

### What is the Reasonable Range of Alternatives?

Once the study team completed their evaluation of the links and decided which ones were not being carried forward for further consideration, the remaining links were connected to form larger segments and named the Reasonable Range of Alternatives.

Beginning and ending points were assigned to groups of links or segments where they converged to a common point. Sections were created along the corridor corresponding to their geographical location and called the Westphalia Section, South of Westphalia Section, Freeburg Section, Vienna Section, and Vichy Section. The point-to-point segments and their corresponding sections are used as a point of reference in the evaluation of the Reasonable Range of Alternatives.

The Reasonable Range of Alternatives includes the No-Build Alternative along with several build alternatives. The configuration consists of a four-lane roadway divided by a grassed median on new alignments. There are also sections within the reasonable range where the existing roadway can be utilized and widened to a four-lane divided highway with a grassed median (Figures 8 and 9, page 15). The configuration through the communities of Westphalia and Vichy consists of a five-lane roadway.

Prior to the public meetings to present the Reasonable Range of Alternatives, an advisory committee meeting was held to share a summary of the screening process, including how segments were eliminated and the information on the remaining thirty-seven links in the reasonable range. The advisory committee functioned as a “sounding board” for the study team throughout the development of the alternatives. In addition to general guidance from the committee regarding the displays for the upcoming public meetings, the following comments were made regarding the alternatives:

- The Purpose and Need of the study is defeated if the Preferred Alternative goes through towns. Studies have shown that bypasses close to towns will not significantly impact the businesses.
- Use improved sections of existing Route 63.
- Address access issues.

When the Reasonable Range of Alternatives was finalized, the alternatives were presented to the public. In Westphalia, 258 people attended the meeting, and 176 people attended the meeting in Vienna. In addition to the Reasonable Range of Alternatives displays on aerial and topographic maps, the Economic Development study and displays representing Route 63 being widened to five lanes through each town were depicted.

Comments from each public meeting are located in Appendix B-Public Involvement and Meetings.



Public meeting in Westphalia

### What criteria were used to proceed from the Reasonable Range of Alternatives to a Preferred Alternative?

The Preliminary Range of Alternatives Matrix used for moving alternatives forward from the preliminary range to the reasonable range was further modified and renamed the Reasonable Range of Alternatives Matrix (Appendix C). Stream mitigation and right of way costs were added. Ruggedness of terrain and constructability ratings were combined and translated into construction costs.



Route 50 in Moniteau County: an example of "light grading"

The construction costs were derived from MoDOT's Engineering Policy Guide Section 104.7 ([www.modot.org](http://www.modot.org)). The *Cost Estimate Guide for Rural Preliminary Design* includes costs per mile for various grading types (Appendix C).

Two recently bid four-lane divided highway projects in the central district area were used for cost comparison because they had current construction and material costs and similar terrain as in the Route 63 corridor area. One project was located through Cole and Moniteau counties on Route 50 and the other was located in Camden County on Route 5.

The Route 50 project west of Jefferson City, Missouri, had gently rolling hills and relatively flat farmland that required light grading. A lower cost per mile for the Route 63 study was assigned to areas of similar terrain.

In comparison, Route 5 in Camden County, Missouri, had continuous rolling terrain with heavy grading.



Route 5 in Camden County: an example of "heavy grading"

A high cost per mile was used for the Route 63 study on areas with similar terrain. The segments were evaluated, initially assuming a grading type for a whole segment.

After reviewing the construction costs, the segments were re-evaluated to get a more accurate cost, because longer segments could possibly have both light grading and heavy grading along their lengths.

The right of way costs were derived from a cost per mile based on a project with similar right of way impacts, i.e. Route 50 west of Jefferson City, Missouri. Homes, farms and business buildings were located by counting rooftops from aerial maps. Field observations were made to check for accuracy.

Public comments received from the public meetings on the Reasonable Range of Alternatives were considered. Most of the comments throughout the study were divided equally between the east and west alternatives. (Comments from the public meeting can be found in Appendix B.)

When data collection for the Reasonable Range of Alternatives Matrix was completed, the Route 63 EIS study team met to evaluate the new information and determine which links should move forward for further consideration. Collaboration from the study team led to the development of the Preferred Alternative. This resulted in reducing the Reasonable Range of Alternatives from thirty-seven to twenty-one links.

General comments from the study team regarding the selection of the Preferred Alternative are mentioned below. The study team compared the various alternatives in each section.

### **Westphalia Section**

Widening the existing highway through Westphalia was not selected as the Preferred Alternative for the following reasons:

- An abundance of access points along the existing highway through Westphalia can lead to increased crashes.
- Westphalia has the second highest number of crashes in the study area following the City of Vienna.
- Westphalia has the highest traffic volume in the study area.
- There are several public facilities resulting in additional traffic: one public school, one Catholic school, public hall with soccer fields, baseball field, and a retirement center.
- Widening the existing highway to a five-lane section would potentially impact portions of thirteen commercial properties and six residential properties.
- Utilizing the existing highway through Westphalia would not allow for improvements to the steep hill on the north end of town.

The east alternative was not selected as the Preferred Alternative for the following reasons:

- The east alignment requires the removal and replacement of large amounts of earthen material.
- Requires two large bridges in the river valley.
- Does not use existing climbing lanes and right of way on the south end of town.
- Requires the community of Westphalia to use the existing highway instead of the new alignment, unless expensive connections were to be built.
- Construction costs would be higher than the other alternatives.
- Potential impact to historic properties.

### **South of Westphalia Section**

The east alternative was not selected as the Preferred Alternative for the following reasons:

- The longest alternative, thus resulting in more costs.
- Less direct route.

The existing route and connector to the west was not selected as a Preferred Alternative for the following reasons:

- Impacts commercial and residential properties the most.
- Less desirable alignment.
- More costs than far west.

### **Freeburg Section**

The east alternative was not selected as the Preferred Alternative for the following reasons:

- There are more potential historic properties than the west alternative.
- The longest alternative, thus resulting in more costs.
- More access points including public roads.
- Relatively close to the city wastewater treatment plant.

### **Vienna Section**

The near-east alternative was not selected as the Preferred Alternative for the following reasons:

- More relocations than the far-east alternative.
- More length resulting in additional costs.
- Less direct route.
- Less desirable alignment.
- Close proximity to school.

### **Vichy Section**

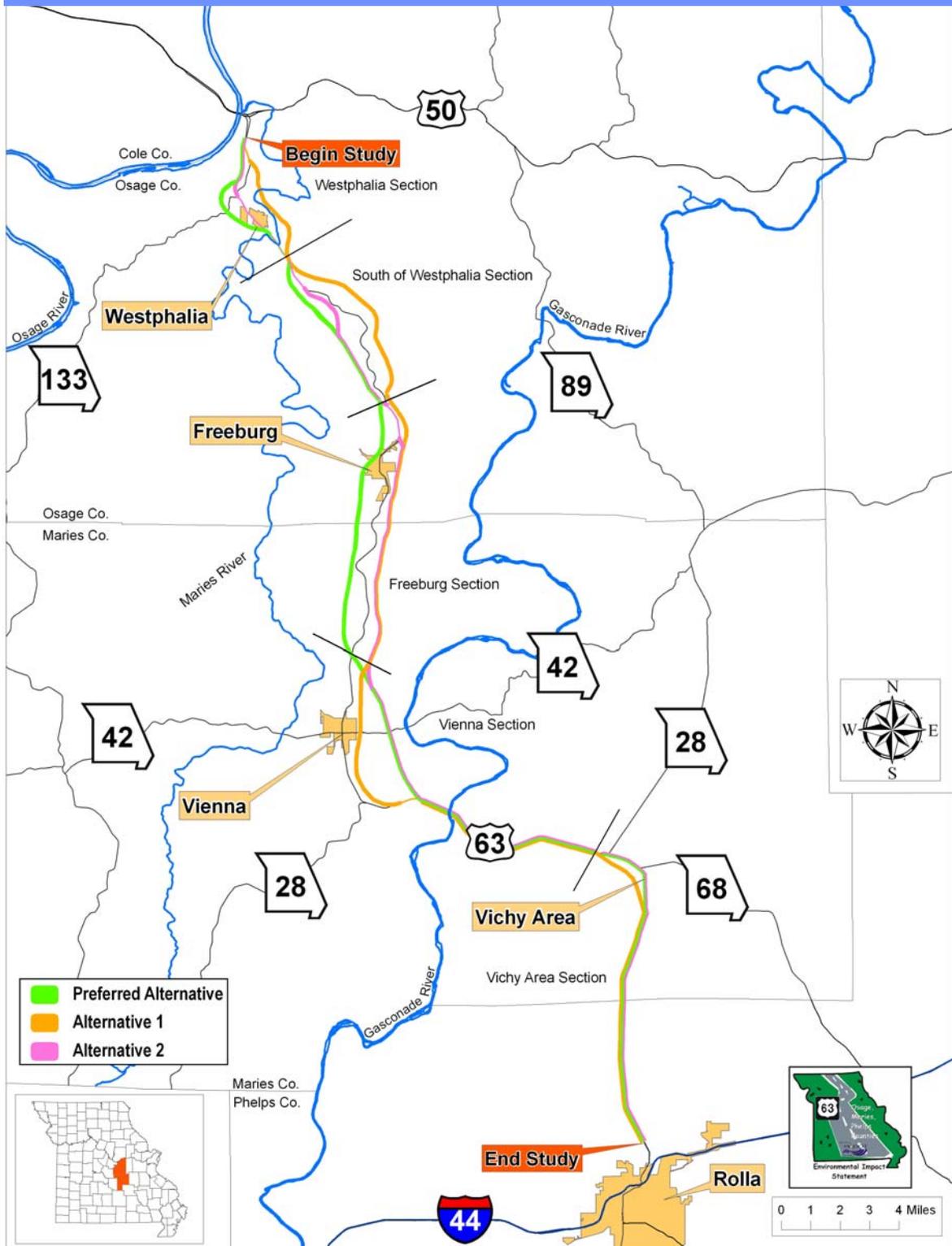
The west alternative was not selected as the Preferred Alternative for the following reasons:

- Does not utilize recent improvements made along existing alignment through town.
- Does not utilize intersection improvements at Route 68 and Route 63.
- Requires the removal and replacement of large amounts of earthen material.
- Significantly more costs than widening along the existing route.

After the study team compared the various alternatives in the Westphalia Section, South of Westphalia Section, Freeburg Section, Vienna Section and Vichy Section, the preferred links from each section were connected together to form the Preferred Alternative for the entire 47 mile length of the study.

The remaining links were then connected together to form Alternative 1 and Alternative 2. Alternative 1 is the combined reasonable alternatives making up an eastern alignment and Alternative 2 is a combination of all links along the existing route that were considered reasonable. Some of the reasonable links along the existing route were combined with links of the Preferred Alternative to form a continuous alternative. Figure 16 illustrates the Reasonable Range of Alternatives. (Detailed maps can be found in Appendix C.)

Figure 16. Reasonable Range of Alternatives



Once the alignments reflecting the Preferred Alternative and Alternatives 1 and 2 were determined, the matrix (Table 2) was finalized to show the total impacts to the Preferred Alternative as well as to the Alternative 1 and Alternative 2 alignments.

When comparing the totals in the matrix:

- The Preferred Alternative total cost is slightly more than Alternative 2 but less than Alternative 1.
- The Preferred Alternative had fewer negative impacts as a whole than either Alternative 1 or Alternative 2, but slightly more stream length and wetland impacts.
- The Preferred Alternative had more parcels impacted than Alternative 1 but less than Alternative 2, had less residential relocations than both alternatives, had more commercial relocations than Alternative 1 but had much less than Alternative 2.
- The Preferred Alternative had less right of way costs than Alternative 2, but more than Alternative 1.

Table 2. Total Impacts of Each Alternative

	Units	Preferred	Alternative 1	Alternative 2
<b>Engineering Considerations</b>				
New Alignment Length	Miles	44.6	45.6	44.0
Traffic Flow (Travel Time)	Min.	41.7	42.0	41.7
Bridges	No.	2	3	2
Stream Mitigation Cost (millions)	\$	13	10	10
Construction Costs (millions)	\$	136.9	182.8	129.1
Access Points	No.	166	143	189
<b>Right of Way Impacts</b>				
Parcels Impacted	No.	306	298	320
Residential Relocations	No.	27	28	38
Commercial Relocations	No.	15	2	33
Right of Way Costs (millions)	\$	29.0	28.4	37.3
Right of Way – New Acres	Acres	2,796	2,961	2,468
Right of Way – Existing Acres	Acres	226	194	292
<b>Environmental Impacts</b>				
Potential Section 4(f) Parklands	No.	3	2	3
Creek/Stream/River Crossings	No.	70	79	66
Stream Length Impact	Feet	64,811	54,831	51,389
Wetlands (total)	Acres	33.54	32.80	28.15
Palustrine Emergent Wetland	Acres	0.7	0.8	4.9
Palustrine Forested Wetland	Acres	19.60	22.60	19.60
Palustrine Scrub Shrub Wetland	Acres	0	0	0
Palustrine Unconsolidated Wetland	Acres	13.28	9.00	7.85
Riverine Wetland	Acres	0	.04	0
Farmland				
Open Farmland	Acres	1,432	1,533	1,317
Forested Farmland	Acres	1,475	1,686	1,402
Floodplain	Acres	174.8	100.8	149.8
Threatened and Endangered Species	Yes/No	Yes	Yes	Yes
Potential Hazardous Waste Locations	No.	11	5	21
Airports	No.	1	1	1
<b>Cultural Resource Impacts</b>				
Cemeteries	No.	0	0	1
Potential Historic/ 4(f) Properties	No.	7	7	9
<b>Total Costs (millions, rounded to the nearest \$)</b>				
	\$	179	221	176

The Preferred Alternative impacts were not always less than the other two alternatives. Each alternative had its own set of positive and negative aspects and many of those impacts were very similar in quantity. There was not an alternative that stood out as having all positive aspects. Alternative 2 stood out as having many more negative impacts than the Preferred Alternative or Alternative 1.

As further evaluations take place in the corridor of the preferred alignment, additional evaluations of the Preferred Alternative may be necessary. The selection of a Preferred Alternative was the result of collaboration among engineers and environmental specialists to produce a corridor for a future highway facility that both meets the project's Purpose and Need and minimizes impacts to the natural and human environments within the project area.

**Were any new options developed as the study analysis continued?**

As a result of public comments, and as part of the effort to continue to improve the alternatives to minimize impacts, adjustments and new alignments emerged at four locations. These emerging options, which led to improved alignments and avoided potential historic properties, were considered to be a part of the reasonable alternatives.

A “drop-in” open house was held on April 10, 2008, in the centrally located town of Freeburg to discuss these emerging options with the public. Figure 17 shows the locations where additional adjustments were made. Details on the “drop-in” open house meeting can be found in Chapter 4-Public Involvement.

Figure 17. Emerging Options

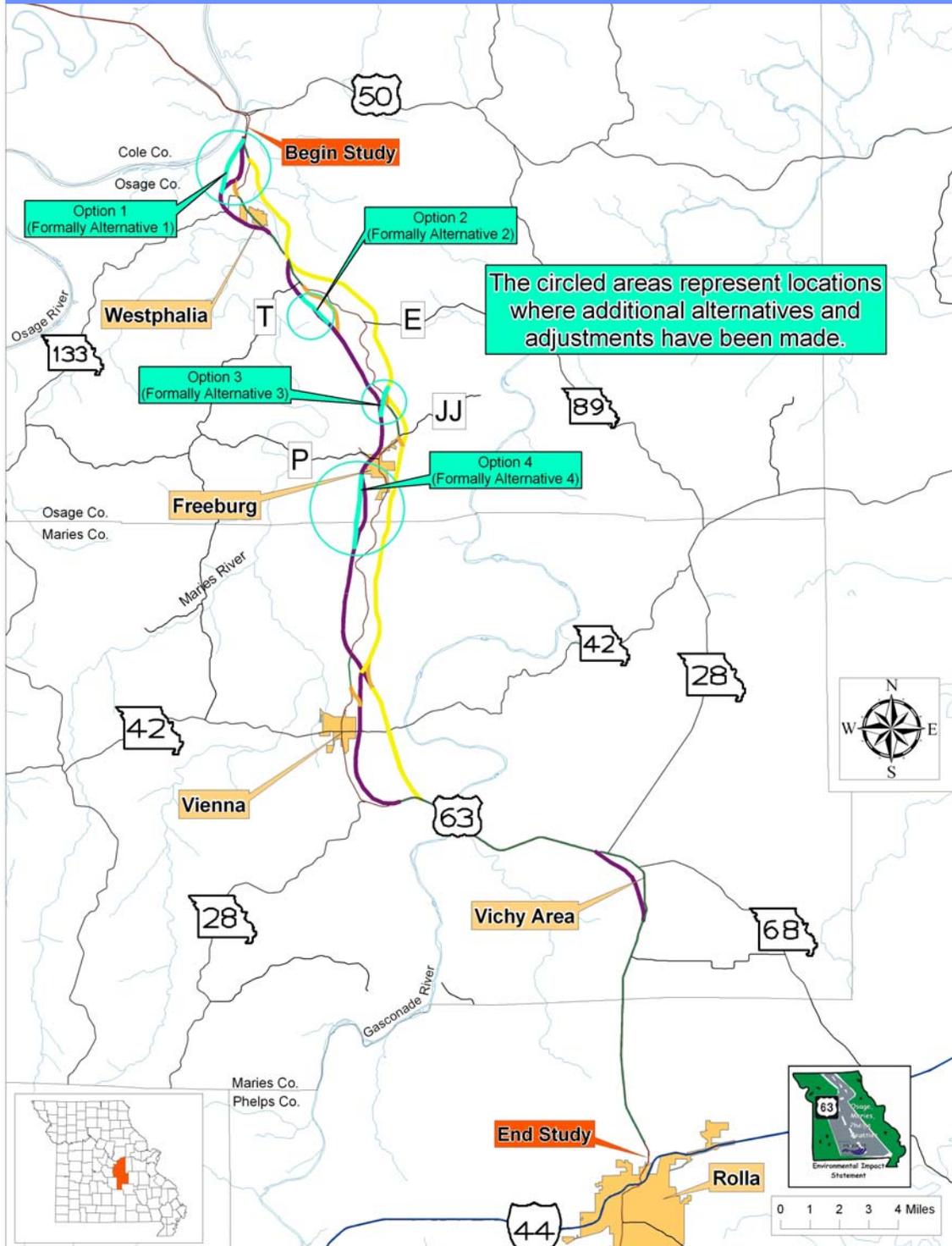
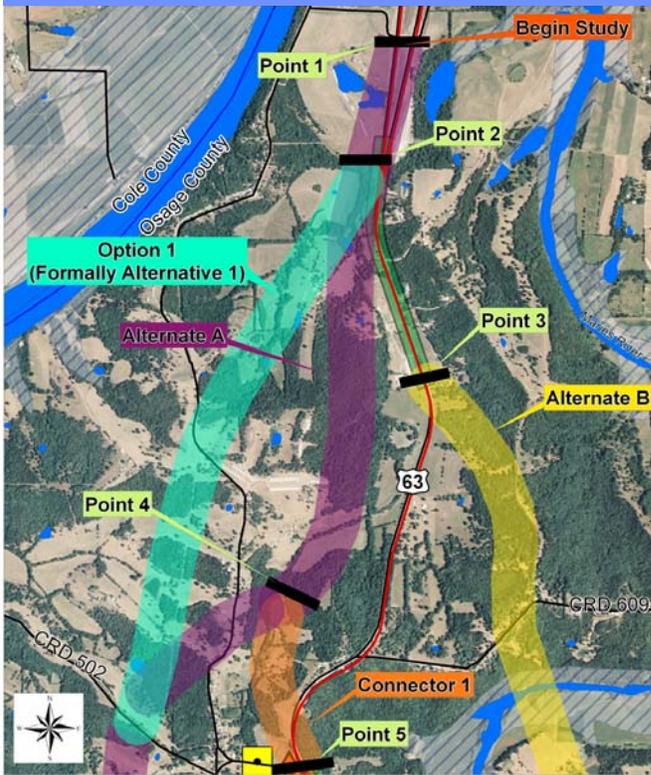


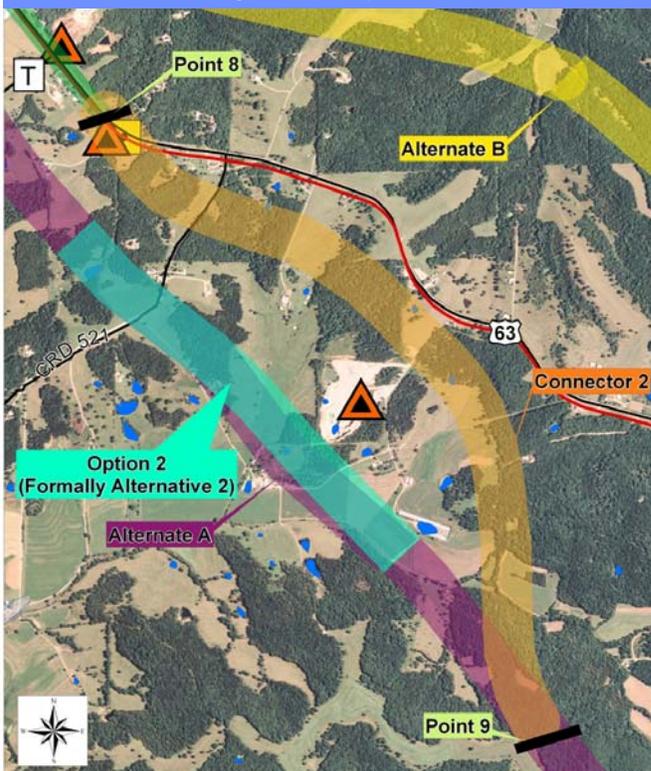
Figure 18. Option 1



Why was Option 1 added? Compared to Alternate A, shown in Figure 18, Option 1 resulted in:

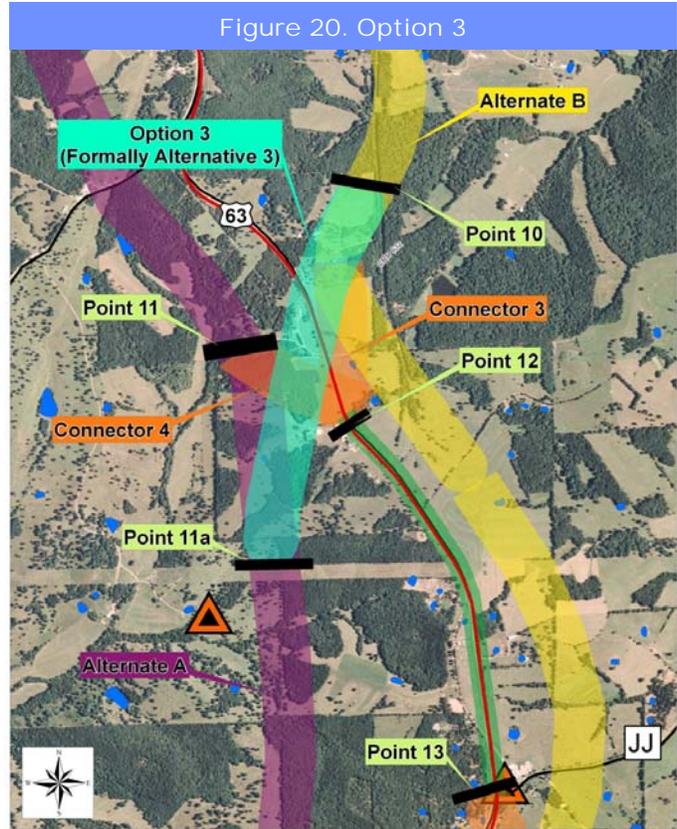
- Slightly less construction costs
- An improved alignment

Figure 19. Option 2



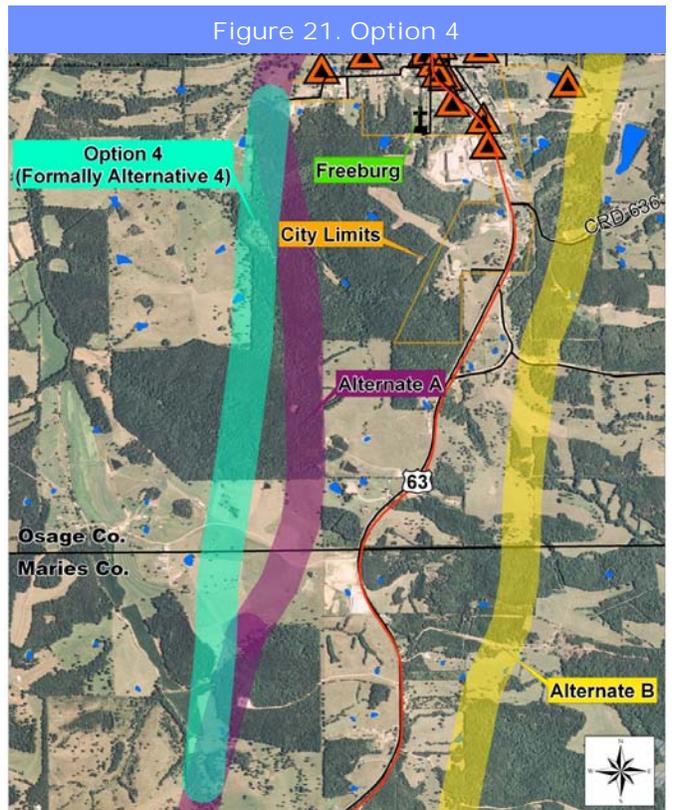
Why was Option 2 added? Option 2, shown in Figure 19, was added south of Westphalia near the Osage Quarry. This slight adjustment to the east was made to avoid relocations and a potential historic property.

Why was Option 3 added? Option 3 was an east to west connector link just north of Freeburg. This was added to ensure we cleared a footprint to allow for an alternative to go from the east of existing Route 63 to the west. (Figure 20)



Why was Option 4 added? Compared to Alternate A, shown in Figure 21, Option 4 resulted in:

- Less construction and right of way costs
- Shorter length
- An improved alignment
- Less relocations



### **What resulted from the drop-in open house meeting?**

The study team continued their analysis of Option 1 and 4 and evaluated the comments received from the public. Option 2 and 3 were slight adjustments that did not require further analysis in order to proceed to the recommendation of a preferred alternative.

As a result of the drop-in meeting, property owners being impacted by the reasonable alternatives northwest of Westphalia requested to meet with representatives from MoDOT. The property owners suggested using the existing lanes through Westphalia for northbound traffic and constructing new lanes just west of the existing route for southbound traffic. This concept was evaluated by the design team and was not considered as a reasonable alternative because of the following:

- Does not address:
  - Sharp curve at Route 63 and MO 133,
  - Steep hills just north of Westphalia,
  - Abundance of entrances along the existing corridor.
- Converting the existing two-lane roadway to northbound lanes will lead to confusion for motorists and unsafe driving conditions with the potential for head-on crashes. MO 13 was sited as an example of a route where the existing lanes were converted to northbound lanes and the southbound lanes were realigned. This route has experienced several crashes and is being re-designed now to address the safety concerns.
- This suggested alternative has several constructability issues requiring significant amounts of material to be moved.

### **Which reasonable alternative north of Westphalia should move forward as the preferred alternative?**

As noted earlier, the recommended preferred alternative north of Westphalia was west of existing Route 63, however, the study team had to determine if Option 1 or Alternate A (see Figure 18) should move forward as the preferred.

When comparing Option 1 and Alternate A (see Figure 18), Option 1 resulted in:

- 1,300 linear feet more stream impacts, 0.1 acre less pond impacts and 0.11 less acres of wetland impacts,
- The same number of residential (2) and commercial (1) displacements,
- Slightly less construction costs,
- Approximately thirty-five acres less forested area being impacted.

Based upon public input and no significant difference between impacts to each reasonable alternative, the study team recommended the alignment closest to existing Route 63 move forward as the preferred alternative.

### **Which reasonable alternative south of Freeburg should move forward as the preferred alternative?**

When comparing Option 4 and Alternate A (see Figure 21), Option 4 resulted in:

- 722 linear feet less stream impacts and 0.66 acres more pond impacts,
- One less displacement resulting in less right of way costs,
- An improved alignment resulting in slightly less construction costs,
- 24 acres less forested area being impacted.

Based upon all resources being impacted less, with the exception of slightly more pond impacts, the study team recommended Option 4 move forward as the preferred alternative.

### **What is the Preferred Alternative?**

The FHWA and MoDOT refer to the alternative that best meets the proposed project's Purpose and Need, as well as minimizes potential impacts to the human and natural environments as the Preferred Alternative (Figure 22).