

## CHAPTER 3 – ALTERNATIVES

### *Substantive changes to Chapter 3 since the publication of the DEIS*

- Figure 3.3-2 – Added Central Alternative 1B Modified (Selected) to the figure
- Section 3.4 – Added this new section to describe Central Alternative 1B Modified (Selected) and explain its development

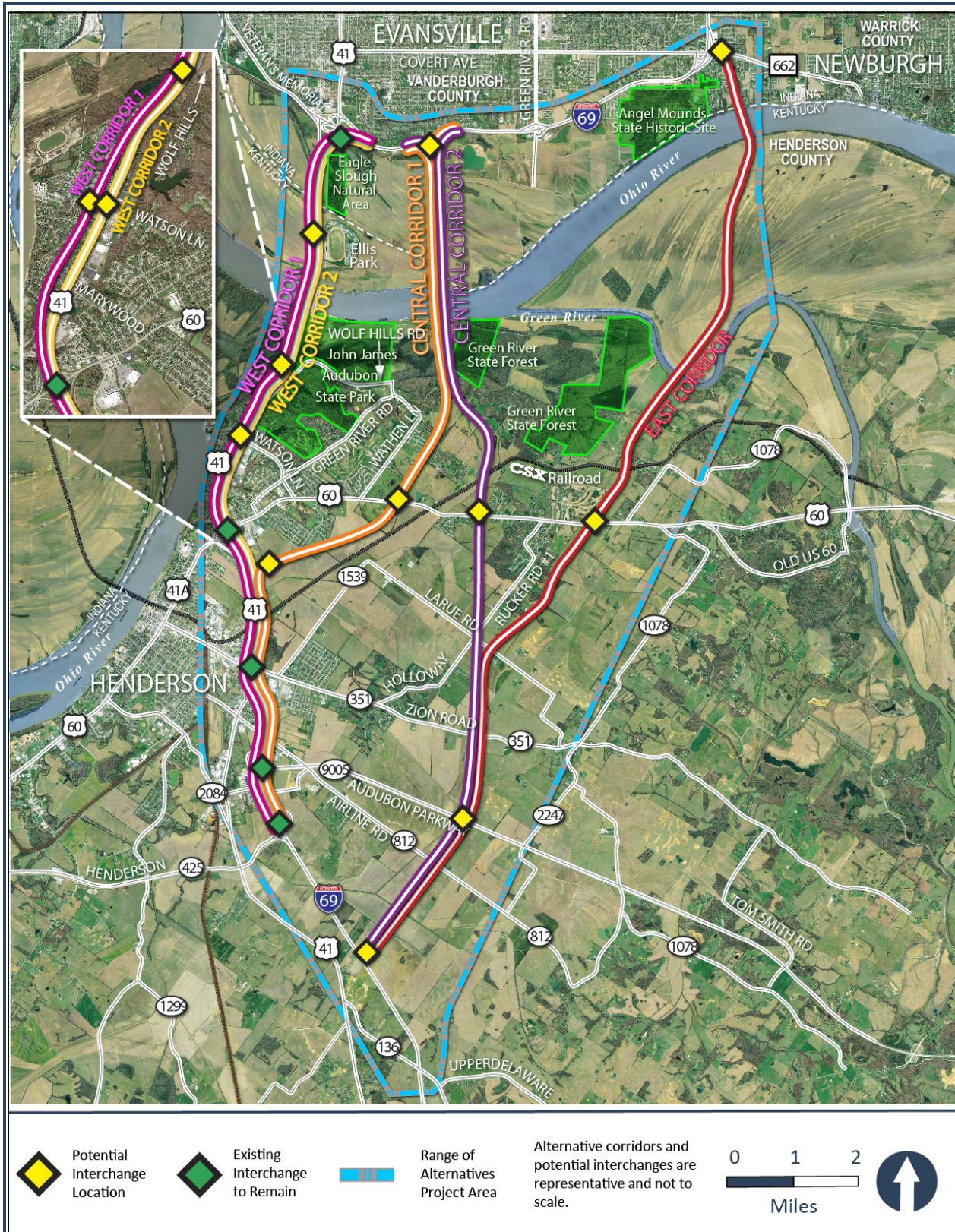
This chapter discusses the identification, development, evaluation, and screening of the project's range of alternatives. The screening process was developed to evaluate and screen a full range of alternatives to the point of determining a Preferred Alternative in the Draft Environmental Impact Statement (DEIS) and a Selected Alternative in this Final Environmental Impact (FEIS). In the initial screening phase, the alternatives were referred to as "corridors". The results of the initial screening of these corridors are documented in the *Screening Report* (Indiana Department of Transportation [INDOT] and Kentucky Transportation Cabinet [KYTC] 2017b) (**Appendix B-1**) and summarized in **Section 3.2.1** of this chapter. Three corridors were recommended to be carried forward in the screening process. These corridors were further developed and evaluated using more detailed preliminary design, traffic modeling data for the year 2045, traffic volume analysis using various tolling scenarios, and additional information on sensitive resources. The results of the additional screening of the three corridors are documented in the *Screening Report Supplement* (INDOT and KYTC 2018f) (**Appendix B-2**). The findings from the *Screening Report Supplement* are summarized in **Section 3.2.2** of this chapter. Finally, this chapter includes descriptions of the alternatives that were discussed in the DEIS (**Section 3.3**) in addition to the development and description of Central Alternative 1B Modified (**Section 3.4**), which has been identified as the Selected Alternative in this FEIS.

### 3.1 IDENTIFICATION OF RANGE OF ALTERNATIVES

The alternatives from the 2004 *Interstate 69 Henderson, Kentucky to Evansville, Indiana Draft Environmental Impact Statement* (INDOT and KYTC 2004) and the 2014 *I-69 Feasibility Study, Henderson, Kentucky, SIU #4, Final* (KYTC 2014a) were evaluated to determine which ones warranted consideration for the I-69 ORX project. From this evaluation, the following range of alternatives was developed and renamed (**Figure 3.1-1**). All of the corridors were derived from the previous studies and no new corridors were developed.

- West Corridor 1 (based on Alternative 7 from the 2014 *Feasibility Study*)
- West Corridor 2 (based on Corridors F and G from the 2004 DEIS and Alternatives 5 and 6 from the 2014 *Feasibility Study*)
- Central Corridor 1 (based on Alternative 1a from the 2014 *Feasibility Study*)
- Central Corridor 2 (based on the Preferred Alternative 2 from the 2004 DEIS)
- East Corridor (based on Alternative 3 from the 2004 DEIS)





**Figure 3.1-1. Range of Alternatives**



The National Environmental Policy Act (NEPA) scoping process provides an opportunity for agencies and the public to help develop the scope of the project and identify important issues. As part of this process, the proposed range of alternatives, which also includes a No Build Alternative, was presented to local, state, and federal agencies and the public to obtain their input. The alternatives were presented as general corridors at the following meetings:

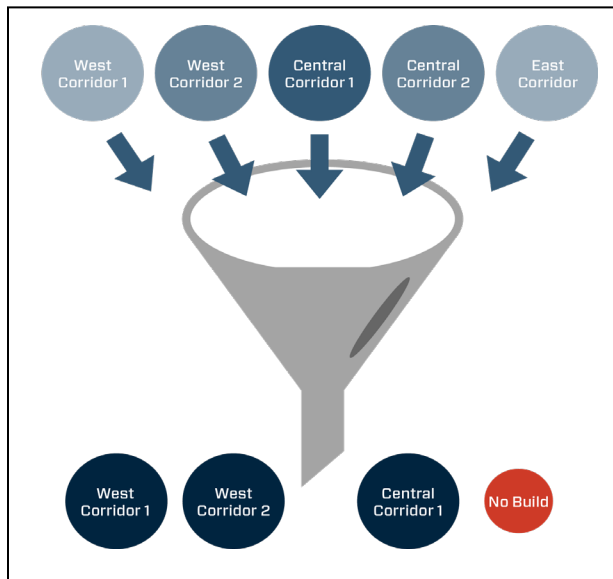
- Interagency Advisory Committee (IAC) Meeting #1, April 12, 2017
- River Cities Advisory Committee (RCAC) Meeting #1, April 13, 2017
- Public Open Houses, April, 18, 2017 in Henderson, KY and April 20, 2017 in Evansville, IN
- Consulting Parties Meeting #1, May 16, 2017
- Environmental Justice (EJ) Subcommittee Meeting #1, June 13, 2017

Summaries of these meetings and comments received are provided in **Chapter 8** and **Appendices C and H**. Comments regarding potential impacts to specific resources were considered in the screening evaluation presented in this chapter in **Section 3.2.1**. Based on the input received from the public and agencies at these meetings, it was determined that no changes to the proposed range of alternatives would be needed for the screening process.

## 3.2 ALTERNATIVES SCREENING

### 3.2.1 CORRIDOR SCREENING

The screening process was developed to evaluate and screen a full range of alternatives with the goal of identifying a Preferred Alternative in the DEIS. During the initial screening, which is documented in the *Screening Report* (**Appendix B-1**), the alternatives were identified as corridors. Five corridors were evaluated using screening criteria that included the corridors' ability to satisfy the project's purpose and need; impacts to environmental and historic resources, residences and businesses; construction complexity; construction costs; and operations and maintenance costs. The goal of the screening process was to identify financially feasible corridors that satisfied the project's purpose and need while minimizing environmental impacts.



For the initial screening phase of the I-69 ORX project, 2,000-foot-wide study limits were established for each corridor. Within each corridor, a conceptual roadway design was then developed for assessing potential impacts. In some locations, modifications were made to the corridors to avoid or minimize environmental impacts.

For purposes of the initial screening process only, the states assumed that both US 41 bridges would remain open under the Central 1, Central 2, and East Corridors. For West Corridors 1 and 2, the states assumed that both US 41 bridges would be closed because of the corridors' proximity to the US 41 bridges.

Conceptual designs were developed for each corridor based on the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Design Standards – Interstate System, 6<sup>th</sup> Edition* (AASHTO 2016). Forecasted traffic volumes indicated the need for a minimum of six travel lanes across the river.

For West Corridors 1 and 2, which would remove the existing US 41 bridges, a six-lane bridge would be constructed. For the Central 1, Central 2, and East Corridors, which would retain both existing US 41 bridges, a four-lane bridge would be constructed. The two West Corridors used an urban design, reflecting the urbanized setting in those corridors, with a narrower median and a barrier wall. For the Central and East Corridors, a rural design with a wider depressed grass median was used. The widths of the corridors varied from 250 to 750 feet depending on the number of lanes, median widths, whether it was an urban or rural design, and whether it was a bridge or an at-grade facility. In addition to the conceptual design of the roadway and bridge crossing, potential interchange locations were identified and conceptual interchange designs were developed to further establish the estimated impact area of each corridor.

The following sections discuss the purpose and need, environmental and engineering screening criteria, and screening results under each criterion. These sections are a summary of the *Screening Report*, which is in [Appendix B-1](#).

#### **PURPOSE AND NEED**

The following discusses each of the five corridors' ability to satisfy the project's purpose and need performance measures. See [Chapter 2](#) for a complete discussion of the project's purpose and need.

##### PROVIDE A ROADWAY FACILITY FOR SIU #4 THAT CAN BE DESIGNATED AS I-69

Because each corridor would include a new interstate facility across the Ohio River that would connect the existing I-69 sections in Indiana and Kentucky, all of the corridors would satisfy this purpose and need criterion.

##### PROVIDE A COST-EFFECTIVE AND AFFORDABLE PLAN FOR LONG-TERM CROSS-RIVER MOBILITY

In the initial screening process, this purpose and need criterion was based on a synthesis of travel lanes, construction costs, and revenue potential. Each of the corridors would provide sufficient capacity—a minimum of six lanes—across the Ohio River to satisfy long-term mobility demands. The cost-effectiveness of each corridor was assessed based on estimated construction costs. Affordability was based on revenue potential from various tolling scenarios. Central Corridor 1 was determined to be highly cost effective, West Corridors 1 and 2 and Central Corridor 2 would be moderately cost effective, and East Corridor would be the least cost effective.



PROVIDE A RIVER CROSSING FOR I-69 OPERATING AT A MINIMUM LEVEL OF SERVICE (LOS) D (C IS PREFERABLE)

During the initial screening process, the traffic analysis was based on the year 2040, the limit of the Evansville Metropolitan Planning Organization's (EMPO) regional traffic model. Following the initial screening process, however, the traffic model was extended to the year 2045. Based on the qualitative analysis of projected traffic volumes for the year 2040, it was determined that each corridor would likely function at LOS D or better, based on the number of through lanes provided. Thus, all the corridors would satisfy this purpose and need performance measure.

PROVIDE A RIVER CROSSING THAT IMPROVES SAFETY

Because each corridor would include a new interstate facility across the Ohio River that would connect the existing I-69 sections in Indiana and Kentucky, each project corridor would improve overall safety for cross-river traffic by shifting traffic from existing US 41, which is classified as a principal arterial, to a new interstate facility.

**POTENTIAL ENVIRONMENTAL IMPACTS**

Based on an understanding of the project area and the potential impacts of the project through the review of previous studies, windshield surveys, and the scoping process, INDOT and KYTC, in coordination with the Federal Highway Administration (FHWA), selected the following environmental resources to be used in the screening process:

- Wetlands
- Rivers/Streams/Open Water
- Floodplains/Floodways
- Forested Habitat/Indiana Bat and Northern Long-eared Bat Suitable Habitat
- Managed Lands
- Section 4(f) Properties (Public Parks/Recreation Areas and Wildlife/Waterfowl Refuges)
- Section 4(f) Historic Properties/Districts
- Section 6(f) Properties
- Prime Farmland Soil/Active Farmland
- Residential Relocations
- Business Relocations
- Public Facilities and Services
- Religious Facilities Relocations
- Cemeteries
- Known Archaeological Sites/Areas of High Archaeological Probability
- Potential EJ Populations
- Community Cohesion
- Noise Sensitive Receptors

- Known Underground Storage Tanks (UST)/Contaminated Material Sites

A more detailed discussion of these resources and the potential impacts from the five corridors is provided in Section 4.2 of the *Screening Report* ([Appendix B-1](#)).

## ENGINEERING

The following engineering criteria were used to screen the corridors:

- Construction Cost
- Right-of-way Cost
- Lifecycle/Operation and Maintenance Cost
- Construction Complexity

A more detailed explanation of these engineering criteria and how they were used to evaluate the five corridors is provided in Section 3.3 of the *Screening Report* ([Appendix B-1](#)).

## SUMMARY OF CORRIDOR EVALUATIONS

Each corridor was evaluated based on the previously described purpose and need, environmental, and engineering screening criteria. The results of this evaluation are summarized in [Table 3.2-1](#). Advantages and disadvantages of each corridor, focused on differentiating criteria, are also presented in [Table 3.2-2](#). The following provides a comparative evaluation of each corridor and recommendations on whether it should be carried forward for more detailed evaluation or dismissed from further consideration.

In addition to the corridor alternatives (i.e., build alternatives), the project also includes the evaluation of a No Build Alternative. However, since NEPA requires the evaluation of a No Build Alternative in the DEIS to be used as a baseline comparison for the build alternatives, it was not evaluated as part of the alternative screening process.

### WEST CORRIDORS 1 AND 2

West Corridors 1 and 2 overlap for much of their length and differ only for the short distance along the US 41 commercial strip in Henderson, KY between Wolf Hills Road and US 60. Thus, the primary difference between the two corridors during the initial screening was that West Corridor 1 would result in more residential relocations while West Corridor 2 would result in more business relocations. In addition, West Corridor 2 would impact the highest number of potential UST/contaminated material sites. Both would result in the highest number of relocations and the highest impacts to noise sensitive receptors when compared to the Central Corridors. They were also rated high for potential impacts to community cohesion. However, because of the urban nature of these corridors, both would generally result in either similar or fewer impacts to natural resources than the two Central Corridors and East Corridor. They would result in the fewest impacts to rivers/streams, floodplains, prime and active farmland, and areas with high archaeological probability. They would also have lower impacts to forested habitat when compared to the Central Corridors.



**Table 3.2-1. Screening Criteria Summary**

	<b>WEST CORRIDOR 1</b>	<b>WEST CORRIDOR 2</b>	<b>CENTRAL CORRIDOR 1</b>	<b>CENTRAL CORRIDOR 2</b>	<b>EAST CORRIDOR</b>
<b>CORRIDOR FEATURES</b>					
Corridor Length	8.6	8.7	9.4	13.0	14.9
Travel lanes on new I-69 Ohio River bridge (number)	6	6	4	4	4
Future of existing US 41 bridges (assumption reflected in impact analysis below)	Removed	Removed	Retained	Retained	Retained
<b>PURPOSE AND NEED</b>					
Provide a roadway facility for SIU #4 that can be designated as I-69	Yes	Yes	Yes	Yes	Yes
Provide a cost-effective and affordable plan for long-term cross-river mobility	Provides for mobility Moderately cost effective	Provides for mobility Moderately cost effective	Provides for mobility Highly cost effective	Provides for mobility Moderately cost effective	Provides for mobility Less cost effective
Provide a river crossing for I-69 operating at a minimum LOS D (C is preferable)	Yes	Yes	Yes	Yes	Yes
Provide a river crossing that improves safety	Yes	Yes	Yes	Yes	Yes
<b>POTENTIAL ENVIRONMENTAL IMPACTS</b>					
Wetlands (type/acres)	Emergent: 2.1 Forest/Shrub: 38.0 Total: 40.1	Emergent: 1.8 Forest/Shrub: 34.4 Total: 36.2	Emergent: 4.5 Forest/Shrub: 49.7 Total: 54.1	Emergent: 3.6 Forest/Shrub: 44.7 Total: 48.3	Emergent: 14.1 Forest/Shrub: 6.5 Total: 20.6
Open Waters (acres)	14.2	11.4	9.6	12.3	2.1
River/Streams (number/length in feet)	24 / 11,025	24 / 11,175	31 / 17,431	36 / 27,516	58 / 39,094
Floodways (acres)	28	28	27	35	28
Floodplain Impacts (acres)	80	80	165	284	391
Forested Habitat (acres)	69	67	120	118	62
Managed Lands <sup>1</sup> (number/acres)	3 / 51	3 / 42	3 / 49	2 / 34	0 / 0
Potential Section 4(f) Recreation/Refuge Properties (public parks/recreation areas and wildlife/waterfowl refuges) <sup>2</sup> (number/acres)	0 / 0	0 / 0	0 / 0	1 / 3	0 / 0
Potential Section 4(f) Historic Properties/Districts <sup>2</sup> (number)	2	2	0	0	0
Known Archaeological Sites (number)	1	1	2	2	2

	WEST CORRIDOR 1	WEST CORRIDOR 2	CENTRAL CORRIDOR 1	CENTRAL CORRIDOR 2	EAST CORRIDOR
Areas of High Archaeological Probability (acres)	114	93	357	551	691
Section 6(f) Properties (number/acres)	0	0	0	0	0
Prime Farmland Soils (acres)	288	274	477	767	1,008
Active Farmland (acres)	27	23	394	652	819
Residential Relocations (number)	213	119	2	13	144
Business Relocations (number)	21	58	0	0	0
Public Facilities and Services Relocations (number)	1	0	0	0	0
Religious Facilities Relocations (number)	1	1	0	0	0
Cemeteries (number)	0	0	0	0	0
Potential Impacts to EJ Populations	Medium	Medium	Low	Low	Medium
Potential Community Cohesion Impacts	High	High	Low	Low	Medium
Noise Sensitive Receptors (number)	1,028	933	378	134	125
Potential UST/Contaminated Material Sites (number)	1	17	2	1	2
<b>ENGINEERING/COST</b>					
Construction Cost (\$ Million) (Low –High)	920 – 1,060	910 – 1,050	740 – 860	880 – 1,000	1,000 – 1,130
Right-of-Way Cost (Low/Medium/High)	High	High	Low	Low	High
Major River Crossing Lifecycle/ Operation and Maintenance Cost (Low/Medium/High)	Low	Low	High	High	High
Roadway Lifecycle/Operation and Maintenance Cost (new lane miles of roadway)	40	40	26	52	60
Construction Complexity (Low/Medium/High)	Medium	High	Low	Low	Medium

<sup>1</sup> Includes Imperiled Bat Conservation Fund (IBCF) sites, Eagle Slough Natural Area, Natural Resources Conservation Service Wetlands Reserve Program (NRCS WRP) easements, and/or wetland mitigation sites.

<sup>2</sup> Impacts to Section 4(f) properties were limited to only the potential direct use of the property. The evaluation of constructive use or potential adverse effects to historic sites due to proximity impacts (e.g., noise and visual) were not included.



Table 3.2-2. Summary-Level Corridor Comparison

	WEST CORRIDOR 1	WEST CORRIDOR 2	CENTRAL CORRIDOR 1	CENTRAL CORRIDOR 2	EAST CORRIDOR
Impact to Section 4(f) Resources	Potential noise/visual/access impacts to Audubon State Park; removal of existing US 41 bridges	Potential noise/visual/access impacts to Audubon State Park; removal of existing US 41 bridges	None	Minor impact to Green River State Forest	None
Impacts to Sensitive Ecological Resources	High impacts to habitat preservation areas and moderate impact to wetlands	High impacts to habitat preservation areas and moderate impact to wetlands	High impacts to forested wetland mitigation area; moderate impacts to other resources	High impacts to forested wetland mitigation area; moderate impacts to other resources	High impacts to streams; low impact to other resources
Farmland Impacts	Minimal farmland impacts	Minimal farmland impacts	Moderate farmland impacts	High farmland impacts	High farmland impacts
Social Impacts and Relocations	High number of residential relocations; moderate business relocations	High number of business relocations; moderate number of residential relocations	Minimal residential and business relocations	Minimal residential and business relocations	Moderate number of residential relocations
Construction and Right-of-Way Costs	High construction and right-of-way costs	High construction and right-of-way costs	Low construction and right-of-way costs	Moderate construction and right-of-way costs	High construction and right-of-way costs
Lifecycle/Operation and Maintenance Costs (River, Bridge, and Roadway)	Low	Low	Moderate	High	High

Both West Corridors would impact the existing US 41 bridges, each of which was identified as a potential Section 4(f) property. A primary advantage of both West Corridors was that they would provide low major river crossing lifecycle/operation and maintenance costs due to the removal of both of the existing US 41 bridges. The other advantage was that they would generally result in potentially fewer natural resource impacts. Based on the advantages and similarities of the West Corridors, the recommendation was to carry forward both corridors for more detailed evaluation in the DEIS.

#### CENTRAL CORRIDOR 1

The primary advantages of Central Corridor 1 were that it would result in the lowest estimated construction cost of the five corridors and the fewest relocations. It was also rated low for potential impacts to community cohesion and would have no Section 4(f) impacts. This corridor

would use approximately 2.8 miles of the limited access portion of US 41, which would be upgraded to meet interstate standards. As a result, it would have the fewest new lane miles of roadway, which would result in the lowest lifecycle/operation and maintenance costs for roadway facilities. However, it would have high major river crossing (i.e., bridge) lifecycle/operation and maintenance costs. As a result, when considering both roadway and major river crossings, Central Corridor 1 was expected to have moderate lifecycle/operation and maintenance costs. The primary disadvantage of this corridor was that it would result in the highest impacts to forested wetlands and forest habitat. Based on this evaluation, the recommendation was to carry Central Corridor 1 forward for more detailed evaluation in the DEIS.

#### CENTRAL CORRIDOR 2

The northern portion of Central Corridor 2 that crossed the Ohio River overlapped with Central Corridor 1, but the southern portion connected with I-69 south of KY 425 in Kentucky. As previously mentioned, Central Corridor 2 was included in the screening analysis because it was based on the 2004 DEIS Preferred Alternative. Some of the notable advantages of Central Corridor 2 included no business relocations, the second fewest residential relocations, and the second fewest noise sensitive receptors. It was rated low for potential impacts to community cohesion and was second lowest in construction cost. However, a key disadvantage of Central Corridor 2 when compared to Central Corridor 1 was that the new I-69 alignment would run parallel to the US 41 limited access highway and existing I-69 for nearly 5.8 miles, adding lane-miles of pavement, bridges, and new interchanges to the roadway inventory. At the time of the 2004 DEIS, Edward T. Breathitt Pennyrile Parkway had not yet been re-designated as I-69; therefore, this redundancy was not considered. As a result, this corridor would have the second highest new lane-miles of roadway, which would result in the second highest lifecycle/operation and maintenance costs for roadway facilities. Other key disadvantages were that it would result in the second highest impacts to wetlands, rivers/streams, open water, forested habitat, floodplains, prime and active farmland, and areas of high archaeological probability. This corridor would potentially impact 3 acres of Green River State Forest, which at the time of the evaluation was considered a potential Section 4(f) property. Based on these disadvantages, the recommendation was to dismiss Central Corridor 2 from further consideration.

#### EAST CORRIDOR

Although East Corridor would have the fewest impacts to wetlands, forested habitat, noise sensitive receptors, and managed lands, it would be the longest and most expensive corridor and would require an additional major bridge structure over the Green River. It would have the highest new lane miles of roadway, resulting in the highest roadway lifecycle/operation and maintenance costs. The construction of a new Green River bridge would result in higher major river crossing lifecycle/operation and maintenance costs. East Corridor would have the highest impacts to prime and active farmland, rivers/streams, floodplains, and areas of high archaeological probability. It would also have the second highest number of residential relocations, associated primarily with the interchange at SR 662 in Indiana. In addition, although East Corridor would not directly impact Angel Mounds State Historic Site, the 2004 DEIS determined that Alternative 3 (i.e., East Corridor) would result in adverse visual and noise



impacts. In addition, in a letter received May 10, 2017, from the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR-DHPA), they expressed their concerns regarding the East Corridor's potential noise and visual impacts to Angel Mounds. Based on these disadvantages, the recommendation was to dismiss East Corridor from further consideration.

### **CORRIDORS RECOMMENDED FOR FURTHER DEVELOPMENT INCLUDING TOLLING OPTIONS**

As discussed in the previous sections, five corridors were evaluated based on purpose and need, environmental, and engineering screening criteria, and the results are summarized in **Table 3.2-1** and **Table 3.2-2**. A comparative evaluation was conducted based on the advantages and disadvantages of each corridor, focusing on differentiating criteria. The purpose of this initial screening process was to recommend corridors to be carried forward for further evaluation. Based on the screening analysis, the following corridors, in addition to the No Build Alternative, were recommended to be carried forward for further evaluation in the I-69 ORX DEIS (**Figure 3.2-1**):

- No Build Alternative
- West Corridor 1
- West Corridor 2
- Central Corridor 1

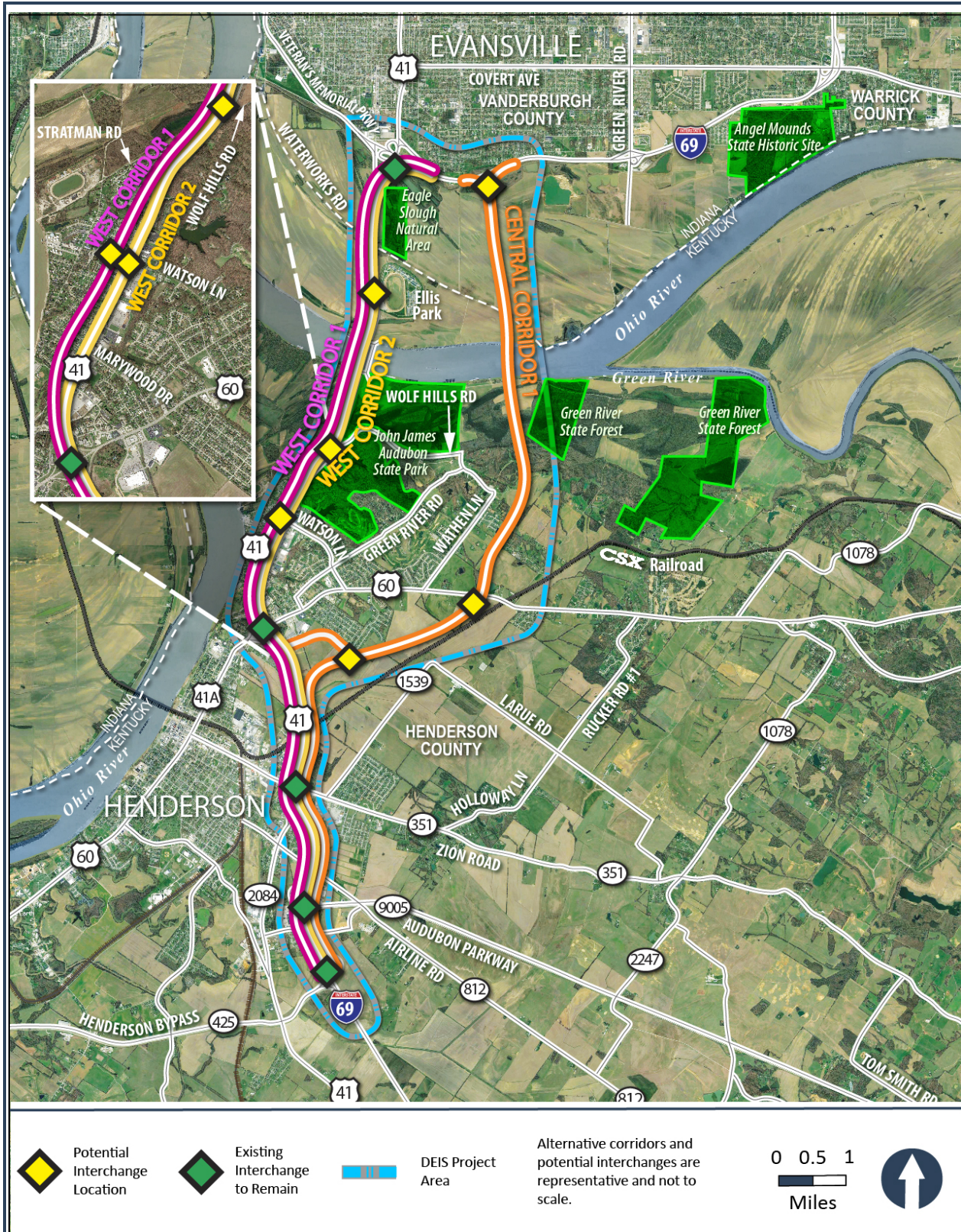
To further develop and evaluate these recommended corridors, tolling options were examined for each corridor, including tolling both the new I-69 bridge and the existing US 41 bridges, and assessing various potential toll rates for different vehicle classes (e.g., trucks and cars). This next level evaluation is discussed in **Section 3.2.2**.

The results of the screening were documented in a *Screening Report* in July 2017 (**Appendix B-1**) and presented to local, state, and federal agencies and the public at the following meetings to solicit their input, explain the corridor options, gather additional information about the corridors, and determine which corridors should be advanced for further evaluation and development:

- RCAC Meeting #2, July 19, 2017
- EJ Subcommittee Meeting #2, July 19, 2017
- IAC Meeting #2, July 20, 2017
- Public Open Houses, July 31, 2017 in Evansville, IN and August 1, 2017 in Henderson, KY

Summaries of these meetings and comments received are provided in **Chapter 8** and **Appendices C and H**. One of the comments submitted by the U.S. Environmental Protection Agency (USEPA) stated that they recommend “retaining the East Corridor as it may be the least environmentally damaging practicable alternative required under the 404(b)(1) Guidelines [from Section 404 of the Clean Water Act]. From a wetland impact perspective, the East Corridor had the least amount of acreage impact by more than 50 percent over the other four corridors evaluated.” However, according to 40 CFR 230.10(a) regarding the Section 404 (b)(1) guidelines,





**Figure 3.2-1. Screening Report Corridors Recommended for Further Evaluation**



a “practicable alternative” must not result in “other significant adverse environmental consequences” and take into consideration costs.

As previously discussed, because East Corridor would have the highest impacts to other resources such as rivers/streams, floodplains, prime farmland, and active farmland, the second highest residential displacements, result in potential adverse impacts to Angel Mounds State Historic Site which was identified as a concern by IDNR-DHPA, and is the most expensive corridor, it was determined that East Corridor would not be a practicable avoidance alternative; therefore, it was dismissed from further consideration.

### 3.2.2 DEIS ALTERNATIVES DEVELOPMENT

Following the completion of the *Screening Report*, INDOT and KYTC determined that the three build corridors selected for further evaluation (i.e., West Corridor 1, West Corridor 2, and Central Corridor 1) would be further developed as specific alternatives within each corridor and analyzed.

The alternatives were refined based on public and agency input, assessment of potential environmental and right-of-way impacts, and results of traffic analysis. Additional studies were conducted regarding the location and configuration of interchanges, the location of the new bridge structure over the Ohio River, the disposition of and long-term maintenance costs for the existing US 41 bridges, and the traffic patterns resulting from different tolling scenarios.

For the *Screening Report*, the states assumed that for West Corridors 1 and 2, both US 41 bridges would be taken out of service for vehicular use (i.e., all motor vehicles would be prohibited from using the bridges) and the new I-69 bridge would have six lanes. For Central Corridor 1, both US 41 bridges would remain open and the new I-69 bridge would have four lanes.

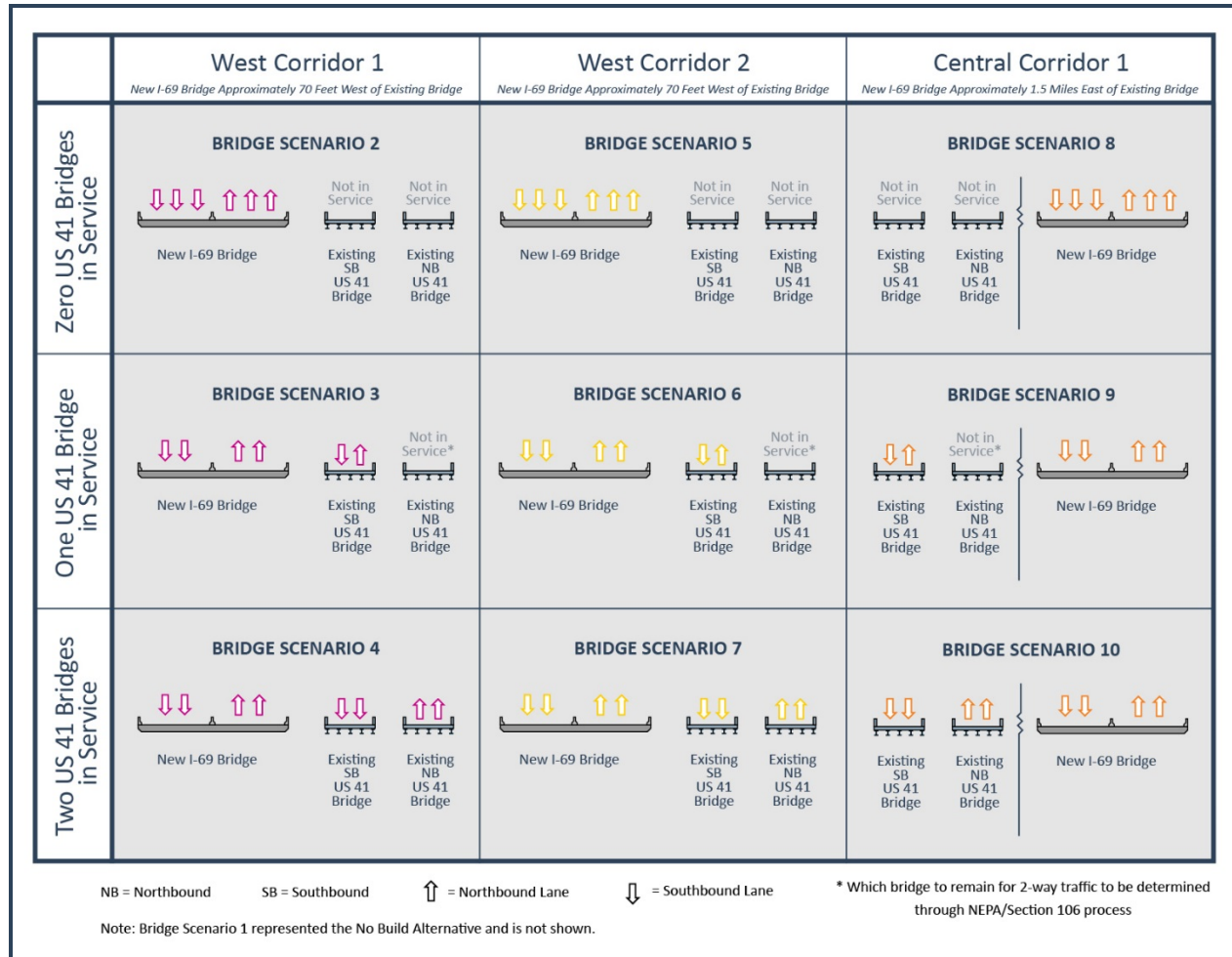
Further analysis and development of the corridors after the development of the *Screening Report* focused on the evaluation of the following three US 41 and I-69 bridge scenarios for each of the three corridors selected to be carried forward:

- Build a six-lane I-69 bridge for all cross-river traffic and take both US 41 bridges out of service for vehicular use
- Build a four-lane I-69 bridge and retain one US 41 bridge for local traffic
- Build a four-lane I-69 bridge and retain both US 41 bridges for local traffic

Based on this approach, the bridge scenarios shown in **Figure 3.2-2** were defined.

The results of this next level of development, evaluation, and screening of these corridors and bridge scenarios were documented in the *Screening Report Supplement* in February 2018 (**Appendix B-2**).

The following sections summarize the *Screening Report Supplement*.


**Figure 3.2-2. US 41 and I-69 Bridge Scenarios**

Note: Following the *Screening Report Supplement*, for Bridge Scenarios 3, 6, and 9, INDOT and KYTC decided that the southbound US 41 bridge would be taken out of service and removed instead of the northbound US 41 bridge.

## ALTERNATIVES DEVELOPMENT

The corridors were further developed and refined into alternatives based on the following:

- Interchange Development (i.e., locations and type)
- Avoidance of Sensitive Resources (i.e., Eagle Slough Natural Area, Historic McClain House and Lee Baskett House, and the Vigo Coal Wetland Mitigation Site)
- Typical Section Refinement (i.e., reduction of the shoulder widths on the new I-69 bridge)
- Cost Estimate Updates
- Life-Cycle Maintenance Costs (i.e., changed from a qualitative to a quantitative assessment)

**TRAFFIC MODELING/TOLL SCENARIO EVALUATION (E.G., EXTENDED THE TRAFFIC MODEL FORECAST FROM 2040 TO 2045)****EVALUATION CRITERIA**

Each corridor and bridge scenario was then evaluated based on the following criteria:

- Potential Environmental Impacts – Potential Section 4(f) impacts to the historic US 41 bridges.
- Cross-River Traffic Distribution, Potential Toll Revenue, and Potential Tolling Assumptions – Based on “low traffic” and “high traffic” tolling assumptions. “Low traffic” assumptions were based on tolling the new I-69 crossing with no tolls or significantly reduced tolls on the US 41 bridges, which would result in relatively low volumes of traffic using the new I-69 bridge. “High traffic” assumptions were based on tolling the I-69 and US 41 bridges using the same toll rates on all the bridges, which would increase traffic on the new I-69 bridge. For the purpose of this screening, the toll rates used were similar to those now being charged in the Louisville, KY, metropolitan area for the I-65 and KY 841/SR 265 river crossings.
- Optimized Bridge Capacity – Traffic LOS and volume-to-capacity (V/C) ratios, which is the relationship between traffic volumes and a roadway’s capacity. The EMPO regional traffic model was used to determine that six lanes of total cross-river capacity are sufficient for the region through 2045 (see **Section 3.3** of the *Screening Report Supplement in Appendix B-2*).
- Safety Considerations – Separation of local and through traffic and limited sight distances.
- US 41 Corridor Accessibility/Visibility – Access to, diversion of traffic to and from, and the visibility of the US 41 commercial strip.
- Reliability and Redundancy – This criterion evaluated whether a bridge scenario provided more than one route for crossing the Ohio River within the region, also known as route redundancy, reducing the impact following a major incident. This criterion also recognized that a new bridge would be constructed to current design standards: it would be wider than the existing US 41 bridges, and thus less likely to require full closure due to a vehicle crash, and it would be designed to be more resistant to barge strikes and seismic events.
- Total Project Costs and Financial Feasibility – Right-of-way, construction, other (i.e., final design, procurement of a contractor, and construction engineering and inspection during construction), and maintenance costs.

**BRIDGE SCENARIO COMPARISON**

Based on the evaluation criteria, a comparative evaluation of the bridge scenarios for each corridor was conducted and recommendations were made regarding the best alternatives for full evaluation in the DEIS. The following sections summarize the findings of the evaluation within each corridor.

#### WEST CORRIDOR 1, BRIDGE SCENARIOS 2 – 4

As the most westerly alignment under consideration, West Corridor 1 would avoid most of the businesses along the US 41 commercial strip, leaving it largely intact and continuing to function as a destination for commercial activity. West Corridor 1 was also sufficiently separated from US 41 so that elevated fills and bridges on I-69 would not impact sight distances at intersections along US 41.

**Table 3.2-3** provides a summary of the evaluation of the West Corridor 1 bridge scenarios. Bridge Scenario 2 would optimize cross-river bridge capacity, providing the needed six traffic lanes across the river, all on the new I-69 bridge. However, it would require all local cross-river traffic to use I-69 to cross the Ohio River, resulting in local traffic having to share the I-69 roadway with higher speed through-traffic, adding turning movements to access and exit I-69, and possibly reducing safety. With only a single river bridge, Bridge Scenario 2 would not provide route redundancy in case of an extreme incident. Although this scenario had the lowest cost of the West Corridor 1 scenarios, it was not recommended to be carried into the DEIS because of the safety, redundancy, and accessibility concerns described above.

**Table 3.2-3. West Corridor 1 Bridge Scenario Comparison**

EVALUATION CRITERIA	BRIDGE SCENARIO 2 (0 US 41 BRIDGES)	BRIDGE SCENARIO 3 (1 US 41 BRIDGE)	BRIDGE SCENARIO 4 (2 US 41 BRIDGES)
Section 4(f) Impacts to Historic Bridges	2 bridges taken out of service	1 bridge taken out of service	Bridges remain in service, no Section 4(f) impacts to historic bridges
Traffic Distribution/ Potential Toll Revenue	All traffic on I-69 bridge	Traffic balanced under low and high traffic assumptions	Traffic balanced under high traffic assumption Traffic imbalanced under low traffic assumption
Bridge Capacity Optimization	Adequate capacity	Adequate capacity	Excess capacity
Safety Considerations	Local/interstate traffic mixed No sight distance concerns	Local/interstate traffic separated No sight distance concerns	Local/interstate traffic separated No sight distance concerns
US 41 Corridor Accessibility/Visibility	US 41 corridor visible from interstate Less accessible due to closure of US 41 bridges	US 41 corridor visible from interstate Accessible from I-69 and US 41 bridge	US 41 corridor visible from interstate Accessible from I-69 and US 41 bridges
Reliability and Redundancy	No route redundancy	Route redundancy provided	Route redundancy provided
Project Cost and Financial Feasibility	Lowest cost bridge scenario	\$31 million more than Bridge Scenario 2	\$159 million more than Bridge Scenario 2

Bridge Scenario 3 would retain one of the existing US 41 bridges for two-way local cross-river traffic and would optimize cross-river bridge capacity, providing two lanes on existing US 41 and four lanes on the new I-69 bridge. Local cross-river traffic would not be required to enter and exit I-69 to cross the river or to mix with higher speed through traffic on I-69.



This scenario also provided redundancy with two independent bridges across the river, making full closures due to extreme incidents less likely. With a total estimated cost of \$1,466 million, Bridge Scenario 3 was \$31 million (about 2 percent) more expensive than Bridge Scenario 2. Because Bridge Scenario 3 provided redundancy and additional safety and reliability benefits, it was recommended to be retained as a practical and feasible alternative for study in the DEIS.

Bridge Scenario 4, which would include a new I-69 bridge and retain both US 41 bridges, also was not recommended to be retained because it would result in eight total bridge lanes across the river while long-term traffic forecasts showed that only six lanes were needed. Bridge Scenario 4 was not recommended for further consideration because it would cost \$128 million more than Bridge Scenario 3 with no additional benefits to traffic.

#### WEST CORRIDOR 2: BRIDGE SCENARIOS 5 – 7

The West Corridor 2 alignment would be located along the west side of the US 41 commercial strip and would remove all businesses along the west side of US 41 in this area. Less than half of the existing US 41 right-of-way would remain to the east of I-69, where a new two-lane roadway would be provided through the commercial strip. These changes would alter the function of US 41, converting it from an independent commercial corridor into a frontage road for I-69.

**Table 3.2-4** provides a summary of the evaluation of West Corridor 2 bridge scenarios. Bridge Scenario 5 would provide the optimum six lanes for cross-river traffic, all on the new I-69 bridge, and both US 41 bridges would be taken out of service for vehicular use. This scenario had an advantage over Bridge Scenario 6 because it shifted all local cross-river traffic to I-69 and reduced traffic volumes on US 41, which would become a frontage road to I-69, rather than an independent commercial corridor. Reducing traffic on US 41 would improve safety at the cross-road intersections due to the proximity of I-69. To some extent, it would also mitigate the concerns of limited sight distance due to the immediately adjacent elevated I-69 roadway. With the lowest total cost of the three bridge scenarios in this corridor, similar footprint impacts, and these safety advantages, Bridge Scenario 5 was recommended to be retained as a practical and feasible alternative for study in the DEIS.

Bridge Scenario 6 would provide the optimum six lanes for cross-river traffic on two bridges: four lanes on the new I-69 bridge and two lanes on one of the existing US 41 bridges. However, with US 41 functioning as a frontage road to the interstate, the higher traffic volumes on US 41, compared to Bridge Scenario 5, would not mitigate the intersection safety and limited sight distance concerns caused by US 41 being immediately adjacent to the elevated I-69 roadway. With total costs being higher than Bridge Scenario 5, similar footprint impacts, and additional safety concerns, Bridge Scenario 6 was not recommended for further consideration.

Bridge Scenario 7 also was not recommended to be retained because it would result in eight total bridge lanes across the river while long-term traffic forecasts showed that only six lanes are needed. Bridge Scenario 7 was not recommended for further consideration because it would cost \$135 million more than Bridge Scenario 6 with no additional benefits to traffic.

**Table 3.2-4. West Corridor 2 Bridge Scenario Comparison**

EVALUATION CRITERIA	BRIDGE SCENARIO 5 (0 US 41 BRIDGES)	BRIDGE SCENARIO 6 (1 US 41 BRIDGE)	BRIDGE SCENARIO 7 (2 US 41 BRIDGES)
Section 4(f) Impacts to Historic Bridges	2 bridges taken out of service	1 bridge taken out of service	Bridges remain in service, no Section 4(f) impacts to historic bridges
Traffic Distribution/ Potential Toll Revenue	All traffic on I-69 bridge	Traffic balanced under low and high traffic scenarios	Traffic balanced under high traffic scenario Traffic imbalanced under low traffic assumption
Bridge Capacity Optimization	Adequate capacity	Adequate capacity	Excess capacity
Safety Considerations	Sight distance concerns, but minimized by reduced traffic on US 41	Sight distance concerns	Sight distance concerns, most serious under low traffic assumption
US 41 Corridor Accessibility/Visibility	US 41 corridor visible from interstate Directly accessible from adjacent interstate	US 41 corridor visible from interstate Accessible from I-69 and US 41 bridge	US 41 corridor visible from interstate Accessible from I-69 and US 41 bridges
Reliability and Redundancy	No route redundancy	Route redundancy provided	Route redundancy provided
Project Cost and Financial Feasibility	Lowest cost bridge scenario	\$27 million more than Bridge Scenario 5	\$162 million more than Bridge Scenario 5

#### CENTRAL CORRIDOR 1: BRIDGE SCENARIOS 8 – 10

Central Corridor 1 would create a new roadway corridor for I-69 about 2 miles east of US 41, geographically separated from the existing US 41 commercial strip.

**Table 3.2-5** provides a summary of the evaluation of the Central Corridor 1 bridge scenarios. Bridge Scenario 8 would provide the needed six lanes, all on the new I-69 bridge, requiring that all local traffic cross the river on I-69. For local traffic between Henderson and downtown Evansville, this route would add approximately 4 miles of travel distance and would require all local cross river trips to use the I-69 crossing. This configuration would also have the greatest potential impact on the commercial strip in terms of reduced traffic visibility and accessibility, and it would not provide route redundancy in case of an extreme incident. For these reasons, Bridge Scenario 8 was not recommended for further consideration.

Bridge Scenario 9 would optimize cross-river bridge capacity, providing four cross-river lanes on the new I-69 bridge and two lanes on one of the existing US 41 bridges. By maintaining one existing US 41 bridge, this scenario would maintain local cross-river access to the US 41 commercial strip and provide a separate travel route that could be used in the case of an incident on either bridge. With a total cost of \$1,415 million, Bridge Scenario 9 was only \$8 million more expensive than Bridge Scenario 8 but would provide additional benefits; therefore, it was recommended to be retained as a practical and feasible alternative for study in the DEIS.

Table 3.2-5. Central Corridor 1 Bridge Scenario Comparison

EVALUATION CRITERIA	BRIDGE SCENARIO 8 (0 US 41 BRIDGES)	BRIDGE SCENARIO 9 (1 US 41 BRIDGE)	BRIDGE SCENARIO 10 (2 US 41 BRIDGES)
Section 4(f) Impacts to Historic Bridges	2 bridges taken out of service	1 bridge taken out of service	Bridges remain in service, no Section 4(f) impacts to historic bridges
Traffic Distribution/ Potential Toll Revenue	All traffic on I-69 bridge	Traffic balanced under low and high traffic scenarios	Traffic balanced under high traffic scenario Traffic imbalanced under low traffic scenario
Bridge Capacity Optimization	Adequate capacity	Adequate capacity	Excess capacity
Safety Considerations	Local/interstate traffic Mixed	Local/interstate traffic separated	Local/interstate traffic separated
US 41 Corridor Accessibility/Visibility	US 41 corridor not visible from interstate Lowest accessibility	US 41 corridor not visible from interstate Accessible from US 41 bridge	US 41 corridor not visible from interstate Accessible from US 41 bridges
Reliability and Redundancy	No route redundancy	Route redundancy provided	Route redundancy provided
Project Cost and Financial Feasibility	Lowest cost bridge scenario	\$8 million (<1%) more than Bridge Scenario 8	\$117 million more than Bridge Scenario 8

Bridge Scenario 10 was not recommended to be retained because it would result in eight total bridge lanes across the river while long-term traffic forecasts showed that only six lanes are needed. Bridge Scenario 10 was not recommended for further consideration because it would cost \$109 million more than Bridge Scenario 9 with no additional benefits to traffic.

#### RECOMMENDED DEIS ALTERNATIVES

Based on the results of the *Screening Report Supplement*, the following alternatives were recommended to be evaluated in detail in the DEIS.

- No Build Alternative: required by NEPA to serve as a baseline for comparison
- West Alternative 1: West Corridor 1, with four lanes on I-69 and retaining one of the existing US 41 bridges (Bridge Scenario 3)
- West Alternative 2: West Corridor 2, with six lanes on I-69 and taking both existing US 41 bridges out of service (Bridge Scenario 5)
- Central Alternative 1: Central Corridor 1, with four lanes on I-69 and retaining one of the existing US 41 bridges (Bridge Scenario 9). (As described below, in [Section 3.3.4](#), two options for Central Alternative 1 were developed: Central Alternative 1A, which would include tolls on the US 41 and I-69 bridges and Central Alternative 1B, which would only include tolls on the I-69 bridge.)

These DEIS alternatives are described in greater detail in [Section 3.3](#).

The results of the *Screening Report Supplement* were presented to the public at Public Open Houses held on February 6, 2018 in Henderson, KY and February 7, 2018 in Evansville, IN. A copy of the report was also distributed to the IAC members to obtain their input. Summaries of these meetings and comments received are provided in **Chapter 8** and **Appendices C and H**.

Based on comments received from local officials, the public, and businesses located along the US 41 commercial strip, the Central Alternatives 1A and 1B southern interchange with US 41 was redesigned to provide more direct access to the US 41 commercial strip. The revised interchange would eliminate the proposed US 41 connector road and keep the existing section of US 41 south of the US 60 interchange open.

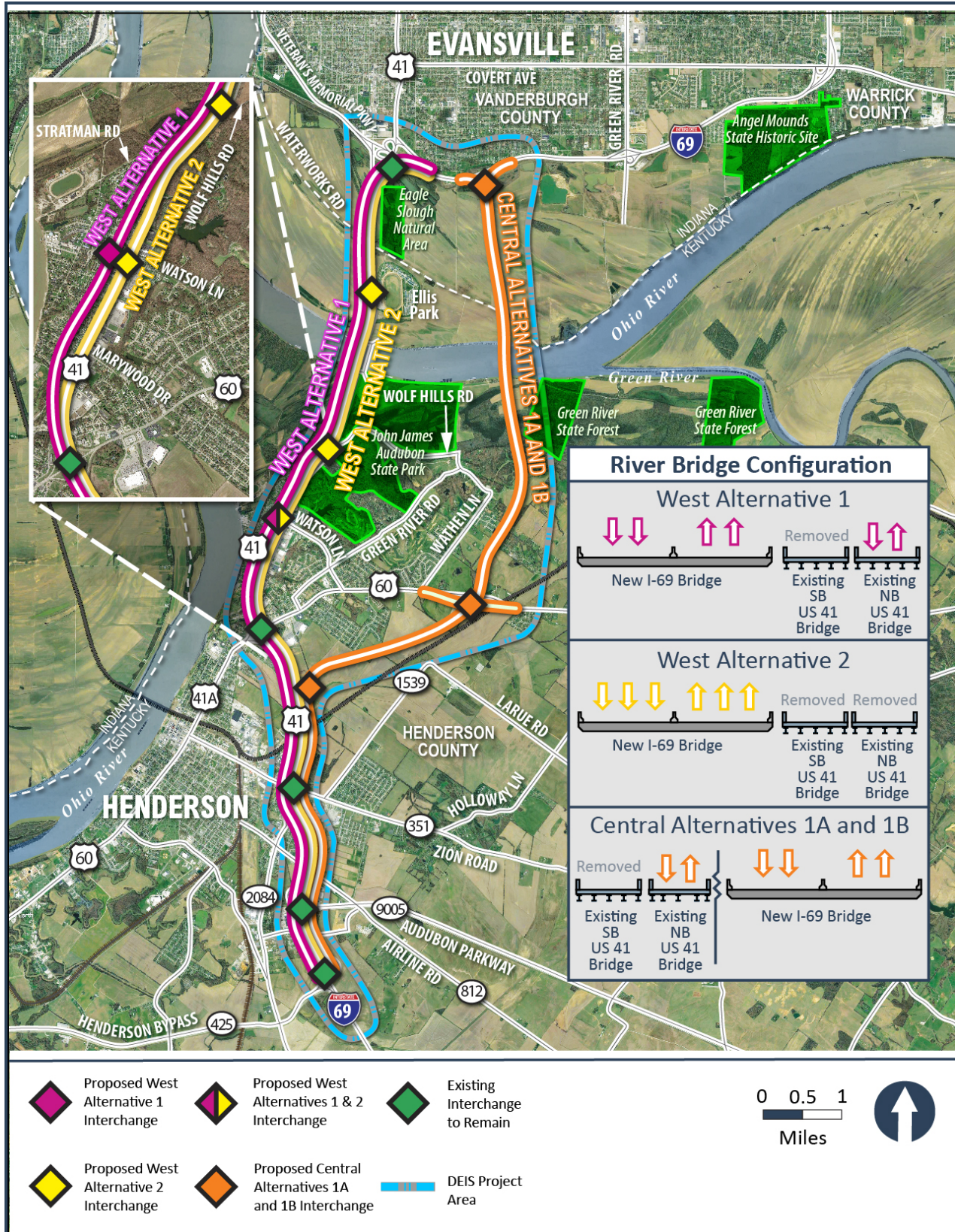
Following the *Screening Report Supplement*, INDOT and KYTC determined that the remaining US 41 bridge that would be taken out of service for vehicular use would be removed (i.e., demolished) instead. This decision was made following coordination with local officials who said that they would not take ownership of the remaining bridge for non-vehicular (i.e., pedestrian and bicycle) use (**Appendix H-8**). Due to the cost of maintaining the existing bridges, retaining either bridge for non-vehicular use would make the project not financially feasible. It was also determined that the northbound US 41 bridge would be retained and the southbound US 41 bridge would be removed and both bridges would be removed for West Alternative 2.

### 3.3 DESCRIPTION OF DEIS ALTERNATIVES

In addition to the No Build Alternative, the three build alternatives that were evaluated in the DEIS are shown in **Figure 3.3-1** and described in greater detail in the following sections. The design of the three build alternatives is also shown in greater detail on the Environmental Features maps in **Appendices A-1, A-2, and A-3**. Regarding the use of tolls, consistent with the EMPO's fiscally constrained *Metropolitan Transportation Plan (2045)* (EMPO 2019a), tolling I-69 will be a key part of the financing for this project. The toll policy will define the toll rates for different vehicle types and will be developed with a federally required financial plan prior to construction. The NEPA process will not determine the toll policy but will evaluate and document the environmental consequences associated with tolling as a part of the project.

An evaluation was conducted of two potential tolling options, one that would toll only the I-69 bridge and another that would toll both the I-69 bridge and the remaining northbound US 41 bridge. The option that would toll the I-69 bridge and the remaining northbound US 41 bridge would provide a "reasonable worst case" in terms of potential impacts associated with increased traffic volumes on I-69. For both tolling options the states assumed that toll rates would be similar to the Louisville, KY metropolitan area bridges for the I-65 and KY 841/SR 265 Ohio River Crossings (i.e., \$2.00 for cars, \$5.00 for medium trucks, and \$10.00 for large trucks). Both projects are located in metropolitan areas within the same geographical region and have comparable estimated total costs. All tolls would be collected through electronic toll collection technology using a combination of transponders for drivers with a pre-paid account or license plate readers for those without an account. Toll collection equipment would be mounted on overhead gantries and/or roadside structures. Advance signage would notify drivers of the upcoming toll and rates for each vehicle class. Tolling is discussed further in **Chapter 4, Section 4.8.2**.





**Figure 3.3-1. DEIS Alternatives**

### **3.3.1 NO BUILD ALTERNATIVE**

Although the No Build Alternative does not meet the project's purpose and need, it must be included in the DEIS as a baseline comparison for the build alternatives in accordance with NEPA. For the No Build Alternative, the states assumed that all of the transportation projects listed in the EMPO *Transportation Improvement Program 2020 – 2024* (TIP) (EMPO 2019b) would be built except for the I-69 ORX project. In addition, the No Build Alternative would likely include the major rehabilitation of the existing US 41 bridges, even though these activities are not currently included in the EMPO TIP. This is based on a review of recent bridge inspection reports and an understanding of the structure types and traffic loads. It is anticipated that the structural condition of the bridges will continue to deteriorate within the next 25 – 30 years to the point where a major rehabilitation of the bridges would be the most cost-effective solution. It is expected that such a project would eventually be added to the EMPO TIP before the design year of the I-69 ORX project (i.e., 2045).

### **3.3.2 WEST ALTERNATIVE 1**

West Alternative 1 (**Appendix A-1**) would include a new I-69 bridge approximately 5,400 feet long over the Ohio River and associated floodway and would be located approximately 70 feet west of the existing southbound US 41 bridge. The new bridge would include four lanes with the capacity to expand to six lanes in the future, if needed, by restriping the lanes on the bridge. The rest of the alternative would also include four lanes. The northbound US 41 bridge would be retained and the southbound US 41 bridge would be removed. The northbound US 41 bridge, which has two lanes, would be converted from a one-way bridge to a two-way bridge for local traffic.

Most of West Alternative 1 would use a rural cross-section, including a grass median; however, through Henderson, it would use an urban cross-section and include a narrower median with a concrete barrier. The typical sections for West Alternative 1 are shown in **Figure 3.3-2**. West Alternative 1 would begin on existing I-69 in Indiana just east of the US 41 interchange and become the through movement for I-69. Connections to US 41 to the north and Veterans Memorial Parkway to the west would be provided. The alternative would include a bridge to carry I-69 over Waterworks Road and Nugent Drive, with local access to Waterworks Road and Ellis Park maintained by US 41.

In Kentucky, the alternative would include a bridge to carry I-69 over Stratman Road, with local access to Stratman Road and Wolf Hills Road provided by US 41 and the local bridge. The alternative would continue south and run parallel to, and approximately one block west of, the US 41 commercial strip. There would be no changes to US 41 through this area. An interchange would be constructed at Watson Lane to provide highway access to the commercial strip and adjacent residential areas. An overpass (no interchange) would be provided at Barker Road to maintain connection to residential areas west of the alternative. A local access road with a sidewalk would be provided on the west side of the alternative between Barker Road and Atkinson Park.

The alternative would then continue south and connect to the existing four-lane, fully controlled access section of US 41 south of the US 60 interchange. The US 60 interchange would be modified



to provide connections to and from existing US 41, US 60, and I-69. US 41 (formerly named Edward T. Breathitt Pennyryle Parkway) south of US 60 to KY 425, where I-69 in Kentucky currently ends, would be modernized to meet interstate standards through improvements to ramps and merge areas. The total length of West Alternative 1 is 11.1 miles, which includes 2.9 miles of existing US 41.

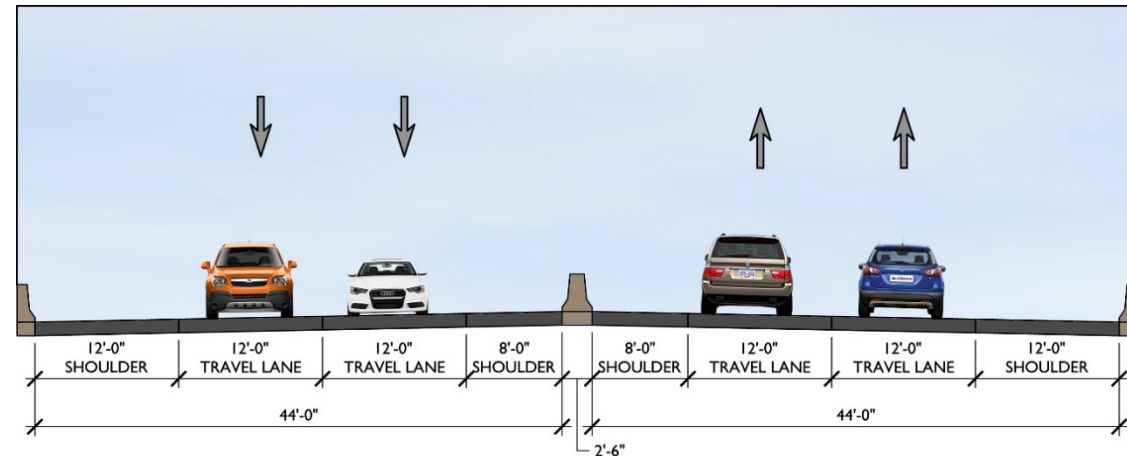
### **3.3.3 WEST ALTERNATIVE 2**

As with West Alternative 1, West Alternative 2 (**Appendix A-2**) would include a new I-69 bridge approximately 5,400 feet long over the Ohio River and associated floodway and would be located approximately 70 feet west of the existing southbound US 41 bridge. The new I-69 bridge for West Alternative 2 would include six lanes and the existing US 41 bridges would be removed. The sections of the alternative north of the new bridge to Waterworks Road and south of the new bridge to US 60 would also be six lanes. North of Waterworks Road and South of US 60, the alternative would transition from six lanes to four lanes.

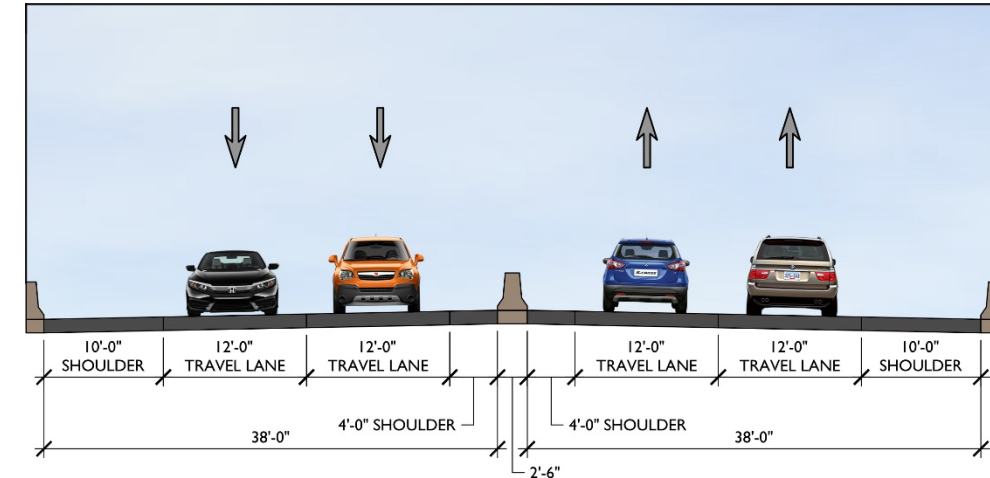
Most of West Alternative 2 would use a rural cross-section and include a grass median; however, through Henderson, it would use an urban cross-section and include a narrower median with a concrete barrier. The typical sections for West Alternative 2 are shown in **Figure 3.3-3**. Similar to West Alternative 1, West Alternative 2 would begin on existing I-69 in Indiana just east of the I-69/US 41/Veterans Memorial Parkway interchange and become the through movement for I-69. Connections to US 41 to the north and Veterans Memorial Parkway to the west would be provided. From the I 69/US 41/Veterans Memorial Parkway interchange to Ellis Park, the alternative would follow the existing US 41 alignment. An overpass would carry Waterworks Road over I-69 and an interchange would be provided at Ellis Park.

In Kentucky, the alternative would follow existing US 41 through the US 41 commercial strip, with local access provided via a reconstructed US 41, which would function as a frontage road located adjacent to and east of the alternative. The reconstructed US 41 would include two lanes plus a center two-way left turn lane and a new sidewalk on the east side. There are currently no sidewalks along US 41 in this area. An interchange would be provided at Stratman Road/Wolf Hills Road and at Watson Lane. At the Watson Lane interchange, US 41 would be relocated approximately 300 feet to the east to provide adequate spacing between the interchange and the US 41/Watson Lane intersection. An overpass (no interchange) would be provided at Rettig Road to maintain connection to residential areas west of the alternative. In addition, a shared-use (i.e., pedestrian and bicycle) path would be provided on the west side of the new interstate.

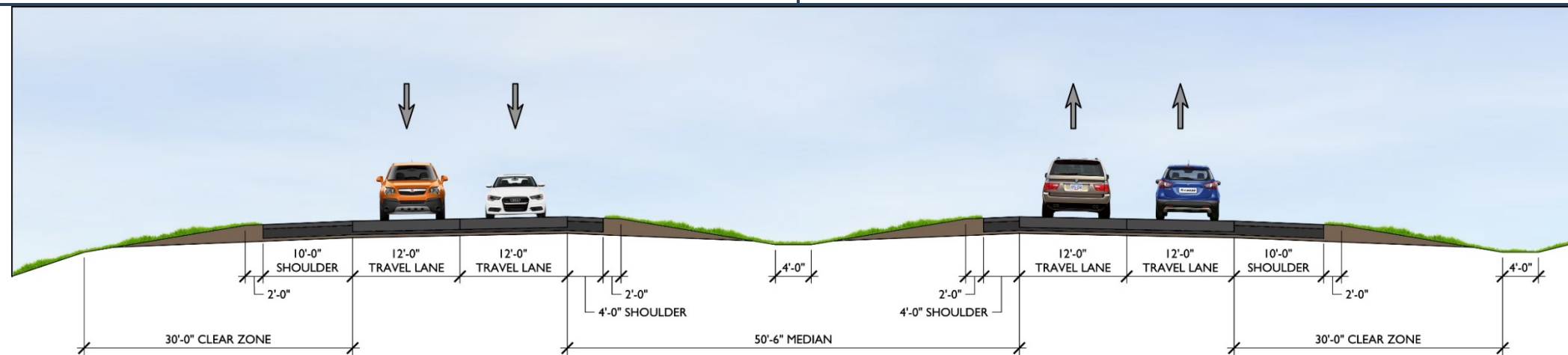
The alternative would continue south, within the US 41 corridor, to the existing US 60 interchange, which would be modified to provide connections to and from existing US 41, US 60, and I-69. The existing four-lane section of US 41 (formerly named Edward T. Breathitt Pennyryle Parkway) south of US 60 to KY 425, where I-69 in Kentucky currently ends, would be modernized to meet interstate standards through improvements to ramps and merge areas. The total length of West Alternative 2 is 11.0 miles, which includes 2.9 miles of existing US 41.



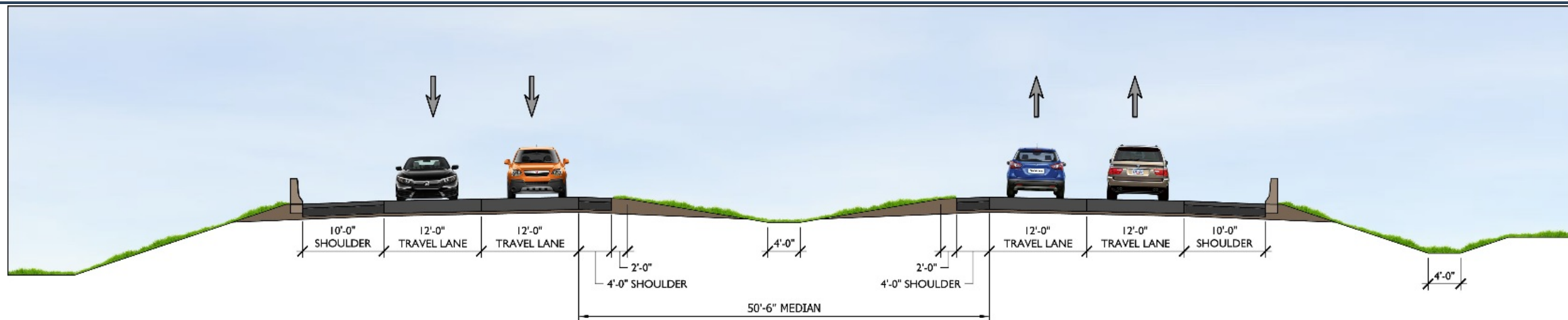
**West Alternative 1 and Central Alternatives 1A and 1B — Main Bridge Span**



**Central Alternative 1B Modified — Main Bridge Span**



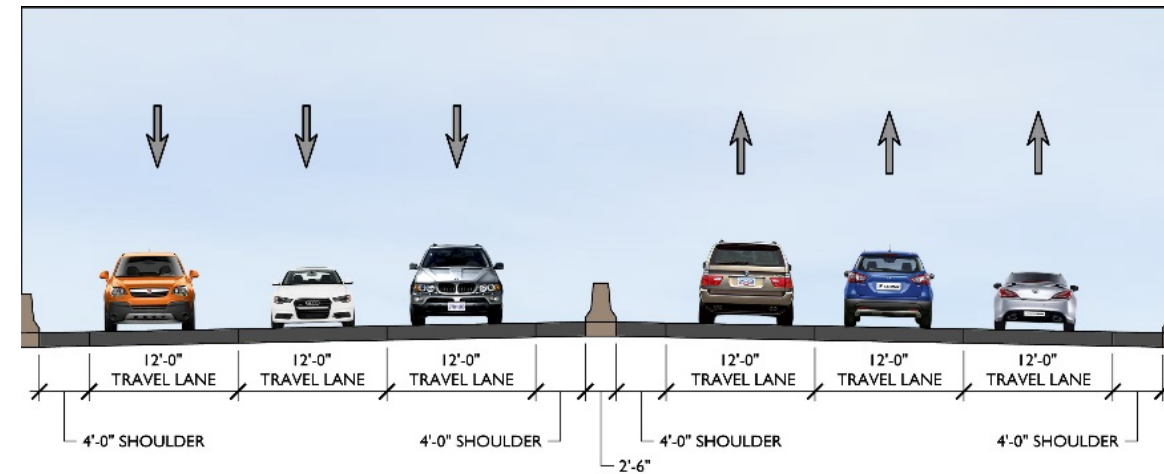
**West Alternative 1 and Central Alternatives 1A, 1B and 1B Modified — Rural — 4 Lanes**



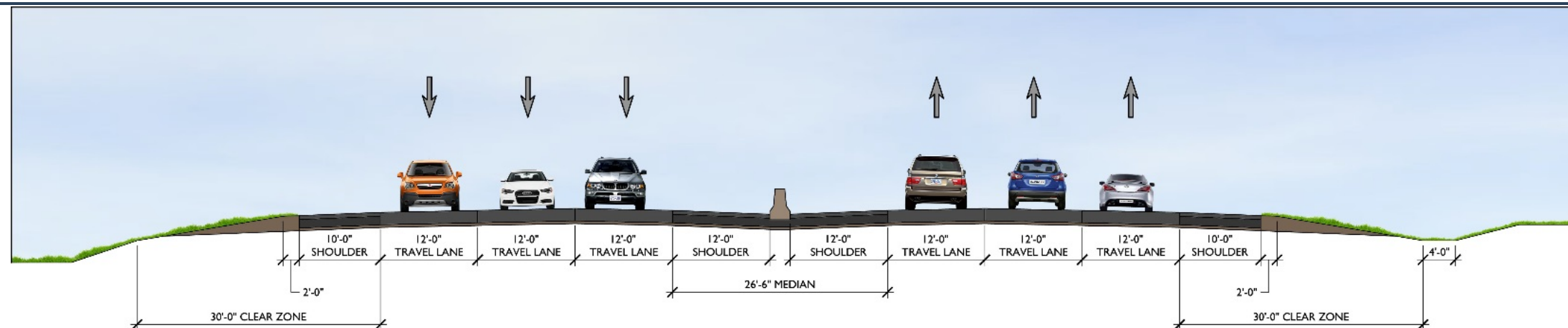
**West Alternative 1 — Urban at Grade — 4 Lanes**

**Figure 3.3-2. West Alternative 1 and Central Alternatives 1A, 1B, and 1B Modified Typical Sections**

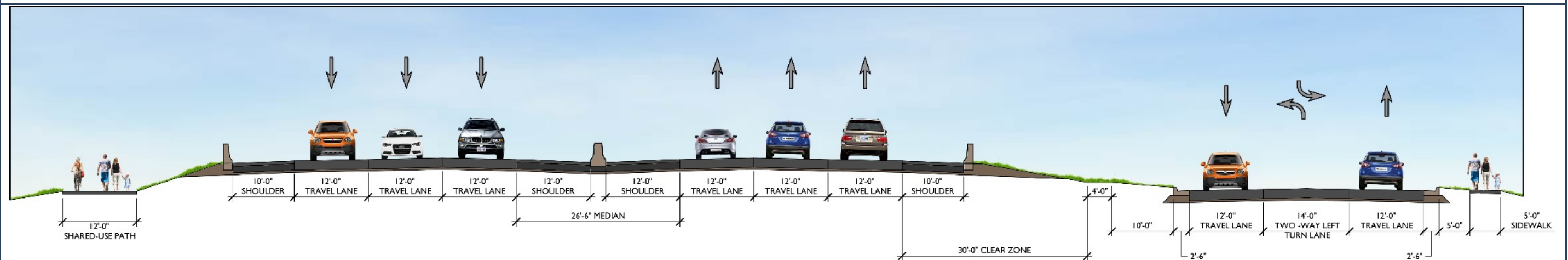




**West Alternative 2 — Main Bridge Span — 6 Lanes**



**West Alternative 2 — Rural — 6 Lanes**



**West Alternative 2 — Urban at Grade — 6 Lanes — With US 41 Frontage Road**

**Figure 3.3-3. West Alternative 2 Typical Sections**

### 3.3.4 CENTRAL ALTERNATIVES 1A AND 1B (PREFERRED)

Central Alternatives 1A and 1B were identified as the Preferred Alternatives in the DEIS. Central Alternative 1A would include tolls on the US 41 and I-69 bridges. Central Alternative 1B would only include tolls on the I-69 bridge. Otherwise, Central Alternatives 1A and 1B are the same. Central Alternatives 1A and 1B ([Appendix A-3](#)) would include a new I-69 bridge approximately 7,600 feet long over the Ohio River and associated floodway and would be located approximately 1.5 miles east of the existing US 41 bridges. The new I-69 bridge would include four lanes, with the capacity to expand to six lanes in the future, if needed, by restriping the lanes on the bridge. The rest of the alternative would also include four lanes. The northbound US 41 bridge would be retained and the southbound US 41 bridge would be removed. The northbound US 41 bridge would be converted from a one-way bridge to a two-way bridge for local traffic. There would be no changes to US 41 through the commercial strip. Central Alternatives 1A and 1B would use a rural cross-section and include a depressed grass median outside of the bridge limits. The typical sections for Central Alternatives 1A and 1B are shown in [Figure 3.3-2](#).

Central Alternatives 1A and 1B begin at existing I-69 in Indiana, approximately 1 mile east of the US 41 interchange. A new system interchange with existing I-69 would be constructed and I-69 would become the through movement. The interchange would accommodate access to Veterans Memorial Parkway to the west. The alternatives would continue south across the Ohio River just west of a gas transmission line. They would remain just west of the gas transmission line near Green River State Forest, then turn southwest where an overpass would be provided to carry the access road for the gas transmission line over the alternatives. The alternatives would continue south to US 60 where an interchange would be provided. As part of the US 60 interchange, US 60 would be relocated approximately 400 feet south and require a new bridge over the CSX Railroad east of the interchange. The alternatives would continue southwest and connect with US 41 via an interchange approximately 1 mile south of the US 60 interchange. From the alternatives' interchange with US 41 to KY 425, the existing four-lane US 41 would be modernized to meet interstate standards through improvements to ramps and merge areas. The total length of Central Alternatives 1A and 1B is 11.2 miles, which includes 2.8 miles of existing US 41.

### 3.4 DEVELOPMENT AND DESCRIPTION OF CENTRAL ALTERNATIVE 1B MODIFIED (SELECTED)

Following publication of the DEIS, the project team continued development of Central Alternatives 1A and 1B, while INDOT and KYTC developed a financial plan including a decision regarding tolling of the remaining US 41 bridge. This section describes the process that resulted in the identification of Central Alternative 1B Modified as the Selected Alternative.

It is important to note that Central Alternatives 1A and 1B (Preferred), as described in [Section 3.3.4](#) of this chapter, have the same design and, therefore, the same construction and right-of-way limits. The only difference is that Central Alternative 1A would include tolls on the remaining US 41 bridge and Central Alternative 1B would not. As a result, the physical impacts from the footprint of these alternatives are the same. The only differences in impacts (i.e., traffic, noise, socioeconomics, and environmental justice populations) would be associated with whether or not the US 41 bridge would be tolled.

### **3.4.1 VALUE ENGINEERING STUDY**

A Value Engineering (VE) Study was conducted on Central Alternatives 1A and 1B (Preferred) via a series of workshops from March 12-14, 2019. The VE Study team consisted of consultant, INDOT, and KYTC engineers that were not part of the I-69 ORX team. The purpose of the VE Study was to identify design modifications to Central Alternatives 1A and 1B (Preferred) that may further reduce costs, improve traffic performance, and minimize impacts. The *Value Engineering Study Report* (INDOT and KYTC 2019b) (**Appendix S-1**) provides a summary of the workshop recommendations.

### **3.4.2 SECTION 1 PRELIMINARY DESIGN**

In 2020, the Kentucky legislature adopted *Kentucky's FY 2020 – FY 2026 Highway Plan* (KYTC 2020a) that included funding for the first section of the I-69 ORX project. Section 1, which will be constructed first, includes all project work from KY 425 to the US 60 interchange, including the upgrades to existing US 41 and the first 2.9 miles of new terrain highway. Section 2 of the project will include the remainder of the project from the US 60 interchange, across the Ohio River, and connecting to I-69 in Indiana. Upon completion of Section 1, drivers will be able to utilize future I-69 as far north as US 60, but cross-river traffic will still utilize US 41 to cross the river. Implementing this construction phasing represents one of the proposed project modifications.

Based on the states' current financial plan for the project, construction of Section 1 will begin in 2022 and construction of Section 2 will begin in 2027. The states will continue to review the financial plan and explore funding opportunities with the goal of accelerating the construction of Section 2.

In preparation for construction of Section 1, KYTC led a preliminary design study of that section of Central Alternatives 1A and 1B (Preferred) as documented in the *Planning Study Report (Final) for the I-69 Ohio River Crossing Project, Henderson: Section 1* (INDOT and KYTC, 2021a) (**Appendix T-1**). Based on the recommendations from the VE Study and the Section 1 Planning Study, and with consideration to the public and agency comments received on the DEIS, design modifications were made to Central Alternatives 1A and 1B (Preferred).

### **3.4.3 FINANCIAL PLAN AND IDENTIFICATION OF THE SELECTED ALTERNATIVE**

As described in **Chapter 4, Section 4.8.3**, tolling would only cover a portion of the financing needs of the project. Therefore, INDOT and KYTC must develop a financial plan to cover the remaining costs through a combination of grants, loans, and/or their respective capital programs. As described in **Chapter 8, Section 8.1.2**, the majority of those providing comments on the DEIS supported keeping the US 41 crossing non-tolled due to its potential impact on local residents and businesses. In addition, as described in **Chapter 4, Section 4.2.6**, tolling of both crossings would likely result in a disproportionately highly and adverse impact on environmental justice populations. After consideration of each of these factors, INDOT and KYTC determined that the US 41 crossing should remain non-tolled (i.e., Central Alternative 1B). With the incorporation of the design modifications noted above and described in more detail in **Section 3.4.4**, Central Alternative 1B was renamed Central Alternative 1B Modified.



INDOT and KYTC provided both the public and agencies an opportunity to review and comment on Central Alternative 1B Modified as the Single Preferred Alternative during a 15-day comment period which included a virtual public meeting on April 1, 2021. Subsequently, Central Alternative 1B Modified was identified as the Selected Alternative (see [Chapter 6, Section 6.2](#) and [Appendix A-4](#)). The original design and impacts associated with Central Alternatives 1A and 1B (Preferred) as presented in the DEIS have been carried forward into the FEIS. This provides a point of reference in the project's development and allows the comparison of those impacts to the changes in design and impacts associated with Central Alternative 1B Modified (Selected). This comparison was also the basis for the determination, described in [Chapter 1, Section 1.1](#), that the changes in impacts were not substantial and that combining the FEIS and Record of Decision (ROD) was appropriate.

### 3.4.4 DESIGN MODIFICATIONS

The following is a list of the design modifications associated with Central Alternative 1B Modified (Selected). Appendix A-4 provides detailed mapping of the design features noted below.

- **Construction Phasing** – As previously discussed, the project will be constructed in two phases that are referred to as Sections 1 and 2. Section 1 will be constructed first and includes all project work from KY 425 to the US 60 interchange, including the upgrades to existing US 41 and the first 2.9 miles of new terrain highway. Section 2 of the project will include the remainder of the project from the US 60 interchange, across the Ohio River, and connecting to I-69 in Indiana. Upon completion of Section 1, drivers will be able to utilize future I-69 as far north as US 60, but cross-river traffic will still utilize US 41 to cross the river.
- **Interchange with Existing I-69 in Indiana** – The modified design for this interchange eliminates the loop ramp that was previously included to provide access for eastbound traffic from Veterans Memorial Parkway heading north on I-69. The latest modified design provides a more direct route that may include an at-grade intersection of two ramps: (1) eastbound Veterans Memorial Parkway to northbound I-69 and (2) northbound I-69 to westbound Veterans Memorial Parkway ([Appendix A-4, Sheet 2](#)). The evaluation of this interchange, and other viable alternatives, is ongoing, and the final layout will require approval of an Interstate Access Document by FHWA.
- **I-69 Bridge** – In order to reduce bridge costs, the width of the I-69 bridge shoulders were reduced from 12 feet to 10 feet on the outside and from 8 feet to 4 feet on the inside ([Figure 3.3-2](#)). Future traffic projections determined that the option to expand the bridge from four to six lanes via restriping the lanes was not needed.
- **Bowling Lane Extension** – In order to eliminate the long-term maintenance costs that would be associated with the local access bridge over I-69 located north of the US 60 interchange, the bridge was replaced with an extension of Bowling Lane, along with a driveway, east of and parallel to I-69 in order to maintain access to the gas transmission pipeline and surrounding private property ([Appendix A-4, Sheets 8 and 9](#)). The name of this street will be determined during final design in conjunction with Henderson County.

- **US 60 Interchange** – The design of the east side of this interchange was modified to improve the connection between Tilman-Bethel Road and the relocated US 60 and to remove the existing section of US 60 and the associated bridge over the CSX railroad in order to eliminate the long-term maintenance cost of the bridge. In addition, the I-69 northbound exit and entrance ramps were shifted to the west to allow sufficient space between the ramp intersection and the Tilman-Bethel Road intersection. The modification also included the relocation of a powerline between the interchange and the historic Ellis-Neville/Lee Baskett House. On the west side, the relocated portion of US 60 was shifted north approximately 130 feet to avoid impacts to a cemetery (**Appendix A-4, Sheets 10 and 11**).
- **Stormwater Detention Basins** – A large stormwater detention basin was added adjacent to and south of I-69 between the US 41 and US 60 interchanges. This basin was added for three reasons: (1) it addresses the project’s stormwater management requirements, (2) it provides needed fill material for construction of Section 1 of the project, and (3) it reduces downstream flooding in Henderson (**Appendix A-4, Sheets 12-14**).
- **US 41 Interchange in Kentucky** – The modified design of the US 41 interchange will be phased to ensure efficient cross-river travel. The Section 1 construction phase will include a trumpet-style interchange, which maintains two-lanes of free-flow traffic on the connection to existing US 41 for both northbound and southbound cross-river traffic. Once Section 2 and the interstate connection to I-69 in Indiana is complete, the interchange will be modified to a traditional diamond interchange with one loop ramp for the US 41 southbound to I-69 northbound movement. This interchange will provide a direct connection to Kimsey Lane to the east (**Appendix A-4, Sheet 14**).
- **KY 351 Interchange** – Further analysis of this area indicated that the proximity of the KY 351 interchange to the partial interchange with KY 2084 did not meet interstate design standards. The revised design for this interchange removes the ramps to/from KY 2084 and reconstructs the KY 351 interchange. The northbound bifurcated section of KY 2084 will be relocated along the existing southbound lane. The revised design for the interchange includes roundabouts at each of the ramp intersections and another roundabout at the KY 351/KY 2084 intersection. The revised design also includes shifting the proposed I-69 mainline (i.e., existing US 41) to the west approximately 30 feet. The roundabouts will support the City of Henderson’s vision for this gateway corridor as well as provide improved safety and access in this area (**Appendix A-4, Sheet 16**).
- **Northbound Auxiliary Lane between the Henderson Bypass and Audubon Parkway Interchanges** – In order to improve traffic weaving and safety, a northbound auxiliary lane was added between the Henderson Bypass and Audubon Parkway interchanges (**Appendix A-4, Sheets 18 and 19**).

In addition to these design modifications, toll rates for Central Alternative 1B Modified were updated to reflect an assumed open to traffic year of 2033 and an inflation rate of 2.5 percent per year. Therefore, the assumed toll rates for Central Alternative 1B Modified were updated to \$3.00 for cars, \$7.52 for medium trucks, and \$15.02 for large trucks.