



Chapter 5 - Environmental Consequences

5.1 Methodology for Evaluating Environmental Impacts

This section provides an overview of the methodology that has been used in evaluating the environmental impacts of the Build and No Build Alternatives. More detailed explanations of the methodologies used for evaluating specific impacts can be found in subsequent sections of this chapter. The purpose of this introductory section is simply to explain the overall approach used in evaluating environmental impacts and to introduce key terms and concepts that will be used later in this chapter.

The changes to this chapter since the completion of the DEIS include:

- Impact calculations have been updated to reflect the selection of variations, route shifts, and other changes, as described in Section 5.1.3.
- Discussion on tiering has been expanded.
- Updates to GIS layers, including discussion of layers removed for homeland security reasons.

5.1.1 Tiered Approach

As a result of the size and complexity of this project, FHWA and INDOT determined that it was appropriate to use a “tiered” procedure for completing the environmental studies required under the National Environmental Policy Act (NEPA). The use of a tiered process to comply with NEPA is authorized under the Council on Environmental Quality (CEQ) regulations, which applies to all federal agencies, and under FHWA’s own NEPA regulations. (See 40 CFR 1508.28 and 23 CFR 771.135(o)).

In recent years, the use of tiering for FHWA NEPA documents has increased. In the context of one recent project, which involved an existing section of I-70 in Missouri, FHWA headquarters explained the agency’s overall approach to preparing tiered documents:

“As contemplated in our regulations and in the Council on Environmental Quality regulations, tiering is an option available to organize analysis and decision-making in complex circumstances in a way that takes into account the different geographic scope and timing for different decisions. The difference in scope and timing for the strategic decision of how to address long range needs on a 200 mile long section of I-70 between the major metropolitan areas in Missouri versus the specific location and design decisions for much shorter “projects” on I-70 certainly justifies a tiered approach. Because tiering is an option available to address complex situations, we have deliberately stayed away from prescriptive guidelines on how to apply tiering, so that each tiered process can be custom designed to the specific situation.”

The Council on Environmental Quality (CEQ) and Federal Highway Administration (FHWA) regulations allow for the use of tiering for large-scale, complex projects. This project involves a 26-county Study Area, encompassing approximately one-quarter of the State of Indiana; it involves the consideration of alternatives approximately 150 miles in length. The alternatives under consideration are geographically widespread, resulting in the need to consider environmental issues across a broad area. As a result, the overall scale of this study is far larger than the scale



of a typical, non-tiered environmental impact statement for a highway project. It also is consistent with the scale of other tiered EISs currently being prepared or recently completed by FHWA in other states, such as Colorado and Missouri.

The tiered approach for this study was developed in consultation with resource agencies and the public. From the onset, FHWA and INDOT have stated that the goal in Tier 1 is to develop sufficient information to make a Build/No Build decision and to select a corridor for I-69 between Evansville and Indianapolis; it is not intended to resolve the exact alignment or to specify details of mitigation measures. This approach has guided all decisions regarding the level of detail to be developed in Tier 1.

In accordance with this flexible approach, a tiered process has been developed to meet the specific needs of this project. In this process, the purpose of the Tier 1 EIS is to provide the basis for an informed decision on a “corridor” for I-69 between Evansville and Indianapolis, *not* to determine the exact alignment for the highway. (The concept of a corridor is explained further below.) As a result, the environmental data in this Tier 1 EIS has been developed with the intention of providing the level of detail needed to make an informed decision on a corridor. As can be seen by the scope of this document, FHWA and INDOT have determined that a substantial amount of information is needed even at this first tier. Nonetheless, it must also be recognized that this study is not intended to provide the basis for selection of an exact alignment, and therefore does not contain the level of engineering or environmental detail that would be needed to make a specific alignment decision. That information will be developed in Tier 2 NEPA studies.

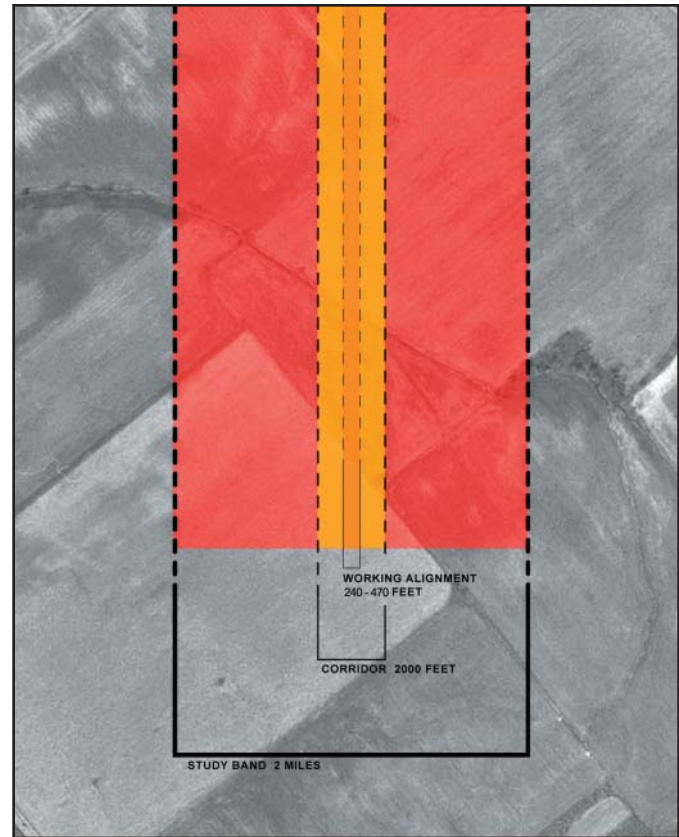


Figure 5.1-1: Illustration of Study Band Corridor and Working Alignment

5.1.2 Key Concepts: Study Bands, Corridors, and Working Alignments

Each build alternative considered in the initial screening stage of this study was developed as a “route concept,” which may be thought of as a simple line connecting points on a map. Throughout the screening process, the initial set of route concepts (A through L) was reduced to five major alternatives (1 through 5). These five alternatives – several of which include a range of potential connections to Indianapolis, or Options, at their northern end – were carried forward for detailed analysis. Including these Options, there were a total of 12 distinct alternatives considered in the EIS. These 12 alternatives are: 1, 2A, 2B, 2C, 3A, 3B, 3C, 4A, 4B, 4C, 5A, and 5B.

In order to provide a set of tools for analyzing environmental impacts of these alternatives, the study team defined each alternative as a set of three overlapping bands (see Figure 5.1-1).

- **Study Band** – A “study band” is a 2-mile-wide band within which the environmental data-gathering efforts were focused for each alternative. It should be noted that much of the environmental data was gathered throughout the entire 26-county Study Area. However, more intensive efforts – for example, field verification of recorded resources – were concentrated within the two-mile-wide study bands.



- **Corridor** – A “corridor” is generally 2000 feet wide, but its width is narrower in some places and broader in others. If a Build Alternative is selected, it is FHWA’s intention to approve a Record of Decision (ROD) for a corridor at the end of Tier 1, rather than approving a specific alignment.
- **Working Alignment** – A “working alignment” is a potential location for a highway right-of-way within the 2000-foot-wide corridor. The Tier 1 EIS is not intended to result in the selection of a specific alignment. However, working alignments have been developed within each corridor in order to provide a sound basis for estimating the environmental impacts of each alternative. The working alignments range in width from 240 to 470 feet. Three factors were considered in estimating the right-of-way width for sections of each working alignment: (1) the topography of the land, (i.e. flat, rolling, hilly); (2) the number of local service (frontage) roads expected, if any; and (3) the number of lanes expected. (See Appendix E, “Typical Sections,” for detailed information on the widths of each working alignment.)

5.1.3 Calculation of Environmental Impacts

Use of GIS

The basic tool used for estimating the environmental impacts of each alternative, was the project’s Geographic Information System (GIS). As explained in Section 4.1, *GIS Approach*, the GIS is an electronic database that consists of a series of data layers. The GIS database for this project includes layers containing each of the study bands, corridors, and working alignments, as well as more than 170 layers containing the locations of various environmental resources and other features.

The GIS database provided two powerful tools for developing the environmental impact information that has been presented in this Tier 1 EIS. First, the GIS was used to generate maps showing the relationship between each alternative and specific environmental resources and other features. Some of these maps are contained in Chapter 5, *Environmental Consequences*; additional maps are included in the Environmental Atlas, which is contained in a separate volume but also is part of the Tier 1 EIS. In addition to generating these maps, the GIS also was used to calculate the impacts that would be caused by each of the working alignments. The impact calculations are given in the tables contained in Chapter 5 and elsewhere in the document.

Since completion of the DEIS, several GIS layers used in this study have been updated to reflect more current information received from agency and public comment. The following information has been updated in the FEIS, including the Environmental Atlas for Preferred Alternative 3C: Cemeteries, Martin State Forest Boundary, Resource Conservation and Recovery Act (RCRA) Sites, Landfills, Patoka National Wildlife Refuge Boundary, Petroleum Wells, Pipelines, Powerlines, Recreation Areas, Superfund Sites, Threatened & Endangered Species, Recreation Trails, Towers, Underground Storage Tanks (USTs), and Leaking Underground Storage Tanks (LUSTs). Also, in recognition of recently enacted state laws and evolving regulations for state agencies, certain data layers were removed from the FEIS Environmental Atlas at the request of the Indiana Department of Environmental Management (IDEM) in the interest of homeland security. These files were considered for impacts and are discussed as applicable within the text of the FEIS. The treatment of this data was comparable to the established confidentiality procedures for sensitive sites such as archaeology sites and endangered species locations. These data layers include: Public Water Wells, Public Water Intakes, Wellhead Protection Areas, Drinking Water Supply Sites, Wastewater/Runoff Treatment Plants, and Water Towers.

Methodology for Calculating Impacts

The direct impact calculations shown in this document reflect the impacts *within the footprint of the working alignment of each alternative*, subject to the following qualifications:



- **Impacts of I-70 Widening and SR 641 (Terre Haute Bypass) Project.** The impacts associated with the planned widening of I-70 and the completion of SR 641 have not been counted as part of the impacts for the alternatives presented in this document. Instead, the impact calculations are based on the impacts of each alternative from its southern terminus at I-64 near Evansville to the point at which the alternative connects with I-70 or SR 641 (or I-465 in the case of those alternatives that do not use any portion of I-70 or SR 641). This approach has been followed because the completion of SR 641 and the widening of I-70 are expected to occur without regard to whether I-69 is completed. Excluding the impacts of those projects from the alternatives analysis for this project allows the reader to compare the I-69 alternatives based on the additional impact that each alternative would cause, over and above the impact that would result from projects that will occur independently of the I-69 project. (The impacts of the SR 641 were disclosed in a Final Environmental Impact Statement, which was signed by FHWA on January 3, 2000. The impacts of the I-70 widening have not been studied in a separate NEPA document, but are summarized in the Cumulative Effects chapter of this document based on existing information, along with other reasonably foreseeable actions that are independent of the I-69 project.)
- **Use of Existing SR 37 and US 41 Right-of-Way.** Several alternatives incorporate portions of existing SR 37 and US 41. Both of these routes are four-lane, divided highways with at-grade access points (partial access control, with signalized and unsignalized intersections). Upgrading these routes to meet freeway standards (which do not allow for at-grade access) would require additional right-of-way for interchanges, local service (frontage) roads, and other improvements. For sections of alternatives that follow these routes, the impact estimates reflect only the additional right-of-way that would be needed beyond the existing SR 37 or US 41 right-of-way.
- **Working Alignments with Multiple Variations.** In the DEIS, several of the working alignments included multiple variations. Each variation had slightly different impacts. Consequently, the impact totals for each alternative were presented as ranges in the DEIS. The ranges reflected the different levels of impact associated with the various working alignments that had been developed in these areas. For a description of these variations see Section 3.3.4.
- **Interchanges.** This document reflects potential interchange locations. Interchange locations and access issues will be refined in Tier 2. These potential locations were determined using the following criteria:
 - The functional classification of intersecting roadways
 - The traffic volumes on intersecting roadways
 - Service to significant communities which otherwise would be isolated
 - Distance between interchanges
 - Ability to relocate/consolidate state highways which are close to each other
 - The number of interchanges serving particular communities
 - The presence of sensitive resources (such as karst) and thus the desire to minimize potential indirect impacts in those areas

During the Tier 2 NEPA studies and design analysis, some interchange locations could be discarded. New locations could also be added.



For this I-69 project, right-of-way needs of approximately 10 acres were assumed for each potential interchange. The actual amount of land could be greater than or less than 10 acres depending upon the interchange configuration. The 10 acre estimate of land for an interchange includes only the land needed for the interchange. Impacts from indirect development as a result of the interchange are incorporated into the Cumulative Impacts analysis in Section 5.26. *Cumulative Impacts*.

Post-DEIS Changes Affecting Impact Calculations

Since publication of the DEIS, Alternative 3C has been selected as the Preferred Alternative. In addition, several changes have been made that affect the environmental impact calculations. These changes are discussed below.

- **Southport Road Interchange.** Since the publication of the DEIS, an interchange has been added at SR 37/ Southport Road in Marion County. This interchange is now shown in the Volume III Environmental Atlas of the FEIS. The traffic modeling and impact calculations in the FEIS include the Southport Road interchange.
- **Rest Areas.** Specific rest area locations have not been identified for this I-69 project. If a build alternative is approved in the Tier 1 ROD, rest areas will be identified and located in the Tier 2 NEPA studies. However, to avoid underestimating the right-of-way needs for the I-69 alternatives, the acreage for four potential rest areas (two northbound and two southbound) has been included in the total right-of-way needs for each alternative. It is expected that approximately 40 acres will be needed for each rest area, for a total of 160 acres. The land acquired for the rest areas is assumed to be agricultural land. In addition, solely for the purposes of calculating impacts, the land for rest areas was assumed to be prime farmland. In the DEIS, acreage required for rest areas was not included.
- **Alignment Shifts.** Several alignment shifts occurred after the distribution of the DEIS in response to comments received from the public and environmental review agencies. These shifts affected the corridor and working alignment for Alternatives 3, 4, and 5. See Section 6.3.5 for more information. Such shifts are as follows:
 - **Prides Creek Shift (Alternatives 3, 4, and 5).** The corridor and working alignment was shifted approximately 0.4 mile to the east to minimize impacts to the Prides Creek wetland complex in Pike County. This shift reduced wetland impacts by approximately 35 acres. Information on the impact trade-offs for the Prides Creek Shift can be found in Section 6.3.5.
 - **Combs Forest Property Shift (Alternative 3).** The corridor and working alignment was shifted approximately 0.2 mile to the south to avoid direct impacts to the Combs Unit of the Martin State Forest. The Combs Unit was recently acquired by the Martin State Forest and is located just south of Koleen in Greene County. In shifting the alignment care was given to avoid both human (homes) and natural (springs, caves) environmental concerns. Information on the impact trade-offs for the Combs Forest Property Shift can be found in Section 6.3.5.
 - **Virginia Iron Works Shift (Alternative 3).** The corridor and working alignment and corridor was shifted approximately 800 feet to the west to avoid the Virginia Iron Works, which contains a number of industrial archaeological sites. It has been determined to be potentially eligible for the National Register of Historic Places. Information on the impact trade-offs for the Virginia Iron Works Shift can be found in Section 6.3.5.
- **Variation Selections.** Since the completion of the DEIS, a single route was selected for the Preferred Alternative 3C by selecting a single variation in the vicinity of Washington and eliminating the Mann Road



Variation. In addition, for purposes of the analysis in the FEIS, a single variation was selected for Alternative 4 at the crossing of the West Fork of the White River, and for Alternatives 3A and 3B in the vicinity of the Keisler Forest Legacy Property. As a result, impact calculations for Alternatives 3, 4, and 5 are presented in the FEIS as a single number rather than as ranges. As a result, impact calculations for Alternatives 1 and 2 are still presented as a range because they still contain variations near Fort Branch, Vincennes, or Farmersburg. Variations were not selected in these areas because of complex issues associated with the decision about whether to remain on US 41 through densely developed areas or construct the project as a bypass around those areas. For a description and map of the variations, refer to Section 3.3.4. The variation selections are described below.

- **Mann Road Variation (Alternatives 2C, 3B, 3C, 4C, and 5B).** The Mann Road Variation that diverted from SR 37 and connected to I-465 to the west has been eliminated from further study due to wetlands, social, and neighborhood impacts. For a further explanation on the Mann Road Variation see Section 6.3.4.
- **Washington Variation (Alternatives 3, 4, and 5).** There were originally four variations around Washington in Daviess County, two to the west and two to the east. The easternmost variation (WE2) has been chosen due to lower natural environmental impacts and resource agency comments. However, the flexibility is being preserved to consider the other eastern variation (WE1) during the Tier 2 studies if necessary in order to avoid or minimize impacts. For a further explanation of the Washington Variation, see Section 6.3.3.

5.1.4 Format for Impact Evaluations

Each section within the Environmental Consequences chapter of this document typically includes: (1) introduction to the resource; (2) methodology used to analyze the resource; (3) policies that may accompany the resource; (4) results of the analysis; (5) mitigation for impacts to the resource; and (6) summary of the discussion. The procedure detailed above describes the process used to determine potential environmental impacts. If a different process was used for a particular resource, it is noted in the methodology section of that discussion.

The alternatives that are discussed in the following sections of this Section are shown in Figure 5.1-2.

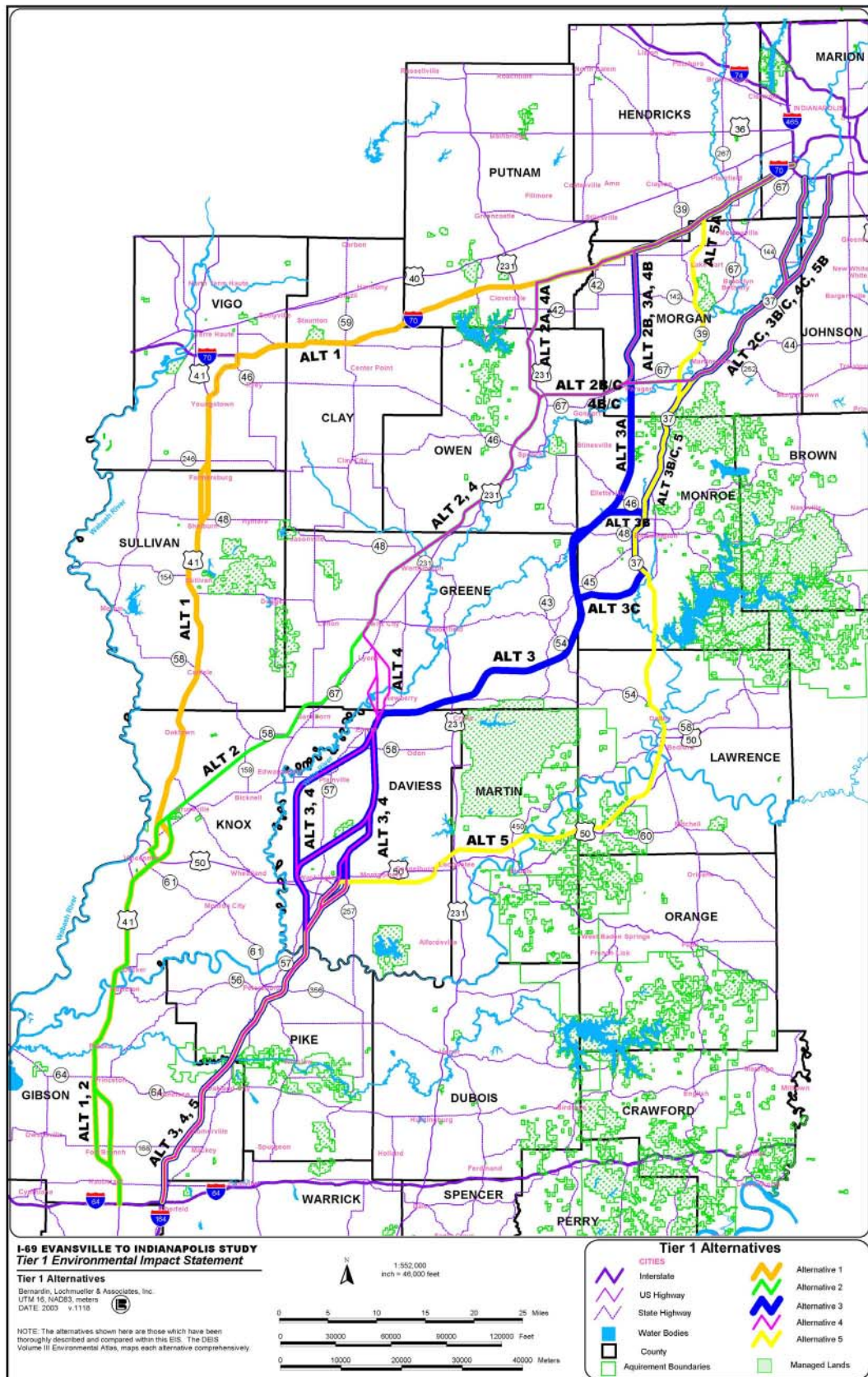


Figure 5.1-2: Alternatives Carried Forward for Environmental Analyses



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