Public School Complex, located west of Route 63 on Route 42. There are two other properties south of Vienna on Route 63, Spring Creek Gap Conservation Area, located on the east side of Route 63, and Scenic View Park, which is located on the west side of Route 63.

The one publicly owned property in Vichy area is the Vichy Public Park, administered by Maries County and located on the west side of Route 63 at the juncture of Route 68. There are no publicly owned properties in the corridor area in Phelps County.

There are four schools that serve the study corridor: Osage County R-III, Saint Joseph Elementary, Maries County R-I, and Visitation Inter-Parish School. Higher education institutions are available in Linn, Jefferson City, Rolla, and Columbia.

The Osage County R-III district operates the local elementary and secondary school systems. The school district has two schools with an enrollment of 776 students. Fatima Elementary serves students from kindergarten to sixth grade and Fatima High School serves students from seventh to twelfth grade. Both schools are located on Main Street in Westphalia.

The Maries County R-1 School district operates the local elementary and secondary school systems. The school district has two schools consisting of 298 students, kindergarten through sixth grade, and 279 students in the high school that serves seventh to twelfth grade. Vehicles operated by the public school districts use Route 63 extensively for transportation of students to and from the schools in the morning and afternoon.

Two private schools are located in the study corridor, Saint Joseph Elementary School and Visitation Inter-Parish School. Saint Joseph Elementary School is for students from first to eighth grade and has an enrollment of 112. Visitation Inter-Parish School is for students from kindergarten to eighth grade, enrollment unknown.

There are a total of eight churches located in study corridor: the Saint Joseph Catholic Church in Westphalia, The Church of the Holy Family in Freeburg, Visitation Catholic Church, First Baptist Church, United Methodist Church, First Christian Catholic Church, First Baptist Church, United Methodist Church, First Christian Church, Church of Christ all located in Vienna, and Vichy Community Church.

The No-Build Alternative would not affect any of the schools, churches, parks, or public or private community facilities. The expected increase in traffic would negatively affect school bus safety and time to deliver students to the school.

Construction of the Preferred Alternative would lead to short-term traffic congestion and detours that would affect school bus traffic and emergency services. All detours would be discussed with local officials before they are put in place. The Preferred Alternative would improve the flow of local traffic, including school bus safety, on the existing route, as it would separate local traffic from through traffic.

Alternative 1 would cause no relocations of any the described community facilities. Construction of this alternative would lead to short-term traffic congestion and detours that would affect school bus traffic and emergency services. The Alternative would improve the flow of local traffic, including school bus safety, on the existing route, as it would separate local traffic from through traffic.

Alternative 2, which widens the existing route through Westphalia and Vichy, would have direct impacts to community facilities. The fire station and the Lions Club buildings in Westphalia could likely be impacted, depending upon design constraints, the church in Vichy, and the Vichy fire department/community center also has the potential to be impacted. However, during design an attempt to avoid impacts to this side of Vichy would be a primary objective given the historical architectural resources located in the corridor. Further, increased lanes and traffic could hamper their operations to some extent.

Construction of this alternative would lead to short-term traffic congestion and detours that would affect school bus traffic and emergency services. This alternative would improve the flow of local traffic since it would add traffic capacity with additional lanes. School bus safety should improve along most of this alternative since a majority of Route 63 would be on new location. Vichy would be a notable exception.

**What are the economic characteristics of the residents?**
The economic characteristics of residents in the area are described in terms of income levels, home ownership rates, and the values of homes in the area. Table 4 includes income levels, home ownership rates, and the values of homes for the counties and cities in the study corridor.

Table 4. Income Levels and Home Ownership Data

| | Median Household Income | Per Capita Income | Average Median House Values | Average Monthly Rent | Owner Occupied Rate |
|---|---|---|---|---|---|
| Osage County | $39,565 | $17,343 | $81,400 | $343 | 82.9% |
| Maries County | $31,925 | $15,753 | $72,900 | $347 | 81.7% |
| City of Westphalia | $35,833 | $18,496 | $87,100 | $347 | 71.5% |
| City of Freeburg | $31,429 | $20,071 | $64,400 | $275 | 74.0% |
| City of Vienna | $23,456 | $13,682 | $56,800 | $353 | 51.0% |

Table Source: Missouri Census Data Center
Data not available for Vichy

**What are the existing local economic conditions?**
The movement of people and goods through the area affects local, regional, state markets and economic conditions. The location of Route 63 and its ability to efficiently and securely transport people and goods would impact markets beyond the area. The presence of the route also affects local businesses by bringing people through the local communities. This section discusses the impacts of the build alternatives on local businesses and jobs. An assessment of the impacts to the tax base of each county is discussed at the end of the chapter.

Travel oriented businesses are a small portion of the total number of businesses. Additional businesses include professional offices, service providers, and private recreation facilities. The city of Westphalia, the only community with an adopted zoning law, has a designated highway commercial sector within the city boundaries along Route 63. This is the only such designated area in the study corridor. The primary business corridor for Westphalia, Freeburg, Vienna, and Vichy is along Route 63 where retail, professional and service establishments are located.

Major employers near the study corridor include Quaker Window Products Inc., El Sevier Distribution Center and Osage Industries, Diamond Pet Foods, Play-Mor Trailers, Osage County Government; Osage County Schools; Osage County Ambulance District; Linn State Technical College, Kingsford Manufacturing, Maries Manor Nursing Home, Maries County Government, Maries County Schools, Bloomsdale Excavating, Brewer Science, Briggs & Stratton, CanTex, Country Mart, Lowe's Home Center, Ozark Health Services, Pet Products Plus Inc., Wal-Mart, Zeno's, Phelps County Regional Medical Center, City of Rolla, banks, and Rolla Public Schools.

What does the term workforce mean?
The workforce consists of all people 16 and over who are working or are actively looking for work.

Unemployment in Osage County is lower than the average unemployment rate for the state, 6.0 percent, while Maries County and Phelps County have unemployment rates higher than the average unemployment rate for the state (Table 5).

Table 5. Unemployment and Workforce Data – February 2008

| Workforce Characteristics | Osage County | Maries County | Phelps County |
|---|---|---|---|
| **2008 Average Unemployment Rate** | 5.2% | 6.5% | 6.2% |
| **2008 Average Workforce Size** | 7,395 | 4,737 | 22,405 |

**Source: MERIC in cooperation with the U.S. Department of Labor, Bureau of Labor Statistics**

The percentage of county residents living and working in Osage County is 41.3 percent. For Maries County, residents living and working in their county of residence is 34.5 percent. In Phelps County, only 15.5% of workers commute outside the county. However, the majority of workers from both counties; Osage County, 58.7 percent; and Maries County, 65.5 percent, commute to work outside of the county in which they live. The mean travel time to work is nearly the same for residents in each county. Osage County residents travel 28 minutes on the average, while Maries County residents travel 34 minutes. These commuting rates are some of the highest in the state, thus the users of the route will benefit more than most from improvements to safety, efficiency, and shorter commutes.

Economic impacts to the residents and businesses located in the study corridor are further expanded upon at the end of this chapter in the economic impacts of the investment of construction dollars section.

**How would the No-Build Alternative affect businesses and jobs within each of the study sections?**

The No-Build Alternative would have minimal effects on existing local businesses and local tax bases. No businesses would be relocated and there are no access changes affecting existing business patterns. New right-of-way would not be required, thus there would be no direct impacts to the property tax base for any of the communities in the study corridor.

As the No-Build Alternative does not involve property acquisition or changes in access, it is unlikely to have any direct impacts on local employment. Many residents work outside of Osage and Maries Counties and use the existing roadway as part of their commute to and from work.

The No-Build Alternative could negatively affect jobs related to the trucking industry and businesses in general that rely on Route 63 for product delivery. Periodic congestion and travel-time delays in stretches of the existing route, particularly in Westphalia, Freeburg and Vienna, is costly for businesses and also for both local commuters and through travelers. The costs include increased fuel usage, wages for drivers, lost productivity of trucks, and a reduction in the number of daily trips drivers can make. Congestion also costs trucking firms and manufacturers because of the uncertainty they create in the delivery process.

These costs are felt directly by trucking companies, manufacturers, and individuals passing through the area. Affects to jobs will be minimal, but the business costs are ultimately passed on to consumers in the form of higher prices to account for higher transportation and inventory storage costs. While an analysis was not directly performed to estimate costs for this project, other studies were used to infer the principles of cost related to congestion and travel-time delays to Route 63. One study showed that an improved road system produced a substantial traveler savings to both households and businesses by reducing travel time and mileage, vehicle operation costs and lower accident costs. The MoDOT Freight Study reports, "In the freight industry, retail marketers (e.g.-Wal-Mart) are the influencing parties of how freight moves upon the national and international transportation system. To them, reliability and dependability of the logistics chain and how dollar investment impacts trip time to speed the delivery process from production to customer represents the key critical component to their industry. Therefore any freight investment consideration made by the public sector, should in some way positively impact private freight transport reliability, shorten trip time, and/or minimize loss and damage for the retail distribution chain. Trip time variance may be a key performance metric for future freight planning efforts."

Fuel consumption would also increase for both those traveling through the area and local traffic caught in related congestion and backups. This would increase the cost of transporting goods and costs for commuters to get to work.

**How would the build alternatives affect businesses and jobs within each of the study sections?**

Since approval of the DEIS, additional research of impacts to communities of comparable size has taken place. See Appendix D for these research papers. The research revealed that all of these communities experienced increased taxable sales after the highway relocation. Only St. Martins had a loss of sales in recent years, but has shown increases ever since the relocation occurred in the late 1980's.

In addition, a 2007 in-house study by MoDOT, see Appendix D, found that for non-urbanized counties in Missouri, the highest rates of economic and community growth tend to occur in counties with more miles of four-lane highway. An analysis of counties found that those with more than 15 miles of four-lane highway scored higher on all seven economic indicators included in the study. The counties with 15 or more miles of four-lane highway scored from 9 to 183 percent higher on these measures than did counties with less than 15 miles. Counties with more than 15 miles of four-lane highways had over a 124 percent greater population level, 11 percent greater annual wage, nearly 14 percent greater household income, 118 percent greater number of business firms, 182 percent greater gross sales tax, 125 percent greater real estate valuations and over 9 percent greater per capita income. This increase in connectivity and access, reflected in more miles of four-lanes highway, demonstrates that the transportation system strongly supports economic development.

**Westphalia Section:**
Economic effects of any of the build alternatives would include the relocation of local businesses, changes in access for local businesses, and impacts to the local tax base. The Preferred Alternative and Alternative 1 would be more effective at reducing the potential for future congestion and providing positive economic benefits to trucking firms, other companies, and individuals. Alternative 2 would be hampered somewhat in this regard with the widening of the existing highway through Westphalia. There would be impacts to existing businesses since all of the build alternatives will relocate businesses. It is assumed that the majority of the relocated businesses own their site while the others lease their business location. These businesses may choose to relocate to a different part of the community, or remain close to their existing location if possible. Some changes in existing business patterns for residents and business owners in the vicinity are inevitable with any of the build alternatives.

Some of the potential relocations are due in part to the need to acquire a portion of a business property but not the whole property. In these cases MoDOT may be able to work out an agreement so that the business can remain in its existing location if the property owner is interested.

Access to businesses in Westphalia and south of Westphalia would change with either the Preferred Alternative or Alternative 1, thus increasing the travel times to these businesses from surrounding communities. Alternative 1 would cause the greatest change and impact with its separation distance of 0.68 miles from existing Route 63. Alternative 1 also has the disadvantage of being separated from Westphalia by the Maries River. The Preferred Alternative would cause changes in access to most businesses, but it is closer than Alternative 1 without a separation by the Maries River. Business impacts would be minor compared to Alternative 1. With either alternative, directional signing to these businesses would be important for their continued operation. MoDOT will provide guide signs to communities, however business signing must be purchased by the company.

A study by the Missouri Economic Research and Information Center (MERIC), in partnership with MoDOT, was conducted to determine business impacts in the study corridor. The study, found in Appendix D, concluded that:

- The drive time between area cities would improve for work commuters and other travelers.
- Shortening commute times will make living in Westphalia more appealing.
- Access to Interstates 44 and 70, and Routes 50 and 54 would also be improved.
- Current economic activity is primarily regional, within 30 miles, with regard to customer base.

With access roads being less than a mile from Westphalia from Route 63 and close to five miles from Route 50, the current local market can continue to be served as drive times to the city would increase by less than a minute. Road improvements, however, would lessen the drive time on Route 63, which in most cases would offset any increase caused by the relocation away from the city of Westphalia. Based on previous relocation studies, noted in the MERIC study, Westphalia exhibits all the characteristics that can contribute to further economic growth in a community following relocation.

The Build Alternatives would impact jobs that are connected with businesses that would be relocated. All of the businesses impacted by any of the alternatives are small in nature regarding employment numbers. Therefore, Alternative 2 has the most likelihood of creating job loss impacts by the mere fact that it has the potential to relocate the most businesses. The Preferred Alternative and Alternative 1 only relocate one and two businesses, respectively. All of the businesses relocated by any of the build alternatives are small sized establishments, generally 25 or fewer employees. These businesses should be able to find comparable new locations relatively easily, since there is an abundance of undeveloped property and commercial zoning through Westphalia. Nonetheless, the business may choose to shut down or move outside of the area, as such there would be a loss of local jobs.

**Freeburg Section:**
Economic effects of any of the build alternatives for this area would include changes in access for local businesses and impacts to the local tax bases for local governments. Each of the build alternatives would reduce the potential for congestion, providing positive economic benefits to trucking firms, other companies, and individuals. Some changes in existing business patterns for residents and business owners in the vicinity are inevitable with any of the build alternatives.

With any of the build alternatives there would be indirect effects to some businesses since the highway would be on a new location. Access to Freeburg and its businesses would be provided. The Preferred Alternative has an advantage of access from an intersection with Route P (Appendix C). Travel times to businesses would change with either one of the build alternatives. But the Preferred Alternative would again have an advantage with the Route P connection. Some travel-oriented businesses may decide to move near this intersection to catch through travelers. Alternatives 1 and 2 would likely cause the greatest change and impact to businesses along existing Route 63 since these alternatives are placed on the east side of Freeburg where access to the city is less favorable.

The MERIC business impact study in Appendix D showed that:

- Drive times would improve access to the cities of Linn, Rolla, and Jefferson City.
- Access to Interstate 44 and Highways 50 and 54, would also be improved.
- A majority of Freeburg residents commute to the surrounding cities for work.
- The population of Freeburg nearly doubles in size during the working hours because of a substantial amount of employees commuting from communities outside of the Freeburg area.
- Shortening the drive time between area cities would make it more attractive for residents to continue to live and work in Freeburg.

Current economic activity is primarily regional with regard to customer base. With access roads being less than a mile to Freeburg from Route 63, the current local market can continue to be served as drive times to the city would increase by less than a minute. Road improvements would lessen the drive time on Route 63, which in most cases would offset any increase caused by the relocation away from the city of Freeburg. Based on previous relocation studies, Freeburg also exhibits characteristics that can contribute to further economic growth in a community following relocation. The new roadway would offer access to the city and be a short distance away from local businesses. Certain strategies can encourage growth in the community and keep existing businesses from relocating. Freeburg could benefit from signage along the new highway, marketing campaigns for tourism and local businesses, and recruitment of new firms because of improved drive times to interstates, highways, and metropolitan areas.

**Vienna Section:**

Economic effects of any of the build alternatives would include changes in access for local businesses, and impacts to the local tax bases for local governments. In this study area each of the build alternatives would reduce future congestion, providing positive economic benefits to trucking firms and other companies and individuals. Some changes in existing business patterns for residents and business owners in the vicinity are inevitable with any of the build alternatives.

With any of the build alternatives there would be indirect effects since the new Route 63 would be on new location from the existing location. Access to Vienna and its businesses would be provided. The Preferred Alternative may have an advantage of access into Vienna on the north with an intersection with existing Route 42.

Travel times to businesses would obviously change with any of the build alternatives. Some travel-oriented businesses may decide to move near intersections to catch through travelers. Signing and advertisement to businesses in Vienna and Lake of the Ozarks would be important with any of the alternatives.

The MERIC business impact study in Appendix D showed that:

- Drive times would improve access to Rolla, Linn, and Jefferson City.
- Access to Interstate 44 and Highways 50 and 54 would also be improved.
- An hour drive time distance would expand to include Fort Leonard Wood, Sullivan, and nearly reach the boundary of Fulton.
- A majority of residents commute to the surrounding cities for work. Although nearly 70 percent of Vienna residents leave the city to work elsewhere, it should be noted that the day employee population changes very little.
- Commuters outside the area travel to Vienna for work. Shortening the drive time between area cities would make it more attractive for residents to continue to live in Vienna and make it easier for others to visit and work in Vienna.

Current economic activity is primarily regional with regard to customer base. The study has specific percentages related to customer patronage. With access roads being approximately a mile and a half from Vienna from the Route 63 intersection, the current local market can continue to be served as drive times to the city would increase by less than a minute.

Based on previous relocation studies, noted in the MERIC study, Vienna exhibits all the characteristics that can contribute to further economic growth in a community following highway relocation. The roadway would offer access to the city and be a short distance away from local businesses. Certain strategies can encourage growth in the community and keep existing businesses from relocating. Vienna could benefit from signage along the new highway, marketing campaigns for tourism and local businesses, and recruitment of new firms because of improved drive times to the interstate and metro areas.

Even though there are no business relocations there may be minor job impacts if a business experiences diminished sales or goes out of business with the relocation of Route 63.

**Vichy Section:**

Some changes in existing business patterns for residents and business owners in the vicinity are inevitable with any of the build alternatives. Economic affects of the Preferred Alternative would include the relocation of local businesses, changes in access for local businesses, and impacts to the tax base. On the positive side each of the build alternatives would reduce future congestion, providing positive economic benefits to trucking firms and other companies and individuals.

With Alternative 1 there would be indirect effects since it relocates the highway from the existing location. Access to Vichy and its businesses would be provided, however, travel times to access these businesses would change with Alternative 1. With this alternative some travel-oriented businesses may decide to move near intersections to catch through travelers.

The MERIC business impact study in Appendix D showed that:

- Drive times would improve access to the cities of Rolla, Licking, Sullivan, and Fort Leonard Wood.
- Access to Interstate 44 and Highways 50 and 54 would also be improved.
- An hour drive time distance would expand to include Linn, Jefferson City, Lebanon, Salem, and Union.
- Nearly all of the residents commute to the surrounding cities for work. Shortening the drive time between area cities would make it more attractive for residents to continue to live in Vichy and would make it easier for others to work in Vichy.
- Traffic flows are expected to increase to over 9,400 vehicles by 2035. With improved connection to interstates, the local airport could also play a role in future economic growth. All of these factors are positive aspects for this community.
- Certain strategies can encourage growth in the community. Vichy could benefit from signage along the new highway, marketing campaigns for local businesses, and recruitment of new firms because of improved drive times to the interstate, highways, and metro areas.

The Preferred Alternative would have job impacts. During design the number of business relocations should be able to be minimized. In the end job losses would be minimal or none depending upon whether or not a business reestablishes in the community. Given the small size of Vichy, even Alternative 1, which relocates the highway from Vichy, would likely cause diminished sales for some of the Vichy businesses or ultimately their closure.

**What are the common modes of transportation used by residents in the corridor?**

Personal vehicles-cars, trucks, and vans- are by far the most common sources of transportation to work for residents along the area. There is not a mass public transit system available for work transportation. Older Adult Transportation Service (OATS) is available for eligible participants to use as a means to travel to work on a limited basis.

Based on census data, it was found that the vast majority of the area workers, over 60 percent, drive alone to get to work. The census data also revealed that slightly over 25 percent of the area workers carpool to work. The commute time to work for residents in the corridor is a minimum of 25 minutes and as much as 40 minutes.

**How important is Route 63 to businesses and communities in the corridor?**

Route 63, which is an important north-south route for the movement of commerce as evidenced by the percent of trucks, is also an important part of the local economy. There are two major ways that the presence of Route 63 helps the local economy. First, there are area businesses that use the route to transport goods to points north and south within Missouri and beyond.

They benefit from the route the same way as businesses outside the area do. Secondly, travelers that use the route also visit local businesses. Up to 6,000 cars and trucks pass through the area on an average day. A portion of those vehicles would be from other places in Missouri that pass through or stop in the area. Some of the drivers and passengers of these vehicles would stop for food, gasoline, supplies, and other business reasons in the area.

In response to concerns by cities along the corridor, MoDOT worked together with the Missouri Department of Economic Development to assess impacts to local business within these cities. This study in its entirety is located in Appendix D. One conclusion from the study was that the vast majority of the customers of retail establishments in each city reside within 30 miles of the city.

**What are the tax base impacts to the communities?**

Local property tax base impacts are discussed based on the taxable value of parcels that would be acquired for right-of-way by the alternatives. Taxable assessed value of real estate was collected from the county assessor's office in Osage and Maries Counties. Right-of-way would not be needed in Phelps County; therefore, a tax base impact to that county was not performed.

What is the Property Tax Base?
The property tax base of a community is the combined taxable value of all properties or real estate in the community. This tax base is an analysis of the impact to tax revenues to the government entity due to the property removed from the tax roles. The impact to property tax revenues is based on the value of those properties that would be potentially acquired for the project. These impacts are shown as a percentage of the total taxable property value in the county.

Future changes in taxable value because of the impacts of a particular alternative on neighboring parcels are not accounted for in the assessment, as it is extremely difficult to forecast the impacts of a transportation project on the taxable value of a property. Local property tax base impacts by build alternative for Osage and Maries Counties are listed in Table 6.

Table 6. Local Property Tax Base Impacts – 2008 Dollars

| | Osage County | | | Maries County | | |
|---|---|---|---|---|---|---|
| | **Taxable Value* Lost** (in millions) | **Total Taxable Value*** (in millions) | **Percent of Total Taxable Lost** | **Taxable Value* Lost** (in millions) | **Total Taxable* Value** (in millions) | **Percent of Total Taxable Lost** |
| **No-Build** | $0.0 | $109.3 | 0.0% | $0.0 | $61.5 | 0.0% |
| **Preferred Alternative** | $1.2 | $109.3 | 1.1% | $2.0 | $61.5 | 3.3% |
| **Alternative 1** | $1.4 | $109.3 | 1.3% | $2.1 | $61.5 | 3.4% |
| **Alternative 2** | $1.7 | $109.3 | 1.6% | $2.2 | $61.5 | 3.6% |

Sources: State Tax Commission of Missouri, County Assessors,
Raw property values from MoDOT Right-of-Way Agent
* Taxable Value is assessed valuations for real estate

Depending upon the alternative built, Osage County would forego approximately 1.1 to 1.6 percent of its existing taxable value. In Maries County, the range is 3.3 to 3.6 percent of the total taxable value. This loss of taxable value would represent a permanent reduction in the taxable property to the governmental revenues and thus would affect budgets and programs. The local public school district would also lose tax base as a result of taxable property taken off the roles. However, a better facility would make the area more attractive and contribute to an increased tax base. It should also be noted that the improvements would be built in stages so that the government entities would not experience a sudden large decrease to their budget.

Residents may experience changes in their property values and property taxes. It is very difficult to isolate the effect of transportation improvements on the value of particular parcels of lands. Some parcels may increase in value because of improved access while other properties may lose value due to noise or visual impacts. A property, which may have lower value as a residential property, may also have a much greater value as a potential business site.

It is also difficult to differentiate between the effects of the new highway and changes in values because of property improvements or changes in the local market. As a result, MoDOT does not attempt to assess the potential changes in value for individual properties that do not need to be purchased for the project. MoDOT does not directly compensate property owners for potential losses in property values because of their proximity to the new highway nor does MoDOT charge property owners for any potential additional value created by the project. Lastly, with any one of the alternatives there could be local income tax revenue reductions if businesses and residents who must relocate choose to move to other communities.

**What are the economic impacts of the investment of construction dollars?**
The investment of construction dollars for the project would result in the creation of new jobs. When an investment is made in the construction of a new facility, the companies and individuals receiving payment for building the project would in turn spend the money they receive on other goods and services. Companies and individuals receiving the benefits of reduced travel time and crash costs would also invest portions of these savings in the local and state economies.

Based on the estimated construction cost range for the build alternatives of $147 million to $195 million, the study team estimates that between 5,113 and 6,782 jobs would be created over a five-year construction period. These job estimates are based on the standard ratio used by FHWA that for every $1 billion of federal money invested, plus the state match, supports 34,779 jobs. Most of these jobs would be short-term construction related positions. Local job benefits from construction would depend in part on the availability of local materials and workers. MoDOT seeks the best possible value from its investments when tendering construction projects and, like any other project, there is no guarantee local firms would be selected or local materials used.

## Relocations

**What relocations are required for the build alternatives?**
All of the build alternatives would require MoDOT to purchase existing homes and businesses in the study corridor. The action of moving these homes or businesses to a new place is referred to as relocations. Residential relocations are homes that must be purchased including single-family homes, duplexes, apartments, and condominiums. Commercial relocations are businesses that must be purchased including stores, offices and restaurants. Relocations would only be necessary if a build alternative directly impacts a home or business. The right of way and relocation analysis used the corridor width along the length of the study area to determine the amount of relocations. However, the actual corridor width varies because of terrain and steep topography.

The residential relocations of each build alternative consist of single-family homes and are representative of the overall housing stock within the study corridor. As shown in Tables 7 and 8, the build alternatives are similar in the number of relocations and impact costs. Most of the homes that may be relocated are owner occupied. No multi-unit rental property relocations are required; a few of the relocations are assumed to be single-family home rentals. Analysis of census data indicates that the residential relocations would include a very small percentage of minority and low-income households.

| Table 7. Right of Way and Relocation Impacts by Alternative and Region | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Right of Way | | | Parcels | | | Relocations | |
| Section/ Alternative | New | Full Acquisition | Partial Acquisition | Total | Full Acquisition | Partial Acquisition | Residential | Commercial |
| | Acres | Acres | Acres | # | # | # | # | # |
| **Westphalia** | | | | | | | | |
| Preferred Alt. | 474 | 152 | 322 | 38 | 13 | 25 | 2 | 1 |
| Alternative 1 | 304 | 83 | 221 | 33 | 9 | 24 | 9 | 2 |
| Alternative 2 | 305 | 98 | 207 | 25 | 24 | 24 | 6 | 12 |
| **South of Westphalia** | | | | | | | | |
| Preferred Alt. | 534 | 65 | 469 | 25 | 3 | 22 | 3 | 0 |
| Alternative 1 | 455 | 73 | 382 | 19 | 3 | 16 | 3 | 0 |
| Alternative 2 | 589 | 235 | 354 | 35 | 14 | 21 | 8 | 3 |
| **Freeburg** | | | | | | | | |
| Preferred Alt. | 820 | 189 | 631 | 43 | 10 | 33 | 6 | 0 |
| Alternative 1 | 870 | 44 | 826 | 39 | 2 | 37 | 7 | 0 |
| Alternative 2 | 777 | 70 | 707 | 43 | 4 | 39 | 7 | 0 |
| **Vienna** | | | | | | | | |
| Preferred Alt. | 691 | 201 | 490 | 69 | 20 | 49 | 1 | 0 |
| Alternative 1 | 734 | 155 | 579 | 90 | 19 | 71 | 8 | 0 |
| Alternative 2 | 655 | 92 | 563 | 63 | 9 | 54 | 2 | 0 |
| **Vichy** | | | | | | | | |
| Preferred Alt. | 277 | 64 | 213 | 131 | 30 | 101 | 15 | 14 |
| Alternative 1 | 464 | 84 | 380 | 117 | 20 | 96 | 1 | 0 |
| Alternative 2 | 277 | 64 | 213 | 131 | 30 | 101 | 15 | 9 |
| **Total** | | | | | | | | |
| Preferred Alt. | 2,796 | 671 | 2,125 | 306 | 76 | 230 | 27 | 15 |
| Alternative 1 | 2,827 | 439 | 2,388 | 298 | 54 | 244 | 28 | 2 |
| Alternative 2 | 2,603 | 559 | 2,044 | 297 | 81 | 239 | 38 | 24 |

- The Preferred Alternative would require the relocation of 27 residential units and 15 businesses.
- Alternative 1 would require the relocation of 28 residential units and two businesses.
- Alternative 2 would require the relocation of 38 residential units and 33 businesses.

No community facilities would be impacted or relocated by any of the alternatives. At this time, all residential and commercial relocations are considered full acquisitions. The opportunity to decrease the relocation numbers for both residential and commercial would be possible and likely during design.

| Table 8. Right of Way and Relocation Impact Costs | | | |
|---|---|---|---|
| **Section/Alternative** | **Right of Way Costs** | **Relocation Costs** | **Total Costs** |
| **Westphalia** | | | |
| Preferred Alternative | $3.5 million | $200,000 | $3.7 million |
| Alternative 1 | $4.2 million | $200,000 | $4.4 million |
| Alternative 2 | $8.8 million | $500,000 | $9.3 million |
| **South of Westphalia** | | | |
| Preferred Alternative | $3.3 million | $200,000 | $3.5 million |
| Alternative 1 | $3.7 million | $200,000 | $3.9 million |
| Alternative 2 | $5.6 million | $300,000 | $5.9 million |
| **Freeburg** | | | |
| Preferred Alternative | $5.3 million | $300,000 | $5.6 million |
| Alternative 1 | $5.8 million | $300,000 | $6.1 million |
| Alternative 2 | $5.7 million | $300,000 | $6 million |
| **Vienna** | | | |
| Preferred Alternative | $6.3 million | $300,000 | $6.6 million |
| Alternative 1 | $7.8 million | $400,000 | $8.2 million |
| Alternative 2 | $6.2 million | $300,000 | $6.5 million |
| **Vichy** | | | |
| Preferred Alternative | $9.1 million | $500,000 | $9.6 million |
| Alternative 1 | $5.6 million | $300,000 | $5.9 million |
| Alternative 2 | $7.5 million | $400,000 | $7.9 million |
| **Totals** | | | |
| Preferred Alternative | $27.5 million | $1.5 million | **$29 million** |
| Alternative 1 | $27.1 million | $1.4 million | **$28.5 million** |
| Alternative 2 | $33.8 million | $1.8 million | **$35.6 million** |

**How were relocations considered during the study and how would property owners be compensated?**

The relocations identified for each alternative represent the worst-case scenario of using the entire width of the alternative corridor. Primarily, if the corridor crossed over the residence or business building it was counted as relocation. Through engineering refinements in the design phase of the project, there may be opportunities to reduce the number of relocations needed for each alternative. To determine the availability of replacement housing and commercial property, 2000 census data for the affected communities was reviewed and local realtors serving the study area were contacted.

MoDOT will compensate homeowners that are relocated and assist 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 relocation purposes. 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 of 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 Part24)as a written statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information.

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 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 operations, or nonprofit organizations, which 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 operation, or nonprofit organization at a replacement site.

A relocated business may be eligible to choose to receive a fixed payment instead of the payments for actual moving 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.

The business relocations for each build alternative would also require the relocation of a number of jobs. An estimate of the jobs connected with the business relocations is presented in Table 9. These estimates were made by knowledge of the businesses that would be potentially relocated. In instances where an employment count for a business was unavailable, an estimate was made based on similar businesses in the study corridor.

Table 9. Estimated Job Relocations

| | Number of Estimated Commercial Relocations | Estimated Total Jobs Relocated |
|---|---|---|
| Preferred Alternative | 15 | 40 |
| Alternative 1 | 2 | 4 |
| Alternative 2 | 33 | 75 |

Commercial relocations based on a wider than needed alternative width.
Relocation numbers would be reduced during highway design.

The No-Build Alternative will not require any relocations.

The Preferred Alternative has the smallest number of relocations of the build alternatives in each area except Vichy, which accounts for over half of the total number of relocations. Through engineering refinements in the design phase of the project, there may be opportunities to reduce acquisitions and relocations. Preliminary engineering was performed in the area to determine if the NRHP eligible structures on the east side could be avoided and the city park on the west side. Both are Section 4(f) properties. It was determined that it would be possible to widen (add lanes) to the west side only to avoid the NRHP eligible structures and the park. For this reason the number of relocations would drop drastically. This would be the same case with commercial business relocations in Vichy.

Alternative 1 contains a large number of relocations at the Westphalia, Freeburg, and Vienna areas where the proposed route crosses county roads and state routes. The residential properties along these roads, especially those near Route 63, have generally developed into smaller tracts with houses in close vicinity. This alternative has only two commercial business relocations, which is the least among the build alternatives.

Alternative 2 includes using the most length of existing Route 63. Therefore, this alternative has the greatest amount of commercial and residential relocations of the three build alternatives.

All of the businesses relocated by these alternatives are small-sized establishments (generally 25 people or fewer). The retail/service businesses are typical of those in most communities similar in size in the study area. These businesses should be able to find comparable new locations relatively easily, especially since there is plenty of undeveloped property. Few long-term job losses are expected with these alternatives as it relocates businesses that are not highly dependent on their current locations.

Those travel-oriented businesses may want to relocate if they believe it is necessary. Appendix D, Preconstruction Community and Business Impact Study, shows the majority of retail customers in each city along the route are within 30 miles of the town.

Current market data (internet real estate search) revealed that there are very few replacement properties along the corridor in terms of number or type of residential dwellings or business relocations. Replacement property should be of a similar size and pricing of the original home. No relocations can occur until it is shown that comparable housing is available. Those being relocated near the communities of Westphalia, Freeburg, Vienna and Vichy have limited residential areas to move to, but do have more homes with a range of values that should provide adequate housing for those that are required to relocate. Available housing for those in the more rural portions would be limited in number and price range.

In addition to property acquisition, any normal construction project of this size would have permanent easements either for utilities or drainage. Wherever there is a large drainage structure a permanent easement is usually purchased for maintenance of the structure and cleaning lodged debris after major storm events. Along the Route 63 corridor permanent easements for utilities will likely be needed as well. Temporary Construction Easements are also common and used when there is no need to absorb the property into the right of way after construction is complete. Property owners will be compensated for easements.

## Noise Impacts

Sound is an element of daily life that we call noise when we perceive it as unpleasant, unwanted, or disturbingly loud. We analyze noise to understand the potential effect of traffic and construction noise on public health and welfare. As part of the study we consider how different project alternatives would cause traffic noise changes, and the noise caused by construction. We also consider whether it is likely the project would include mitigation measures, such as noise barriers, to buffer noise-sensitive areas from the roadway.

**How do we describe noise?**
Noise is unwanted sound. Sound is the result of vibrations in the air that travel as a wave at different frequencies. The frequency is commonly referred to as the pitch of a sound. A high pitch sound corresponds to a high frequency sound wave and a low pitch sound corresponds to a low frequency sound wave.

A meter measures sound electronically and combines all the frequencies of sound into one overall level that simulates how a typical person hears sound. Environmental noise is often measured and described in terms of A-weighted decibels (dBA). The A-weighting is a filtering system that helps to present information about sound in a way that is similar to the way the human ear works.

What are A-weighted decibels (dBA)?
A-weighted decibels are an expression of the relative loudness of sounds in air as perceived by the human ear.

Loudness, in contrast to sound level, refers to how people subjectively perceive a sound. This varies from person to person, but most people judge relative loudness between sound levels similarly. The human ear can barely perceive a 3 dBA increase, but a 5 or 6 dBA increase is readily noticeable and seems as if the sound is about one and a half times as loud. A 10-dBA increase seems to be twice as loud to most people.

The human ear is less sensitive to higher and lower sound frequencies than to mid-range frequencies. Therefore, sound level meters used to measure environmental noise generally use a filtering system that cuts out higher and lower frequencies in a similar way to how the ear works. This produces noise measurements that approximate normal human hearing. Table 10 shows the noise levels commonly associated with different types of noise sources.

Table 10. Common Sources of Noise (dBA)

| Thresholds/Noise Sources | Sound Level (dBA) | Subjective Evaluations | Possible Effects on Humans |
|---|---|---|---|
| Human threshold of pain<br>Carrier jet takeoff (50 feet) | 140 | Deafening | Continuous exposure can cause hearing damage |
| Siren (100 feet)<br>Jackhammer, power drill | 130 | | |
| Loud rock band<br>Auto horn (3 feet) | 120 | | |
| Busy video arcade<br>Baby crying | 110 | | |
| Lawn mower (3 feet)<br>Noisy motorcycle (50 feet) | 100 | Very Loud | |
| Heavy truck at 40 mph (50 feet)<br>Shouted conversation | 90 | | |
| Kitchen garbage disposal (3 feet)<br>Busy urban street, daytime | 80 | Loud | |
| Normal automobile at 65 mph (25 feet)<br>Vacuum cleaner (3 feet) | 70 | | Speech interference |
| Large air conditioning unit (20 feet)<br>Normal conversation (3 feet) | 60 | Moderate | |
| Quiet residential area<br>Light auto traffic (100 feet) | 50 | | Sleep interference |
| Library<br>Quiet home | 40 | Faint | |
| Soft whisper (15 feet) | 30 | | |
| Broadcasting studio | 20 | Very Faint | |
| Threshold of human hearing | 0-10 | | |

Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Report No. 550/9-74-004. U.S. Environmental Protection Agency, Washington, DC: March 1974

**How did we evaluate existing and future noise levels?**

Existing noise levels were measured at nine locations in the study corridor. Figures 24 through 26 show the noise measurement locations. Measurements were taken to find the average noise levels (Leq(h)) during the loudest hour of the day at locations next to the existing Route 63 highway, and further away from the current highway in quieter areas closer to one or more of the proposed alternative locations.

What is Leq(h)?
Leq(h) is the equivalent sound level widely used to describe environmental noise. It is the average sound level measured during an hour.

Figure 24. Existing Noise Monitoring Locations – North Portion

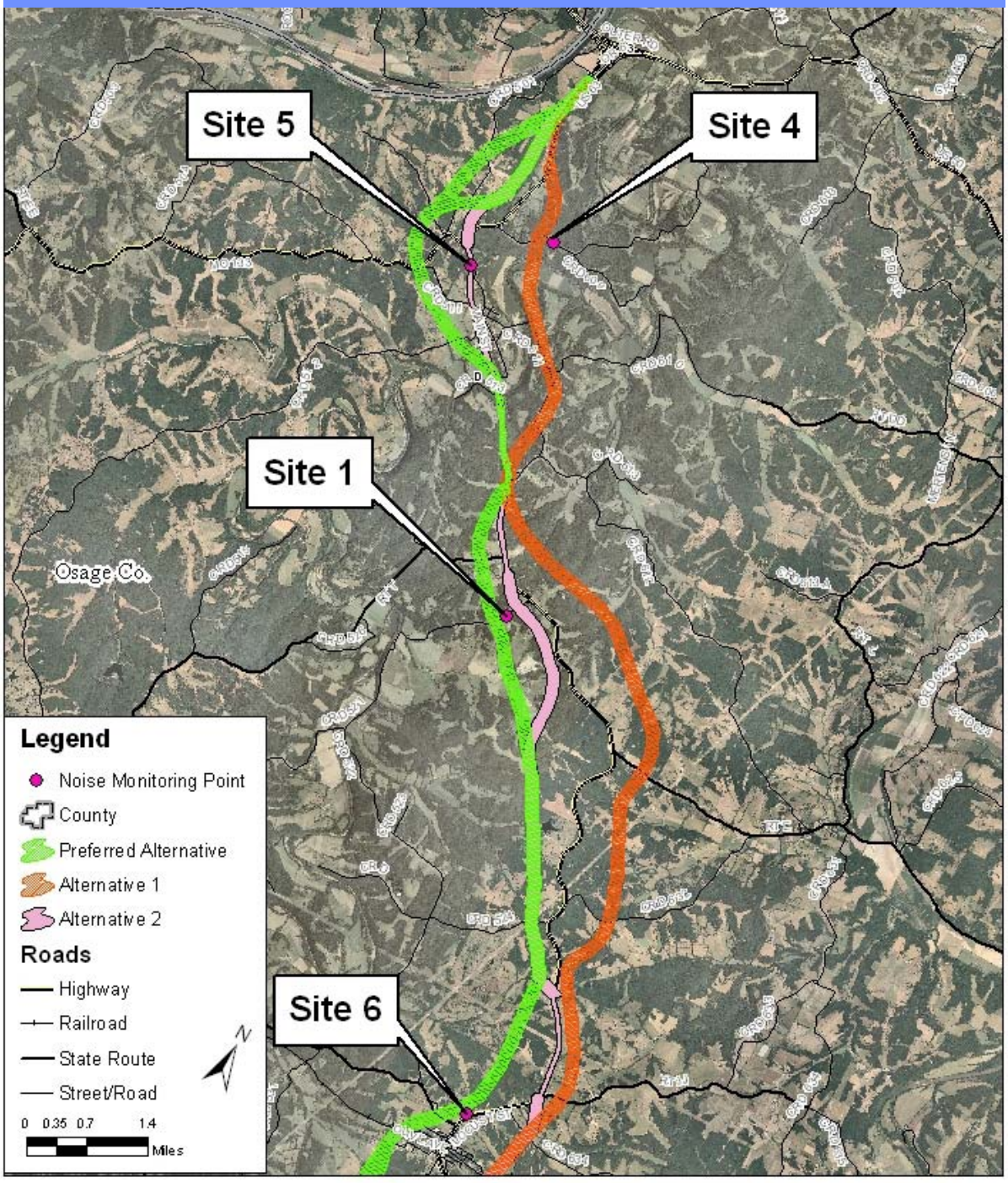


Figure 25. Existing Noise Monitoring Locations – Central Portion

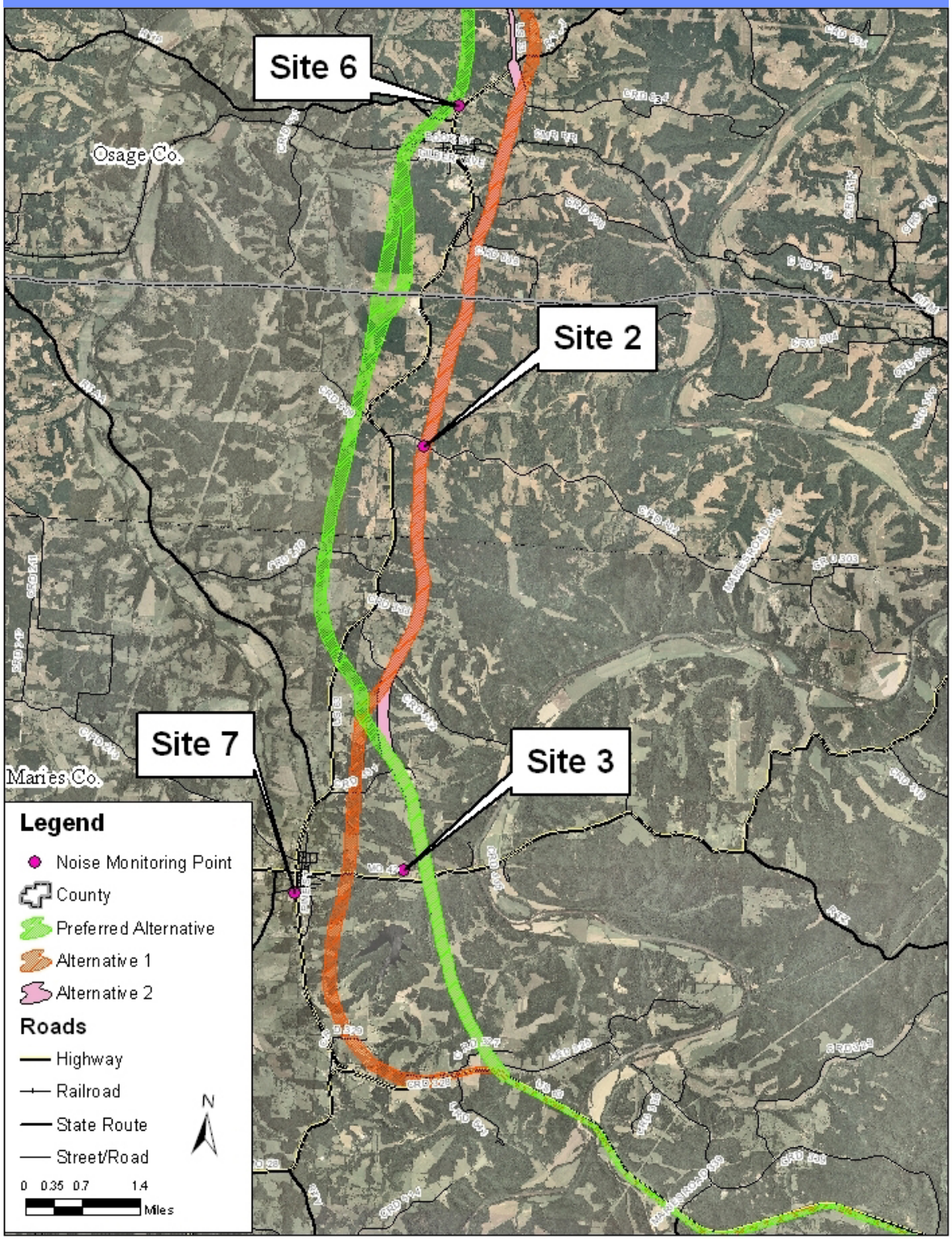
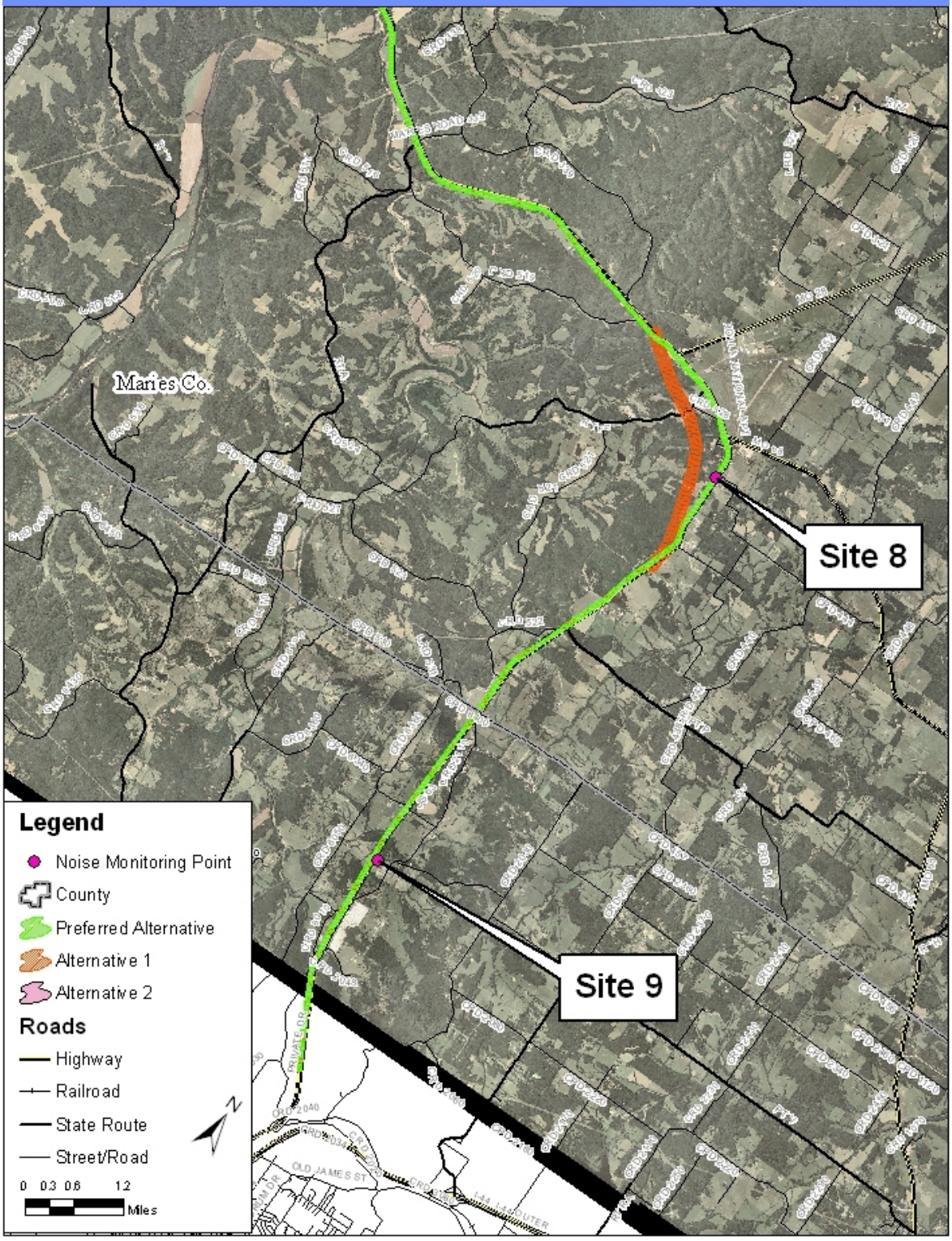


Figure 26. Existing Noise Monitoring Locations – South Portion



In the analysis, we look at noise levels at different land uses in the study corridor. The land uses in this area are primarily residential (homes) and small businesses (commercial). Land uses in the towns (Westphalia, Freeburg, Vienna, and Vichy) are a mixture of commercial and residential properties. The areas between the towns are predominantly residential.

Noise levels are compared to the MoDOT noise impact criteria, which have been approved by FHWA, and are based on the FHWA noise abatement criteria (NAC), for different types of properties. Table 11 lists the MoDOT noise impact criteria. An impact occurs when the predicted traffic noise levels approach or exceed the MoDOT noise impact criteria, or when the predicted traffic noise levels substantially exceed the existing noise levels.

Table 11. Noise Abatement/Impact Criteria by Land Use – Leq(h) - dBA

| Land Use - Primary Activity | MoDOT Noise Impact Criteria |
|---|---|
| Residential, Recreation, Churches, Schools, Hotels (Exterior Levels) | 66 |
| Commercial, Industrial (Exterior Levels) | 71 |
| Residential, Recreation, Churches, Schools, Hotels (Interior Levels) | 51 |

MoDOT is responsible for implementing the FHWA regulations in Missouri and is required to define the terms "approach" and "substantially exceed" in order to apply the FHWA regulations locally through the *MoDOT Traffic Noise Policy* (MoDOT, 1997). MoDOT has determined that a traffic noise impact occurs if predicted noise levels are predicted to be within 1 dBA of the FHWA criteria. MoDOT has also determined that a substantial excess of existing noise levels is an increase of 15 dBA.

**What are noise abatement criteria (NAC)?**
For residential and public use buildings or outdoor recreational areas, FHWA defines the NAC at 67 dBA. MoDOT has adopted the NAC and sets its own criteria at 66 dBA for residential land uses, public use buildings and outdoor recreational areas. If the NAC is approached, met, or exceeded, noise mitigation must be evaluated.

The noise analysis we performed for this study is intended to provide a simplified or "broad brush" evaluation of the proposed alternatives to help decide between the alternatives. As such, this noise analysis does not include detailed modeling of noise impacts or final noise wall locations.

The noise analysis used a simplified screening approach in conjunction with FHWA's Traffic Noise Model. The simplified screening analysis assumes the study area is completely flat, and calculates noise levels at certain distances from the roadway. The simplified screening analysis does not take into account hills and other features that can block noise.

The screening analysis is designed to help understand study area noise levels, provide a method of determining the potential for noise impacts, and allow us to make a side-by-side comparison of alternatives. Calculating the distance from the roadway to the residential (66 dBA) and commercial (71 dBA) noise impact "contour" for each alternative, and estimating the number of properties that are between the road and the contours, shows the range of potential noise impacts for each alternative. The distance from the roadway centerline to the point where traffic noise levels declines to below the noise impact criteria was calculated for nine sections of each highway alternative alignment, including the No Build Alternative.

The nine sections were calculated separately to take account of changes in the general amount of traffic in different sections, and changes in the posted speed limits, both of which would affect how much traffic noise is generated.

The screening analysis is not intended to provide accurate noise level predictions at each property, but allows us to compare the range of potentially noise-impacted properties under each alternative.

**How noisy is the study area?**

Table 12 shows the daily peak hour noise levels for each of the nine locations where noise was measured, and the distance of that location from the existing highway. Currently, the existing highway is the main source of noise in the area. The results show that noise levels at locations within approximately 250 feet of Route 63 are currently between 63 dBA and 71 dBA during the loudest hour of the day. Locations further away from the existing highway have noise levels between 50 dBA and 56 dBA during the loudest hour of the day. The results in Table 12 show how the highest average noise levels generally decrease as you move farther from the existing highway.

Table 12. Peak Hour Noise Monitoring Results and Distance from Route 63

| Monitoring Location | Distance from Route 63 (feet) | Morning Peak Hourly Noise Level (dBA) | Afternoon Peak Hourly Noise Level (dBA) |
|---|---|---|---|
| Site #5 | 75 | 71 | 70 |
| Site #8 | 75 | 61 | 62 |
| Site #7 | 80 | 68 | 68 |
| Site #6 | 80 | 66 | 65 |
| Site #9 | 250 | 59 | 63 |
| Site #1 | 1,700 | 54 | 52 |
| Site #2 | 2,150 | 54 | 56 |
| Site #4 | 3,250 | 50 | 50 |
| Site #3 | 6,900 | 49 | 51 |

**What would future noise levels be if we do not build the project?**
Numbers of potentially noise-impacted homes and businesses between the highway and the calculated noise contours were counted for each study alternative, including the No Build Alternative. Table 13 shows the range of calculated distances in feet from the highway to the different noise impact contours. The distance changes depending on future projected traffic volume and on the speed limit in different sections of the highway.

Table 14 shows the estimated number of impacted properties for each of the project alternatives. Note that the No Build Alternative has the greatest potential to cause noise impacts at both residential and commercial properties. This is because traffic volumes would continue to grow each year and the majority of homes and businesses are located close to the current highway.

**How would noise levels change after the project is completed?**
As illustrated in Table 13, the range of calculated distances in feet from the centerline highway to the different noise impact contours in each of the nine sections of Route 63 is included in the analysis. Numbers of potentially noise-impacted homes and businesses between the highway and the calculated noise contours were counted for each study alternative.

A Noise Contour is a line on a map that represents equal levels of noise exposure.

| Table 13. Range of Distances to Noise Impact Contours from the Highway Centerline (feet) | | | | |
|---|---|---|---|---|
| | **No Build Alternative** | | **Build Alternatives 1, 2 and the Preferred Alternative** | |
| **Route 63 Analysis Section** | **Distance to Residential Noise Impact Contour (feet)** | **Distance to Commercial Noise Impact Contour (feet)** | **Distance to Residential Noise Impact Contour (feet)** | **Distance to Commercial Noise Impact Contour (feet)** |
| Northern Project Limits to Westphalia City Limits (north end) | 200 | 115 | 215 | 110 |
| Westphalia City Limits (north end) to Westphalia City Limits (south end) | 160 | 65 | 220* | 115* |
| | | | 130** | 45** |
| Westphalia City Limits (south end) to Freeburg City Limits (north end) | 190 | 105 | 205 | 100 |
| Freeburg City Limits (north end) to Freeburg City Limits (south end) | 125 | 45 | 190 | 85 |
| Freeburg City Limits (south end) to Vienna City Limits (north end) | 185 | 95 | 195 | 95 |
| Vienna City Limits (north end) to Vienna City Limits (south end) | 145 | 55 | 210 | 105 |
| Vienna City Limits (south end) to Missouri Route 68 | 215 | 130 | 210 | 105 |
| Missouri Route 68 to Phelps County Line | 210 | 125 | 205 | 100 |
| Phelps County Line to Southern Project Limits | 205 | 125 | 200 | 95 |

* Distance for Alternative 1 and the Preferred Alternative
** Distance for Alternative 2

Table 14 shows that among the proposed alternatives, the No Build Alternative has the greatest potential to cause noise impacts, and Alternative 1 has the smallest potential. The number of properties affected under Alternatives 1, 2, and the Preferred Alternative is much less than under the No Build Alternative because the new highway would be located in areas where there are currently far fewer homes and businesses compared to the existing highway location.

Table 14. Estimated Number of Impacts Under Each Alternative

| Project Alternative | Number of Residential Noise Impacts | Number of Commercial Noise Impacts |
|---|---|---|
| No Build Alternative | 234 | 16 |
| Alternative 1 | 43 | 1 |
| Alternative 2 | 77 | 5 |
| Preferred Alternative | 53 | 0 |

Sections of the new highway alignment options are located in areas where there is currently little road noise. These areas, as shown in Table 12, have lower ambient noise levels than areas close to the existing highway. Properties in these quieter areas have the potential to be impacted by a substantial increase in noise. A substantial increase is defined by MoDOT, as an increase of 15 dBA over existing noise levels. Depending on how close the future highway comes to properties in these quieter areas, substantial increase impacts are possible. More detailed analysis of existing and future levels of noise would need to be performed in order to say where these impacts could occur and how many there would be.

**How would we minimize the effects of traffic noise?**

FHWA regulations (23 CFR 772) require MoDOT to evaluate measures to reduce noise, known as "noise abatement measures" when project-related noise impacts are identified. Usually, noise walls are the most effective noise abatement measures, however earth berms can be just as effective where there is enough room to accommodate them. Noise abatement measures that are determined to be "feasible and reasonable," must be incorporated into our project design.

What do the terms feasible and reasonable mean?

MoDOT evaluates many factors to determine whether barriers will be feasible and/or reasonable. To be feasible, a barrier must be constructible where noise levels will be reduced at least 5 dBA for one or more first row properties. MoDOT determines reasonableness based on how many properties are benefited by a reduction in noise of at least 5 dBA, the cost effectiveness of the barriers, and concerns such as aesthetics, safety, and the desires of nearby residents.

Evaluating the reasonableness of proposed noise abatement mitigation measures is more subjective than evaluating the feasibility. Reasonable implies use of common sense and good judgment and is based on a number of factors. These factors include, but are not limited to the following:

- Noise wall must provide noise reduction of at least 5 dBA at properties closest to the highway.
- Noise wall must provide a benefit of at least 5 dBA for more than one property.
- Noise wall must not interfere with normal access to the property.
- Noise wall must not exceed a cost of $30,000 per property that receives a noise reduction of 5 dBA or more.
- The majority of the affected property owners (primary and benefited properties) must agree that a noise wall is desired.

For noise mitigation to be considered cost effective (reasonable) under the MoDOT policy, it must be able to benefit more than one property, with no direct access (such as driveways) onto the highway dividing benefited properties. Walls with gaps to allow access are not effective at blocking noise and so are usually not able provide the minimum noise reduction needed to be considered reasonable. Alternatives 1, 2, and the Preferred Alternative are located in areas with a small number residence that are widely scattered throughout the proposed corridors. In these areas, individual residences would still require access to the highway. As a result, the noise impact analysis did not identify areas where noise walls would be both effective and reasonable.

**How would construction activities affect noise levels?**
Roadway construction activities that generate noise include clearing, cut-and-fill (grading) activities, removing old roadways, importing fill, and paving. These activities would result in unavoidable short-term increases in noise levels.

During the construction phase of the project, operating vehicles and equipment engines generate the most noise. Engine-powered equipment includes earthmoving, material-handling, and stationary equipment. Truck noise could also affect area residents because trucks would operate outside the project site. Other construction noise sources would include impact equipment and tools such as pile drivers.

Construction noise will be intermittent and construction noise levels would depend on the type, amount, and location of construction activities. The types of construction activities, when they occur, as well as their duration, will ultimately determine the noise levels associated with the construction activity. In addition, the proximity of individual properties to the construction activity will determine the degree of construction noise experienced. Maximum noise levels of construction equipment, for the project, would be similar to typical maximum levels presented in Table 15.

| Table 15. Typical Construction Equipment Noise (dBA) | | |
|---|---|---|
| **Types of Activities** | **Types of Equipment** | **Range of Noise Levels at 50 feet** |
| Material Handling | Concrete mixer | 75-87 |
| | Concrete pump | 81-83 |
| | Crane (movable) | 76-87 |
| | Crane (derrick) | 86-88 |
| Stationary Equipment | Pump | 69-71 |
| | Generator | 71-82 |
| | Compressor | 74-87 |
| Impact Equipment | Pneumatic wrench | 83-88 |
| | Rock drill | 81-98 |
| Land Clearing | Bulldozer | 77-96 |
| | Dump truck | 82-94 |
| Grading | Scraper | 80-93 |
| | Bulldozer | 77-96 |
| Paving | Paver | 86-88 |
| | Dump truck | 82-94 |
| *Source: U. S. Environmental Protection Agency, 1971.* | | |

**How can we minimize effects from construction noise?**
Analysis results indicate that fifty-three traffic-related noise impacts were predicted to occur at residential land uses, and no traffic noise impacts were predicted to occur at commercial land uses. To reduce the impacts of construction noise, MoDOT requires all contractors comply with applicable local, state, and federal laws and regulations relating to construction noise levels.

In an effort to reduce impacts during construction, MoDOT may require contractors to equip and maintain muffling equipment for trucks and other machinery to minimize noise levels. Contract specifications may also restrict excessively noisy construction activities to daytime working hours. Further, MoDOT would monitor project construction noise and may require extra measures to reduce noise in cases where noise standards are exceeded.

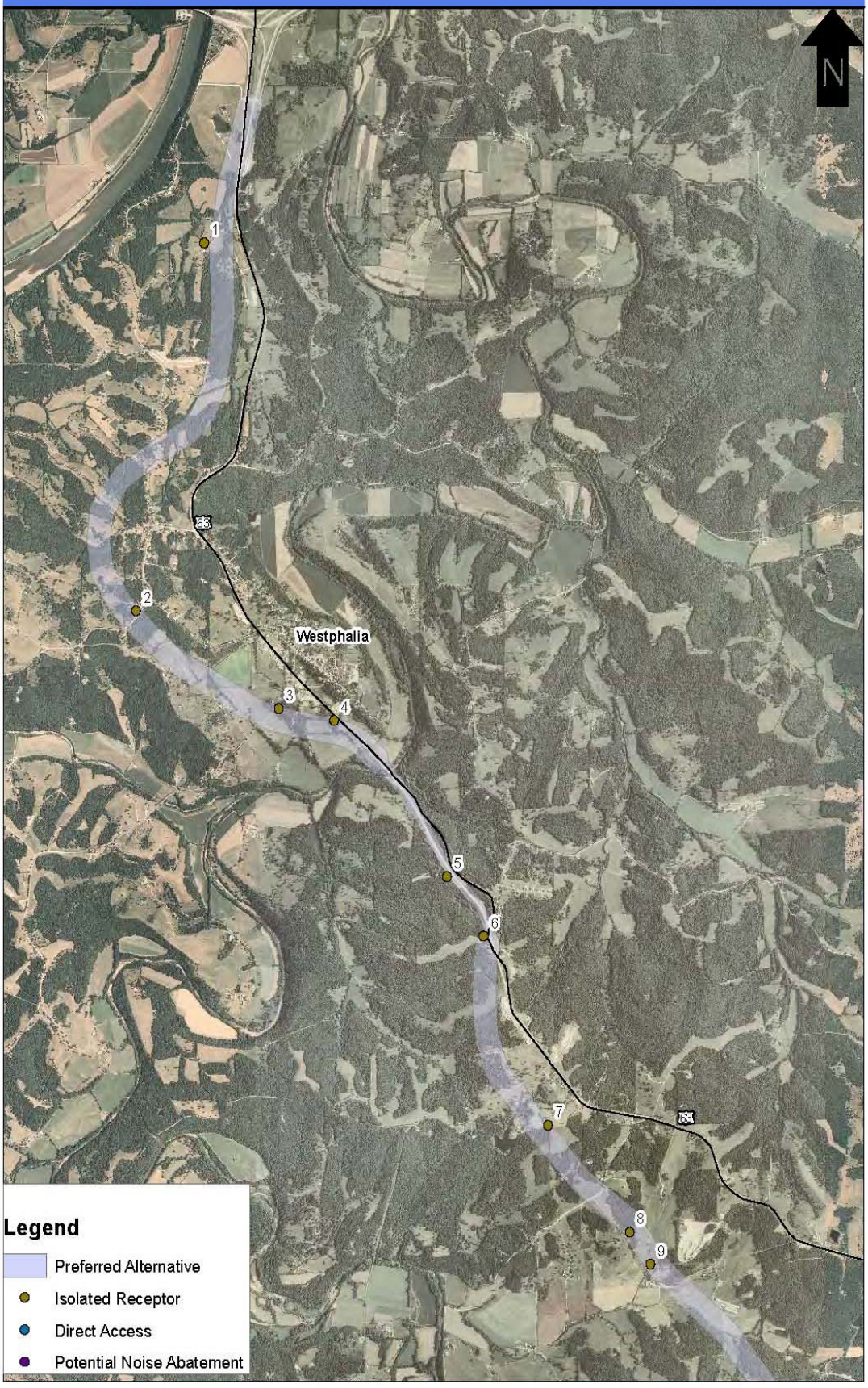
A number of noise reduction measures are available for consideration. Construction noise strategies that could be implemented may include:

- Wherever possible, sound walls and retaining walls would be built in their final locations as soon as possible to help mitigate the temporary noise impacts from construction.
- Restricting night operations for particularly loud construction operations.
- Using temporary noise mitigation screens in residential area impacts to reduce noise levels.

Figures 27 through 31 show locations of noise receptors associated with the Preferred Alternative along with potential noise abatement locations. Receptors that were assumed to be acquisitions associated with the project were not included in the noise study.

A copy of the Noise Analysis report is available upon request.

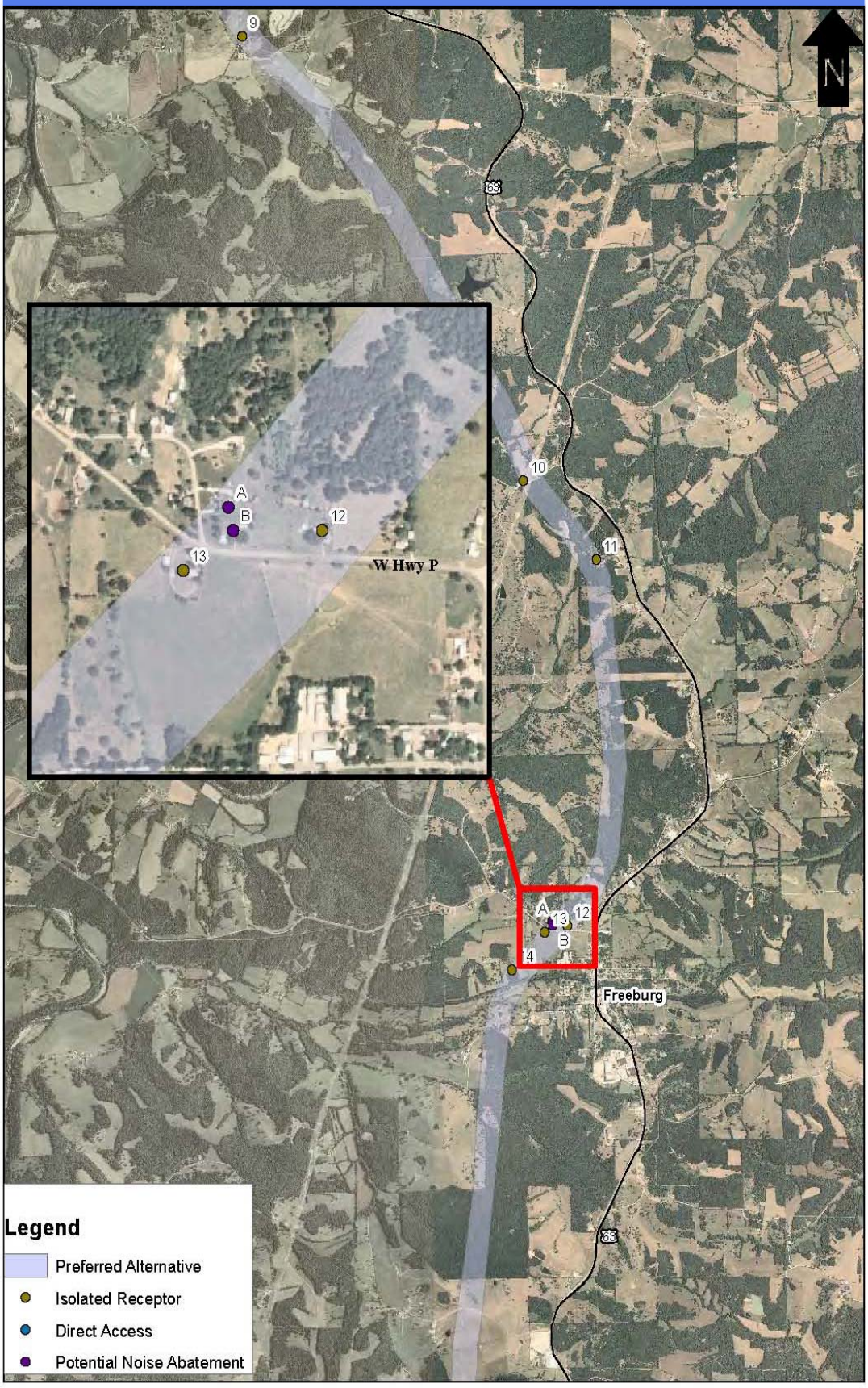
**Figure 27. Noise Abatement Analysis**




**Potential Noise Impact Locations**

U.S. Route 63
Environmental Impact Statement

**Figure 28. Noise Abatement Analysis**




**Potential Noise Impact Locations**

U.S. Route 63
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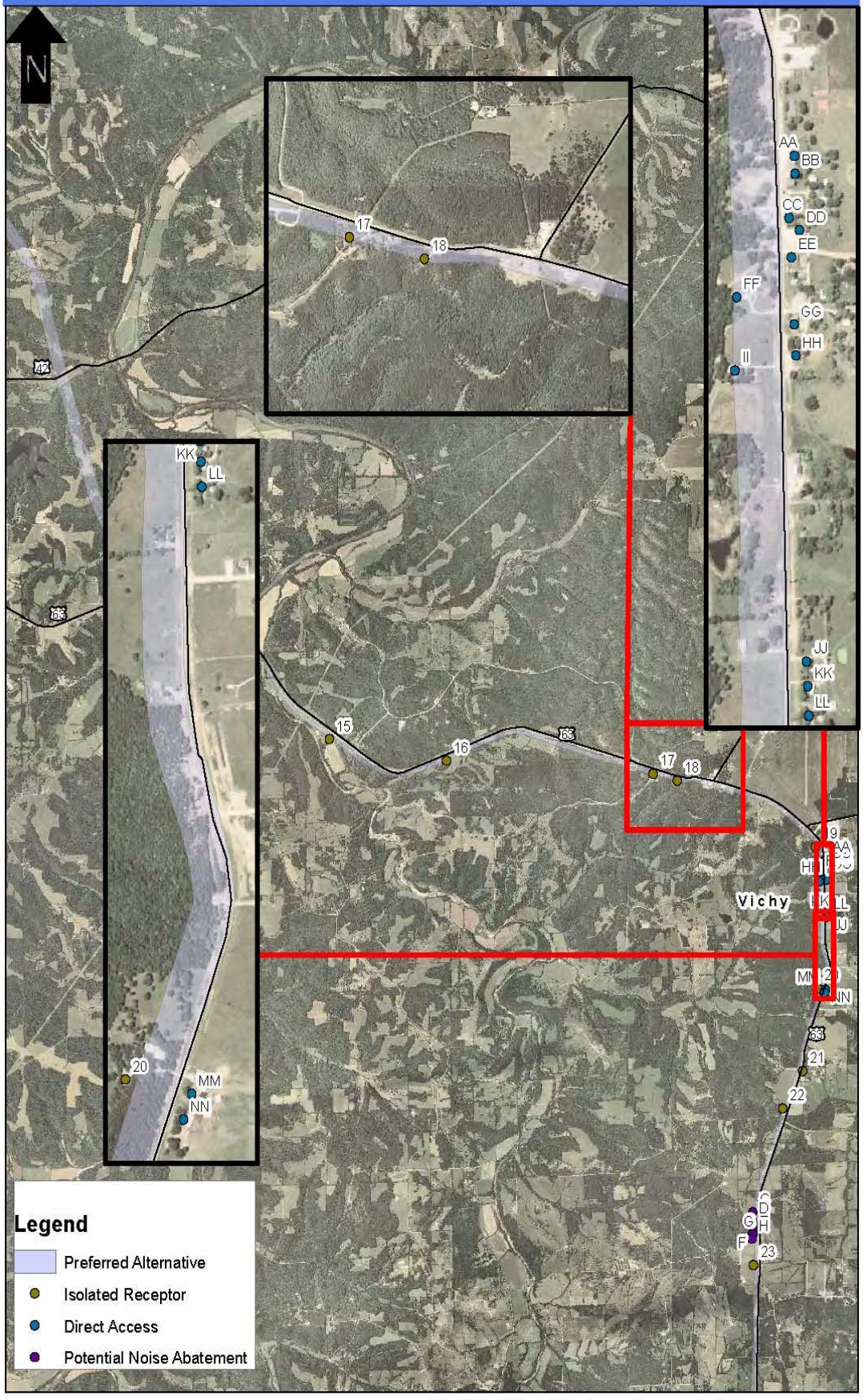
**Figure 29. Noise Ababement Analysis**


**Potential Noise Impact Locations**

0.5 0.25 0 0.5 Miles

U.S. Route 63
Environmental Impact Statement

**Figure 30. Noise Abatement Analysis**




**Potential Noise Impact Locations**

U.S. Route 63
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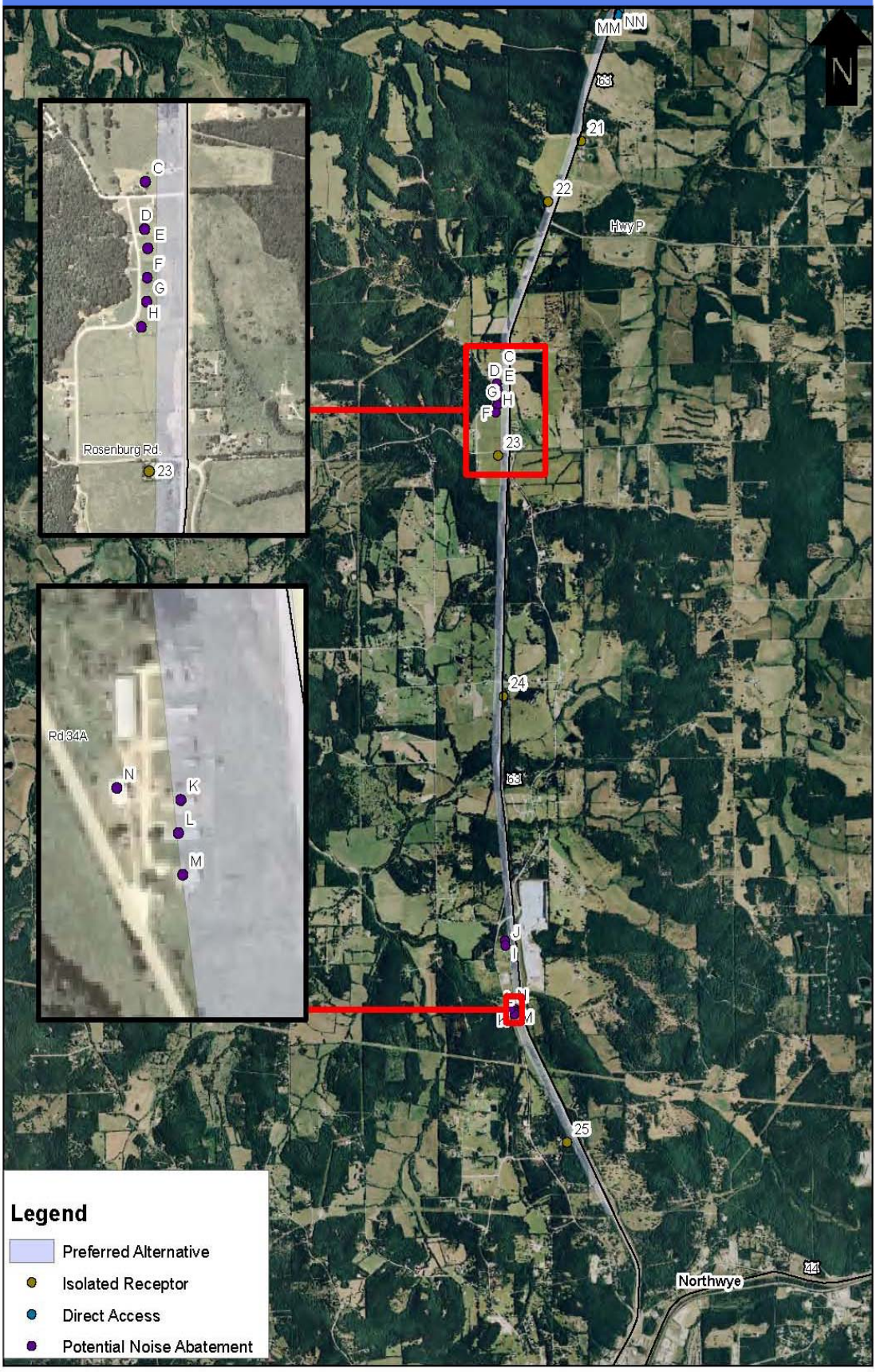
**Figure 31. Noise Abatement Analysis**




**Potential Noise Impact Locations**

U.S. Route 63
Environmental Impact Statement

## Hazardous Waste Impacts

**What is hazardous waste?**
An assessment of the proposed Route 63 corridor was conducted to identify any hazardous waste concerns in the study area. Hazardous wastes as regulated by the Environmental Protection Agency (EPA) are defined as "waste with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous wastes can be liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides." In order for a waste to be considered hazardous, a waste must exhibit at least one of the the four characteristics of hazardous waste; ignitability, corrosivity, reactivity, or toxicity. If the waste exhibits just one of these characteristics, it is given the title of a hazardous waste.

**What resources were used to search for hazardous waste data?**
The following sources were searched for potential hazardous and solid waste concerns, in the study area: Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); Environmental Protection Agency (EPA) Emergency Response Notification System (ERNS); Missouri Department of Natural Resources (DNR) Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites in Missouri, Fiscal Year 2007; DNR Missouri Hazardous Waste Treatment, Storage, and Disposal Facilities List; DNR Solid Waste Facilities List; and DNR Underground Storage Tank database.

These information sources were used to identify listed hazardous waste sites such as underground and above ground petroleum storage tanks (UST's and AST's), that could cause an environmental impact in the projected right of way. After reviewing the site databases, a field check of the study area was conducted by MoDOT environmental specialists to identify listed and any other additional hazardous waste sites that may be of concern. Any unknown sites that are encountered during project construction would be handled in accordance with federal and state laws and regulations. See Appendix H, Plates 1-9 for location of all identified hazardous waste sites. Waste can also be hazardous by being identified as a "listed waste" in state and federal regulations.

An evaluation of the study corridor for possible hazardous waste impacts found that there is a possibility for site impacts on each of the three alternatives being considered, the majority being along the existing route. Throughout the corridor there are sites that include petroleum storage tanks, (gasoline, diesel, etc.) these sites are listed as "Tank Sites" in Table 16. Petroleum storage tanks have the potential to cause problems because of releases that contaminate the surrounding soil and groundwater. Other sites of concern in the proposed Route 63 corridor are things such as automobile repair facilities and equipment dealers, listed as "Other Concerns" in Table 16. Facilities of this nature have the potential to contaminate soils and groundwater due to the oil, fuel, solvents and other chemicals that could be released into the environment and cause need for cleanup. A short description of each of the sites is also included with approximate location.

| Table 16. Potential Hazardous Waste Sites | | | | |
|---|---|---|---|---|
| **Facility Name** | **ID#** | **Preferred Alternate** | **Alternative 1** | **Alternative 2** |
| Weber Equipment | 1 | OC | OC | OC |
| Fritz's Auto Body | 2 | | | OC |
| CSH Automotive | 3 | | | OC |
| Leroy's 63 Mini Mart (CNEX) | 4 | | | T |
| Shelter Insurance | 5 | | | T |
| Rehagen HT/AC | 6 | | | OC |
| Delbert Wieberg DumpTruck Service | 7 | | | T |
| Play Mor Trailers | 8 | | OC | |
| Skidmore Lumber | 9 | | OC | |
| Luecke's Roofing | 10 | | OC | |
| MFA Bulk Storage | 14 | | T | |
| Dickneite Oil | 15 | | OC | |
| Vichy Café | 59 | T | T | |
| Suspect Gas Station | 60 | T | T | |
| Suspect Gas Station | 61 | T | T | |
| Vichy Store, Tire & Deli | 63 | T | T | |
| J & M Feed | 64 | T | T | |
| Auto Repair | 65 | OC | OC | |
| Abandoned Trailer Park | 66 | OC | OC | |
| Dump Site | 67 | OC | OC | |
| **T = Tank Site**<br>**OC = Other Concerns** | | | | |

**Weber Equipment** is located on the east side of Route 63 approximately 4,000 feet south of the Route 50/63 junction. The site is currently used as a farm implement dealer and farm equipment repair facility. No commercial sales of petroleum products are known to have occurred at the facility.

**Fritz's Auto Body** is located on the west side of Route 63 approximately 250 feet south of Route 133. The site is currently used as an auto repair facility. No commercial sales of petroleum products are known to have occurred at the facility.

**CSH Automotive** is located on the west side of Route 63 approximately 500 feet north of County Road 511. The site is currently used as an auto repair facility and trailer sales. No commercial sales of petroleum products are known to have occurred at the facility.

**Leroy's 63 Mini Mart** is located on the west side of Route 63 approximately 1,300 feet south of County Road 511. The site is currently being used as an active gas station. Currently the site has three AST's in use.

**Shelter Insurance** is located on the east side of Route 63 approximately 1,600 feet south of County Road 511 and is the site of a former gas station. Three UST's were removed from the site and the site was closed on August 30, 1996.

**Rehagen Heating and A/C** is located on the west side of Route 63 approximately 2,000 feet south of County Road 511. This site is the former location of Weber Equipment, a farm implement dealer and repair facility. No commercial sales of petroleum products are known to have occurred at the facility.

**Delbert Wieberg Dump Truck Service** is located on the east side of Route 63 approximately 1,300 feet north of County Road 615. The facility currently has two AST's in use. Minor auto repair may also be performed at the site. No commercial sales of petroleum products are known to have occurred at the facility.

**Play-Mor Trailers** is located on the west side of Route 63 approximately 1,800 feet north of Route T. This site is currently used as a manufacturer of trailers. No known UST's or AST's are present at the site. No commercial sales of petroleum products are known to have occurred at the facility.

**Skidmore Lumber** is located on the east side of Route 63 directly across from the junction of Route T and Route 63. This site is currently used as a sawmill. There are field mounted AST's present at the site. At this time it is not known if any wood treatment is done onsite. No commercial sales of petroleum products are known to have occurred at the facility.

**Luecke's Roofing** is located on the west side of Route 63 approximately 1,500 feet south of Route T. Now used as a roofing company, this site was formerly Bray's Auto Sales. Minor auto repair may also have been performed at the site. No commercial sales of petroleum products are known to have occurred at the facility.

**MFA Bulk Storage** is located on the east side of Route 63 approximately 400 feet north of Route JJ. This site is currently used as a bulk storage facility of petroleum products. Several AST's are located at this site.

**Dickneite Oil** is located on the west side of Route 63 approximately 800 feet south of Route JJ. This site is currently used as a bulk storage facility of propane and propane accessories. Several tanks are located on this property.

**Vichy Cafe** is located on the east side of Route 63 approximately 450 feet north of Route 28. This site is currently used as a restaurant but was the site of a former gas station. Pump islands are present at the site. The presence or absence of tanks is not yet confirmed.

**Suspect Gas Station** is located on the west side of Route 63 approximately 450 feet north of Route 28. This site is currently abandoned. A structure resembling a station remains at the location. It is not yet determined if the structure was at one time a gas station. The presence or absence of tanks is not yet confirmed.

**Suspect Gas Station** is located on the west side of Route 63 approximately 575 feet south of Route 28. This site is currently abandoned. Concrete resembling pump islands remain at the site. The presence or absence of tanks is not yet confirmed.

**Vichy Store, Tire, and Deli** is located on the east side of Route 63 approximately 500 feet north of County Road 444. This site is currently used as a tire change facility and formerly was used as a gas station. Two underground storage tanks are on site and remain temporarily closed since about December 14, 2005. Tanks deemed beyond repair.

**J & M Feed** is located on the east side of Route 63 approximately 1,300 feet south of County Road 444. This site is currently vacant. The site was once used as a gas station and AST's still remain onsite. The conditions of the tanks are unknown at this time.

**Auto Repair** is located on the west side of Route 63 approximately 1,200 feet north of County Road 443. This site is currently used as an auto repair facility. No commercial sales of petroleum products are known to have occurred at the facility.

**Abandoned Trailer Park** is located on the west side of Route 63 approximately 500 feet north of County Road 443. The site is currently abandoned and contains many abandoned house trailers that are in disrepair.

**Dump Site** is located on the west side of Route 63 approximately 150 feet north of County Road 443. This site is currently being used as a dumpsite for an unknown party or parties. Significant amounts of solid waste have been dumped at this site.

Until the sites are acquired by MoDOT, and sufficient sampling and/or a Phase I/II Environmental Site Assessment is conducted to determine if the site is contaminated, MoDOT can not determine the amount of effort and cost it would take to clean up a potentially contaminated site.

**What happens if an unknown hazardous waste site is discovered?**
If regulated solid or hazardous wastes are found unexpectedly during construction activities, the MoDOT construction inspector would direct the contractor to cease work at the suspect site. The construction inspector would contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the construction office, and the contractor would develop a plan for sampling, remediation if necessary, and continuing project construction.

# Environmental Justice

This section analyzes the potential adverse and excessive environmental and human health impacts the proposed project may have on low income and minority communities. The area of analysis includes the entire length of the study corridor since a regional view, as performed for community impacts, would not produce substantive differences for the analysis.

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**What is environmental justice?**
In early transportation projects, many of the impacts affected minority and low-income populations in greater ways than other groups. This has been partly attributed to low-income populations and neighborhoods being located near downtowns and other common destinations, which were the target of transportation projects.

These neighborhoods typically had low value properties and perceived to have a lack of political power and representation. As a result, low income and minority populations and neighborhoods were impacted more often than other populations and neighborhoods. Environmental justice is an attempt to address disproportionately high and adverse human health or environmental impacts that projects funded by the federal government may have on minority and low-income populations.

The President of the United States created the current environmental justice analysis requirements through Executive Order 12898 in 1994. The President directed all federal agencies to make environmental justice part of their missions and to identify and address the effects of their programs, policies and activities on minority and low-income populations.

Environmental justice was built on Title VI of the 1964 Civil Rights Act, which prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance.

Title VI of the 1964 Civil Rights Act:
Prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance.

Environmental justice is a policy that has three major parts:

1. Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects of the project, on minority populations and low-income populations,

2. Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process, and

3. Ensure minority and low-income populations receive their equal share of the benefits from the project.

**What groups are included in environmental justice analysis?**

For the analysis of environmental justice, minority persons are defined as any person who is African American, Hispanic, Asian American, American Indian, or Alaskan Native. Low-income populations are those households with incomes at or below the Department of Health and Human Services poverty guidelines of $22,050 for a family of four.

> Low-Income Populations Defined:
>
> Low-income households are those with annual incomes at or below the Department of Health and Human Services poverty guidelines of $22,050 for a family of four.

Whether or not they fit the definition of an environmental justice population, all groups and individuals have the right to access and participate in the transportation decision-making process as protected by Title VI of the Civil Rights Act. The environmental justice analysis for this project was performed using a set of guidelines provided by the Federal Highway Administration (FHWA).

The environmental justice analysis included all of the census tracts and block groups that are associated with the study corridor. Eight census block groups, made up of 10,313 residents, were used to determine the environmental justice population. However, since this is a rural, low-populated region, the eight census block groups encompass more geographical area than is necessary. Census block data for low-income populations indicates no more than 9.87 percent of the residents along the entire corridor live at or, below the poverty rate, while the total for any of the cities (Westphalia, Freeburg, Vienna) was no greater than approximately 2.8 percent.

There are low-income housing units and Section 8 HUD Rental Assistance located in Vienna near Route 63. Neither would be relocated as a result of this project since the alternative on existing Route 63 through Vienna was eliminated partially because of the excessive residential and business relocations.

Rural housing supply, in general for any income group, is typically lower than a large metropolitan area; therefore sufficient housing replacement may not be available if in the future a family who receives a housing subsidy is relocated. According to the Phelps County Public Housing Authority, it would not be difficult to relocate families with the program. The Housing Choice Voucher program gives the family its choice of where they would like to live. No families participating in this program would be relocated by the transportation improvement.

**How did MoDOT ensure full and fair participation by minority and low-income communities?**

Both Federal and MoDOT policies stress that early and ongoing public outreach is a vital component of the environmental justice process. While the study team did not specifically seek out and solicit information from potentially low-income and/or minority individuals who live and work in the area, many opportunities were provided to have full and fair participation in the decision making process. Various public outreach efforts, including meetings held in local area facilities accessible to low-income and minority populations, were available.

The strategy used for effective public participation included a series of well-advertised public meetings, held at convenient times in two locations along the corridor, Westphalia and Vienna, at strategic points in the study process. The public involvement chapter outlines all of the efforts taken to acquire public comment.

The study team encouraged the public to comment on the study and alternatives at all meetings. Newsletters, including meeting notices and study updates, were sent to homes and businesses within the study corridor that would have included any minority and lower income households. Several hundred copies of the newsletters also were provided at local gathering places, including churches, to be distributed to concerned citizens who may not have received the newsletter through other sources. All low-income, minority, and other community members will have further chances to comment on the project through a well-advertised public hearing process and public comment period of the Environmental Impact Statement.

**What are the minority groups in the study corridor?**
Based on information obtained from the 2000 United States Census, the study team compared the populations affected by the alternatives. As previously mentioned, the environmental justice analysis included all of the census tracts and block groups that covered the impact area of the reasonable alternatives in the study area. The resulting analysis identified that there is a higher percentage of minorities in the census block adjacent to the city of Rolla in Phelps County. No other parts of the study corridor contained a larger percentage of minority populations.

Within the study corridor the two largest minority groups are African American and Hispanic. Other groups in the study corridor include White (Non-Hispanics), American Indian, and Asian populations. The study team did not identify any concentrations of other populations or ethnic groups that would be protected under Title VI and fit the specific criteria of environmental justice populations.

Of the 10,313 residents found in the study corridor, 98 percent of the residents are identified as white (non-Hispanic). African-Americans and Hispanic are the two largest minority groups at 0.2 percent each of the total population in the analysis area.

A summary of the racial makeup of the cities located in the study corridor follows. The exception is at Vichy, where no specific demographic data is available.

- The city of Westphalia had a residency of 320 people and 137 households. The racial makeup of the city is 97.81 percent white, 0.31 percent African-American, and 0.62 percent Hispanic.
- The city of Freeburg had a population of 414 people and 345 households. The racial makeup of the city is 99.3 percent white and 0.7 percent Hispanic.
- The city of Vienna had a population of 630 people and 545 households**.** The racial makeup of the city is 98.7 percent white and 1.0 percent American Indian.

**What are the effects of each alternative on environmental justice populations?**
Potential environmental justice impacts are defined as the unavoidable negative effects of the project that would be mostly experienced by minority and low-income populations or are higher than the negative effects that would be suffered by non-minority and/or non-low-income populations. The analysis has determined that there are no disproportionately high and adverse human health or environmental impacts on minorities and/or low-income populations by any of the Reasonable Alternatives.

Impacts from any Reasonable Alternative would be similar for all groups regardless of the demographic or socioeconomic characteristics of the community. All negative impacts to environmental resources, such as water quality, noise, and public services would be avoided, minimized, or rectified to the highest extent possible.

MoDOT would provide purchasing and relocation assistance and advisory services, as stated by the Uniform Relocation Act, 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 to the highest extent possible.

All residents of the study corridor, including minorities and lower income groups, would benefit from positive impacts of an improved Route 63. Potential beneficial impacts include relief of local traffic congestion, increased safety, potential job creation, and improved economic conditions for businesses.

The No-Build Alternative would have no disproportionate impacts on any segment of the population including minorities and low-income persons. However, the potential benefits of the build alternatives mentioned above would be lost.

Given the homogenous demographic nature of the study corridor, the effects of any of the build alternatives on environmental justice populations are considered nearly the same. Therefore, the discussions of the effects by each build alternative are combined.

Approximately two percent of the residents in the census blocks encompassing the corridor study area would be considered part of a minority group. The census blocks located at the south end of the corridor study area are the only ones that contain greater than three percent minority population. However, MoDOT already owns adequate right of way along stretches of that section. Therefore, limited property acquisition would be needed and thus there would be only limited residential relocations. The village of Vichy is the exception. Concentrated relocations would occur here with the Preferred Alternative. However, using previously mentioned project experience in Vichy, the residents are known to be non-minority.

The total number of relocations for any of the build alternatives is low given the length of the corridor. The greatest concentration of relocations is at Vichy. Any cohesion of the city, given the division by the highway, would be further damaged as a result of expansion at this location.

The potential relocation of businesses currently operating in the corridor could also affect low-income and minority households. The Preferred Alternative has 13 commercial relocations and Alternative 2 has 16. Alternative 1 was well below these numbers with only two potential commercial relocations. As with residential relocations, the opportunity to decrease the numbers would likely be possible during the design process. If local retail businesses would be relocated, this could present a challenge to the local low-income population to find sufficient alternatives to these businesses. Similar businesses to the relocated businesses, such as gas stations and restaurants, would still exist in the study corridor. However, for some unique businesses such as medical offices the effect would increase if these or similar businesses do not relocate at the other sites near the study corridor.

It is likely that minorities and/or low-income families would be relocated by any one of the build alternatives. However, the low minority and poverty rate percentages and relocation numbers discussed above are strong evidence that there are no disproportionately high and adverse human health or environmental impacts on minorities and/or low-income populations by any of the build alternatives.

All of the impacts by any of the build alternatives discussed in sections of this document would affect various segments of the general population based on their proximity to the project and their use of the existing roads in the study corridor. Neighborhood effects or effects to residences created by a build alternative would be the same for all persons regardless of race or income. Environmental justice populations would experience the same changes in access, emergency service routes as the entire population. Changes in noise levels**,** would affect all community groups in a similar manner, and not disproportionately affect low income and minority households. In addition the noise levels, aesthetic and visual impacts of a new route, would also affect environmental justice populations in the same manner as the general population. All of the alternatives would result in the reduction of the local tax base, which would be felt by all residents regardless of income or race.

Environmental justice populations would share the potential benefits of any of the build alternatives. Reduced congestion, improved safety, and reduced travel times on the new Route 63 and on local roads would benefit all users. Congestion is costly to local and state economies and individuals. The improvement may lead to more jobs and reduced transportation costs, with widespread benefits to general population including low income and minority populations.

## Bicycle and Pedestrian Concerns

**How would the alternatives affect pedestrians and bicyclists?**
Since the study corridor has no known extensive pedestrian and bicycle use, none of the alternatives would have a negative effect on bicycle or pedestrian use. Further, there are no designated bicycle routes or documented extensive use of either existing Route 63 or the connecting road network by bicyclists. The alternatives do not improve access for pedestrians or bicyclists. However, long distance bicyclists would likely find a geometrically improved Route 63, an attractive north-south route through Missouri.

In accordance with the American Disabilities Act (ADA), sidewalk ramps would be upgraded to current ADA standards on roadways that are altered as part of this project. Sidewalks would be maintained on roadways, which currently feature sidewalks. New sidewalks would be provided on affected roadways that do not currently have sidewalks if there is a demonstrated need for pedestrian accommodation and/or a need to maintain or improve pedestrian connectivity between the neighborhoods affected by the proposed project.

There are sidewalks within MoDOT right of way within the commercial section of Route 63 through the city of Freeburg (north and south lanes). These sidewalks start at Beck Motors and run approximately 0.75 miles to Holy Family Catholic Church. This is the only location where MoDOT owns and is responsible for maintenance of sidewalks along Route 63. These sidewalks would not be affected since the preliminary alternative along existing Route 63 in Freeburg was eliminated. There are no MoDOT proposed pedestrian or bicycle facilities in the corridor.

New sidewalks or upgrades are not anticipated in the communities of Westphalia, Freeburg or Vienna, since the Preferred Alternative relocates the roadway outside of these communities. Pedestrians and bicyclists would benefit from improved safety from the reduced vehicle movements through these communities. Conversely, the Preferred Alternative would continue on the existing alignment through Vichy. Sidewalks through Vichy will be provided if there is demonstrated need for pedestrian accommodation.

Currently, there are no barriers to pedestrian travel in Vichy except the roadways. There are also no existing sidewalks or other pedestrian improvements adjacent to or connecting to Route 63. At this time Vichy does not have any major pedestrian generators such as schools or major businesses in the town. There were no comments generated from the public meetings on pedestrian facilities from city residents, although the Missouri Bicycle Federation did provide written comments encouraging MoDOT to provide pedestrian facilities in Vichy. Therefore, further need for pedestrian accommodation will be evaluated and prioritized during the design phase of the proposed project. If it is found that there is not a need for pedestrian concerns, the new roadway with wider shoulders will give both bicyclists and pedestrians' adequate room for travel.

## Land Use and Zoning

The study corridor is located in east-central Missouri on the northern edge of the Ozark region. The landscape patterns in Osage and Maries Counties are highly diverse. Route 63 closely approximates the location of a winding ridge top that divides the major watersheds in the counties. To the west, tributaries flow to the Maries River or other smaller tributaries that drain to the Osage River in neighboring counties. On the eastern side, most of the drainage flows toward the Gasconade River.

The dominant landscape configuration between these rivers consists of moderately sloping to steep uplands dissected by flood plains along small streams. In the south portion of Maries County and into Phelps County, broad plateaus occur on the crests of the major divides. The major flood plains in Osage and Maries Counties are along the Gasconade River and Maries River and their tributaries.

Each of the build alternatives would mostly affect land uses in the rural, agricultural portion of the counties. Land uses in Phelps County would not be impacted since the Preferred Alternative, the only alternative in the county, provides lane additions adjacent to the existing lanes on existing right of way.

The Preferred Alternative would affect land uses in Vichy, while Alternative 2 would affect the land uses of Westphalia. Both of these alternatives make improvements on existing Route 63 through each respective city. Land uses would not be impacted in either Freeburg or Vienna. Alternatives through Freeburg and Vienna were eliminated partly due to a large number of relocations.

**What are the land uses in the study area?**
There are various land uses within the entire corridor study area. These land uses include farms, single-family residential, multiple family residential, commercial, and public facilities. The following sections describe the study area land uses.

Both developed and undeveloped land can be found in the study area. Developed lands are primarily found in the cities established in the study corridor. These developed lands include various uses typical of cities, such as residential, commercial, and recreational.

Undeveloped lands are generally found in the primarily rural and agriculture portion of Osage and Maries Counties. Existing undeveloped lands are either open fields of pasture or hay, limited tillable fields or wooded tracts.

**How would the alternatives affect land use?**
Discussed in the following sections are the impacts of the alternatives on land uses within and adjacent to the study corridor. The compatibility of the alternatives with local zoning ordinances, if applicable, is also discussed. Potential impacts to land uses in communities outside the study corridor are discussed in the Indirect and Cumulative Impacts section of this chapter.

The study team analyzed all of the local land use plans and zoning ordinances for the communities located in the study corridor. The Westphalia Planning and Zoning Code, the only city with an ordinance, was obtained from the City Clerk of Westphalia, for the analysis. Officials from the Meramec Regional Planning Commission (MRPC) were contacted to discuss any known land use plans and zoning impacts of the alternatives. Members on the Route 63 Advisory Committee were also consulted.

The discussion of land use and zoning compatibility is based on the planning and development data and future land use plans available at the time of the analysis. At this time there are no county or city comprehensive land use plans.

The No-Build Alternative would have few impacts on land use policies and decisions within the study area. Any future land use plans would have to acknowledge Route 63 in its existing location and plan land use development accordingly.

With the No-Build Alternative, existing land uses would not be impacted because Route 63 would maintain its current footprint and would not encroach upon adjacent development. Increased congestion along with the associated safety reduction and potential noise issues may impact adjacent residential areas but are unlikely to cause widespread conversion to other land uses. The increases in traffic expected by 2030 would likely result in some bottlenecks and backups at several intersections. This could impact access to local businesses and change land uses.

Primarily due to the principally rural, undeveloped nature of the corridor, the build alternatives would have similar impacts to all of the land use categories regardless of the location of the alternative in relation to the existing route or city.

The majority of the Preferred Alternative and Alternatives 1 and 2 are on new location in land use designated as agriculture. These undeveloped, rural areas would not change. However, the alternatives would influence land use development patterns, and population density at the location of the corridor communities. The magnitude of that influence would be a function of where and how close the alternative is in relation to the cities. Likewise, the access provided to the city from the relocated route would influence land use change and be the cause of indirect or secondary impacts. Further influences of change, discussed by city, are given in the following paragraphs.

At the Westphalia section, the Preferred Alternative would have the most likely influence on land use development patterns in comparison to Alternative 1. That is due to its desirable proximity and location in developable landscape. The location of Alternative 1 to the east creates a barrier with Westphalia by more distance and the Maries River. Hence, the influence to cause land use changes would be little or nonexistent. As with the Preferred Alternative in Vichy, Alternative 2 would impact land uses along the existing route. Minimum relocations would occur, but businesses and the Lions Club recreational facility would likely be negatively impacted by increased traffic. Any businesses relocated may be interested in moving as close as possible to the widened route to remain within or near Westphalia's designated business districts. This in turn could cause the conversion of residences to businesses in the immediate surrounding location of the widened highway.

By Freeburg, the same situation with the Preferred Alternative would exist. The western location of the Preferred Alternative, especially at the intersection with Route P, makes it more favorable to influence increased development. Without access to Alternative 1 on the east side of Freeburg, land use changes would be gradual.

With the Vienna section, both the Preferred and Alternative 1 relocate Route 63 to the east side of Vienna. However, using proximity as a basis for influence, Alternative 1 would be more likely to cause a change in land use patterns and population density. The Preferred Alternative is approximately 1.5 miles from Vienna, at this distance it could be speculated there would be changes to commercial land use and development patterns. However, as discovered in the *Pre-Construction Community and Business Impact Study, Hwy 63 Route Relocation Report* (Appendix E), 91 percent of Vienna retail customers are within 30 miles of the town. Therefore, with that percent of a local customer base a relocated Route 63 would not cause a commercial land use change within Vienna.

In Vichy, an expanded highway would greatly influence land use decisions. This will be the situation with the Preferred Alternative in Vichy, as relocations will result from lane additions on the west. This in turn will open up agriculture or undeveloped property to the possibility of development. On the converse, Alternative 1 in the Vichy section would not cause land use changes.

**Are the alternatives consistent with local zoning and ordinances?**
Westphalia is the only community in the study corridor with land use zoning plans. The No-Build Alternative would be consistent with local planning in Westphalia. This alternative would have no impacts on land use policies and zoning within the city.

Only a small portion of the Preferred Alternative passes through the city limits on the south side of the city. It would impact rural residential zoned land and therefore would not be consistent with the planned zoning and land uses within Westphalia. This area may be rezoned to accommodate the new highway location.

Alternative 2 improves existing Route 63 through the city of Westphalia. Most of the adjoining zones are categorized as highway commercial making Alternative 2 consistent the zoning plan. The other areas are zoned rural residential and multi-family residential. The widening of Route 63 would not be entirely consistent with these planned uses. The widening is not anticipated to relocate these multi-family residential facilities. Therefore, this land would not require rezoning.

## Farmland Impacts

Missouri has a long history of farming, especially in the project vicinity. Farming, a $5 billion per year industry in Missouri, produces approximately $78 million in agricultural revenue each year in Osage, Maries, and Phelps Counties.

Study Corridor Farmland

**How is farmland impact evaluated?**
Recognizing the importance of protecting farmland from conversion to non-agricultural uses by minimizing the impacts to it from federally funded programs, Congress passed the Farmland Protection Policy Act (FPPA) in 1981. Before farmland can be used by a federal project, it must be determined if prime, unique, statewide, or locally important farmland would be converted to non-agricultural uses. This assessment is a collaborative process with the Natural Resources Conservation Service (NRCS). If farmland is used in excess of parameters developed by NRCS, then the federal agency must take measures to minimize farmland impact.

**How is farmland classified?**
NRCS classifies farmland as prime, unique, or of statewide or local importance based on soil type. Prime farmland has the best blend of physical and chemical characteristics for producing normal crops while requiring less human labor and less assistance from pesticides and fertilizer than farmland of statewide or local importance. Unique farmland is used for the production of specific high-value food items such as nuts and certain fruit or vegetables, and usually has the special combination of soil characteristics, moisture, and location needed to produce high quality and high yields.

Statewide or locally important farmland is designated by state or local agencies for the production of crops in a specific area, but is not of national significance.

**How were the project alternatives rated?**
Statewide or locally important farmland is common throughout the area of the proposed project, as is, to a lesser extent, prime and unique farmland (Appendix I, Plates 1-9). The average farm size in Osage County is 258 acres, in Maries County it is 265 acres, and Phelps County is 244 acres.

Agricultural enterprise in the study vicinity is primarily devoted to pasture and livestock; pigs, hogs, and cattle provide much of the area's agricultural income. Row crops, primarily soybeans and corn, also provide income to area farmers. The study area has been evaluated (Appendix F) using the Farmland Conversion Impact Rating Form (SCS-CPA-106). Because ratings were determined by NRCS before the final alternatives were picked, the following are approximates of the final ratings. Four alternatives were evaluated: 1) Alternate A (nearly identical to the Preferred Alternative), 2) Alternate B (or the current Alternative 1), 3) connectors between the two, and 4) expanded acreage surrounding existing Route 63 (closely aligned with Alternative 2).

Alternate A required approximately 2,609 acres of new right of way, Alternate B required about 2,278 acres, the connectors required approximately 496 acres, and 953 acres were required for improvements along existing Route 63. The recorded Part V Relative Value of Farmland to be converted totaled 63.1 points out of a possible 100 for Alternate A, 65.3 points for Alternate B, 62.2 points for the connectors, and 58.4 points for land along existing Route 63.

The Part VI Site Assessment Criteria rating scored 64 points out of a possible 160 for Alternates A and B, 51 points for the connectors, and 52 points for land along the existing route. The total conversion impact ratings were 127.1 points, 129.3 points, 113.2 points and 109.4 points respectively, which is well below the 160-point threshold established by NRCS for consideration of farmland protection.

The proposed alternatives are primarily located east and west of Route 63's existing alignment, with links between the two or expanded acreage along existing Route 63 as additional options. The project is not protected from conversion by any state, local government, or private nonprofit policy or program. Any project impacts to on-farm investments, such as water diversion systems or terracing, would be minimized as design is further refined.

Severances to farmland will be avoided to the extent possible. After project completion, any farms with uneconomic remnants would be compensated at prevailing market rates. All farm support services are available to the area and would not be negatively impacted by the project. The project would be fully compatible with existing agriculture.

## Threatened and Endangered Species and Unique Natural Communities

The Endangered Species Act of 1973 provides for the protection of threatened and endangered species, both plants and animals, and the habitats that are considered critical to the survival of these species, e.g., breeding, nesting, roosting, and foraging areas.

The U.S. Fish and Wildlife Service (USFWS) is empowered as the chief administrative, regulatory, and enforcement agency regarding threatened and endangered species and their critical habitats. The State of Missouri also maintains endangered species legislation that protects those species, which have been determined to be endangered in the state.

What is an endangered species? An endangered species is a species that is in danger of extinction throughout all or a significant portion of its range.

The Missouri Department of Conservation (MDC) is the administrative, regulatory, and enforcement agency for state sensitive species. The following sections explain the potential impacts that this project could have on threatened or endangered species, designated critical habitat, and unique natural communities.

**What methods were used to assess potential impacts?**
MDC maintains a Natural Heritage Database (NHD) that tracks known locations of all rare species (state and federal) and sensitive habitats in the state as well as significant or unique natural communities. The NHD database was used to determine if there are any known locations of rare species or unique natural communities within the corridor of the three alternatives.

Caves are one of the unique natural communities found in Missouri. The NHD lists some of the cave locations in Missouri. However, the Missouri Speleological Survey maintains a database of all known cave locations in the state of Missouri. This database was used to determine if any caves would be directly impacted by any of the alternatives for this project.

MoDOT also corresponded with the USFWS and MDC to obtain any information they may have regarding rare species or communities within the project corridor. Finally, a MoDOT biologist conducted field observations. Information from all of these sources was used to determine the projects potential impacts to threatened or endangered species and unique natural communities.

**Would the project impact any threatened or endangered species?**
A review of the NHD revealed that the Niangua darters (*Etheostoma nianguae*) are known to occur throughout this entire stretch of the Maries River. There are also numerous records of this species in the Maries River near the existing bridge.

The NHD also indicates that the Gasconade River supports populations of two federally endangered species, the pink mucket (*Lampsilis abrupta*) and scaleshell (*Leptodea leptodon*), one federal candidate, the spectaclecase (*Cumberlandia monodonta*), and one state endangered amphibian, the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*). It is unknown if there are any populations of these species in the immediate vicinity of the existing bridge.

What is a threatened species? A threatened species is a species that is likely to become endangered within the foreseeable future.

Although there are no known records of these species within the corridor of any of the alternatives for this project, correspondence from the USFWS indicates that the following federally listed species could also occur in the area: Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), running buffalo clover (*Trifolium stoloniferum*), and Hine's emerald dragonfly (*Somatochlora hineana*). Besides the potential for the project to directly impact these species, it could also have indirect impacts to these and other species by impacting water quality and riparian habitat.

Finally, during field investigations, stains left by roosting bats were observed under the existing Gasconade River Bridge. At this point it is unknown what species of bat is roosting under the bridge. Further field investigations would be necessary to identify what species left these stains. The potential impacts the project could have on each of these species are discussed below.

Niangua Darter: The Niangua darter is a federally threatened fish endemic to Missouri. It is a small fish, 2 to 4 inches long, that lives in clear upland creeks and small to medium sized rivers with slight to moderate currents. The species requires continuously flowing streams with silt-free gravel or rock bottoms. The species survival is threatened by deterioration of stream quality, loss of habitat because of reservoir and bridge construction, stream channelization, loss of streamside vegetation, and unrestricted sand and gravel removal.

What is an endemic species? An endemic species only occurs in a particular area. Species that are endemic to Missouri *only* occur in Missouri.

All three alternatives involve constructing a new bridge across the Maries River within a stretch that MDC considers important for the Niangua darter. There are numerous known locations of the species upstream and downstream of the existing bridge. Therefore, all three alternatives could have some impact on this species.

Niangua darter. Courtesy of Craig Fuller, Missouri Department of Conservation

Alternative 2 and the Preferred Alternative both cross the river at the same location. Both of these alternatives could result in direct impact to important habitat for the species as well as temporary impacts from sedimentation that results from construction of the bridge.

Alternative 1 would have the least potential for direct impacts to the species or its habitat. However, Alternative 1 would have more indirect impacts because it follows close to the stream for some distance and thus would involve clearing more riparian vegetation. Loss of streamside vegetation is considered one of the major threats to this species survival.

Pink Mucket: The pink mucket is a federally listed endangered freshwater mussel. Freshwater mussels live on the bottom of streams or ponds. This species is found in mud, sand and in shallow riffles and shoals in major rivers and tributaries. They move very little and they depend on water current to bring them oxygen and food. Most species of mussels burrow into the bottom of the stream, leaving the upper edge of the shell exposed to the current. As river currents flow over the animals, they siphon the water for food, which includes different types of microorganisms such as plankton. They need a stable river bottom to survive. If the river bottom they are living in is washed away, they get washed away with it. Freshwater mussels provide food for wildlife like muskrats, otters, and raccoons and act as filters that improve water quality.

Pink Mucket mussel. Photo courtesy of the Missouri Dept. of Conservation.

Dredging and in-stream sand and gravel mining are threats to this species. Besides directly killing individual mussels, these activities disturb and destabilize the river bottom resulting in mortality for large numbers of individuals.

Since it is difficult for freshwater mussels to move, sediment is also a threat because it can suffocate them. Increased sediment levels may also make it difficult for them to feed, which can lead to decreased growth, reproduction, and survival. Diminishing water quality is a concern for all aquatic species. Because mussels are sedentary (stay in one place), they are especially sensitive to any kind of contamination, including pesticides and agricultural runoff.

This species could occur in the Gasconade River. There is only one proposed option for this project at the Gasconade River crossing. Therefore, the impacts of the three alternatives on this species would be the same.

Scaleshell: This species is also a federally listed endangered freshwater mussel. Scaleshells live in medium-sized and large rivers with stable channels and good water quality. They bury themselves in sand and gravel on the bottom with only the edge of their partially opened shells exposed. All other life history information and threats are very similar to those discussed for the pink mucket.

Scaleshell mussel. Photo courtesy of Dr. M.C. Barnhart

This species could also occur in the Gasconade River. There is only one proposed option for this project at the Gasconade River crossing. Therefore, the impacts of the three alternatives on this species would be the same.

Eastern Hellbender: The eastern hellbender is state listed as an endangered species. Hellbenders are aquatic throughout their life and remain active year-round. They generally spend the daylight hours in a natural or self-excavated den beneath large slabs of rock or other shelter-providing objects (logs and boards) on the bottom of streams or rivers.

Hellbenders become active after dark, leaving shelter to forage, feeding primarily on crayfish, fish, frogs and a variety of invertebrates.

Eastern hellbender. Photo courtesy of the Marshall University Web site.

Hellbenders prefer swift running, well oxygenated, unpolluted streams and rivers. An important physical characteristic of these habitats is the presence of riffle areas and abundant large flat rocks, logs or boards which are used for cover and nesting sites.

This species is found in the Gasconade River. However, there are no known locations of this species in the immediate area of the existing bridge and that area does not appear to be suitable habitat for this species. Therefore, none of the alternatives should have a direct impact on this species. There could be indirect impacts caused by sedimentation entering the stream and other temporary impacts to water quality.

Hibernating Indiana bats. Photo courtesy of Bill Elliott.

Indiana Bat: The Indiana bat is a federally listed endangered species that hibernates in caves during the winter months and roosts in trees during the summer months.

Individuals begin congregating around the caves where they will hibernate in early fall. They emerge from hibernation in early spring and begin migrating to their summer roosting and foraging areas.

Indiana bats are entirely insectivorous, eating primarily moths, but also mosquitoes and aquatic insects. In the summer, females gather beneath the loose bark of living and dead trees in maternity colonies of 50 to 100 individuals.

Indiana bats exhibit strong loyalty to their roosting and hibernating sites and will return to the same locations year after year. Current threats to the species include stream channelization, bank modification, agricultural development, and conversion of forested land, which has affected the amount and quality of habitat available to the species.

Harvesting suitable live trees and removing dead trees reduces the amount of available habitat and forces the bats to utilize areas where the potential for disturbance or predation may be higher. Pesticide contamination is another threat to this species. Contamination of waterways that eliminates aquatic insects may hurt local populations of Indiana bats.

The USFWS considers the entire state of Missouri to be within the breeding range of this species. Therefore, any project that involves tree clearing in Missouri could impact this species by removing potential roosting habitat.

All three alternatives involve tree clearing so they could potentially impact this species. At this time it is estimated that Alternative 1 would require clearing 1,686 acres of trees. It is estimated that Alternative 2 would require clearing 1,402 acres of trees. It is estimated that the Preferred Alternative would involve clearing 1,475 acres of trees. Alternative 1 requires the greatest amount of tree clearing, so it has the greatest potential to impact this species. Alternative 1 also involves clearing more forested riparian habitat than the other alternatives. This could also impact the Indiana bat because it removes foraging habitat.

Gray Bat: The gray bat is federally listed as an endangered species that uses caves year round. They roost, breed, rear young, and hibernate in caves. Unfortunately, few caves meet their specific roost requirements. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm or have small rooms or domes that can trap the body heat of roosting bats.

Gray bat. Photo courtesy of Adam Mann, Environmental Solutions and Innovations.

Individuals migrate between summer and winter caves and will use transient or stopover caves along the way. Summer caves are normally located close to rivers or lakes where the bats feed. A few hundred to many thousands of pregnant females congregate to form maternity colonies. Males and nonreproductive females gather in smaller groups to form what are known as bachelor colonies.

Gray bats feed primarily on flying insects over rivers and lakes. Aquatic insects, particularly mayflies, make up most of their diet. Threats to this species include human disturbance of caves that the bats are using, alterations of caves and cave entrances, e.g., commercialization and improper gating, and overuse of pesticides. Gray bats have also been killed during natural flooding and flooding caused by manmade reservoirs. Pollution and siltation of streams causing a reduction in aquatic insects may also affect gray bat populations.

Although none of the alternatives would directly impact any known gray bat caves, they all could still have indirect impacts to this species. Gray bats forage in riparian areas along wadeable streams. They have been known to fly as far as 12 miles from their colony to feed, so clearing riparian habitat within 12 miles of a gray bat colony could have an indirect impact on the species by removing potential foraging habitat.

There is a known gray bat maternity cave approximately 10 miles from the proposed Maries River crossings and one approximately 12.5 miles from the proposed Gasconade River crossing. In addition, gray bats have been found using the underside of concrete bridges for night roosts.

Alternative 1 is likely to have the greatest impact on this species because it would require clearing more riparian habitat along the Maries River than the other alternatives. There is also a transient gray bat cave within two miles of all three alternatives. However, the project should not have an impact on this resource.

Extirpated: extinct or gone from a particular area but surviving in other places.

Running Buffalo Clover: Running buffalo clover is a native plant of Missouri that is on the federal list of endangered species. At one time it was thought to be extirpated from the state until 1989 when it was rediscovered in St. Louis. It is a perennial that grows from 4 to 20 inches tall, blooming generally from mid-May through June. It is called *running* buffalo clover because it produces runners similar to stolons that extend from the base of erect stems and run along the surface of the ground.

Running Buffalo Clover. Photo courtesy of the U.S. Forest Service.

Running buffalo clover grows in rich moist soils on areas that have a pattern of periodic disturbance such as mowing, trampling, grazing, or light bank scouring. At one time buffalo and other large herbivores probably dispersed the seeds. These same animals may have also created habitat for this species by periodically disturbing areas.

In Missouri the species is generally found in riverine settings, along the first wooded terrace or bench above the river. Threats to the species include habitat loss and competition with introduced clover species. A lack of prescribed fire or other regular disturbances has resulted in a loss of open woodlands and a reduction in running buffalo clover habitat. Mowing may remove seed heads before seeds are mature but may help the clover by controlling competing vegetation.

At this time there are no known locations of running buffalo clover within the corridor for any of the three alternatives. Therefore, none of the alternatives should impact this species.

Hine's emerald dragonfly. Photo courtesy of the Illinois Natural History Web site.

Hine's Emerald Dragonfly: This federally listed endangered species lives in calcareous (high in calcium carbonate), spring-fed marshes and sedge meadows overlaying dolomite bedrock, called fens. This dragonfly has brilliant emerald-green eyes and a dark brown and metallic green body, with yellow stripes on its sides. Its body is about 2.5 inches long; its wingspan reaches about 3.3 inches.

The greatest threat to the Hine's emerald dragonfly is habitat destruction. Most of the fen habitat that this dragonfly depends on for survival has been drained and filled to make way for urban and industrial development. Contamination of fens by pesticides or other pollutants also poses a threat to this species.

The dragonfly depends on fens with good water quality for growth and development. Development that decreases the amount or quality of ground water flowing to the dragonfly's habitat threatens its survival because it depends on spring-fed shallow water to breed.

There are no known locations of the species within the corridor for any of the three alternatives and there are no known fens in any of the corridors. Therefore, none of the alternatives would likely impact this species.

This section described the project's potential impacts to rare species that could occur in the study area. However, the true extent of these impacts cannot be determined until plans for the project have been completed. MoDOT will conduct periodic reviews of the NHD and coordinate with the USFWS and MDC throughout the design phase of the project to track new locations and further analyze the projects impacts to these species.

If it is deemed necessary, MoDOT will have qualified biologists conduct surveys for individual species. If it is determined that the project may impact one of these species, MoDOT and FHWA would conduct the necessary consultation with the USFWS to comply with the Endangered Species Act and to determine what measures can be implemented to eliminate or reduce the projects impacts to these species.

**Will the project impact any unique natural communities?**

A review of the NHD and the cave database did not reveal any unique natural communities within the corridor for any of the three alternatives. Initial field investigations verified these findings. However, it is possible that unique natural communities do exist in the study area, but to date they have not been identified. Further field investigations will be conducted during the design phase of the project.

What are unique natural communities? Natural communities are recurring groupings of plants and animals found in a particular physical environment. Unique natural communities include all examples of rare types and high quality examples of more common types. These are often difficult or impossible to replace, such as a cave or prairie.

## Wildlife

**How would the project affect more common wildlife and their habitats?**

The variety of wetland and terrestrial ecosystems in the study area provide habitat for a diverse mix of wildlife species. White-tailed deer, wild turkeys, rabbits, and squirrels are known to frequent forests, cutover forests, and open areas. These species seem to have adapted well to the fragmented landscape created by humans.

Upland woods may support wildlife such as fox, deer, raccoon, opossums and many other species. Woodlands interspersed with old field or overgrown lots favor species such as skunk, woodchuck, rabbit, squirrel, red-tailed hawk, turkey vulture, and a variety of songbirds and small mammals.

The wetlands found in the vicinity of the study area are used by a variety of reptiles and amphibians and provide valuable foraging areas for numerous species of wading and shorebirds. Other species such as muskrats, beavers, otters, kingfishers, blackbirds, wood ducks, and numerous insects also use wetland areas.

There are two perennial streams/rivers within the study corridor, the Maries River and the Gasconade River. Both of these waterways are home to numerous species of fish and other aquatic species. The project will have minimal direct impacts to habitat for these species where construction activities occur within the waterway and where bridge piers are placed in the waterways. The project may also have temporary indirect impacts from sedimentation in these waterways.

Species such as robins, starlings, house sparrows, house wrens, cardinals, mockingbirds, squirrels, and many rodents are commonly found in developed residential areas. These species have adapted to human disturbance and seem to thrive in these areas. Several communities, which provide this type of habitat, are located in the study area.

Clearing and grading operations during construction of the project might temporarily affect the flora and fauna within the study corridor. Nearby areas of habitat similar to that within the limits of construction for this project are expected to support indigenous wildlife potentially relocated by the project. Some initial stress on the carrying capacity of the ecosystem may occur, but the impact should be minimal because of to the relatively small scope of the project in relation to the amount of similar habitat in the area. Clearing of trees and other vegetation would be confined to construction limits to preserve as much existing natural growth as possible.

Clearing of a highway corridor such as this one does fragment existing habitat. Habitat fragmentation occurs as the result of subdividing larger parcels of habitat into smaller parcels. Habitat fragmentation has varying degrees of impact on different species.

Fragmentation of forested habitat tends to be more detrimental than other types of habitat. Larger species such as deer, raccoons, and coyotes may be able to cross the barrier created by a roadway with little or no impact. Some would not be impacted but others may be if the width of the corridor exceeds the distance that they are willing to travel between forested areas. However, for smaller species that cannot cross wide stretches of hot pavement, such as amphibians, the potential impact due to fragmentation is greater. For these species, the roadway may be a complete barrier, in effect confining them to the remaining habitat on one side of the road. The remaining habitat may not supply all of the resources necessary to support the population.

Forest fragmentation can also impact migratory birds by creating more edge habitat. Predators such as skunks, raccoons, foxes, etc. tend to follow forest edges looking for food and thus bird nests that are constructed close to forest edges are more commonly predated and are overall less successful than those built farther from the edge of a forested tract.

If habitat is fragmented to the point that it no longer supports viable populations of certain species, species diversity can be lowered to the point that only species with a high tolerance human development can survive. Or, as in the case of many amphibians, the adults live in upland drier habitats but must return to wetland habitats to breed. If the barrier prevents access to the breeding habitat, the adults would be unable to reproduce. Ultimately, barriers to movement may reduce gene flow between individual populations and cause genetic defects, further impacting species.

It is difficult to analyze the impact of habitat for a long corridor such as this one because it touches so many forested patches but impacts them each in a different way. Some are cut through the middle, in other patches a small area may be isolated by the road alignment, and still others the roadway may parallel the forested area for some distance and just remove a narrow edge.

Also, different species of wildlife need different sized patches to satisfy all of their requirements and, as mentioned above, for some species the size of the patch isn't as important as what the particular patch of forest contains. For example, some amphibians need a wetland surrounded by some forest; a highway cannot separate these two components without affecting the life cycle of individual animals.

Aerial photographs and GIS data on forest patch size, provided by MDC, were used to evaluate fragmentation. All three alternatives do result in some fragmentation of forested habitat, however, Osage, Maries, and Phelps counties are largely agricultural and most of the forested areas are already heavily fragmented. There is no distinct difference between the three alternatives in the amount of fragmentation that they create. Aerial photographs were used to alter the alignment of the Preferred Alternative in some places to reduce fragmentation.

## Geologic Features

**What are the typical geological features of the Osage, Maries and Phelps County region?**

Topography along Route 63 through Osage, Maries and Phelps Counties is one of long tapering ridges, separated by moderately steep, well-entrenched valleys. The overall geologic conditions are characterized by layered, carbonate sedimentary bedrock. Under certain conditions, and infrequently, the rock can be disturbed or crushed and broken through faulting. Rock may be rotated at higher angles caused by tectonic activity and deep underground water solutioning activity. Since the rock is solutional, containing water-dissolving properties, shallow and deep features such as caves, voids and clay filling may be present. Caves or rock that have been voided and collapsed under pressure can be seen in the rock masses.

Existing rock cut along Route 63 at the Gasconade River Bridge shows solutioning activity, voids and clay filling.

All the soils, except for that which is alluvial (soil deposited by flowing water) and colluvial (soils transported downhill by gravity and water), are derived from the in-place chemical and mechanical weathering of the underlying original rock mass. The depth to bedrock can be highly variable, but can be predicted based on the particular location it is in. The soil layer, or mantle, is typically thin, 10 feet or less on the ridges underlain by the Jefferson City Formation. Rock is exposed in places along bluffs and some hillsides, and in road cuts. Depth to bedrock can be deeper, 10 to 50 feet, in the uplands and on ridge tops, with the underlying rock belonging to the Roubidoux Formation. Soil found above the layer of the Roubidoux Formation may contain a large amount of residual chert fragments. Pennsylvanian age shales, sandstones and claystones may be encountered in cuts from north of Vichy to just south of the Maries/Osage County line and just north of Rolla. These materials may require special handling. Only a few flat alluvial valleys exist throughout the study area. A mantle of 10 to 25 feet of mostly sand and gravel overlying bedrock may characterize these valleys. Colluvial soils can be found at the base of some slopes and may be up to 15 feet deep.

**How does this geological data relate to the design of the roadway?**
After horizontal and vertical alignments have been established, a geotechnical investigation is performed consisting of drilling, sampling and testing. During the design process, it is assumed there may be deep rock cuts and fills to achieve the desired grades. An economical design consists of balanced earthwork where the volumes of cut are sufficient to provide material for sections requiring fill and where hauling material from cut to fill sections is minimal. General locations of rock and soil layers are helpful for quantifying the different classes of excavation for construction bidding purposes. The type of material also affects the slopes used on the roadsides. Unstable soils require a more gradual slope to prevent slides, whereas some rock can be cut with a near vertical face. The types of cut and fill slopes also affects the amount of land required for the project.

**What methods are used for drilling, sampling and testing along the proposed highway?**
MoDOT geotechnical teams usually probe the cut area for rock at 100-foot intervals along the centerline of the roadway, to the left at the ditch line and to the right at the ditch line of the proposed alignment. The borings at the centerline locations are usually drilled to refusal and in the ditch lines to 10 feet below proposed grade or to the top of rock, whichever is less.

## Wild and Scenic Rivers

The National Wild and Scenic Rivers Act of 1968 established a national system of rivers to be preserved in free-flowing condition, with their immediate environments protected. Congress selected certain rivers that possess outstandingly remarkable outdoor values. They established an initial system of eight rivers, and set up methods and procedures for adding new rivers to the system.

The Nationwide Rivers Inventory (NRI) is a register of rivers that may be eligible for inclusion in the National Wild and Scenic Rivers System. Rivers are placed on the NRI based upon the degree to which they are free flowing, the degree to which the rivers and their corridors are undeveloped, and the outstanding natural and cultural characteristics of the rivers and their immediate environments. There are three classifications of rivers in the system: wild, scenic, or recreational depending on the level of development near the stretch of river. There are no designated wild, scenic, or recreational rivers in the study area.

## Air Quality

**What impacts would the project have on air quality?**
The Clean Air Act (CAA) requires the adoption of air quality standards, quality control regions, and state implementation plans. The federal government established the National Ambient Air Quality Standards (NAAQS), to protect public health, safety and welfare from known or anticipated effects of 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.

Transportation can contribute to four of the six NAAQS pollutants: ozone, carbon monoxide, particulate matter, and nitrogen dioxide. Transportation conformity 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 State Implementation Plans. MoDOT is responsible for implementing the conformity regulation in nonattainment and maintenance areas. However, the Route 63 study area is located in a non-classified area as defined by the EPA through the CAA. Therefore, the transportation conformity requirements do not apply to this project. All of the alternatives, including the No-Build Alternative, would generate only minimal air quality impacts and are not subject to any other air quality analysis.

## Floodplain Impacts

**What is the 100-year (one-percent) floodplain and regulatory floodway?**
Executive Order 11988, Floodplain Management, and subsequent federal floodplain management guidelines mandate an evaluation of floodplain impacts. When available, flood hazard boundary maps (National Flood Insurance Program) and flood insurance studies are used to determine the limits of the base (100-year) floodplain and the extent of encroachment.


Maries River Floodplain

The Federal Emergency Management Agency (FEMA) and FHWA regulation 23 CFR 650 have identified the base (100-year) flood as the flood having a one-percent probability of being equaled or exceeded in any given year. The base floodplain is the area of 100-year flood hazard within a county or community.

The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount.

FEMA has mandated that projects can cause no rise in the regulatory floodway, and a one-foot cumulative rise for all projects in the base (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, should be obtained prior to issuance of a permit.

**How are floodplains beneficial?**

Floodplains provide a number of important functions in the natural environment, including creating wildlife habitat, providing temporary storage of flood water, preventing heavy erosion caused by fast moving water, recharging and protecting groundwater, providing a vegetative buffer to filter contaminants, and accommodating the natural movement of streams. Engineering analyses of floodplain impacts will be conducted to avoid and reduce impacts by bridging wherever possible. A determination will be made as to whether or not floodplain encroachment is significant. It is not possible to avoid floodplains completely; however, encroachments will be longitudinal whenever possible, so as to minimize floodplain impacts.

The use of bridges serves a dual function by reducing wetland disturbance while minimizing construction impact in the floodplain. Where feasible, the proposed crossings are located adjacent to existing road crossings where the additional impact would be minimized.

Flood Hazard Boundary Maps are available for Osage, Maries, and Phelps Counties. Special Flood Hazard Areas (SFHAs), classified as Zone A base (100-year) floodplain, occur intermittently throughout the area of the proposed project. Detailed hydraulic analyses are not performed by FEMA for Zone A areas, so no base flood elevations or depths have been determined.

The proposed project crosses base (100-year) floodplain at the Maries River, just south of Westphalia in Osage County, the Gasconade River and Spring Creek in Maries County, and Spring Creek in Phelps County (Appendix H, Plates 1-9). The Preferred Alternative and Alternative 2 would require a total of 45.1 acres of floodplain. Alternative 1 would need 76.1 acres, the connectors would require 4.8 acres, and improvements on existing right of way would need 97.6 acres. A floodplain development permit would be necessary.

**Are there any FEMA buyout properties?**

The Flood Disaster Protection Act of 1973, as amended by the Disaster Relief and Emergency Assistance Act of 1988, the Stafford Act, identified the use of disaster relief funds under Section 404 for the Hazard Mitigation Grant Program (HMGP), including the acquisition and relocation of flood damaged property. The Volkmer Bill further expanded the use of HMGP funds under Section 404 to "buyout" flood damaged property that 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 stay in public ownership.

These conditions and restrictions, along with the right to enforce 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 two to three years is necessary to process an exemption from FEMA to utilize this parcel. This exemption would likely be a permanent easement rather than a transfer of property. According to available references, there are no FEMA buyout properties in the study area.

The crossings of all regulated floodplains will be designed and constructed in compliance with applicable floodplain regulations, including Executive Order 11988. There will be no increases in base flood elevations attributable to the implementation of the proposed roadway improvements. During the design process, a detailed hydraulic analysis of the flows and water surface elevations will be made in accordance with the requirements of the FEMA and the COE to ensure the absence of any encroachments upon regulatory floodways as well as to avoid any adverse impacts.

The proposed action conforms to applicable state of Missouri and local floodplain protection standards.

Based on the above considerations, and for the reasons stated in this EIS, the FHWA determines that the Preferred Alternative is the only practicable alternative.

## Water Quality

**What is water quality?**
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 primary uses considered for such characterization are parameters, which relate to drinking water, safety of human contact, and for the health of ecosystems.

There are several public water supply wells located within the study area. These wells are located in the vicinity of Westphalia, Freeburg, Vienna, and Vichy and serve the adjacent communities or are owned by the county water supply districts serving rural customers. All of these public wells draw from the Gasconade and Potosi Dolomite Geological Formations, both of which are formations of the Ozark aquifer having moderate yields of groundwater production ranging from 70 to over 125 gallons per minute.

The Preferred Alternative and Alternative 2 may impact two public water supply wells, owned by Osage County Public Water District #2, northeast of Westphalia. No wellhead protection areas are known to exist within the study area, although MDNR has established preliminary source water areas for public water supply wells in the region. If a public water supply well is 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. Abandoned wells will be plugged in accordance with 10 CSR 23-3.110, as this is standard operating procedure.

Several streams within the study area have beneficial uses as designated in the water quality standards established by the Missouri Clean Water Commission. The Gasconade River has several designated uses: Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health – Fish Consumption, Cool Water Fishery, Whole Body Contact Recreation, and Boating and Canoeing. The Maries River also has beneficial uses designated by the Missouri Clean Water Commission. These are: Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health- Fish Consumption, and Whole Body Contact Recreation. While none of the alternatives directly impacts the Gasconade, all alternatives would impact the Lower Maries River near the community of Westphalia.

For all alternatives, water quality impacts to surface water systems would outweigh impacts to groundwater systems. In general, longer alternatives would lead to more land disturbance and erosion potential than shorter ones. As a result, potential water quality impacts for each alternative can be represented as a function of both the number of streams crossed and the length of each proposed alternative.

The project crosses the Gasconade River at existing crossing on Route 63, while the crossing of the Maries River at Westphalia includes all of the alternatives. The U.S. Coast Guard does not consider the Gasconade or the Maries Rivers to be navigable rivers. For all of the alternatives, there may be unmapped streams that could qualify as waters of the U.S. and thus fall under the jurisdiction of the Army Corps of Engineers. All of the alternatives are comparable in size and would involve approximately the same amount of land disturbance activities.

The project will utilize retention basins or other applicable Best Management Practices (BMPs) adjacent to the Maries River Bridge to ensure adequate protection to the waterway. It is possible that project components could prove to benefit the water quality of the Maries River. The current state of disrepair of both the existing roadway and bridge allow runoff directly into the Maries River. A new facility and structure could function to prevent the direct discharge of highway runoff into the river by creating detention basins to capture and temporarily store this runoff. The temporary storage should allow the water to slowly percolate through the ground, thus filtering contaminants and minimizing the probability of water pollution.

In addition, the new bridge would have solid walls that would prevent spray from tires from going directly into the river. To prevent contamination of streams, lakes, ponds, or other water impoundments adjacent to the project area, job specifications would require temporary or permanent pollution control measures as outlined in MoDOT's Sediment and Erosion Control Program first approved by the Missouri Department of Natural Resources on October 8, 1991, and subsequently approved June 15, 2007.

## Water Resources

**Why are water resources important?**

Water Resource: ponds, wetlands, streams and springs.

Water resources are important because they provide essential biological functions in the environment. Wetlands provide water storage and energy dissipation during storm events, promote cycling of nutrients including removal and retention of some elements. Streams support animal and plant community types and are an integral part of the hydrologic cycle. In addition to these functions, public water resources provide aesthetic benefits, as well as recreational opportunities including fishing, canoeing, etc.

The Clean Water Act of 1972 (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 (CWA) requires that water quality certifications be obtained for any activity that results in discharges into streams or jurisdictional wetlands. The MDNR manages this program.

MoDOT project concerns relating to waters of the U.S. include potential stream impacts at bridges and culverts, filling of jurisdictional wetlands, stream channelization, filling of ponds and filling of designated special aquatic sites. All regulated stream impacts are those that take place below the designated ordinary high water mark (OHWM), where the vegetation line is on the stream bank (Figure 27).

Figure 32. Ordinary High Water Mark

**What are the key points affecting water resources?**
The Route 63 study corridor would impact a variety of water resources including wetlands, streams, and ponds (Appendix H, Plates 1-9). Of the three alternatives, the Preferred Alternative has a greater mitigation cost, hence greater number of stream credits required, greater linear feet of streams impacted, but less actual streams crossed. After doing field studies and verifying impacts within the Preferred Alternative, overall impacts to ponds and wetlands were fairly equal for all alternatives. The northern portion of the corridor falls within a designated Conservation Opportunity Area (COA), which are MDC focus areas to target mitigation efforts where sensitive species and higher quality water resources exist.

**How were the water resources evaluated and quantified for the study?**
Streams, wetlands and ponds were initially identified using USFWS National Wetland Inventory (NWI) maps, FEMA Flood Insurance Rate Maps (FIRMs), U.S. Geological Survey (USGS) 7.5 minute topographic quadrangle maps and 2007 aerial photography. A minimal amount of field reconnaissance was conducted to confirm mapped resources and identify any additional unmapped resources for the DEIS. A preliminary jurisdictional determination (PJD) for all streams and wetlands within the Preferred Alternative (where accessible) was made prior to the Final EIS. The PJD involved field reconnaissance to enable the completion of the Routine Wetland Delineation Data Forms, Stream Data Forms, and GPS activities to define the boundaries of the resources. (Technical Report available upon request)

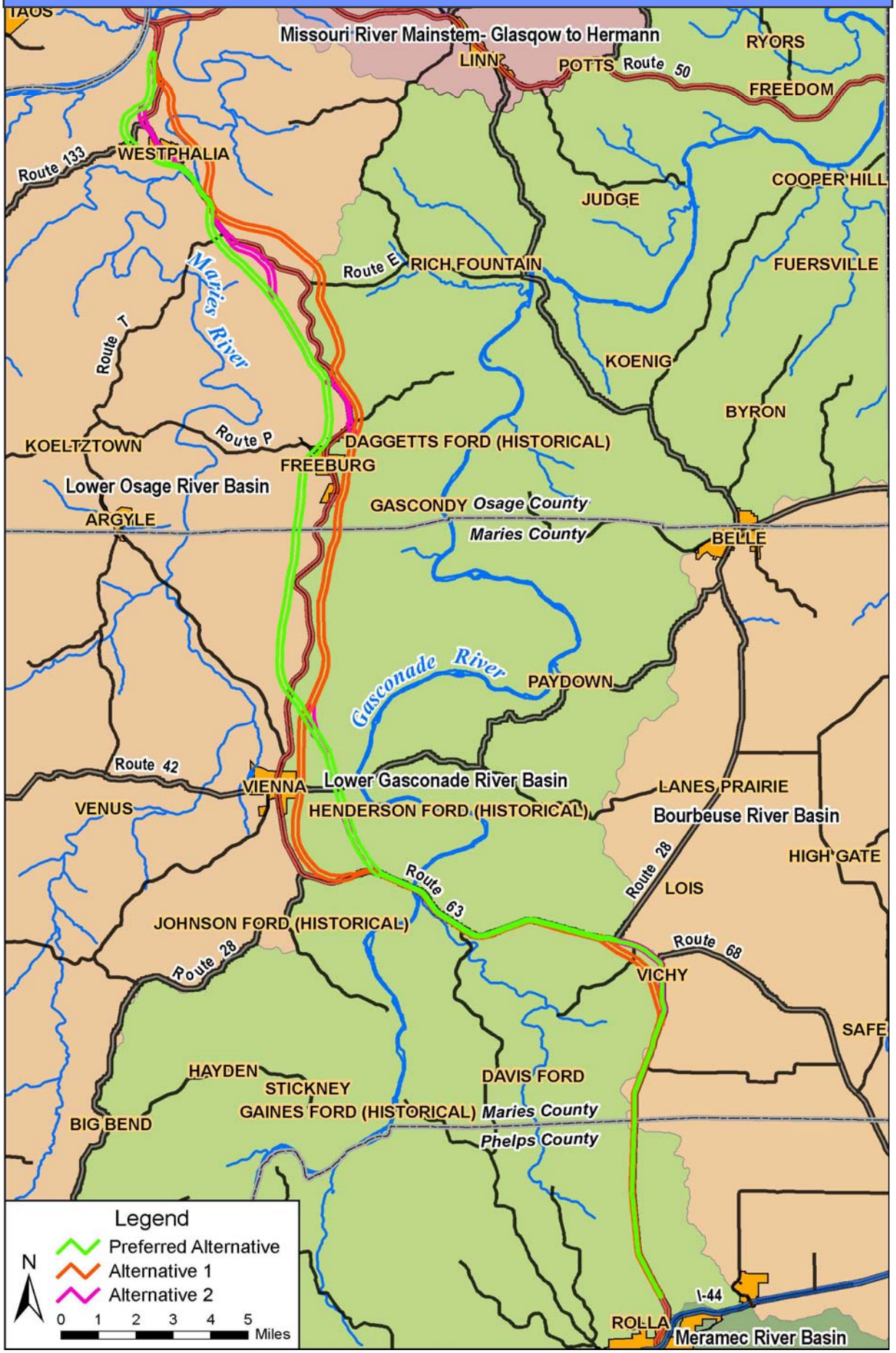
Wetland impacts were based on the entire wetland size of the mapped feature regardless of whether a portion fell outside of the corridor limits. Wetlands are classified in accordance with the USACE 1987 Wetland Delineation Manual. Potential wetland areas are considered jurisdictional wetlands if they meet all three wetland criteria (USACE, 1987):

- **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 continuously for at least five percent of the growing season in most years (50 percent probability of recurrence).

**What water resources are found in the study area?**
The existing Route 63 follows a ridge-top between three 8-digit hydrologic unit codes (HUC) watersheds, the Lower Osage River Watershed, the Lower Gasconade River Watershed, and the Bourbeuse River Watershed (Figure 28).

What is a Watershed?
A watershed is the entire geographical area drained by a river and its tributaries.

Figure 33. Watershed Map



North of Route E water resources drain into the Maries River, Lower Osage River Watershed. South of Route E resources are split. Water resources to the west of the existing Route 63 drain into the Maries, and to the east drain into the Gasconade River.


Maries River

At Route 28, water resources drain into the Gasconade on both the west and east, until you arrive at Highway 68. At that point, water resources are split until you get to the county line, with water resources on the west draining into the Gasconade River and on the east into the Bourbeuse River (Figure 28).


Gasconade River

After crossing the county line, water resources are entirely located within the Gasconade River drainage. The largest water resources in the study area are the Maries River and the Gasconade River.

Wetlands are not widespread throughout the study area. The majority of the wetlands were identified in the Westphalia area, in association with Alternative 1 as it crosses through the Maries River floodplain. The other area of higher density wetland occurrence is in the Gasconade River floodplain crossing in association with widening on the existing alignment. There are numerous ponds in the project area. Most of the ponds are true farm ponds used for livestock watering. The average size of the ponds in the study area is 0.23 acres. There were no springs identified within the Preferred Alternative corridor.

**How do wetland impacts compare between alternatives?**

Overall, there was not a great difference in the amount of wetland impacts between the alternatives within the DEIS. There were slightly more wetland impacts in Alternative 1, 23.73 acres; than in Alternative 2, 20.06 acres; or the Preferred Alternative, 20.24 acres (Table 17). The largest wetland complex identified in the DEIS is located within the Gasconade River floodplain, 16.35 acres, and is potentially impacted by all alternatives. The NWI database shows the majority of this wetland complex is located outside the study corridor; however, it is contiguous with what lies within the corridor. After field verification, this wetland was preliminarily determined to be non-jurisdictional because although it is in the 100-year floodplain, the connection to the river has been lost.

Forested Wetland

Throughout each alternative, the majority of the impacts are classified as forested wetland. The second largest impacts are classified as ponds, and the third largest with emergent wetlands. There were no impacts associated with farmed wetlands or scrub-shrub wetlands across the alternatives. Compared to the other two alternatives, the Preferred Alternative has equal to or less forested wetland impacts; greater pond impacts, and is second in emergent wetland impacts. The pond resources generally represent ponds constructed for livestock watering and are of significant value to the farming community. However, they are considered a less significant ecological resource since they are easily reproduced.

Emergent Wetland

After significant field reconnaissance, impacts to streams increased, but impacts to ponds and wetlands decreased significantly. Early estimates for streams only included mapped streams on the USGS topographic maps and wetland/ponds on the NWI maps. Additional streams were preliminarily identified as jurisdictional in the field. (Technical Report available upon request).

Table 17. Wetland Impacts by Type in Each Alternative

| Type | Preferred-draft (acres) | Preferred-final (acres) | Alternative 1 (acres) | Alternative 2 (acres) |
|---|---|---|---|---|
| **Farmed** | 0 | 0 | 0 | 0 |
| **Ponds** | 10.03 | 2.13 | 10.24 | 7.37 |
| **Emergent** | 0.63 | 0.2 | 0.72 | 0.45 |
| **Scrub Shrub** | 0 | 0 | 0 | 0 |
| **Forested** | 19.61 | 0 | 22.61 | 19.61 |
| **Riverine** | 0 | 0.46 | 0.4 | 0 |
| **Total** | **30.27** | **2.79** | **33.97** | **27.43** |

**How do the stream impacts compare between alternatives?**

Stream impacts (linear feet) are greater in the Preferred Alternative, 63,639 linear feet, as compared to 54,581 linear feet in Alternative 1 and 45,626 linear feet in Alternative 2. The actual number of streams impacted in the Preferred Alternative is 69, as compared to 79 for Alternative 1 and 55 for Alternative 2 (Table 18). After field reconnaissance, the number and linear feet of streams impacted by the preferred was greater than what was reported in the draft. It is assumed that this would be the case for any of the alternatives if field verified. (Technical Report available upon request)

Each alternative has a footprint encompassing more area than necessary, sometimes twice as much, to construct the new alignment and thereby allow room for adjustments. This additional width affords some flexibility for determining the final location of the selected alternative within the broader alternative boundaries and therefore enables efforts to minimize project effects to water resources.

Two large order streams would be crossed. The Maries River and Gasconade River would be crossed adjacent to the existing alignment for the Preferred Alternative. This minimizes aquatic impacts by spatially co-locating bridges rather than placing another bridge farther upstream or downstream from the existing structure, as would be the case in Alternative 1.

**How do the pond impacts compare between alternatives?**
The difference in the amount of pond impacts in the Preferred Alternative when compared to either Alternative 1 or Alternative 2 is minimal. Overall, across the corridor, ponds are small and generally occur in the headwaters of streams high on the landscape. After field verification, where access was available, only three ponds were preliminarily determined to be jurisdictional. (Technical Report available upon request)

Table 18. A Comparison of Water Resource Impacts for Each Alternative.

| | Preferred-draft | Preferred- final | Alternative 1 | Alternative 2 |
|---|---|---|---|---|
| **Estimated Impact (linear feet)** | 63,639 | 66,594 | 54,581 | 45,626 |
| **Number of streams** | 69 | 80 | 79 | 55 |
| **Wetlands (acres)** | 20.24 | 0.66 | 23.73 | 20.06 |
| **Ponds (acres)** | 10.03 | 2.13 | 10.24 | 7.37 |

**How does the alternative analysis comply with Section 404(b)(1) guidelines?**
There was no alternative that stood out as clearly having the fewest overall environmental impacts. In the case of the proposed alternatives for Route 63, the Preferred Alternative impacts were not always the least, as evidenced by the linear impact and number of streams and ponds respectively. It also did not have the greatest number of negative impacts, as evidenced by the number of streams and wetland acres impacted as compared to the other two build alternatives. To get a clearer picture of which alternative would be chosen as the preferred, the study team compared the alternatives by conducting an impact assessment, and combining those results with an evaluation of how well the alternatives addressed the purpose and need of the project.

Alternative 2 fails to address the need to improve safety compared to the Preferred Alternative or Alternative 1, because it uses the existing highway through Westphalia. The existing highway has an abundance of access points leading to increased probability of crashes, and was therefore deemed not practicable. Although Alternative 2 has the fewest negative impacts for the most environmental factors, including stream length, number of stream crossings, wetlands and ponds, it has a higher number of negative impacts for other factors, and thus does not meet the need for improved safety as effectively as the Preferred Alternative.

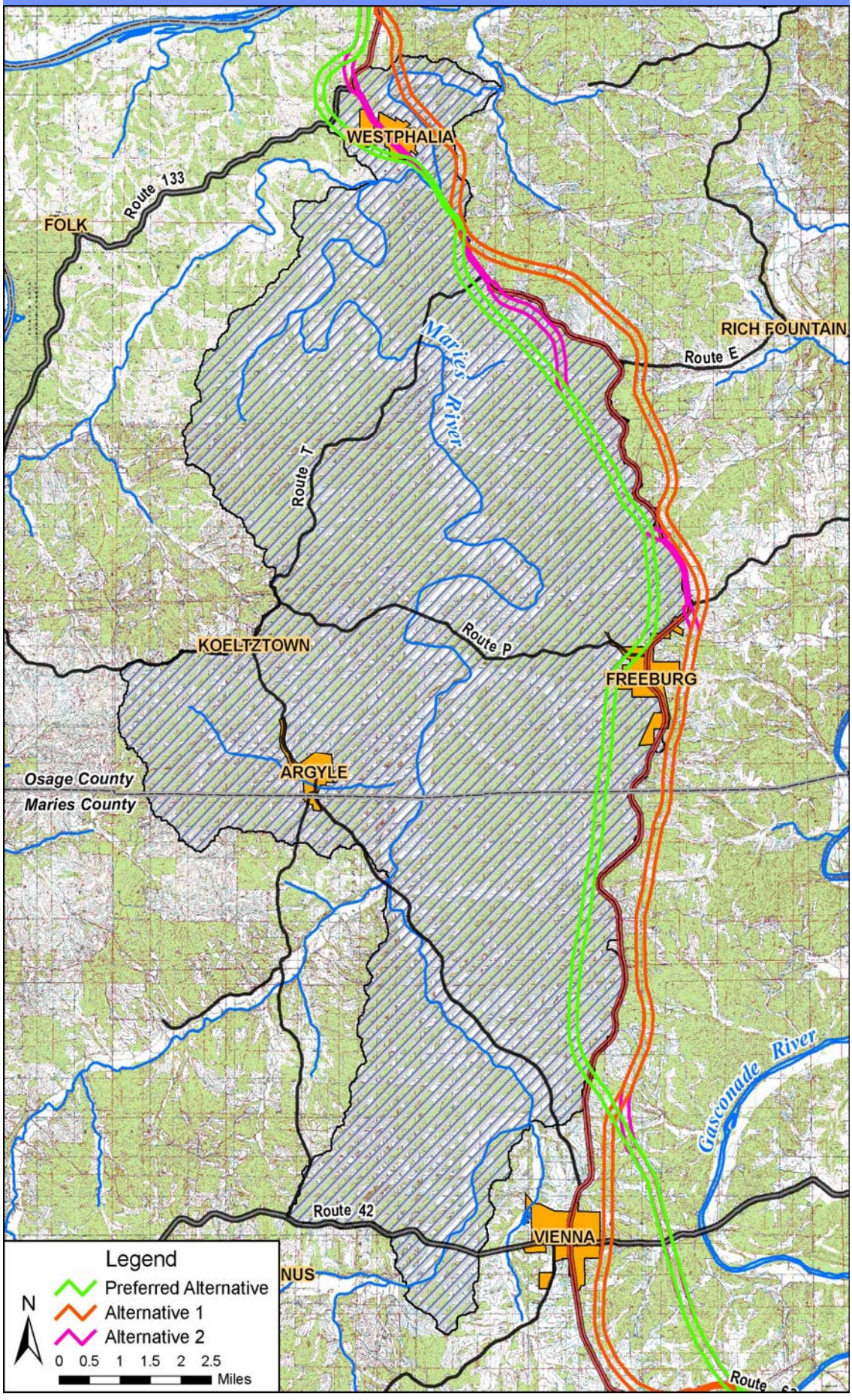
Alternative 1 also had a higher number of negative impacts than the Preferred Alternative, including the number of stream crossings and acres of forested wetlands impacted. Based on the negative impacts associated with Alternatives 1 and 2, and the ability to best meet the project's purpose and need (i.e. safety, traffic flow, continuity, and overall operational efficiency), the Preferred Alternative was carried forward as the recommended alternative. No appreciable difference was noted between Alternatives 1 and 2 with respect to negative impacts. However, both of these alternatives had considerably more negative impacts than the preferred.

**What types of compensatory mitigation would be expected?**
Mitigation is required after avoidance and minimization have been accomplished for impacts to streams, wetlands and some ponds in the project area. Mitigation for wetlands and ponds 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 USACE and MDNR discretion. 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 stream impacts. More stream mitigation is required when impacts fall within certain priority areas or higher order, larger, streams. Examples of these are when impacts are on streams with spawning restrictions or involve those providing habitat for federally listed threatened and endangered species.

One such area is located within the study corridor. The Missouri Department of Conservation has designated part of the Maries River as a Conservation Opportunity Area (COA) (Figure 29). This particular COA is further designated by the USACE as"priority water". Impacts within this area would be required to have more mitigation than impacts outside of this area. The Preferred Alternative traverses through this area, and will require additional mitigation. Within the COA, first and second order stream impacts will be minimized by reducing velocities at the outlet of structures with additional Best Management Practices (BMP's) such as step-pools and other energy dissipaters.

Figure 34. Conservation Opportunity Area Map



**How were compensatory stream mitigation costs calculated for the project?**
Compensatory stream mitigation costs were calculated based on the cost to participate in the Missouri Conservation Heritage Foundation's Stream Stewardship Trust Fund (SSTF). This cost was estimated at $35.00 per credit at the time of the DEIS. Since then, the cost per credit has decreased to $25.00 per credit. Credits were calculated using the MSMM, Adverse Impact Worksheet. Certain assumptions were made in advance of knowing specific impacts to streams in order to complete the worksheet.

For example, all impacted streams are assumed to be fully functional streams (existing condition), involve *permanent* fill (duration), and a fill (activity). Based on these criteria, the number of credits needed for each alternative could be estimated. More credits are needed for the Preferred Alternative than either Alternative 1 or Alternative 2. Likewise, the cost of mitigation, if MoDOT were to participate in the SSTF, is more for the preferred ($12.6 million) than for Alternative 1 ($9.8 million) or Alternative 2 ($8.5 million) (cost of mitigation numbers based on $35.00 per credit). Worksheets can be referenced in the Appendix F and will reflect the $25.00 per credit cost.

**Overall, what are the water resource impacts and how would the project compensate for unavoidable impacts?**
Overall, water resource impacts were not significantly different between the alternatives. The greatest difference is that there are more linear feet of stream impacts in the Preferred Alternative, which then reflects the higher number of credits required, and subsequently the higher cost to mitigate. Overall, impacts to wetlands and ponds showed little variation between any of the alternatives. During field verification, ponds and wetland impacts decreased significantly, whereas, stream impacts increased slightly.

Under the obligation of the Clean Water Act (CWA), Section 404 and 401, a permit is necessary for any dredge and fill activities within waters of the United States. A Section 404, USACE permit, and a Section 401, Missouri Department of Natural Resources (MDNR) certification would be needed prior to construction. Impacts to construct the entire Preferred Alternative would require Individual Permit authorization. Final impacts and a mitigation proposal would be required for permit submittal to the USACE and MDNR. Permit application submittal is typically completed during the design phase.

In accordance with Executive Order 11990, the FHWA ensures that, to the extent possible, this project avoids long- and short-term adverse impacts associated with the destruction or modification of wetlands.

The Preferred Alternative would affect 30.27 ac of wetlands. Such impacts would be mitigated in the manner prescribed by the associated Section 404 Clean Water Act Permit.

## Public Lands

**How does Section 4(f) apply to public lands?**

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

**What are Section 4(f) resources?**

A Section 4(f) resource could be a public park, recreation area, wildlife or waterfowl area, or a historic property. When 4(f) resources are involved in federally funded MoDOT projects, alternative alignments must be considered to minimize or eliminate adverse effects to 4(f) resources. Section 4(f) prohibits federal transportation agencies from using 4(f) resources unless there is no "feasible and prudent alternative" to the use of land and the action includes all possible planning to minimize harm.

There are four privately owned properties with recreational facilities in the study area: The Knights of Columbus facility north of Westphalia on the west side of Route 63, the Lions Club property just south of Westphalia on the west side of Route 63, the Lions Club property just south of Freeburg on the west side of Route 63, and the recreational facilities belonging to Visitation Inter-Parish School and Visitation Catholic Church in Vienna. The Knights of Columbus property has a lease agreement for public use of its recreational facilities, thus making it potentially Section 4(f) eligible. None of these facilities would be affected by the proposed project.

Publicly owned properties in the study vicinity in Osage County include the Dr. Bernard Bruns Access on the Maries River east of Westphalia and the Msgr. Bernard S. Groner Memorial Park to the south of Holy Family Church in Freeburg.

Publicly owned properties in Maries County in the corridor area include the Freeburg Tower site, owned by the MDC, located on the west side of Route 63 at County Road 209. East of Route 63, on County Road 302, a lengthy drive leads to Paydown Access on the Gasconade River, also owned by MDC.

Further south, Vienna Park is located just west of Vienna and the Vienna Public School Complex is located on Route 42, just east of town. Both have recreational facilities. Continuing south, MDC's Spring Creek Gap Conservation Area is located north of Route 63. Scenic View Park, owned by MoDOT, is located opposite Spring Creek Gap on the south side of Route 63.

Further south, the final publicly owned property in the study area is Vichy Public Park, a 7.24 acre park administered by Maries County and located on the west side of Route 63 at the juncture of Route 68. There are no publicly owned properties in the corridor area in Phelps County.

One of these properties may be affected by the proposed project. The Preferred Alternative would impact the Freeburg Tower site; it is FHWA's opinion that since this property was developed for fire suppression, its primary purpose is not recreational and Section 4(f) does not apply. Correspondence from MDC indicates that the property has been utilized in recent years for fire suppression only, and that there are no long range plans for the tower or the site (see correspondence in Appendix A). Available references indicate that there are no planned potential Section 4(f) resources in the project area.

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

There are two properties with LWCF investment in the study area: Msgr. Bernard S. Groner Memorial Park in Freeburg in Osage County and Vienna Park, west of Route 63 in Vienna, in Maries County. Neither would be affected by any of the alternatives.

The study area has been examined for possible impacts to Section 4(f) and/or Section 6(f) resources. There are no parks/public lands Section 4(f) or Section 6(f) properties affected by this study. The study area has also been examined for resources funded with federal money from the Pittman-Robertson Act. Funds from this act are set aside for wildlife restoration projects. There are no properties using Pittman-Robertson Act funds in the project area.

## Cultural Resources

**What are cultural resources?**
The consideration of cultural resources is a critical part of MoDOT project development. MoDOT must comply with federal and state environmental laws and regulations designed to protect significant cultural resources.

**What are historic properties?**
Historic properties are cultural resources (buildings, structures, sites, districts, or objects) that are listed or eligible for listing on the National Register of Historic Places. They may be prehistoric or historic in nature.

Cultural resources can be many things, such as old buildings; groups of tools or trash found where Native Americans or settlers lived, and sometimes even the locations where important events took place. Not all cultural resources are important, but those that are significant may be referred to as "historic properties."

Cultural resource specialists use this language to identify resources that are listed or eligible for listing on the National Register of Historic Places (NRHP). Just because something is old does not mean it is historic and automatically eligible for the National Register. MoDOT evaluates the historical and architectural significance of cultural resources to determine if they fulfill eligibility criteria for listing on the NRHP. The NRHP is the official federal list of historic properties in the country that are significant at the local, state, or national level. The NRHP eligibility criteria were established in 1966 through the National Historic Preservation Act to recognize and help protect historic properties.

Under Section 106 of the National Historic Preservation Act, agencies using federal funds, licenses, or permits must review the effects of their proposed actions on historic properties. This law and other related historic preservation regulations are briefly described below. More information about the role of cultural resources in MoDOT's projects can be found online in the MoDOT Engineering Policy Guide, Section 127.2, at *http://epg.modot.org*. This section discusses the potential effects that the various alternatives would have on historic properties in the study area.

**How was the cultural resources study conducted?**

MoDOT Historic Preservation staff typically use a phased approach for cultural resources investigations for corridor projects like the Route 63 EIS. The level of investigation depends on the project stage and the resource type. The two investigation phases correspond with the stages of the EIS document: the draft and the final stages.

MoDOT Historic Preservation staff consults with the State Historic Preservation Office (SHPO), Missouri Department of Natural Resources, throughout the study's Section 106 Process.

During the draft stage of the EIS investigation, and following the records investigation, an architectural historian looks at buildings and structures located within each reasonable alternative to identify those that are likely to be considered eligible for listing on the NRHP.

What makes a property eligible for the National Register of Historic Places (NRHP)?

To be eligible for the NRHP, properties generally are at least 50 years old and must fulfill at least one of the four Criteria for Evaluation, meaning they must be:

a) associated with historic events or broad patterns of history,

b) associated with significant persons,

c) significant for their design or construction, or

d) yield information important in prehistory or history.

Properties also must be fairly unaltered so they possess historic integrity, including aspects of location, design, setting, materials, workmanship, feeling, and association.

Archaeologists review the known professional archaeological reports and previously recorded archaeological sites so they can be plotted on the project maps to show which are located near any of the alternatives being considered.

Cemetery locations are also plotted on the project maps if the locations can be documented. While small family cemeteries may not be identified on existing maps, they must be treated the same as other known cemeteries. MoDOT would attempt to avoid impacts to known cemeteries; however, if impacting the cemetery were necessary, MoDOT would comply with all applicable laws.

After the draft stage of the EIS investigation, a detailed archaeological survey was conducted within the Preferred Alternative. Resources associated with alternatives other than the Preferred Alternative, or no longer located within corridor footprint of the Preferred Alternative, would not be affected by the study and therefore were no longer considered or included in the project. MoDOT requested permission from property owners to conduct an archaeological survey for each parcel that could be impacted by the future construction, and 64% responded with permission.

**What are the cultural resource concerns in the study area?**

Nine previous archaeological investigations have been conducted within the current study area. While several of these investigations were for relatively minor utility improvements such as water system expansions, sewer systems, and the construction of cell towers, the others have been more extensive, occurring in connection with proposed highway improvements.

**What is an archaeological survey?**

An archaeological survey is an intensive search of the proposed construction project to identify any archaeological sites. If there is good surface visibility (for example a recently plowed field), archaeologists simply walk the area and examine the surface.

In a pasture or wooded area the archaeologists use shovel or auger tests to look for artifacts. Shovel tests are small hand-dug holes about 12 inches wide and up to 24 inches deep, while auger tests are six-inch diameter holes up to six feet deep. In most survey areas, shovel tests or auger tests will be excavated at 50- or 100-foot intervals.

The archaeologists look through the soil to find artifacts and other evidence of prehistoric or early historic archaeological sites.

As early as 1977, the highway department was considering improvements to Route 63 and archaeological surveys were conducted as various routes were considered. Two different investigations were conducted, one in Maries County and one in Phelps County. Based on those surveys, additional investigations were conducted in 1979. Both of these looked at improvements that were later included in the current alignment of Route 63. The most recent investigation was conducted in 2004, for the improvements that were made in the vicinity of Vichy.

At the present time, 13 archaeological sites have been recorded along the reasonable alternatives being considered for this project. Only one of those sites is found in the northern half of the study area.

The remaining 12 sites were identified during cultural resources investigations for previous improvements to Route 63. Based on those investigations, eight sites have already been determined to be "not eligible" for listing on the NRHP. In general, the eight sites represent very light scatters of stone debris that suggest someone stopped at those locations and worked with some stone tools, some time in prehistory. There is no evidence of when the site was occupied or what sort of activities took place. Because those sites have already been determined to contain little or no useful information, no additional work is planned. However, if it is determined that the future improvements to Route 63 would impact one or more of the remaining five sites, some amount of additional investigations would be necessary.

During the literature review, six documented historic architectural resources were identified in the study or study vicinity. Three of these six historic properties are listed on the NRHP: Huber's Ferry Farmstead Historic District, north of Westphalia; St. Joseph Church, Westphalia; and the Maries County Jail and Sheriff's Residence, Vienna. As indicated on maps in Appendix G, these properties are not associated with any of the reasonable alternatives and would not be affected by the study.

While not listed on the NRHP, three additional historic properties have been determined eligible. The Westphalia Bridge, determined eligible in 2003, is at the edge of Alternative 1 and would not be impacted by the study.

The Vichy Normal & Business Institute and the Vichy Public School were determined eligible for listing on the NRHP in 2004. These two buildings are adjacent to existing Route 63, but outside the Preferred Alternative and Alternative 2 and therefore will not be affected by the project.

Historic architectural resources exist within each alternative. Westphalia has more historic buildings located in the alternatives than any other region, whereas no historic buildings were identified within any the alternatives in Vienna or the study limits south of Vichy. The Westphalia Bridge is the only historic bridge in the study limits. Although a dozen other bridges that are more than 50 years old are in the study vicinity, none are located in any of the alternatives.

Following reconnaissance surveys, MoDOT Historic Preservation staff identified 11 architectural resources in the study area that fulfill eligibility criteria for listing on the NRHP (Table 19 and Appendix G). These 11 resources are included among those historic properties counted in the table in the Executive Summary (page iii) and also Table 2 (page 32), "Total Impacts to Each Alternative." These two previous tables were prepared with preliminary information and compiled early in the study to capture potentially eligible properties and potential project impacts by alternative, whereas this chapter provides information obtained later in the study following consultation with SHPO staff and efforts to avoid and minimize project impacts to historic properties. While the table in the Executive Summary appears as a summary itself, a further evaluation of cultural resources appears here, in Chapter 3. The cultural resources technical report contains more information about individual properties and the cultural resources investigation methods used than is presented in the abbreviated discussion that follows.

| Table 19. Historic Architectural Resources by Reasonable Alternatives | | |
|---|---|---|
| Region/Property Name | NRHP Evaluation Status | Alternative |
| **Westphalia Region** | | |
| Schmitz Barn | Considered Eligible | Preferred |
| Maries Valley Farm | Considered Eligible | Preferred |
| Castrop Barn | Considered Eligible | Alternative 2 |
| Bure Farm | Considered Eligible | Alternative 2 |
| Former Gas Station | Considered Eligible | Alternative 2 |
| Luebbert Farm | Considered Eligible | Alternative 1 |
| Westphalia Bridge | Determined Eligible, 2003 | Alternative 1 |
| **Freeburg Region** | | |
| Bauer Log House | Considered Eligible | Alternatives 1 and 2 |
| Johannesmeyer Farm | Considered Eligible | Alternatives 1 and 2 |
| **Vichy Region** | | |
| Vichy Normal & Business Institute | Determined Eligible, 2004 | Preferred and Alt.2 |
| Vichy Public School | Determined Eligible, 2004 | Preferred and Alt. 2 |

**What are the cultural resource concerns in the Preferred Alternative?**

**Archaeology:**
Five previously recorded sites in the study area have already been determined eligible for listing on the NRHP or potentially eligible for that listing. It was found that the Preferred Alternative might impact all five of these sites. Each of these sites examined during the archaeological survey to gather information to help determine what, if any, additional investigations are necessary.

What do Archaeological Site numbers mean?

The first two numbers stand for Missouri; the next two letters for the County; and the final numbers are for the sites that have been recorded in that county. So, 23OS14 indicates that this site is the 14th site recorded in Osage County in Missouri (the 23rd state when the states are listed in alphabetical order). This system was set up by the Smithsonian Institution in Washington D.C. Additional information can be found at: *http://www.dnr.mo.gov/shpo/Archaeology.htm*.

Archaeological site 23MS12, located south of the Gasconade River, was tested in the late 1970s. Those investigations revealed that the site contained important information about how prehistoric people lived. Some of the information came from trash pits that were used between 1000-1500 years ago while other material provided information about life ways between 3000-5000 years ago.

This information was sufficient for site 23MS12 to be determined eligible for listing on the NRHP. At this location, the Preferred Alternative would require the existing highway to be widened and because of the significance of site 23MS12, additional large-scale excavations would likely be necessary to mitigate impacts caused by that widening.

Sites, 23MS57 and 23MS77, were revisited when the archaeological survey was conducted. Site 23MS77 extends beyond the right of way but is not considered eligible for the NRHP. Site 23MS57 is located on the south side of the right of way and most likely will not be impacted. At the northern end of the project, site 23OS14, is no longer in the Preferred Alternative. The final previously recorded archaeological site that was considered to be potentially eligible for listing on the NRHP is site 23PH234. When revisited in the archaeological survey, none of the site is within existing right of way.

Previously recorded sites 23MS 80, 85, 23PH232, 233, and 234 appear to have been destroyed by previous road construction. Previously recorded sites 23PH 77, 78, 79, and 81 along with 23PH231 were revisited and do not appear to be eligible for the NRHP. Previously recorded site 23PH235 is outside of the existing right of way.

The archaeological survey recorded an additional 57 archaeological sites (50 prehistoric and 7 historic). Two of these (23MS1126 and 23MS1141) are outside the Preferred Alternative. Seven sites (23OS1218, 1221, 1230 and 23MS1121, 1123, 1124, and 1130) are of unknown status and are potentially eligible for the NRHP. These sites need to be avoided or, if that is not possible, then Phase II testing will be initiated to determine if they are eligible for the NRHP.

Forty-eight sites (23MS1115-1120, 1122, 1125, 1127-29, 1131-1140, 23SO1219-1220, 1222-1229, 1231-1244, and 23PH1564-1566) are relatively low-density sites and are considered not eligible for listing on the NRHP and no further work is recommended.

**Architecture**: During the preparation of the DEIS, four properties associated with the Preferred Alternative were considered eligible for the NHRP, yet none of them were expected to be adversely affected by road construction (Table 20).

Table 20. Historic Architectural Resources within the Preferred Alternative During the Draft Stage of the EIS

| Region/Property Name | Applicable NRHP Criteria/Period/Boundary | Adverse Effect* |
|---|---|---|
| **Westphalia Region** | | |
| Schmitz Barn | C, ca. 1890, bank barn footprint | No |
| Maries Valley Farm | C (and A), 1927, hatchery footprint | No |
| **Vichy Region** | | |
| Vichy Normal & Bus. Inst. | C, ca. 1880, building footprint | No |
| Vichy Public School | A, 1901-1954, building footprint | No |
| *This column indicates whether or not this alternative is likely to have an adverse effect on the historic property. | | |

Now, at the final stage of the EIS, these buildings are no longer within the corridor footprint because the Preferred Alternative has been modified. By reducing the width of the Preferred Alternative at these four sensitive locations, all the buildings at these properties that were identified during the draft stage can be completely avoided; therefore they are considered outside the area of potential effects. A summary of these four historic or potentially historic properties that the Preferred Alternative now avoids is included in the following section.

### Schmitz Bank Barn

This farm is comprised of several buildings including an abandoned house, a stone retaining wall, and outbuildings. Of the two barns are located on the property, one is considered architecturally significant--an unusual, bank barn with a stone foundation that exhibits Missouri-German characteristics.

Schmitz Barn, Westphalia

Its hanging gable, the entire width of the north gable end, distinguishes it from other barns; none like it were discovered during the literature review of previous architectural surveys for the county, nor were any others encountered during the present survey. Its construction date is undetermined, but it probably was built during the last quarter of the nineteenth century.

Maries Valley Farms Chicken Hatchery, Westphalia

### Maries Valley Farms

This clay tile chicken hatchery is noteworthy for its architectural and possibly historical, commercial significance also. The business, Star Chick Hatchery, was established in 1923. After a fire in 1926 destroyed the original hatchery, the new, tile hatchery was constructed in 1927. In 1929, the business was renamed Maries Valley Farms. The company's name and advertising is featured inside a brick tablet under the stepped parapet. The hatchery sold hatchlings locally and through mail orders, producing two million chicks per year at its peak.

### Vichy Normal & Business Institute

In 2004, the Vichy Normal & Business Institute, a prominent two and one-half stories, commercial building built ca. 1880, was determined eligible for listing on the NRHP for its architectural significance.

The design, scale, massing, form, materials, and workmanship are architectural characteristics that set the building apart from others in the Vichy community.

Vichy Normal & Business Institute

While most other historical buildings in Vichy are frame construction, this one is brick. Although it does not represent a specific architectural style, features such as the steeply pitched roof and the arched window and door openings suggest the influence of the Gothic Revival and Italianate styles popular during the mid to late-nineteenth century.

Vichy Public School

Vichy Public School

In 2004, the Vichy School was determined a historic property as one of three Maries County schools in operation during the early twentieth century that advanced education in the area. The school is not considered architecturally significant because of the slight modifications to the windows, exterior siding, and shed porch addition to the building. These recent physical alterations are minor and could be reversed in the future; however, they affect the present evaluation.

In contrast to the draft stage of the study when the Preferred Alternative was wider and encompassed these buildings, no historic buildings are located within the Preferred Alternative at the final stage of the EIS. As a result of changes to the Preferred Alternative, the former Vichy Public School, Vichy Normal & Business Institute, Maries Valley Farms, and the bank barn at the Schmitz Farm are considered outside the area of potential effects. Of the fifty-three parcels with buildings that remain located within the Preferred Alternative, twenty-four of them are greater than forty-five years old (built before 1964) and none of them are considered eligible for the NHRP. The results of MoDOT's architectural investigation were submitted to the SHPO for review on April 29, 2009. On May 19, 2009, SHPO responded that a thorough and adequate cultural resources survey had been conducted for the project area and concurred with the recommendations that none of the architectural resources fulfilled NRHP eligibility criteria (see Appendix G).

**What are the cultural resource concerns in Alternative 1?**

**Archaeology:** Because Alternative 1 is located to the east of Westphalia, it does not impact site 23OS14, which would be impacted by Alternative 2. However, all the rest of the sites described above would be impacted by any of the three alternatives.

**Architecture:** There are approximately 69 parcels with buildings located in Alternative 1. Of these properties, four are considered eligible for the NRHP and three would be adversely affected by Alternative 1

| Table 21. Historic Architectural Resources Associated with Alternative 1 | | |
|---|---|---|
| Region/Property Name | Applicable NRHP Criteria/Period/Boundary | Adverse Effect* |
| **Westphalia Region** | | |
| Luebbert Farm | C (and A), ca. 1860, complex | Yes |
| Westphalia Bridge | C, 1893 and 1903 | No |
| **Freeburg Region** | | |
| Bauer Log House | C, undetermined date, house footprint | Yes |
| Johannesmeyer Log House | C, undetermined date, house footprint | Yes |
| *This column indicates whether or not this alternative would be likely to have an adverse effect on the historic property. | | |

### Westphalia Bridge

Westphalia Bridge

Westphalia Bridge, carrying County Road 611 over the Maries River, is located at the base of the bluffs on the east side of Westphalia and on the western edge of Alternative 1. Constructed of steel and wrought iron, it is a seven panel, pin-connected Pratt through truss type with pin-connected Pratt half-hip pony truss approach spans. The Kansas City Bridge Company built the bridge in 1893 and the approach spans were added in 1903. The Westphalia Bridge is included in the Missouri Historic Bridge List and is considered a historic property.

### Luebbert Farm

This Missouri-German farmstead is architecturally and historically significant. Stone is used extensively at this hillside site, not only for two houses, but also for retaining walls, building foundations, and even a watering trough.

Luebbert Farm, Westphalia

The complex also includes two barns (with log components), and a multipurpose outbuilding (combination privy and storage shed/smokehouse). The parcel was patented in 1837 and stone architecture at the site suggests at least two building periods, perhaps ca. 1860 and 1890. The later stonework at the site may be attributed to a stonemason who built Catholic churches in Frankenstein and Wardsville, Missouri.

Bauer Log House

The log house at the Bauer Property exhibits at least two historic building phases and is architecturally significant both for its log construction and building form. Its log core suggests the house expanded from its dogtrot origin, a name derived from its characteristic central, open breezeway or "dogtrot." As common in other regions of the state, the breezeway between the two log units of the Bauer House was later enclosed with frame construction that resulted in a central-hall I house.

Bauer Log House, Freeburg

Johannesmeyer Log House, Freeburg

Johannesmeyer Log House

The stack house at the Johannesmeyer Farm represents a vernacular architectural type that is distinguished by its two-story, single-pen form. The single-pen, in essence, is "stacked" on itself to create a taller building than the basic, one-story single pen house.

In addition to its vernacular form, the Johannesmeyer stack house is noteworthy because of its log construction. Like the nearby Bauer log house, it is indicative of early building methods that used locally available materials and both are worthy of further study in this traditionally German-American region.

**What are the cultural resource concerns in Alternative 2?**

**Archaeology**: Alternative 2 would impact all of the same sites previously described under the Preferred Alternative.

**Architecture**: There are approximately 108 parcels with buildings located in Alternative 2. Of these properties, seven are considered eligible for the NRHP and Alternative 2 would adversely affect five (Table 22). Because Alternative 2 has not been selected as the Preferred Alternative, none of the buildings are located in the final EIS study limits.

| Table 22. Historic Architectural Resources Associated with Alternative 2 | | |
|---|---|---|
| Region/Property Name | Applicable NRHP Criteria/Period/Boundary | Adverse Effect* |
| **Westphalia Region** | | |
| Castrop Barn | C (and possibly A), 1850-1940, barn footprint | Yes |
| Bure Farm | C (and A), ca. 1885, complex | Yes |
| Former Gas Station | C, ca. 1940, gas station footprint | Yes |
| **Freeburg Region** | | |
| Bauer Log House | C, undetermined date, dogtrot log house footprint | Yes |
| Johannesmeyer Farm | C, undetermined date, stack house footprint | Yes |
| **Vichy Region** | | |
| Vichy Normal & Bus. Inst. | C, ca. 1880, building footprint | No |
| Vichy Public School | A, 1901-1954, building footprint | No |
| *This column indicates whether or not this alternative would be likely to have an adverse effect on the historic property. | | |

### Castrop Barn

This ca. 1850 barn with red siding is a highly visible, local landmark in Westphalia. It has been in continuous use since it was built, serving general farming purposes its first 70 years.

Castrop Barn, Westphalia

In the 1930s, owners August and Elizabeth Castrop used the second floor as a dance hall and restaurant to supplement their income and provide a gathering place and recreational facility for the community. Weekly dances were held for approximately a decade, while farm animals continued to occupy the first floor.

In the 1940s, the barn returned to its original purpose of sheltering stock and hay and serves the same function today. The barn would contribute to a historic district comprised of multiple properties in Westphalia, both for its architectural and historical significance.

Bure Farmhouse, Westphalia

Bure Farm

The Bure Farm is a good example of an intact, compact "urban" farm located within the town of Westphalia. The property includes the original farmhouse (an I-house), barn, icehouse, privy, chicken house, and a contemporary Ranch house. The I-house, with its decorative spindle-frieze porch, is one of the best-preserved examples of its type in the corridor. The outbuildings add to the property's historical significance as a small, extant late 19th century farm.

Former Gas Station

This vintage gas station is considered eligible for the NRHP for its historical and architectural significance. Its omission from early highway project plans indicates it post-dates 1929 and an estimated construction date is ca. 1940, following the relocation of Route 63 in the early 1930s. Designated a "house and canopy" form, its design may be traced to early Texaco stations.

Former Gas Station, Westphalia

Bauer Log House. See the Alternative 1 Discussion.

Johannesmeyer Farm. See the Alternative 1 Discussion.

Vichy Normal & Business Institute. See the Preferred Alternative Discussion.

Vichy Normal School. See the Preferred Alternative Discussion.

**Overall, how would the effects on historic properties compare between the alternatives?**

During the draft stage of the study, the number of potential historic properties likely to be adversely affected was compared by alternative as shown in Table 23. Since that time, due to design alterations and field surveys, the number of adverse effects to historic properties in the Preferred Alternative has decreased (Table 24).

| Table 23. Adverse Effects to Historic Properties by Alternative (Draft EIS Stage) | | | |
|---|---|---|---|
| Alternative | Associated Historic Architectural Resources | Associated Historic/Prehistoric Archaeological Sites | Historic Properties Adversely Affected |
| Preferred | 4 | 1 | 1 |
| Alternative 1 | 4 | 1 | 4 |
| Alternative 2 | 7 | 1 | 6 |

Only one archaeological site in the project area, 23MS12, was considered to be a historic property (eligible for listing on the NRHP) at the time. The eligibility of the other four sites, as previously discussed, has not yet been determined. This prehistoric archaeological site is located in a portion of the study area where all three alternatives merge. As previous investigations at the site have shown that the site extends on both sides of the existing highway, any widening of Route 63 would impact the site and would require an intensive archaeological investigation. However, the impacts are the same for all three of the reasonable alternatives and one alternative is not recommended over the other two.

During the draft stage of the EIS, the number of historic architectural resources associated with each alternative varied from four to seven properties. The preliminary cultural resources study results indicated that the Preferred Alternative and Alternative 1 included the fewest historic buildings and structures at four, whereas Alternative 2 had the most, at seven.

Upon closer examination of the location of these properties in relation to the alternative footprints, topography, and engineering concerns, the Preferred Alternative would have the least impact to historic buildings and impact the same number of archaeological sites as the other alternatives. Furthermore, because of their location at the edge of the alternative, the alignment was adequately reduced in width, so no direct impacts to historic architectural resources would result. During the draft stage of the study, alternatives that represented new alignments were 750 feet wide, approximately three times the width necessary to construct a four-lane divided highway. In areas resulting in minimal amounts of cut and fill, this generous width provided a buffer for indirect effects and enabled flexibility within the alternatives. The narrower final alignment can be located by shifting it within the larger, wider preliminary alternative to avoid sensitive resources.

The final alignment of the Preferred Alternative has been centered between the Schmitz Barn to the west and the Maries Valley Farm Hatchery to the east. Due to minimal amounts of cut and fill needed in this particular area, the Preferred Alternative has been reduced to a corridor width of 500 feet between the two buildings, which is almost twice the width required to accommodate the proposed facility. The alignment width may shrink even more as it advances to the design stage and more engineering details are developed. In Vichy, the highway improvements were shifted to the west to avoid the Normal & Business Institute and the old county school. The entire parcels with these buildings lie outside the Preferred Alternative. Both MoDOT and SHPO believe this alignment could be built without affecting the historical qualities or character of these historic properties, and therefore consider these historic buildings beyond the area of potential effects. The number of identified historic properties located within each alternative following Phase 1 archaeological investigations and modifications made to the Preferred Alternative between the draft and final stage of the EIS are illustrated in Table 24.

Table 24. Adverse Effects to Historic Properties by Alternative (Final EIS Stage Assessment)

| Alternative | Associated Historic Architectural Resources | Associated Historic/Prehistoric Archaeological Sites | Historic Properties Adversely Affected |
|---|---|---|---|
| Preferred | 0 | 1 | 1 |
| Alternative 1 | 4 | 1 | 4 |
| Alternative 2 | 7 | 1 | 6 |

In contrast to the Preferred Alternative, Alternative 1 and Alternative 2 would likely have adverse effects on historic architectural resources. Historic properties are located near the center of both alternatives; therefore, the final location of the highway within these alternatives cannot be as easily adjusted to avoid these buildings. The Westphalia Bridge, located at the extreme western edge of Alternative 1 could be successfully avoided; however, the remaining identified historic properties associated with that alternative—the cluster of buildings Luebbert Farm, the Bauer Log House, and the Johannesmeyer Log House—would be directly impacted and adversely affected.

Alternative 2 has the potential to adversely affect seven historic architectural resources; therefore, it would have the greatest impact on historic properties. Besides impacting four historic properties associated with the two other alternatives, Vichy Normal & Business Institute, Vichy Public School, Bauer Log House, and Johannesmeyer Log House, Alternative 2 impacts three additional properties in Westphalia: the Castrop Barn, Bure Farm, and the gas station.

**Why would archaeological site 23MS12 not be considered a Section 4(f) resource?**

While site 23MS12 is considered significant and eligible for the NRHP, Section 4(f) applies to an archaeological site only when the site must be preserved in place. Since the significant information from site 23MS12 can be preserved by excavation, it does not fall under the requirements of Section 4(f).

Through Westphalia, Alternative 2 is centered on the existing alignment and is already reduced in width compared to the other two alternatives in the region. Designing the improvements to the west could avoid the three historic properties east of the existing highway in Westphalia, but would create other environmental impacts.

Further assessments, such as costs and engineering requirements, would be addressed by a Section 4(f) Evaluation if adverse effects to historic properties could not be prevented. Section 4(f) of the Department of Transportation Act is introduced in Chapter 2 and included in the preceding Public Lands discussion and included in Appendix G.

**How would the project affect Section 4(f) historic resources?**
Because the Preferred Alternative involves no known historic properties that must be preserved in place, no Section 4(f) resources are associated with it. Historic buildings have been avoided by reducing the width of the Preferred Alternative, whereas the other alternatives do not present that option.

What are Section 4(f) resources?

A Section 4(f) resource could be a public park, recreation area, wildlife or waterfowl area, or a historic property. When 4(f) resources are involved in federally funded MoDOT projects, alternative alignments must be considered to minimize or eliminate adverse effects to 4(f) resources. Section 4(f) prohibits federal transportation agencies from using 4(f) resources unless there is no "feasible and prudent alternative" to the use of land and the action includes all possible planning to minimize harm. Section 4(f) Evaluations explore avoidance alternatives to determine if there are feasible and prudent alternatives that avoid historic properties.

Had an alternative other than the Preferred Alternative been selected and had adverse effects on historic properties to preserve in place, a Section 4(f) Evaluation addressing them would have been necessary

## Energy Impacts

Energy impacts refer to the effect that each alternative has on energy use and consumption. There are two types of energy impacts measured. The first is energy spent on constructing the facility, and the second is the energy spent in long-term operation.

Initially, the No-Build Alternative would use less energy than the build alternatives because there would be no construction energy costs. However, the No-Build Alternative may use more energy than the build options in the long run due to slower speeds, stop-and-go-traffic, and other traffic delays that are typical of the existing facility. Since all of the 'build' alternatives are on new location, they would require roughly similar energy in construction and operation.

## Construction and Utilities Impacts and Traffic Management

This section gives an overview of how MoDOT would manage traffic in construction zones and how the construction activities would affect the study area. Most likely the study area would be divided into smaller projects and construction would occur at different times. For the most part the traffic management and construction plan would be similar for each project. The No-Build Alternative will not be discussed because this alternative would not have any construction activity impacting the study area.

A bulldozer clears trees and brush for the Route 5 project in Camden County.

**What would be the first order of work during construction?**

Once the contractor gets the "Notice to Proceed" with construction of a project, the first task is to set up work zone signing. If the new alignment construction were parallel to the existing highway, there would be minimal traffic disruptions, with the exception of trucks entering and leaving the construction area, either to move equipment or to haul material in and out of the site.

The first major order of work is clearing the land, followed by earthwork. Most land clearing operations can be done without any disruptions to traffic. Trees that are potential roosting trees for the endangered Indiana Bat are marked and cut down between October 1 and March 31. Logging is possible and may be done by MoDOT contract, by the contractor, or by agreement with property owners. MoDOT attempts to make sure the usable timber is not wasted. The remaining trees would be removed by bulldozing.

**What would the effects be from land clearing operations?**

Clearing trees and stumps would require the use of heavy equipment such as bulldozers. A section of land between the limits of roadway construction would be cleared to bare earth to allow for excavating material and fill.

Smoke from burning trees, exhaust and noise from the dozers at work are some of the impacts that would be encountered during this phase of construction. These impacts are temporary and work can be completed usually in a few months. While the land clearing operations are taking place, the contractor may perform subsurface investigations to confirm rock layers.

**How would waterways be protected during the land clearing operations?**
Because the landscape is reduced to bare earth, erosion control measures must be put in place as the land clearing operations proceed. Erosion and sediment control may consist of a combination of ditch checks, silt fence, berms, sediment basins, temporary seeding, dams, slope drains, etc. The use of these erosion control measures is dependent upon the type of soil encountered. Sand and silt is easier to remove from suspension than clay. Clay is less erodible but once in suspension is more difficult to remove. The inspector/engineer needs to review the soil sheets and soil report for the project to apply the most effective Best Management Practices.

The following describes MoDOT's best management practices used in most land clearing operations.

**Ditch Checks**
Flow velocities increase as ditches become steeper and longer. Ditch erosion is controlled by widening ditches, flattening ditch grades, or by application of proper ditch protection such as mulch, sodding, ditch checks, erosion control blanket, rock ditch liner and paved ditches.

Silt fencing is most effective to control sheet erosion along the edge of the right of way where runoff from erodible fill could go onto adjacent property or into an adjacent stream.

**Silt Fence**
Silt fences or rock dams should be placed around culvert ends to prevent sediment from entering the drainage ditch. However, silt fence should never be placed across the drainage area, as it cannot withstand concentrated flows. Seeding has to be done as soon as possible.

Some examples of temporary erosion control in ditches – silt fence and rock ditch checks are often used depending on the grade of the ditch.

**Sediment Basins, Slope Drains, Berms, Rock Dams**
Various types of slope protection are used and many varieties of products are available. The design of flat slopes, 3:1 or greater, is the most desirable and requires the least erosion control measures. Often right of way costs drive the designer to settle for steeper slopes. If slopes become steeper than 3:1, rock fill may be used to minimize erosion and slides. Rock dams are used at downstream culvert outlets to prevent sediment from entering the stream. These erosion control measures are used mostly to fill areas to reduce the erosion of slopes. Temporary seeding and mulching is also required for effective erosion control.


Slope Protection


Installation of drainage structure

**What happens after the clearing and grubbing is finished?**
After the contractor has finished clearing and grubbing, drainage structures will be put in place and earth moving would begin.

The earthwork portion of the project takes longer than any other phase. Most of the earthwork can be done without disruption to traffic on the existing alignment unless the new alignment crosses the existing highway and trucks have to move material from one side of the roadway to the other. In this case, there would be some disruption to traffic and a flagging operation to stop traffic may periodically occur.
Large earthmovers, bulldozers, dump trucks, and concrete trucks may be some of the equipment moving in and out of the project area. In areas with deep rock cuts, explosives would be used to break up the rock to use in fill areas. While earthwork is moving along, fill for approach ends of bridges would also be constructed. Impacts during this phase of construction would consist of noise and exhaust from equipment and periodic rumblings from the explosives. Contractors usually take care to avoid impacts to nearby homes during blasting operations. Property owners, tenants, and utility companies are notified in advance of any explosives activity. Noise and air impacts are temporary, however, depending on the size of the project, the grading phase could take a full year or more to complete.

**How long after the grading is done would the pavement be placed?**
After the grading work is complete and base material placed, contractors can begin the paving process. MoDOT restricts placement of pavement, depending on the type of pavement selected, during the winter months. Conditions must be favorable for concrete and asphalt curing before material can be placed. Depending on the length of the project, weather conditions, and the type of material selected, the length of time required to complete construction of the paving portion of the project could be several months and can even extend over into a second construction season.

**How would paving operations affect the project area?**
Before paving operations begin, contractors would move in paving equipment. Traffic control would be set up at entry points for trucks hauling either asphalt or concrete. Some contractors set up portable plants in the project area to reduce the cost of hauling material miles from a supplier. Emissions and noise are the most common impacts of the equipment required to build a roadway. All impacts are temporary and would subside as the project is completed

**How would motorists be handled effectively during the construction stage?**
During the design phase of the project, a Traffic Management Plan (TMP) would be developed. A TMP lays out a set of coordinated traffic management strategies to manage the work zone impacts of a road project. Strategies for managing traffic include temporary traffic control measures and devices, public information and outreach, working during low traffic volume hours i.e. staying off the road during peak morning and evening rush hours, if possible, and the use of law enforcement agencies to control traffic speeds.



Various traffic control devices
used in construction work zones.

Generally, the temporary traffic control plan includes the signing for each construction stage required controlling traffic through a work zone, detour plans, if required, and detail of temporary connections. When contractors are ready to tie the new construction in to the existing highway, traffic disruptions would occur and would be handled by a temporary flagger-controlled lane drop. If the construction takes place along the existing highway, reduced speeds would be enforced because of the proximity of the work crews to the highway. Narrow lanes and shoulder drop-offs would be a concern along the roadway edge, requiring special signing along the construction zone.

If the disruption causes severe back-ups, the contractor may stop and perform the work at night. During construction message boards would be placed in each direction to inform travelers of upcoming work or work that is in progress that would require them to change their driving pattern – to be alert and slow down, for example.

Prior to each week's work, a news release is placed in the local newspapers giving locals information that could affect their daily travels. Local radio stations also air traffic related news releases. MoDOT publishes construction-related news releases and information on its Web site at *www.modot.org* for those who have access to a computer and the Internet. Work zone impacts and issues would vary along the project area 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 communities.

**What major utilities would be impacted within the Route 63 study area?**
A number of major utilities exist within the Route 63 corridor. Impacts to the utilities would be similar in nature for each alternative in the reasonable range. Utility costs were not considered in this study as an impact criterion because of the uncertainty of actual impacts to each alternative.

Westphalia, Freeburg and Vienna have a variety of utilities. Telephone, cable, electric, gas and water utilities would be impacted by a through-town alternative. The alternative through the towns of Freeburg and Vienna was eliminated as a reasonable alternative.

Utilities through Westphalia include lighting in town along the highway. The alternative through Westphalia is among the reasonable range of alternatives.

There are two power transmission companies that would have impacts, Central Electric Power Cooperative and Ameren UE. Both companies have transmission facilities that would be impacted.

The impacts could involve moving one or two structures, or raising the existing lines, for each crossing. Central Electric also identified a substation that is close to the corridor, but the corridor is just north of the substation.

There are two major pipelines that cross the corridor. The impacts to these pipelines may require changes in depth of the existing lines.

Other utilities that would be impacted are distribution lines of the electric, water, sewer and communication companies that serve the local area. These lines would require adjustments to be made to accommodate the new roadway.
Once the final location of the roadway is established within the corridor and the final grades are established, coordination with the utility companies would be made to ensure utility services to the local area is continued.

This recent improvement through Vichy required several major utility adjustments. For a 6.5-mile section of highway the utility costs were estimated to be $1,960,000. That's about $300,000 per mile.

**Railroads**

The railroad line, which runs in an east/west direction through the town of Freeburg, was originally owned by the Chicago, Rock Island, and Pacific Railroad. Most of the local citizens refer to the railroad as the Old Rock Island, even though Ameren UE currently owns the railroad line. The name of the railroad is the Missouri Central Railroad, which is a subsidiary of Ameren UE. Officially this part of the railroad line is out-of-service, but it has not been abandoned.

The alternatives that bypass Freeburg on both the east and west side of town would both cross the railroad line. Neither alternative would impact the railroad tunnel, which is inside the city limits of Freeburg. There are four scenarios when a road meets an existing railroad line that has not been abandoned: 1) Bridge the road over the railroad, 2) Bridge the railroad over the road, 3) Build an at-grade crossing, and 4) Pave over the existing tracks and sign a legally binding agreement that MoDOT would provide access from one side of the road to the other, if the railroad line is to become active again.

The costs associated with all of the above mentioned options are not able to be determined at this time. However, the costs and impacts associated with either the east alternative or the west alternative would be the same, unless there are some unknown extenuating topographical circumstances. As the project progresses a more detailed evaluation of the specific options would be needed.

## Indirect and Cumulative Impacts

Indirect and cumulative impacts can be positive or negative depending on the environmental impact of the resource being evaluated. This section will analyze the indirect and cumulative impacts of the proposed project on the community, threatened and endangered species, water quality (encompassing streams and wetlands), and cultural resources. These issues are discussed because they have the greatest potential to be affected by the project. The study team has determined that this project when combined with other past, present, and reasonably foreseeable future projects will have minimal cumulative or indirect impacts on the other resources evaluated in this document.

Indirect impacts are caused by the project and are later in time or farther removed in distance than direct impacts, but are still "reasonably foreseeable." Consider the construction of a new highway on what is now farmland. With increased access to this rural area, developers build new residential developments, and new houses increase demand on water supplies. The construction of the homes and increased water consumption are not directly caused by road construction, but rather are indirect impacts.

Indirect and Cumulative Impacts.

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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.

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: homes were acquired for the original construction. This next improvement to the route would result in yet more homes being acquired.

**Community Impacts**
This section analyzes the potential indirect and cumulative impacts of the proposed project. The area of analysis includes the cities of Westphalia, Freeburg, Vienna and Vichy. This section will analyze the indirect and cumulative impacts of the proposed project on land use, traffic patterns, wildlife habitat, and wetlands. These issues are discussed because they have the greatest potential to be affected, indirectly or cumulatively, by the project.

**Why do we look at existing conditions and development trends?**
When considering a project's indirect and cumulative impacts, it is important to understand past and current conditions of the natural and built environment, and use these observations as a point of reference for assessing the project's potential effect on a particular natural or cultural resource. The following discussion sets the stage for understanding current conditions and development trends in areas that may be affected, indirectly or cumulatively, by the project.

**Description of development in Osage, Maries and Phelps Counties:**
The majority of each of the counties development has occurred within the cities identified along the corridor. Outside of these population centers, residential uses primarily located along major and minor roadways with a few commercial uses located mostly at the intersections with Route 63.

It is clear that Route 63 has influenced land development patterns in the immediate area for some time. In general, the primary land uses that surround the existing route include low-medium density commercial and low-medium density residential.

**What are the indirect impacts?**
The No-Build Alternative would not involve any expansion of the existing system. Under this alternative, traffic backups would likely increase over time along streets and intersections within the cities along the corridor. This may indirectly affect the travel patterns of people living in the vicinity of Route 63, as they try to avoid the areas of congestion. However, it does not appear that the effect on traffic patterns would be significant.

There is the potential for some increase in certain air pollutants over time such as particulate matter, because of increased traffic congestion. Overall, the No-Build Alternative would not have a significant indirect impact on land use, businesses, traffic patterns, farmland or wetlands.

Alternative 1 would require the relocation of only two businesses along its entire length. It is highly likely that all of these businesses would relocate in the general area since the area is primarily rural with plenty of undeveloped property. With this alternative induced business growth would most likely occur, if at all, at intersections with Route E, JJ and Route 42. These businesses would likely be travel-oriented businesses, but these locations could be ideal for new business growth that would benefit from access to a new four-lane highway.

Alternative 2 would require the relocation of 28 businesses along its entire length. The greatest numbers of these are located on existing Route 63 in Westphalia. These relocations would be reduced during the design phase of project development. Whatever the end result of relocations will be, it is likely that most of these businesses would relocate in the general area since there is ample undeveloped property. Because this alternative makes use of existing Route 63 in numerous locations, it has the greatest probability of indirect impacts caused by relocated businesses or new business development. As with all of the alternatives, business growth would most likely occur, if at all, at intersections with other state routes. These businesses would likely be travel-oriented businesses. But as with Alternative 1, these locations could be ideal for new business growth that would benefit from easy access to a new four-lane highway.

The Preferred Alternative would require the relocation of 15 businesses along its entire length. The greatest numbers of these are located on existing Route 63 in Vichy because of the larger width of the study corridor in comparison to the final roadway width. These relocations would be substantially reduced during the design phase of project development. Whatever the end result of relocations will be, it is likely that most of these businesses would relocate in the general area since there is ample undeveloped property. As with all of the alternatives, travel-oriented business growth would most likely occur, if at all, at intersections with state lettered Routes T and P, and Route 42. These locations could be ideal for new business growth that would benefit from easy access to a new four-lane highway.

The vitality of the cities as an indirect impact of being bypassed is assessed in terms of effects on their economies, which would be measured by revenues lost from diverted travelers. At first glance, the relocation may be a concern for all local businesses because it may allow potential customers to bypass their stores. However, the MERIC study shows that the majority of customers are local residents. In addition to this, a safer highway with faster average speeds will likely draw new businesses to these communities.

Additional studies on bypasses have suggested that, for the most part, bypasses seem to have favorable impact on rural communities and small urban areas but evidence in these studies is often weak. In these studies, interviews and surveys of residents and businesses indicate that bypasses increase development potential along the fringe areas served by the new route, and at the same time relieve congestion, safety hazards, and other undesirable conditions in the central areas from which traffic is diverted. In most cases, adverse effects on otherwise viable bypassed businesses appeared to be largely recouped by improved ambiance for patrons and residents in the community, although individual businesses may suffer when a new bypass is opened. A summary of the results reveals several contributing factors to the economic growth in a community following route relocation. Increased traffic flow, short distance from the interchange (typically within 10 miles), growing community population, nearness to major urban centers, prior economic development, and nearness to the next interchange are all important attributes correlating with economic growth.

**Summary of indirect impacts for all three-build alternatives**

If new or relocated businesses do develop around these intersections, that would cause conversion of farmland, pasture and other natural resources to another use. Residential relocations should not be an issue since there should be enough open, developable property at each intersection. On the other hand, it is probably more likely that new residential development would occur near these intersections or even county road intersections because of shortened travel times to work locations such as Jefferson City.

Access, in some manner, would be maintained to cities where the new route is relocated either east or west of its present location. Consequently, it is uncertain how much indirect growth would occur. Further, analysis revealed that every business studied in each community had over 60 percent of its customer base located within 30 miles. This finding is according to a study to determine business impacts caused by relocating Route 63, conducted by the Missouri Economic Research and Information Center of the Missouri Department of Economic Development in partnership with MoDOT (Appendix E). Thus, traffic pattern changes may cause only a small number of drivers to switch the location for their gas or meal purchases. But there may not be enough change to sustain a businesses relocation or development of at least additional travel-oriented businesses.

**What are the cumulative effects?**

During the Public Hearing comment period and the writing of this document, neither local officials nor the Meramec Regional Planning Commission reported planned development along the corridor, which would contribute to cumulative impacts.

Thus far it has been deduced that cumulative impacts to the communities, as a result of past development activity are limited to residential and business relocations. These relocations were minimal given the small cities and rural nature of this corridor.

The No-Build Alternative would not affect existing communities and, thus, would not result in a cumulative impact on the community and neighborhoods.

Alternative 1 would require the relocation of twenty-eight residences, and two businesses. The proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. Nor, with the rural nature, would there be any significant impact to the cohesive nature of any community. There would also be a very small cumulative effect on the tax base of each county.

Alternative 2 would require the relocation of thirty-eight residences, and twenty-eight businesses. The proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. However, since this alternative proposes improvements to existing Route 63 through Westphalia and other sections, the cumulative impacts to that community and the corridor in general would be greater. There would also be a very small cumulative effect on the tax base of each county.

The Preferred Alternative would require the relocation of twenty-seven residences, and fifteen businesses. As with the other Alternatives, the proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. However, since this alternative proposes improvements to existing Route 63 through Vichy the cumulative impacts to that community would be greater. There would also be a very small cumulative effect on the tax base of each county.

**Threatened and Endangered Species**

**Would the project impact the Indiana bat?**
When considering cumulative effects to Indiana bats the entire state needs to be considered because the entire state of Missouri is considered potentially suitable breeding habitat for the species. Since this species roosts under the bark of trees during the breeding season, loss of forested habitat could have a negative affect on this species. It would be impossible to determine every past, present, and future activity across the entire state that involved tree clearing, so this discussion will be general. The Preferred Alternative for this project involves clearing 1,475 acres of forested land.

According to Frances Main in an article in the February 2007 issue of the *Missouri Conservationist* magazine, there were 14.5 million acres of forestland in the state of Missouri in 2005. So, this project would involve clearing less than one thousandth of a percent of the forested land in the state of Missouri. By itself that should not have an impact on this species. But when combined with all of the other tree clearing that has happened in the past, is currently happening, and is planned for the foreseeable future within the state, that percentage increases significantly.

Main states that there were 12.9 million acres of forestland in the state of Missouri in 1972 compared to 14.5 million acres in 2005. So the amount of forested acres in Missouri is actually increasing, which would indicate that the amount of potentially suitable breeding habitat available for this species should also be increasing. However, this species uses large, oftentimes dead or dying trees and there may not be as many of these types of trees now as there were in the past. Mains' concern is not that the amount of forested land is shrinking; rather it is that the average size of forested plots is shrinking. In other words there are more small patches of fragmented forestland and less large tracts of unfragmented forest. This does not necessarily impact Indiana bats since they do not rely on large tracts of forested land, but it could impact forest interior species such as many migratory songbirds.

Also, MoDOT and the MDC have started a program called "Trees for Tomorrow." Under this program, MoDOT purchases a half million trees every year and MDC distributes them to youth groups around the state to plant. These are small trees that would not provide suitable bat habitat for many years, but the program is helping to assure that there would be forested land in Missouri for years to come.

None of the three alternatives for this project should result in any noticeable indirect impacts to the Indiana bat. This project does not have a noticeable increase or decrease to the cumulative impacts to the Indiana bat.

**Would the project impact the Niangua darter?**
The project involves two river crossings. Both of these rivers have rare aquatic species in them. The Niangua darter is found in the Maries River and three rare mussel species and one rare amphibian, described in Threatened and Endangered Species and Unique Natural Communities Section, are all found in the Gasconade River. All of these species are sensitive to sedimentation in the waterways where they live. Any in-stream activities, such as bridge construction can destroy habitat and increase sedimentation in a waterway. MoDOT implements Best Management Practices when working in streams to minimize the amount of sedimentation created by its projects. The impacts from any of the three alternatives for this project alone should be minimal and short term. However, when combined with all other past, present, and future activities occurring in these watersheds, they could become more noticeable

**How would the habitat fragmentation impact the different species?**
Habitat fragmentation has negative impacts on many species. Much of the forested habitat in Missouri has previously been fragmented by the development of housing, industry, and other related infrastructure as well as intensive agriculture and forestry. All three alternatives for this project would result in more fragmented habitat. It is difficult to compare the impacts of the different alternatives since different species require different amounts of unbroken habitat for survival. In other words, fragmenting a 100-acre parcel of forest may have a negative impact on some species but not on others. The configuration of the remaining parcels may influence the extent of impact on some species. Since all three alternatives result in more habitat fragmentation, there is no detectable difference in the cumulative affects created by them. However, MoDOT did alter the preferred alignment slightly in some places to reduce fragmentation.

**Water Resources**

The three alternative alignments intersect three 8-digit hydrologic unit code (HUC) watersheds, the Lower Osage River Watershed, the Lower Gasconade River Watershed, and the Bourbeuse River Watershed. The Preferred Alternative lies within the Lower Osage River Basin from its starting point to just north of Route AA. South of Route AA, the Preferred Alternative lies in the Lower Gasconade River Basin to Highway 28. From this point, the Preferred Alternative traverses in and out of the Lower Gasconade and Bourbeuse River Basins and winds along the ridge top to the county line where it re-enters the Lower Gasconade River Basin all the way to Rolla, Missouri.

**What would be the cumulative effects on wetlands?**

The spatial presence of water resources varies significantly across the corridor, as the alignments traverse ridge tops where ponds are more prevalent and crosses lowland areas where streams, rivers, and wetlands are more common. According to the NWI database, the predominant water resources represented in the three watersheds are streams and rivers, forested wetlands and ponds (Table 25). As one might expect, corridor improvements have the greatest impact to these three most prevalent water resources types (Table 26).

Table 25. Wetland Resources by Type in Each Watershed Basin

| Type | Lower Osage | Lower Gasconade | Bourbeuse River |
|---|---|---|---|
| **Emergent (acres)** | 294.22 | 604.96 | 268.30 |
| **Forested (acres)** | 4305.24 | 3683.6 | 1105.28 |
| **Scrub Shrub (acres)** | 358.35 | 49.98 | 128.73 |
| **Ponds (acres)** | 2954.38 | 2519.2 | 4939.18 |
| **Riverine (acres)** | 2068.68 | *n/a* | 2205.35 |

| Table 26. Percent of Wetland Impacts in Each Watershed Basin | | | |
|---|---|---|---|
| **Preferred Alternative** | | | |
| **Type** | **Lower Osage River Basin (%)** | **Lower Gasconade River Basin (%)** | **Bourbeuse River Basin (%)** |
| **Ponds** | 0.255% | 0.041% | 0.030% |
| **Emergent** | 0.122% | 0.028% | 0.037% |
| **Scrub Shrub** | 0.000% | 0.000% | 0.000% |
| **Forested** | 0.000% | 0.532% | 0.000% |
| **Riverine** | 0.000% | 0.000% | 0.000% |
| **Alternative 1** | | | |
| **Ponds** | 0.066% | 0.265% | 0.033% |
| **Emergent** | 0.054% | 0.076% | 0.037% |
| **Scrub Shrub** | 0.000% | 0.000% | 0.000% |
| **Forested** | 0.070% | 0.532% | 0.000% |
| **Riverine** | 0.019% | 0.000% | 0.000% |
| **Alternative 2** | | | |
| **Ponds** | 0.152% | 0.114% | 0.000% |
| **Emergent** | 0.119% | 0.017% | 0.000% |
| **Scrub Shrub** | 0.000% | 0.000% | 0.000% |
| **Forested** | 0.000% | 0.532% | 0.000% |
| **Riverine** | 0.000% | 0.000% | 0.000% |

The national goal set by the FHWA for wetland compensation is to construct 1.5 acres of wetland for every 1.0 acre of wetland impacted. Compensating for wetlands at this ratio helps to offset the lost beneficial functions during the time it takes for a wetland to develop. Over the past two years, MoDOT has replaced wetlands at an average compensation ratio of 3:1. Overall, the impacts associated with any of the alternatives as compared to the amount of resources in the watershed, appear to be minimal.

After significant fieldwork, the actual amount of wetlands and ponds impacted greatly decreased in Preferred Alternative. Therefore, the percent of wetlands and ponds impacted in the watershed also decreased.

**What types of land use have impacted water resources in the past and present?**
Historical and recent land use impacts for all three watersheds include farming, grazing, mining, sand and gravel operations, and logging. According to MDC's watershed impact assessments, using the Army Corps of Engineer's Regulatory Analysis Management System database, the Lower Gasconade River basin had high densities of permitted sand and gravel sites. The Bourbeuse River basin in Gasconade and Phelps counties has one or two operations with a 30- to 40 year history of commercial sand and gravel mining (Michael Smith, personal communication). A few permitted gravel mine operations are present within the Lower Osage River basin; however, gravel mining from streams within this watershed is an ongoing, largely unregulated cumulative activity with serious natural resource consequences to biota and geomorphology. Other recent land use impacts to water resources within the Lower Osage River include a high density of Confined Animal Feeding Operations (CAFOS).

All three watersheds are predominantly rural areas with low population densities and high farmland/pastureland densities. In comparison across all three of these basins, the current rate of water resource loss/degradation is likely to be similar and directly related to typical land use activities such as logging, grazing, burning, row cropping, and development. It appears that the primary consequences of constructing any of the three alternatives are the stream channel impacts resulting from the project footprint.

Indirect impacts to stream resources could include increased sedimentation and in-stream habitat degradation. Based on the influences of historic and current land use within these basins, the construction of the new facility should not significantly alter the functional capacity of the water resources beyond their current condition. The proposed project would not have significant indirect impacts on the water resources within these basins based on the minimal systematic effects that are expected to occur. In addition, the project will not have a noticeable increase or decrease to the cumulative impacts.

**Cultural Resources**
The project is likely to indirectly affect both historic and prehistoric archaeological sites. Such impacts develop in the area because of the project that have greater impacts to sites over a larger area. Changes in communities and their structure are likely to further affect cultural resources negatively.

The project is not likely to have indirect or cumulative effects to historic buildings already bordering the existing highway. Because the alignment would remain virtually the same in relation to adjacent historic buildings, there is little change to the site or setting of these properties.

In contrast, new alignments near historic buildings have greater potential to create changes in the surrounding area and possibly the use of these properties. Because alternatives in this corridor study are fairly wide, they enable immediate indirect and cumulative impacts to be considered early in the planning stages.

Each alternative has a footprint encompassing more area than necessary, sometimes twice to three times as much, to construct the new alignment and thereby allow room for adjustments. This additional width affords some flexibility for determining the final location of the selected alternative within the broader alternative boundaries and therefore enables efforts to minimize project effects to adjacent historic resources. By shifting the alternative to one side or another of this broad band and away from the historic property at the early stages of the project, it is often possible to avoid impacting them, while simultaneously reducing indirect and cumulative impacts.

Future indirect and cumulative impacts are more difficult to accommodate given their unpredictable nature, especially when the project's construction lacks funding and the design year is unknown. With time being an unknown factor, it is difficult to assess how the project would influence or be influenced by the broader development patterns and changes in the area. It is possible that by the year the project is built, the historic resources may no longer be present, or different historic properties may be identified.

Indirect and cumulative impacts could have positive effects on historic buildings and promote historic preservation in the sense that the project could make them more visible and perhaps more accessible. Bringing motorists closer to them would improve their view, enabling them to be better seen and appreciated. Greater accessibility to the highway may yield higher commercial potential and market value for the historic buildings. These factors may encourage re-use of otherwise abandoned or vacant old buildings and reduce investment risks.

Historic properties in the vicinity of the project area appear to have benefited from recent highway improvements, especially considering the timing of their transformation in relation to the transportation project. Victorian brick houses at three farms bordering the new Route 50 and Route 63 interchange are less than one mile north of this study corridor. They began to show signs of improvement following MoDOT's plans to build the highway interchange. The first of these to reveal noticeable exterior restoration work in the late 1990s now welcomes guests traveling on Routes 50 and 63 while promoting historic preservation in its new role as a historic inn, Huber's Ferry Bed and Breakfast.

MoDOT began its cultural resources investigations for the Route 50/63 interchange project in 1995, Huber's Ferry Farmstead became a B&B and was listed on the National Register in 1998, and the interchange was completed in 2002. The proximity of the interchange project to the farmhouse had no adverse effects to it and the indirect or cumulative effects appear to be favorable.

The area's land use has changed somewhat over the past decade with more residential or suburban development near the new interchange, but the grounds surrounding the historic properties continue to provide some buffer to these encroachments, while these and neighboring parcels increase in value. During field consultation in the Route 63 corridor, MoDOT Historic Preservation staff and the SHPO concurred that historic and potentially historic buildings associated with the alternative ultimately selected as the Preferred Alternative could be avoided so none would be adversely affected by the project. As a result of reducing the width of the Preferred Alternative (see Chapter 3) the distance between the alignment and the buildings increased, thereby reducing potential indirect and cumulative impacts.

**Would the project impact any historic properties or archaeological sites?**
MoDOT's cultural resources investigation (April 2009) identified one historic property and 63 prehistoric sites that are associated with the Preferred Alternative. One site (23MS12) has been determined to be eligible for the NRHP and the Preferred Alternative would affect it. Seven additional sites are potentially eligible but are of unknown status. Fifty-two of the sites have been determined not eligible for the NRHP. During the draft EIS when the project area was larger, additional historic or potential historic properties were identified, including four buildings at the edge of the alternative that become the Preferred Alternative. As a result of project modifications to minimize impacts, including indirect and cumulative effects, the width of the Preferred Alternative was reduced and the buildings are no longer located within or as close to the alignment as they were during the draft EIS stage. Because all the buildings likely to fulfill NRHP eligibility criteria are associated with alternatives other than the Preferred, or located outside the Preferred, none will be impacted by the project and is considered outside the area of potential effects.

This includes two buildings that were previously determined eligible for the NRHP and are already located beside the existing Route 63 facility at Vichy, the former Vichy Normal & Business Institute and the Vichy Public School.

The other two buildings, a vacant barn and former chicken hatchery, are located outside a proposed realigned segment in the Westphalia area. During preliminary studies when the alternative was broader, MoDOT identified the barn at the former Schmitz Farm as the only potential historic building at the property. At that phase of the study, the proposed alternative did not impact the barn, but impacted an associated outbuilding at the farm. Since that time, the alignment has been reduced in width to avoid impacting any buildings at the farm and thereby reducing indirect effects to the complex. The fourth historic building, a former chicken hatchery, is currently used as a storage building. The barn and hatchery are located on nearby parcels at opposite sides of the Preferred Alternative. The proposed highway would be situated between the barn and hatchery, avoiding direct impacts to both.

Because these four buildings are no longer located within the Preferred Alternative or no longer associated with other buildings that are located within the Preferred Alternative, they are not considered within the area of potential effects. This assessment, additional information about these properties, and information regarding 53 properties with architectural resources in the area of potential effects was submitted to the SHPO on April 29, 2009. On May 19, 2009, the SHPO commented that MoDOT had conducted a thorough and adequate cultural resources survey of the project area and concurred with the results of the study.

A copy of the Cultural Resources Technical report is available upon request.

## Visual Impacts

Federal legislation took its first notice of highway esthetics by protecting scenic road and parkway views. The significance of the view of the road began to emerge with the Historic Preservation Act of 1966. This act directs all federal agencies to account for the efforts of proposed projects on historic resources. NEPA applied environmental awareness policies to all types of federally supported projects and all types of project settings. It directs that we carefully consider existing visual resources which are high in quality and that we enhance the built environment by good project planning and design. This section will address the existing visual qualities of the project area and attempt to analyze the potential impact of a new highway through the adjacent land *(Publication No. FHWA-HI-88-054).*

**What visual qualities characterize the existing landscape?**
The existing Route 63 corridor can be characterized as having underlying landforms of gently rolling hills and valleys interrupted by developments such as towns, houses, farm buildings, and county roads. Route 63 is located along a ridge between two river valleys. The Gasconade River Valley runs along the east side and the Maries River Valley runs along the west side.

Key land use in the area is farming. Most of the farmland consists of wooded areas and open pasture for grazing cattle and hay production. Wooded areas consist mostly of deciduous trees such as oak, hawthorn, hickory, etc. This landscape is typical of many areas throughout Missouri. There are several areas along Route 63 that are more highly visual than others but only in comparison to the rest of the corridor.

Two scenic overlooks are located in the study area. The overlook near Westphalia is located at a roadside park also used as a commuter parking lot. The scene is a rolling hillside and valley with a mixture of wooded areas and open pasture. The other overlook is located at a roadside park between Vienna and Vichy. Its primary scenic characteristic is forested hills and valleys.

Route 63 runs through landscapes that transition from rolling pastureland to steep river valleys to thick-forested hillsides. These landscapes are interrupted by three towns; Westphalia, Freeburg, and Vienna. Vichy and the Rolla National Airport are located south of Vienna. Each town consists of residential areas and business districts. The towns serve those living in residences in the town and those living on farms in the surrounding area. The existing highway is lined with homes and businesses throughout the Route 63 corridor.

Visual quality is evaluated using measures called vividness, intactness, and unity.

- Vividness is the memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- Intactness is the visual integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment.
- Unity is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. (*Publication FHWA-HI-88-054)*

All three measures must be high to indicate high visual quality. Some examples of areas with high visual quality are national parks, scenic rivers, or areas designated by scenic overlooks, the New York skyline, the Grand Canyon, Rocky Mountains or Grand Tetons, Cape Cod etc.

Two locations within the study would be considered to have high visual quality simply because they have designated scenic overlooks and have been categorized as being visually appealing prior to previous highway improvement projects. Some areas near the Gasconade River or Maries River may be considered highly visual, however the scenery is not viewable from the existing highway except at bridge crossings.

**What impact would the alternatives have on the visual qualities of the surrounding area?**

The No-Build Alternative would not alter the existing visual quality of the environment through which Route 63 travels. Since there would be no changes in the horizontal or vertical alignment, the existing visual environment would be left intact and existing scenic views would remain unchanged.

This small section of Route 63 in Maries County has a more vivid and unified view of the surrounding landscape. This scene for a traveler would not be highly intact because of the buildings interrupting the view of the landscape. The landowners view, however, is intact until any future obstacle to the east side of their property interrupts it.

All the remaining alternatives would affect the visual qualities of the existing landscape to some degree in that a new highway would be built through undeveloped land. The quality of the scenery for some landowners would be affected because what is now an uninterrupted view for them would be interrupted with an undesirable man-made feature. "No one wants a four-lane highway in their back yard". Areas that currently have no view of a highway would no longer have an intact visual quality of their surrounding landscape.

Since the landscape consists of rolling hills that can hide man-made features, the visual impact would be different for each landowner. The impact to the visual qualities of the landscape would be greater for the landowners than for the traveling public. The ultimate highway design, a four-lane divided highway, is primarily to move people and goods safely and efficiently through the state as a whole. Travelers along the new highway corridor would most likely be those wanting to get from point A to Point B in a hurry without interruptions to their travel. Four-lane divided highway speeds are typically between 60 and 70 mph. There are no specific scenic views that would inspire a traveler to interrupt their trip.

**How would design features of the highway limit visual impacts?**

The physical characteristics of the corridor put limitations on the design features of the new highway. There may be fewer large rock cuts and long straight stretches of highway because they are not cost effective. Design parameters would be stretched to the limit without affecting safety. There would be stretches of long sweeping curves and hills with grades improving the visual intactness and unity of the landscape. Cuts through rock would be benched and soil slopes can be revegetated with native plants and wildflowers to soften the view of the roadway and reinforce the natural beauty of the area.

The areas of highway that have existing right of way would have similar design features of the existing roadway and the additional visual impact would be slight. Additional bridges at each of the river crossings would have the same clean simple visual lines and general construction as the existing bridges.

## Permits

There are various permits that would be required prior to construction of the proposed improvements. These include a Floodplain development permit, a Section 401 Water Quality Certifications (WQC), a Section 10 permit, and a Section 404 permit.

Water Quality Certification: Required for any project that involves discharge into navigable waters of the U.S., and is linked to the issuance of a Section 404 permit. The State of Missouri has the authority to issue Water Quality Certifications under Section 401 of the Clean Water Act.

Because this project involves the discharge of fill into waters of the U.S., a Section 404 Clean Water Act permit application would be submitted to the Missouri Department of Natural Resources (MDNR), and the U.S. Army Corps of Engineers (USACE) for Section 401 WQC and Section 404 permit issuance, respectively. A complete Section 404 permit application, as determined by the USACE, provides MDNR and USACE the information they need to issue the Section 401 WQC and 404 permit. Water quality conditions included in the certification become conditions of the Section 404 permit. The Section 401 water quality certification is needed to ensure that the state water quality standards are not exceeded by the proposed activity.

The Gasconade River is considered a Section 10 navigable water of the United States from its confluence with the Missouri River, upstream to the vicinity of Arlington, in Phelps County, Missouri. Section 10 of the Rivers and Harbors Act of 1899 regulates excavation, as well as fills, for impacts to those water bodies. All Section 10 navigable waters are also regulated by Section 404 of the CWA. A Section 10 authorization will be obtained concurrently with the Section 404 permit.

## Mitigation

Compensatory stream mitigation costs were calculated based on the cost to participate in the Missouri Conservation Heritage Foundation's Stream Stewardship Trust Fund (SSTF). This cost was estimated at $35.00 per credit during the draft stage. At this time, the cost is $25.00 per credit. Credits were calculated using the MSMM, Adverse Impact Worksheet.

Under the authority of the Clean Water Act (CWA), Section 404 and 401, a permit is necessary for any dredge and fill activities within waters of the United States. A Section 404, USACE permit, and a Section 401, Missouri Department of Natural Resources (MDNR) certification would be needed prior to construction. Impacts to construct the entire Preferred Alternative would require Individual Permit authorization. Final impacts and a mitigation proposal would be required for permit submittal to the USACE and MDNR. Permit application submittal is typically completed during the design phase.

## Commitments

The Route 63 improvement is planned as a four-lane divided highway with a 65 mph design speed**.**

Mass transit facilities, such as commuter bus, subway, and light rail service currently do not exist within the corridor and are not considered to be viable alternatives for consideration.

There are three upgraded sections of Route 63 that have right of way available for a future four-lane divided highway and one section that has been recently widened with improved intersections. The study team agreed these sections of improved highway should be considered as alternatives throughout the study.
The Preferred Alternative will route traffic around the community of Vienna and allow for the use of existing Route 63 as a business route for lake traffic and a connector to Route 28.

The Preferred Alternative will use the recently upgraded segment through Vichy. The existing alignment through Vichy is relatively flat and can be widened to the west for a 5-lane section. To avoid a county owned park in Vichy, the new alignment can be adjusted to fit within existing right of way.

From the Maries/Phelps County line, the existing alignment and roadway can be used and expanded to the west within existing right of way with no additional impacts.

All of the alternatives will require new bridge crossings over the Maries and Gasconade Rivers.

Maintenance of traffic and sequence of construction will be programmed to minimize traffic delays throughout the corridor. A traffic management plan will be developed and implemented during future engineering phases to ensure reasonable and convenient access to agricultural fields, residences, businesses, community services, and local roads during construction. Signs will be used to provide notice of road closures and other pertinent information to the traveling public. Where appropriate, the local news media will be notified in advance of road closings and other construction related activities that could excessively inconvenience the community.

MoDOT will coordinate construction activities, sequencing, and traffic management plans with the county Sheriff's Departments, local fire and emergency services, school districts, and other appropriate organizations to minimize delays during construction.

Erosion control measures will be implemented during construction to prevent sedimentation in the floodplain and streams. Following construction, the areas will be reseeded with a mix of fast-growing grasses. In addition, construction debris will be kept out of the floodplain and river.

If a public water supply well is compromised by highway construction, the well will be properly closed and the public water supply district will be provided a new supply source located at a different place.

Once the final location of the roadway is established within the corridor and the final grades are established, coordination with the utility companies would be made to ensure utility services to the local area is continued.

MoDOT and Osage, Maries, and Phelps counties would need to reach an agreement regarding maintenance responsibilities for any portions of existing Route 63 that would remain in service after construction.

Energy dissipaters will be used at culvert and pipe outlets, where necessary, to minimize downstream velocities, especially in first and second order streams.

MoDOT will conduct periodic reviews of the NHD and coordinate with the USFWS and MDC throughout the design phase of the project to track new locations and further analyze the projects impacts to these species. If it is deemed necessary, MoDOT will have qualified biologists conduct surveys for individual species. If it is determined that the project may impact one of these species, MoDOT and FHWA will conduct the necessary consultation with the USFWS to comply with the Endangered Species Act and to determine what measures can be implemented to eliminate or reduce the projects impacts to these species.

Further field investigation will be necessary to verify these preliminary findings. It is possible that unique natural communities do exist in the study area but to date they have not been identified.

To minimize disruption to turkey farm operations, the new roadway will be designed and constructed as far as possible from turkey barns located within the Preferred Alternative corridor.

**What will happen after the Final Environmental Impact Statement is signed?**
After the Final Environmental Impact Statement (FEIS) is completed and signed, a Record of Decision (ROD) will be drafted as the final step in the EIS process. The ROD will identify the selected alternative, presents the basis for the decision, identify all the alternatives considered, specify the environmentally preferable alternative, and provide information on the processes selected to avoid, minimize, and compensate for environmental impacts.

This project is consistent with the overall goals and objectives of the Statewide Long Range Plan to enhance Route 63 capacity from Iowa to Arkansas. The project is currently in MoDOT's 2010 -2014 Statewide Transportation Improvement Program (STIP) for completion of environmental work and preliminary engineering.

A Transportation Community and System Preservation Program grant has been appropriated by FHWA for preliminary design on this project. Pending receipt of the Record of Decision, MoDOT will apply the grant funds toward the project and continue the next phase of work.