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3 ENVIRONMENTAL RESOURCES, IMPACTS, & MITIGATION

Chapter 3 of the Mid-States Corridor DEIS provides an overview of the existing environment within the 12 County Project Study Area and an analysis to estimate the potential impacts to resources from the implementation of each Build 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, detailed field investigations are not conducted for each resource. Information is gathered through public and agency engagement, review of publicly available data, and conducting windshield surveys from public right-of-way. Separately, roadway design is limited to the extent necessary to develop reasonable environmental footprints for the estimation of impacts. The intent of the tiered approach is to defer the full design and resource survey effort until Tier 2, but to generate enough data to provide confidence in the analysis 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 for each type of resource. Each resource will be evaluated for potential avoidance and minimization efforts, given consideration for the types of mitigation efforts needed, and any associated agency coordination or permitting/certifications required. 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 multiple facility types and actions (Expressway, Super 2, and localized improvements).

3.1.1 Working Alignments Selected for Detailed Study

Chapter 2 of the DEIS provides a detailed chronology of the alternative development process, and how alternatives were ultimately selected for detailed study. This section summarizes the process and highlights the development of 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 consideration of where a reasonable working alignment could be placed. Sixteen study bands were used to guide the development of corridors 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 routes between the termini in the preliminary alternative development phase. After a pre-



screening analysis, 10 routes were recommended to be considered for preliminary alternative development to move forward into the screening phase of the study. The 10 routes were grouped into the three families to categorize their northern terminus. The Northwestern Routes connect into I-69 west of Loogootee; the North Central Routes connect into I-69 north of Loogootee near Crane; and the Northeastern Routes connect to I-69 via SR 37 east of Loogootee.

Alignments were created within the study bands for the 10 routes. Depending on the terrain, land use, and facility type, buffers of set distances were placed along the alignment to conduct the first estimation of impacts to resources. Combinations of facility types produced 28 alternatives from the 10 routes. Findings from the screening report recommended carrying forward 10 build alternatives from 5 of the routes. After the screening report, freeways were removed from consideration and the selection of a facility type was deferred to Tier 2. This action compressed the number of alternatives to be equivalent to the number of routes (5).

Working alignments were refined for the 5 alternatives. Each alternative had two working alignments for the route (one for expressway and one for super 2) plus associated individualized localized improvements. **Appendix E - Working Alignment Typical Sections and Cost Estimating** provides Typical Sections and Cost Estimating for the working alignments that represent the two potential facility types and the separate localized improvements.

The alternatives carried forward for detailed study are associated with Routes B and C (Northwest Family); M and O (Northeast Family) and P (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 detail study as a point of comparison in **Chapter 5**; however, since this alternative represents the existing condition, it will not be listed as an alternative in this Chapter.

3.1.2 Calculation of Impacts

The most effective way to quantify and comparatively evaluate impacts to environmental resources at a Tier 1 EIS is using a geographic information system (GIS) database. GIS is a computer-based system that allows performance of “location analytics”. Use of a GIS approach is technically relevant and meets legal requirements for the development of major projects that cover large geographic areas, like the Mid-State’s 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 were gathered from both publicly available and private sources for the 12-County Study Area. Initially, the GIS database provided the ability to create comprehensive environmental resource maps used to first avoid and then minimize impacts as part of 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 then exported for use within GIS. The five route alignments were used to develop footprints representing appropriate right-of-way areas and included with the environmental resource data. Resource layers overlaying each of the working alignment footprints were clipped to its boundaries, or an associated buffer zone, for quantification/estimation of impacts. 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, 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 standards. 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, 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 the occurrence of impacts and thus avoid harm or even produce positive outcomes.
 - 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 from minimizing either (or both) the duration or severity of the impact. Strategies and measures identified during Tier 1 represent a starting point upon which more detailed mitigation will be developed and refined during Tier 2 NEPA studies.