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3 ENVIRONMENTAL RESOURCES, IMPACTS & MITIGATION

The following substantive changes have been made to this chapter since the Draft Environmental Impact Statement (DEIS) was published:

- During the Screening of Alternatives, Alternative R was evaluated before being removed from further consideration. Alternative R consists of upgrading US 231 from I-64 to I-69. Many comments on the DEIS requested further consideration of an upgrade of US 231 in addition to the five alternatives presented in the DEIS. In response to these comments, this FEIS further evaluates the costs, impacts and benefits of Alternative R. See **Section 2.5.1** for details about Alternative R.
- Multiple comments were received from the public and local officials in Loogootee and Martin County about the alignment of Alternative P in Martin County, in particular in the vicinity of Loogootee. The DEIS showed Alternative P with an alignment west of Loogootee. Portions of this alignment are in Daviess County. These comments requested modifications to Alternative P to bring it through or to the east of Loogootee.
- In response to these comments, three additional variations of Alternative P have been added in Martin County. All variations of Alternative P are within Section of Independent Utility (SIU) 4. See **Section 2.7** for a discussion of Tier 2 sections for all alternatives. Alternative P with these variations has been designated as Refined Preferred Alternative P (RPA P). It is evaluated separately from any alternative considered in the DEIS for comparison. A single variation of RPA P will be selected in Tier 2 studies for SIU 4. See **Section 2.5.2** for details about the variations of RPA P near Loogootee.

Chapter 3 provides an overview of the existing environment within the 12-county Study Area and analyses to estimate the potential resource impacts of each alternative carried forward from **Chapter 2 - Alternatives**. The descriptions will include effects to the social, economic, and natural environment. For consistency with guidance provided in 84 FR 44351 (*Page Limits for National Environmental Policy Act Documents and Focused Analyses*), details of impacts to resources which are not significant, or which do not differentiate among alternatives, will be restricted to Volume II (*Appendices*) or otherwise incorporated by reference.

3.1 ENVIRONMENTAL RESOURCE ANALYSIS APPROACH

The level of analysis presented in this document is consistent with the detail required for a tiered environmental process. At the Tier 1 level, resources generally are not identified using detailed field investigations. Information is gathered through public and agency engagement, review of publicly available data and windshield surveys from public right-of-way. Separately, roadway design is conducted in sufficient detail to develop reasonable footprints to estimate impacts. The intent of the tiered approach is to defer the full design and resource survey effort until Tier 2, but to generate sufficient data to select a preferred alternative in Tier 1.

The narrative of this analysis will include a description of the relevant laws, regulations, guidelines and methodology used to assess impacts. Each resource will be evaluated for potential avoidance and minimization of impacts.



These evaluations will consider types of mitigation needed, and any associated agency actions or coordination. As noted in **Chapter 2**, impact calculations will be provided as a range for each alternative to account for the variation in potential roadway footprints from alternative variations, multiple facility types (Super-2 and expressway) and localized improvements.

3.1.1 Working Alignments Selected for Detailed Study

Chapter 2 provides a detailed chronology of the alternative development process and how alternatives were selected for detailed study. This section describes the process to develop the working alignments used for impact calculations.

The sequence of alternative selection began with the development of two-mile-wide study bands during the scoping phase for evaluating resources and identifying reasonable locations where alternatives could be placed. Sixteen study bands were identified to develop alternatives within the three sections of the 12-county Study Area (*sections being roughly from Rockport to I-64, I-64 to the East Fork White River and White River to either I-69 or SR 37 north of the East Fork White River*). After study bands were established, combinations of these were used to form contiguous alternatives between the termini in the preliminary alternative development phase. After a pre-screening analysis, 10 preliminary alternatives were advanced into the screening phase of the study. The 10 alternatives were grouped into three families based on their northern termini. The Northwest Family connects with I-69 near Washington. The North Central Family connects with I-69 near Crane. The Northeast Family connects to I-69 via SR 37.

Center lines were identified within the study bands for 10 alternatives. Depending on the terrain, land use and facility type, buffers of set distances were placed along the center line to conduct the initial estimates of impacts to resources. Combinations of center lines with different facility types produced 28 preliminary alternatives. The Screening of Alternatives Report identified 10 alternatives to be carried forward for detailed study. After the screening report freeways were removed from consideration. The selection of a facility type was deferred to Tier 2. This action resulted in five alternatives with both expressway and Super-2 facility types.

Working alignments were refined for the five Build Alternatives. Each alternative had both an expressway and Super-2 working alignment, plus associated individual local improvements. **Appendix E - Working Alignment Typical Sections and Cost Estimating** provides typical sections and cost estimates for the working alignments that represent the two potential facility types and the separate local improvements.

The alternatives carried forward for detailed study are Alternatives B and C in the Northwest Family, M and O in the Northeast Family and P in the North Central Family. The Build Alternatives are presented in **Section 2.5**. A No-Build Alternative was also included in the alternatives carried forward for detailed study. The impacts and performance of alternatives are evaluated by comparison with the No-Build Alternative. As mentioned at the beginning of this chapter, two additional alternatives are added in this FEIS. These include Alternative R and RPA P, which is the Preferred Alternative in this FEIS.

3.1.2 Calculation of Impacts

The most effective way to quantify and evaluate impacts to environmental resources at a Tier 1 level is to use a geographic information system (GIS) database. GIS is a computer-based system providing “location analytics.” A GIS approach is technically relevant and meets legal requirements for the development of major projects that cover large geographic areas, such as the Mid-States Corridor. Refer to **Appendix X – Geographic Information System Technical Documentation** for details of the GIS analysis of resource impacts.

A GIS database of environmental resource spatial datasets was obtained from both publicly available and private sources for the 12-county Study Area. This GIS database initially was used to create comprehensive environmental



resource maps to first avoid and then minimize impacts during the pre-screening of alternatives. The GIS database was also used throughout the alternatives screening process described in **Chapter 2**.

GIS allows for comparative analysis of geographic data by overlaying information with the ability to query it in terms of attributes and spatial relationships. Reasonable roadway alignments were developed in Computer Aided Design (CAD) software by roadway engineers for each alternative. These alignments then were exported for use within GIS. The alternative alignments were used to develop footprints representing alternative right-of-way areas. These were compared with the environmental resource data. Resource layers overlaying each of the working alignment footprints (Super-2 or expressway) were clipped to its boundaries, or an associated buffer zone, for impact estimates. Clipped resources generally had their geometry calculated in the form of total area (acres) or total length (feet). For some resources (parcels and historic structures) total counts were used to tally impacts. Some resource impacts are described as “potential” (e.g., archaeological, historical and threatened and endangered species) pending field investigations to be completed as part of the Tier 2 NEPA studies.

3.1.3 Consistency of Resource Reporting

Each section of **Chapter 3** will be organized in a similar format for each environmental resource to support consistency, help facilitate project review and ensure that environmental documents follow federal requirements. Although some unique resources may require additional division or adjustment, each section will follow a format of:

- **Introduction.** This provides background research for the resource being considered, including a description of the relevant laws, regulations and guidelines.
- **Methodology.** This provides a description of the data sources and procedures used to analyze impacts to the resources being considered.
- **Analysis.** This provides the description of the estimated impacts associated with the alternatives presented.
- **Mitigation.** This provides a description of resource specific strategies and measures that could be used to offset impacts to the resource. These strategies will focus on:
 - Preventive measures that avoid impacts and thus avoid harm.
 - Measures that focus on limiting the severity and the duration of the impacts.
 - Compensation mechanisms for those impacts that are unavoidable and cannot be reduced further.
- **Summary.** This provides a summary of anticipated impacts to the resource associated for each alternative.

Mitigation measures developed at the Tier 1 level creatively seek to find the best ways and means of avoiding, minimizing and remedying anticipated impacts. Mitigation strategies are designed to alleviate the loss of resources through replacement of, or compensation for, the resources displaced. Mitigation can be used to manage the short- and long-term impacts produced by an action by minimizing the duration and/or severity of the impact. Strategies and measures identified during Tier 1 represent a starting point. More detailed mitigation will be developed and refined during Tier 2 NEPA studies.