



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 Appendix E.

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.

Demographic data for the entire study corridor, found in Appendix E, consists of eight census blocks. The census blocks provide the best available information concerning demographics. Population density is low because of the rural nature of the area. The census blocks extend beyond the study area.

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 negative effects of the construction of a new Route 63.

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 study corridor is largely rural in character consisting and has low-density residential uses. Residential development, aside from the areas surrounding the towns, is located near Route 63 on state or county roads. 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 town. Therefore, the total residential and commercial relocations would be lessened.

The existing route through the communities of Westphalia, Freeburg, Vienna, and Vichy, other than the area where the Preferred Alternative parallels the existing route, 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 E 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 E 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.

Using the study corridor width of the Preferred Alternative, there would be relocations of the church in Vichy and the Vichy fire department/community center. 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. Construction of this 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 on 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. 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?

Westphalia:

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 E, 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:

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.

None of the alternatives would cause businesses to relocate. Thus, no direct job losses would occur. 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 E 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.

None of the alternatives would cause a business to be relocated. 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 E 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 E 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 E. 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 rolls. 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. These actions are 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 the length of the study 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

Section/ Alternative	Right of Way			Parcels			Relocations	
	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	2,326	495	1,831	320	51	138	38	33

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. 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	\$1.3 million	\$28.4 million
Alternative 2	\$35.8 million	\$1.8 million	\$37.6 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, 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.

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.

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 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.

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 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.

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 these properties. 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 E, 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.

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.

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

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

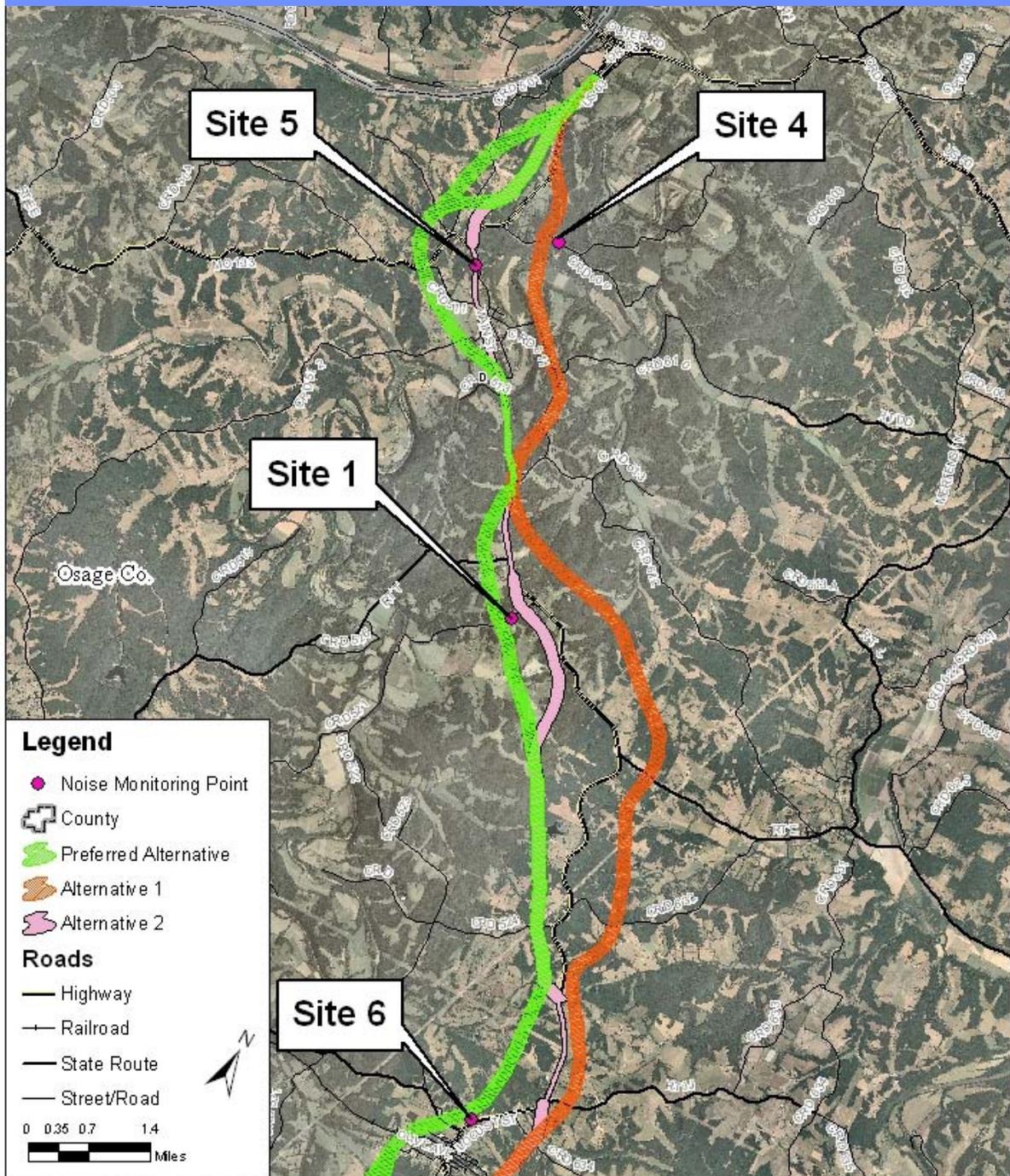


Figure 25. Existing Noise Monitoring Locations – Central Portion

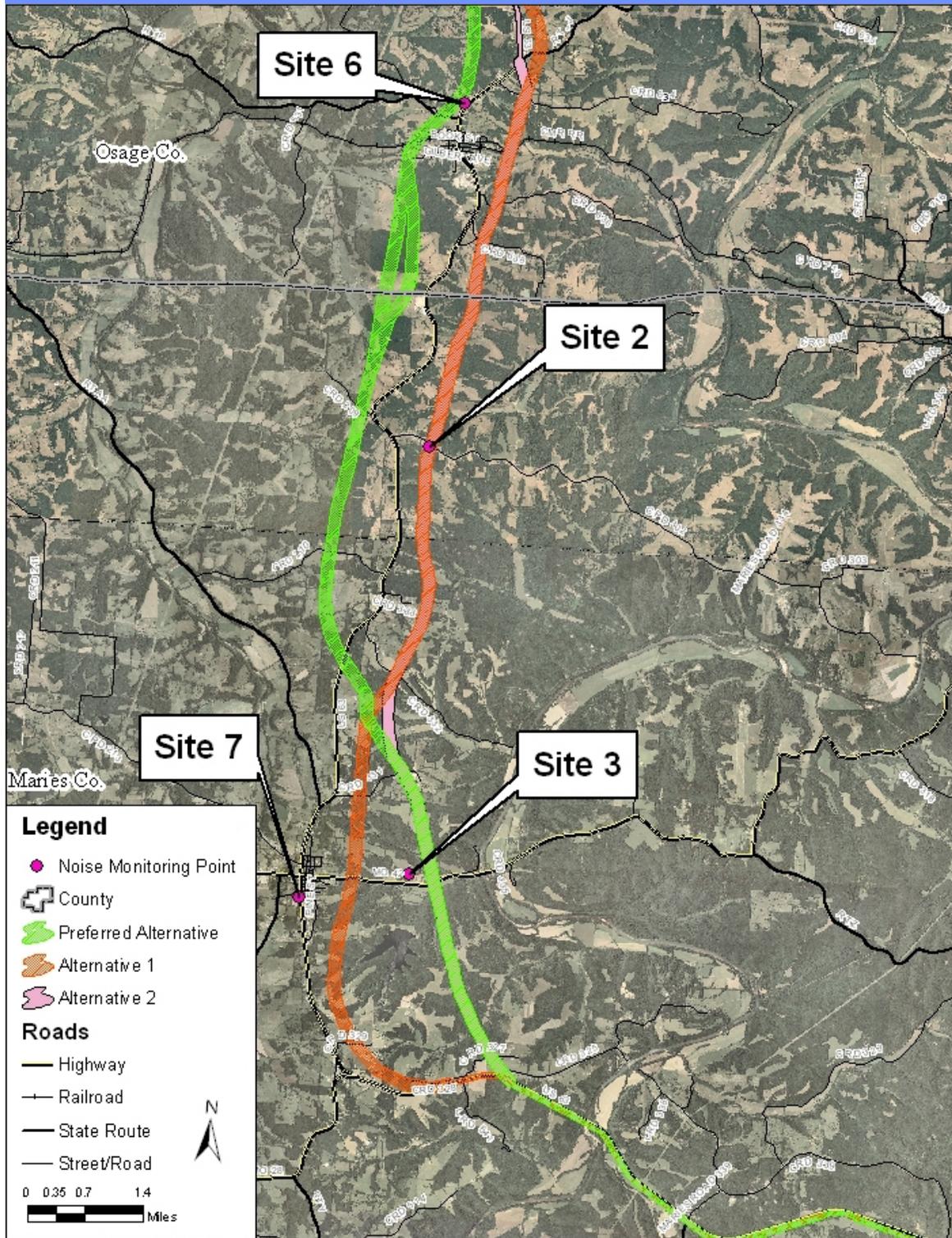
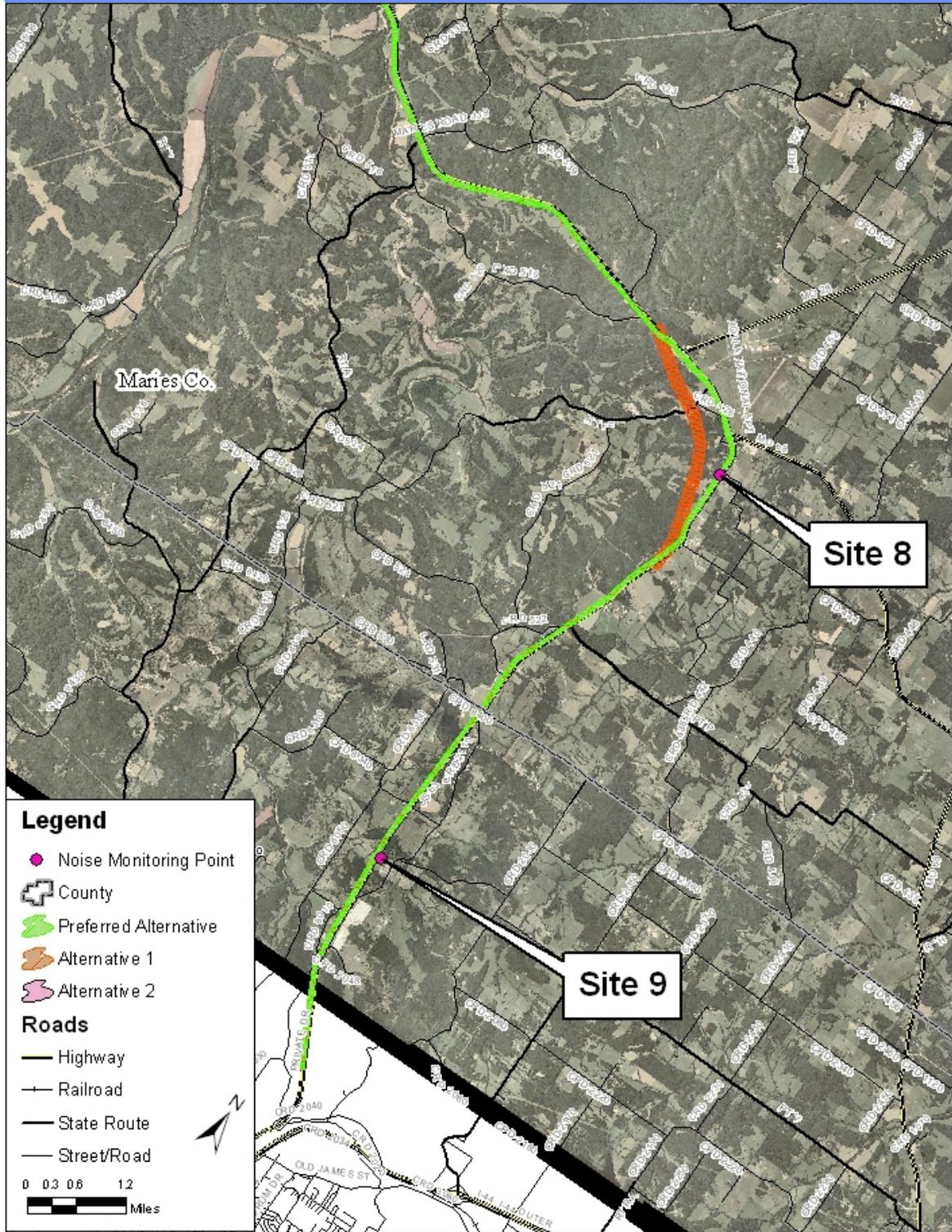


Figure 26. Existing Noise Monitoring Locations – South Portion



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.

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.

Table 13. Range of Distances to Noise Impact Contours from the Highway Centerline (feet)

Route 63 Analysis Section	No Build Alternative		Build Alternatives 1, 2 and the Preferred Alternative	
	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

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

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.

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?

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.