Chapter 3 - Alternatives

Since the publication of the Draft Environmental Impact Statement (DEIS), the following substantive changes have been made to this section:

- Section 3.2.2.1 – Notation about the August 26, 2010 Public Hearing and comments received.
- Section 3.3.1.3 – Crash analysis has been updated using more recent crash rates. The updated crash rates are use reported crashes in the five county study area in 2007 – 2009.
- Section 3.4.1 – Updated with a footnote, to note the existence of a newly formed cave within the Section 4 Alternatives' rights-of-way.
- Section 3.4.2.1 – Expanded discussion about the findings of the transportation performance measures for the interchange options.
- Section 3.4.2.2 – Cited newly-released NCHRP Report regarding rural interchange spacing guidelines in various states.
- Section 3.4.2.3 – Expanded discussion about the forecasted traffic and travel patterns for the interchange options.
- Section 3.4.2.4 – Additional explanation about the purpose of the environmental impacts screening for the interchange options.
- Section 3.4.2.6 – Revised discussion about the conclusions reached for the decision to discard Interchange Option 3 and Interchange Option 5.
- Section 3.5 – Refined Preferred Alternative 2 and modifications to Alternative 2 to determine Refined Preferred Alternative 2 along the eight subsections are identified.

This chapter describes the preliminary alternatives analysis and screening of alternatives for Section 4 of the I-69 Evansville to Indianapolis Tier 2 Studies. It begins (Section 3.1) with an overview of key factors in the development of Tier 2 alternatives. Because this is a tiered study, the development of alternatives differs significantly from what is typical in a non-tiered NEPA study. Next, the development and scoping of the Tier 2 Preliminary Alternatives is discussed (Section 3.2), followed by a discussion of the performance measures that determine how the build alternatives perform in relation to the no-build scenario (3.3). Next, the Preliminary Alternatives are screened and the Alternatives Carried Forward for detailed evaluation are identified (3.4). The section also summarizes potential impacts (both environmental and social), and cost estimates (capital and maintenance). Lastly, the Preferred Alternative is identified (3.5).

3.1 Alternative Development Overview

The range of alternatives in the second tier of a tiered NEPA study is constrained by the decisions reached in Tier 1. In a typical non-tiered NEPA study, these constraints do not exist. In non-tiered studies the project termini, along with a general routing (which may include alternative choices for communities to be served) are used in the scoping process to specify a range of alternatives. Even in a relatively small non-tiered NEPA study, the locations of alternatives may differ by many miles. Section 3.1.1 describes how the range of alternatives is affected by the tiered nature of this study.

The selection of a corridor in Tier 1 also requires an innovative approach to traffic forecasting for Tier 2 alternatives. Because the range of alternative alignments in a Tier 2 highway study is limited to the corridor selected in the Tier 1 decision, more detailed modeling tools are needed to evaluate alternatives. The traffic forecasts for this study are provided by a hierarchy of traffic models. Both Version 4 of the Indiana Statewide Travel Demand Model (ISTDM) and a more detailed model are used.[1] The corridor model is "fed" by the results of the ISTDM. The corridor model includes the counties through which the approved corridor for I-69 passes, as well as all or part of other nearby counties. Section 3.1.2 describes this hierarchy of modeling tools.

The development of the Section 4 alternatives was also assisted by the use of a computer program named Quantm. Quantm is an engineering alignment optimization tool. It was used to help generate alternatives within the selected I-69 corridor for the Tier 2 studies within Sections 1-4 (which are primarily on new alignment). Quantm was not used in Tier 2 Sections 5 and 6. Section 3.1.3 describes the use and application of Quantm to generate alternatives in the scoping phase of this study. Note that the ways in which Quantm is applied differs among the I-69 Sections, due to the variations in terrain and types of resources potentially impacted in these four Sections.

3.1.1 Scoping of Alternatives in a Tiered Study

The Tier 1 Record of Decision (ROD) approved a corridor for I-69 between I-64 north of Evansville and I-465 south of Indianapolis. This corridor generally is 2,000 feet in width. It narrows in some places to as little as 420 feet (near the Patoka River National Wildlife Refuge); in other locations, it widens to as much as 6,400 feet (in northern Daviess County). The Tier 2 studies will determine an exact alignment for I-69 within this corridor. As provided in the Tier 1 ROD (p. 8), the flexibility exists to consider alternatives outside the selected corridor to avoid significant impacts within the selected corridor.

The selection of a corridor in Tier 1 appreciably limits the range of Tier 2 alternatives. The Tier 1 decision determined which communities would be served and the general route for the highway.

The Tier 1 ROD specified that the following would be key issues for distinguishing alternatives in Tier 2 studies. See Section 2.3.4, *Range of Alternatives*, in the ROD for additional details.

- Interchange location and design
- Access to abutting properties
- Location of grade separations and intersecting roads

Because the alignments themselves are constrained by a narrow corridor, variations in alignment may not be as significant in distinguishing alternatives as the issues cited above. Variations in alignment will be considerations in minimizing costs and impacts.

[1] In the urban areas of Bloomington, Martinsville, and Indianapolis (in Tier 2 Sections 5 and 6), a microsimulation model is also used. The use of this model will be described in the DEIS documents for these sections.

3.1.2 Traffic Modeling

As discussed above, alternatives in this study are much more similar than is typical in a non-tiered NEPA study. Accordingly, the tools used to compare the performance of these alternatives also must be more focused. The ISTDM is a very robust tool for comparing the alternatives in a typical NEPA study. However, with the alignments confined to a corridor that generally is less than one-half mile in width, tools to evaluate alternatives on a more minute scale were needed.

To prepare for Tier 2 studies, the ISTDM was refined to provide a more detailed highway network throughout the state.[2] The results of this upgrade are illustrated in **Figure 3-1** (p. 3-7) and **Figure 3-2** (p. 3-7). **Figure 3-1**[3] shows the highway network for the previous version (Version 3) of the ISTDM. It had 18,000 links, with 23,000 miles of highway network. **Figure 3-2** shows the highway network for Version 4 of the ISTDM. It has 35,000 links, with 29,000 miles of highway network.

Figure 3-3 (p. 3-7) and **Figure 3-4** (p. 3-7) further illustrate the updates made to Version 4 of the ISTDM. These figures show that the Version 4 contains more than five times as many Traffic Analysis Zones[4] (TAZs) as Version 3. Version 3 included 844 zones, while Version 4 includes 4,720 zones. The greater number of zones means that each zone is smaller; smaller zones provide a more detailed and precise representation of traffic movements within the area.[5]

Once the ISTDM was updated to Version 4, an even more detailed model was created for the region proximate to the I-69 corridor. This "I-69 corridor model" was essentially an overlay on the standard ISTDM Version 4 model. The I-69 corridor model includes all of the roads that are included in Version 4, plus additional roads that are considered too minor to be included in the standard version of the statewide model. These additional roads are included in vicinity of the selected I-69 corridor. These additional roads are represented by the higher density lines along the selected corridor in **Figure 3-5** (p. 3-8).

Specifically, the I-69 corridor model includes all roads along the I-69 corridor with the functional classification[6] of "minor collector" (in rural areas)[7] and collector (in urban areas),[8] as

[2] The Indiana Statewide Travel Demand Model (ISTDM) is regularly updated by INDOT to incorporate the most current data and transportation planning practices. ISTDM Version 3 was used for the Tier 1 Study; ongoing Tier 2 Studies are using ISTDM Version 4. Traffic forecasts for ISTDM Version 3 were for a forecast year of 2025. Traffic forecasts in ISTDM Version 4 are for a forecast year of 2030.

[3] Figures 3-1 through 3-5 are intended to communicate, in a schematic manner, the relative level of detail of the modeled highway network and Traffic Analysis Zones (TAZs). Other maps provided in the DEIS and FEIS will be much more detailed, consistent with the resource or impacts under discussion.

[4] A "traffic analysis zone" (TAZ) is a geographic area that conforms to US Census geography, is consistent with the highway network, and is relatively homogeneous with respect to population demographics and land use. The transportation model regards trips on the highway network as originating and terminating within these TAZs. In ISTDM Version 3, land use forecasts within each TAZ were for the year 2025; in ISTDM Version 4, the land use forecasts are for the year 2030.

[5] The traffic model calculates trips as movements from one TAZ to another TAZ. Any movements that occur entirely within a single TAZ are not recognized as trips in the model. Therefore, increasing the number of TAZs within the model allows the model to provide a more complete picture of travel movements within a given area.

[6] "Functional classification is the process by which streets and highways are grouped into classes, of systems, according to the character of the service they are intended to provide. Basic to this process is the recognition that individual roads and streets

well as all local roads that possibly could be affected by I-69 (e.g., be considered for closure or grade separations). The corridor model also is designed to be suitable for considering alternative interchange locations.[9]

The TAZ structure in the I-69 corridor model also is more detailed than in Version 4 of the ISTDM. As noted above, Version 4 of the ISTDM includes 4,700 TAZs throughout the state, which was a five-fold increase compared to Version 3. But the I-69 corridor model contains over 4,300 TAZs *just within the vicinity of the I-69* corridor. Thus, the I-69 corridor model has a much more detailed structure (within the vicinity of the I-69 corridor) than ISTDM Version 4.

To provide Tier 2 forecasts, the first step is to run Version 4 of the ISTDM. Next, the results from the ISTDM are "fed into" the I-69 corridor model. The corridor model produces assignments for the morning (AM) peak hour, the afternoon (PM) peak hour, and total for a typical weekday (24-hour period). The traffic forecasts used in the engineering analysis of alternatives are provided by the corridor model. In addition, the performance measures provided in Section 3.3 are calculated using postprocessors[10] that analyze the traffic assignments provided by the corridor model.

The Tier 2 traffic modeling procedures were reviewed by FHWA's Resource Center and were found to be adequate for purposes of the Tier 2 study. A *Traffic Modeling Technical Report*, which provides technical documentation for the Tier 2 traffic forecasting methodology, is included as **Appendix B** to this FEIS.

In June 2007 INDOT issued a new statewide long-range transportation plan (LRP) for 2030. The net effect of the new LRP was to designate a large number of previously planned projects as "unfunded." All of the previously planned projects had been assumed to be built for purposes of the I-69 Tier 2 2030 traffic forecasts shown in this EIS. This change in the LRP assumptions requires an assessment of the continued validity of the Section 4 forecasts and their associated levels of service (LOS). Given this question, a comparison between the traffic forecasts on I-69

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do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads." Quoted from *Highway Functional Classification: Concepts, Criteria and Procedures*. FHWA, Revised March, 1989, p. II-1.

[7] In rural areas, collectors are defined as routes that "… generally serve travel of primarily intracounty rather than statewide importance and constitute those routes on which (regardless of traffic volume) predominant travel distances are shorter than on arterial routes. Consequently, more moderate speeds may be typical." Rural minor collectors are described as routes which should "… (1) Be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities (nor served by major collectors); and (3) link the locally important traffic generators with their rural hinterlands." (*Ibid*, p. II-10).

[8] In urban areas, collectors are defined as routes that provide, "… both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. It (the collector street system) differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination." (*Ibid*, p. II-13). In urban areas, there is no distinction between major and minor collectors.

[9] As noted in Section 3.1.1, grade separations, treatment of intersecting roads, and locations of interchanges are major issues that will define Tier 2 alternatives. The I-69 corridor model can be used to provide a meaningful comparison of such alternative treatments.

[10] A "postprocessor" is a computer program that analyzes a traffic assignment to compute measures of transportation performance. For example, an accessibility postprocessor may compare the travel times between any number of location pairs in the "no-build" and "build" networks in order to assess the improvement in accessibility provided by a particular alternative.

under both sets of assumptions regarding the LRP projects was undertaken. A memorandum providing this analysis is included as **Appendix U**, *INDOT Long Range Plan Update Sensitivity Analysis*. It concluded that the changes in planned projects have no material effect on traffic forecasts in Section 4.

3.1.3 Use of Quantm

Quantm is a relatively new computer-aided tool that facilitates the development and analysis of alternative horizontal and vertical roadway alignments. It automates the otherwise manual functions of developing and assessing route alignments for transportation projects. Quantm has the capability to generate a set of alignments that minimize construction costs and negative impacts to selected environmental resources. Based on parameters provided, Quantm will generate a set of alignments; illustrate those alignments within a digital terrain model; superimpose them on aerial photographic images; track key statistics (e.g. wetland acreage impacted) for each alternative; and allow alternatives to be compared according to a variety of attributes, including construction cost.[11]

Quantm develops a graphic representation of alternative horizontal and vertical roadway alignments and computes the cost of each based upon the input of geographic, topographic, and geologic information; geometric design criteria; unit cost data; and environmental constraint information. The program processes a large volume of data and generates a large number of alignment possibilities in a relatively short period of time. However, results are constrained by the quality and quantity of data provided. The development of alternative alignments requires consideration of more detailed information and judgment factors than can be cost-effectively and reasonably input into the program. Within the constraints of a 2,000-foot corridor, Quantm is valuable for obtaining first-cut alignment definitions and conducting "what if" scenario analyses. This process provides a reasonable number of alignments to develop with conventional geometric design techniques.

Quantm was used in Section 4 to establish preliminary mainline alignments. These Quantm-generated alignments were then refined using conventional design practices to develop the alternative mainline alignments. The combination of terrain and natural resource constraints in Section 4 are more pronounced than in I-69 Tier 2 Sections 1 through 3. Accordingly, Quantm software was applied differently than in these Tier 2 sections.

Following is a short description of the Quantm scenarios and how they were used to develop alternative mainline alignments for Section 4.

- **Scenario 1** generated alternative mainline alignments using highway design criteria, topographic data from the corridor digital terrain model (which shows the corridor terrain at 2-foot contour intervals), and bridge clearances for major waterways using estimated flood

[11] Costs identified by Quantm are appropriate for comparing mainline construction cost components, but do not include all costs. Costs that Quantm does not estimate include interchanges, some drainage structures, local road improvements, right-of-way, design engineering, construction engineering, utility relocation, and environmental mitigation. The costs presented throughout Chapter 3, including Tables 3-27 and 3-28, are based on the Quantm mainline component costs only. Once the subsection alternatives were screened, and the engineering for the end-to-end alternatives was further defined, more detailed cost estimates were generated for each of the remaining subsections.

elevations. No constraints for key resources were used. This scenario defined the least-costly alignments and trends that minimize earthwork and structural quantities.

- **Scenario 2** generated alternative mainline alignments that avoided identified historic properties and cemeteries. The estimated costs were in the same range as Scenario 1. This scenario illustrated that avoiding small, isolated environmental resources would not substantially affect costs.
- **Scenario 3** generated alternative mainline alignments that avoided identified historic properties and cemeteries and also avoided (or minimized) impacts upon wetlands. While all wetlands could not be avoided, including the wetlands along Black Ankle Creek, this scenario demonstrated that costs are not substantially affected by avoiding and minimizing wetland impacts.
- **Scenarios 4 and 5** generated alternative mainline alignments with differing horizontal stiffness factors. The Quantm "stiffness" factor is a variable that controls the rate of change of horizontal and vertical curvature of the alignments. When the stiffness parameters are close to 0, the alignments follow the natural surface as closely as geometric design criteria permit. When the stiffness parameters are close to 1, the alignments minimize changes in curvature as much as possible. Rerunning scenarios with varying stiffness factors illustrated that higher stiffness factors result in higher costs. In general, higher stiffness results in higher costs because there is more earthwork (i.e., cut/fill) since the alignment does not follow the natural terrain as closely as when a lower stiffness factor is used.
- **Scenario 6** generated alternative mainline alignments based on avoidance of identified historic properties, cemeteries, buffers around known cave locations and major springs, and most wetlands. Using the results of Scenarios 4 and 5, it was decided that a horizontal stiffness factor of 0.75 represented the optimal input for Quantm to provide a balance between mainline costs and flexibility to avoid key community and environmental resources. A stiffness factor of 0.75 was also considered adequate to meet all travel speed and safety requirements for highway design. Conventional geometric design criteria (applying both the INDOT's *Design Manual (IDM)* and AASHTO criteria) were applied to the Quantm mainline alignments. Additional minor adjustments were also made to add tangents (straight sections) and provide appropriate curve radii, while avoiding wetlands, ponds, and minor springs (5 to 20 gpm discharges). Adjustments were also made to the termini approaches to coordinate with Section 3 to the south and Section 5 to the north.

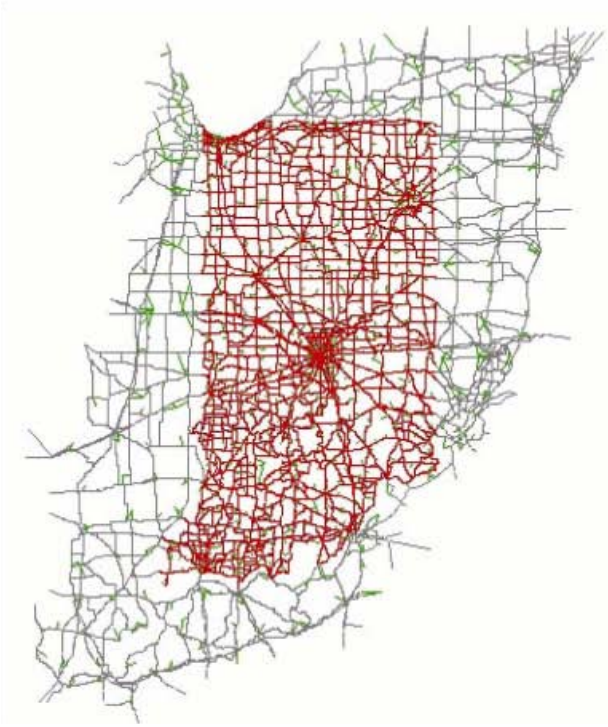

Figure 3-1: ISTDM Version 3 Network

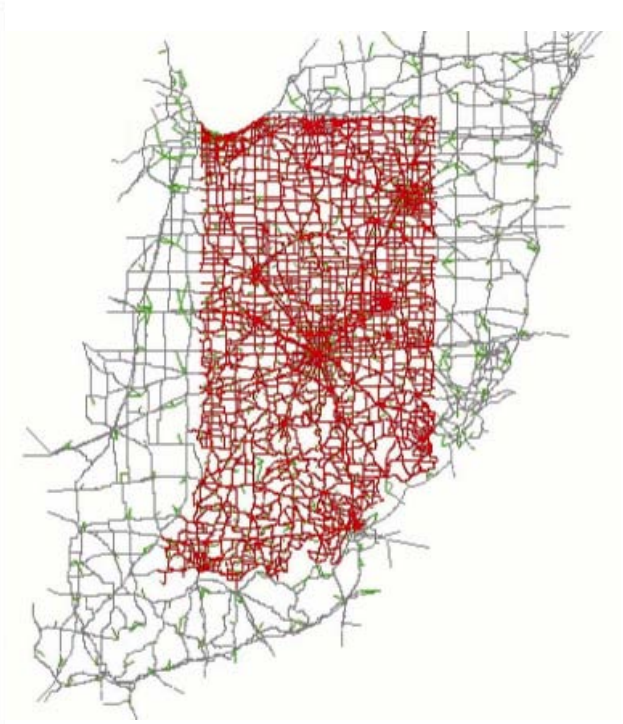

Figure 3-2: ISTDM Version 4 Network

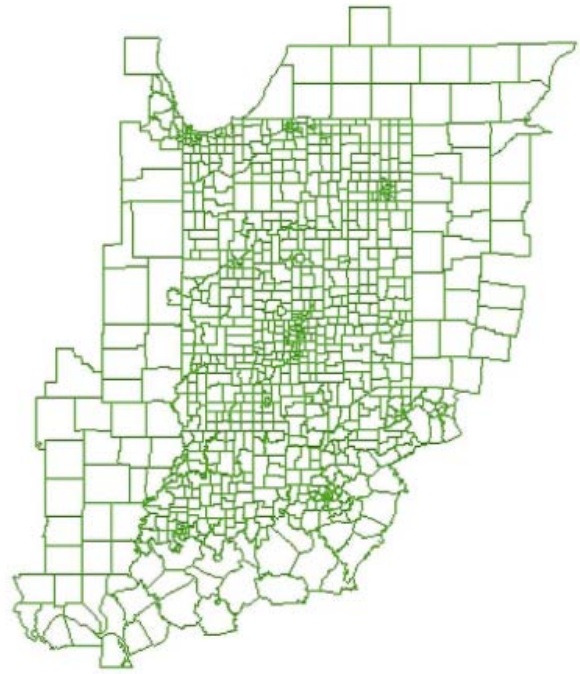

Figure 3-3: ISTDM Version 3 Traffic Analysis Zones

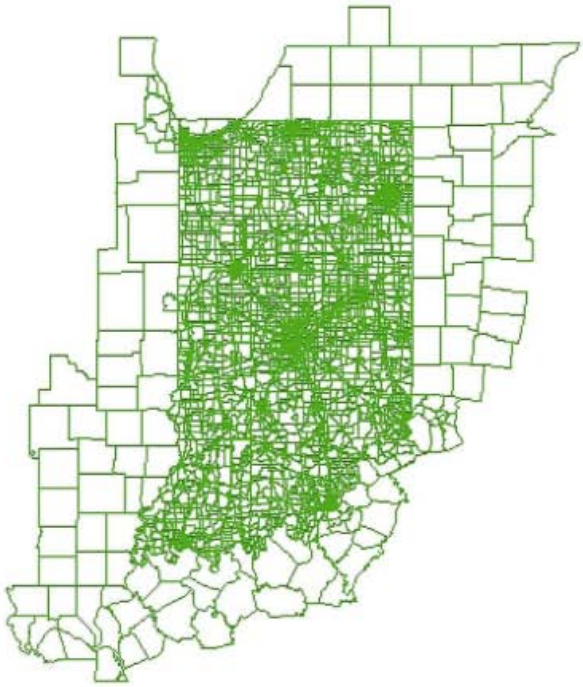

Figure 3-4: ISTDM Version 4 Traffic Analysis Zones

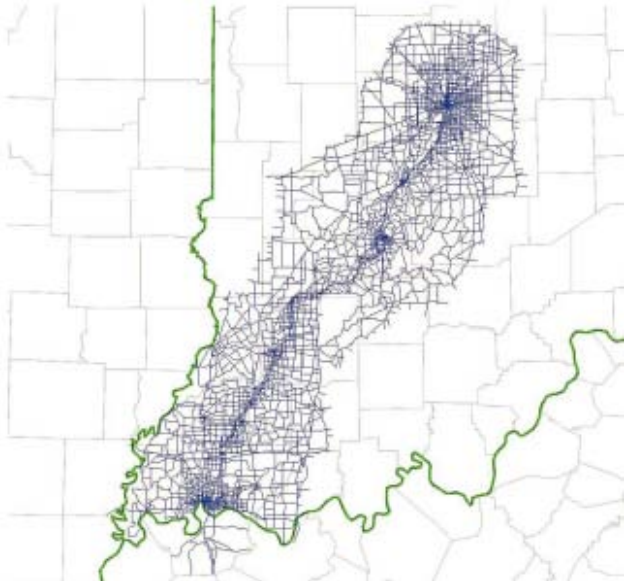

Figure 3-5: I-69 Tier 2 Corridor Model Network

3.2 Development of Alternatives

This section describes the scoping process, the development of preliminary alternative roadway alignments, and the identification of potential interchange locations within the approved corridor for Section 4. This corridor, including the termini for Section 4, was approved in the Tier 1 ROD on March 24, 2004.

3.2.1 Methodology

The development of alternative roadway alignments under the NEPA process requires consideration of multiple criteria. These include satisfying highway design standards, avoiding and/or minimizing environmental impacts, minimizing cost, and satisfying project purposes. These criteria cannot be reduced to a single numerical unit of measurement; applying them involves an exercise of professional judgment. Developing alignments requires input from affected parties and resource agencies, environmental analyses, and highway engineering, all conducted in a public process to develop a range of solutions. The development of alternative alignments may be defined as having a six-step process:

1. The first step is to define the basic elements of the project including: the beginning and ending points of the project, the geometric design criteria, the typical section(s) of the roadway, the initial anticipated right-of-way width (approximately 300 feet to 500 feet in Section 4), and access control limits.[12] These items are essential for defining the area that would be impacted by any alignment.

[12] Within the context of this project, an "access control limit" is a specific length along roads with an interchange within which no at grade access is permitted. Access control limits are specified to avoid conflicts with traffic entering and leaving interchanges. Traffic entering and leaving the interchanges may be traveling at relatively high rates of speed.

2. The second step is to determine points of access to the highway, the types of interchanges that will be required, and grade separations. For purposes of comparing alternatives in Tier 1, it generally was assumed that access to the interstate system would be limited to interchanges with other state jurisdictional highways;[13] however, the Tier 1 studies acknowledged that interchanges with important county jurisdictional highways also might be warranted. These highways are identified on a case-by-case basis through coordination with local and county officials and members of the public.
3. The third step is to define and locate all the environmental resources that might affect the roadway location. Key environmental resources for the development of preliminary alternatives for Section 4 were: historic properties, wetlands, cemeteries, known caves, and major springs (See Section 3.2.2.3). Additional environmental resources used for the screening of the preliminary alternatives were: forests, core forests, agricultural lands, prime farmland, managed properties, floodplains, streams, ponds, other karst features, and developed properties (See Section 3.4.1).[14]
4. The fourth step is to develop and test alternative alignments. Initial studies used Quantm to generate first-cut alignments that satisfied certain criteria (See Section 3.1.3). These initial studies were then refined using AutoCAD engineering software and ArcView GIS software to further define the attributes of the alignment and plot the roadway on maps. The basic objectives were to avoid key environmental resources.
5. The fifth step is to present the preliminary alternatives to the resource agencies and the general public. These alternatives went through a screening process. The subsection alignments were then modified or eliminated in response to the input received.
6. The sixth step involves the development of the end-to-end alternatives. The subsection alternatives that survived the screening process were assembled into various combinations to develop four end-to-end alternatives (See Section 3.4.2.7). Further engineering was completed to develop the grade separations, access roads, frontage roads, and parcel access for the end-to-end alternatives. This information is used in Chapter 5, *Environmental Consequences* and Chapter 6, *Comparison of Alternatives*.

3.2.2 Scoping Process

The scoping process defined the range of alternatives to be considered and the process to be used to address potential environmental impacts. The Tier 1 ROD limited the range of alternatives to freeways within the defined corridor, with Section 4 termini at US 231 and SR 37. FHWA and INDOT have provided numerous opportunities for involving the public and government agencies in the process. The following sections summarize these opportunities.

[13] It is not required that state-jurisdictional highways have interchanges with freeways, such as I-69. This statement is meant to indicate that interchanges with non-state-jurisdictional highways are considered on a case-by-case basis.
[14] Habitats for threatened or endangered species reside in wetlands, caves, forests and managed properties such that habitats were not identified as a separate category in the screening process.

Chapter 11 of this DEIS, *Comments, Coordination, and Public Involvement*, contains detailed information regarding the public and agency input process, the key issues that were raised, and how they were addressed.

3.2.2.1 Public Involvement

Public involvement has been extensive and ongoing since the beginning of the Tier 1 process, and will continue throughout Tier 2. Several opportunities and methods were used to involve the public in the study. Meetings with local public officials, a project newsletter, hotline, website, outreach meetings, Community Advisory Committee (CAC) meetings, and other means were used to solicit input. In addition, a local project office on the southwest side of Bloomington has been staffed and open to the public during weekday business hours[15] to allow convenient public access to project team members and materials. Public input was also sought at key milestones in this Tier 2 study, including the following:

On July 1, 2004, INDOT hosted a Section 4 **open house** to acquaint the public officials and the general public with the project office, introduce project staff, provide visitors with project information, and receive input regarding issues of concern.

Public Information Meetings were held to share project information with the public and receive feedback. On June 16, 2005, a meeting was held to present and receive input regarding Preliminary Alternatives and the draft Purpose and Need Statement. A second meeting was held on November 16, 2005, to present the screened alternatives.

Community Advisory Committee (CAC): A Community Advisory Committee (CAC) was developed in the fall of 2004 to facilitate communication between project team members and representatives of potentially impacted and key constituent groups in the project area. Representation on the committee was sought from among such constituencies as local elected officials, major employers, the farming community, civil organizations, schools and churches, social service providers, etc. Through a series of four meetings, committee members learned details of the project; provided feedback on such subjects as community access, local needs, and the development of alternatives; and relayed the information about the project to the groups they represented.

A **Public Hearing** was held on August 26, 2010 to present and receive input on the DEIS and the preferred alternative identified herein. The comment period on the DEIS concluded October 28, 2010. Several government agencies, organizations, and the public submitted comments on the DEIS. Responses are provided to all substantive comments; these include oral comments made at the public hearing. The comments and responses comprise Volume III of this FEIS.

Extensive input was received through coordination with local governments and the general public. The numerous comments regarding the need for an interchange along the Greene

[15] The Section 4 Project Office was open Monday through Friday from June 2004 through September 2008. In October 2008 the weekly office hours were changed to Tuesday through Thursday.

County/Monroe County Line were a major consideration in the development of the Preliminary Alternatives. Other important comments included suggestions on additional grade separations of local roads and information on community and natural resources for specific properties along the Section 4 corridor. Proposed access roads,[16] road relocations and overpasses are identified in Section 3.4.1, and are described in greater detail in Section 5.3, *Land Use and Community Impacts*, and Section 5.6, *Traffic Impacts*.

3.2.2.2 Resource Agency Coordination

Many of the issues to be addressed in the evaluation of alternatives and selection of a preferred alternative are mandated by various laws, regulations, and environmental resource agency guidelines. To ensure the scope of study for these issues would be adequate, five general meetings have been held to date among resource agencies, FHWA, INDOT, and their consultants working on six Tier 2 sections. They are described below.

- On August 12, 2004, a meeting was held with federal and state review agencies. The purpose of the meeting was to familiarize the environmental review agencies with the scope and status of environmental survey activities associated with the Tier 2 studies; to introduce the Project Management Team, agency representatives, and consultants responsible for each of the six sections; acquaint agency representatives with the Tier 2 project corridor, overall project Purpose and Need, public involvement efforts, and project schedules; and identify major issues to be addressed in the study.
- A second two-day environmental resource agency meeting was held February 23-24, 2005. The first day's agenda included a general meeting of all participants followed by breakout sessions to discuss specific topics. The general session focused on explaining the steps in the formal agency coordination process that each Tier 2 study will follow; identifying project schedules and timeframes; explaining how local needs and goals will be identified and incorporated into the Purpose and Need Statements of each section; and discussing how preliminary alternatives will be developed and evaluated. Each section's consultant project manager gave a brief presentation summarizing activities to date and future planned activities. These presentations were followed by questions and comments from the agencies. In the afternoon the following three breakout sessions were held: (1) the Interagency Water Resources Coordination Team discussed issues related to wetlands, water quality, floodplains, floodways and stream crossings; (2) the Interagency Karst Geology Team discussed issues related to sink holes; and (3) a demonstration and training session was provided for the Quantm program. The second day of the agency coordination activities was primarily devoted to a bus tour to provide agency representatives with an overview of notable features in Sections 1, 2, and 3.
- A third two-day environmental resource agency meeting was held August 1-2, 2006. The first day's agenda included a general meeting of all participants, as well as updates on the status of each section, a summary of the findings of the Tier 1 Re-evaluation (See Chapter 1,

[16] Overpasses, interchanges and some access roads were identified for each subsection alternative. Those items were further developed with the assessment of the end-to-end alternatives.

Background), and the potential role of public-private partnerships in this project. Three general sessions also were held to discuss progress and seek agency input on cumulative impacts analysis in Tier 2 EIS documents, water resource analysis, and special karst studies in Tier 2 Sections 4 and 5.

- A fourth one-day meeting with federal and state review agencies was held March 1, 2007, to provide an update on the status of environmental survey and documentation activities for the Tier 2 studies. The agenda included an update about each section's schedule, as well as updates on the status of each section. The agenda included a summary of and discussion of comments on the Section 1 DEIS published in December 2006; the status of permitting and mitigation related to wetlands, streams and forests; a discussion of the methodology for tracking and reporting mitigation activities to permitting agencies and the U.S. Environmental Protection Agency (USEPA); and an update on the status of potential impacts to karst resources in Sections 4 and 5.
- A fifth one-day meeting with federal and state review agencies was held April 30, 2009. The meeting focused on overview presentations and discussions about the Section 2 DEIS and Section 3 DEIS. The agenda also included updates on the schedules and project status for Sections 4, 5 and 6; the Section 1 design and construction; project permitting and mitigation; karst studies in Sections 4 and 5; the I-69 community planning grant studies, and a video documentary on Indiana caves was shown by the USEPA.

In addition, two resource agency coordination meetings/web casts have been held for Section 4. These are summarized below:

Purpose and Need/Preliminary Alternatives

A resource agency coordination meeting/web cast was conducted on December 19, 2005, to review and receive resource agencies' comments on the Section 4 Purpose and Need and Preliminary Alternatives package that had been submitted to the agencies on November 11, 2005. In addition to FHWA and INDOT, agencies represented were USEPA Region 5 and U.S. Fish and Wildlife Service (USFWS) Bloomington Field Office. The discussion focused primarily on the local goals that comprise the Section 4 Purpose and Need Statement. It was noted that the needs identified for Section 4 were identified through extensive public involvement activities and that they support the Tier 1 goals while providing the local focus required of the Tier 2 Studies. Regarding the analysis of alternatives within the selected corridor, it was noted that all alignments would likely satisfy the Tier 1 Purpose and Need equally. Also, the effects of alternative interchange locations on local purpose and need, the potential environmental impacts and the cost of each alignment would be key determinants in evaluating and comparing alternatives. Updates on completed and on-going field work and public involvement activities were also presented.

USEPA and USFWS participated in the discussion at the December 19, 2005, meeting, and their questions, comments and the responses to those questions are found in the meeting minutes in **Appendix C**, *Agency Coordination Correspondence*. Key questions and comments at the meeting focused on: local transportation and land use planning relative to the proposed Greene

County/Monroe County Line interchange, the proposed toll financing option for I-69,[17] wetland fieldwork and delineations including the area along Black Ankle Creek, karst features, core forests, and wildlife crossings (corridors).

The U.S. Department of Agriculture, Forest Service; Indiana Department of Natural Resources (IDNR), Division of Water; and IDNR, Division of Historic Preservation & Archaeology provided written comments. The letters are in **Appendix C**. The U.S. Department of Agriculture, Forest Service (January 13, 2006) noted that "The Purpose and Need for Section 4…is consistent with the Tier 1 FEIS and seems to reflect local concerns. The range of alternatives seems adequate." The IDNR, Division of Water (February 17, 2006) provided comments on forested habitat; light and noise effects; stream, wetland and riparian impacts; habitat connectivity; and karst impacts. Concerns were expressed about the potential loss of canopy forest and interior forest habitat especially with regards to the effects upon neotropical migrant songbirds. The value of wooded riparian corridors which are used for travel between larger habitat areas was noted. Concerns about water quality effects upon the subterranean ecosystem associated with karst features were also noted. The IDNR, Division of Historic Preservation & Archaeology (December 16, 2005) indicated no particular concerns on the purpose and need statement. The Division did indicate concerns about potential direct and indirect effects upon the Dowden Farm in Greene County, should this property subsequently be determined eligible for the National Register, and potential indirect effects upon the John May House, a National Register eligible property located in Monroe County.

The Purpose and Need package, meeting minutes, and letters from the U.S Department of Interior, the U.S. Forest Service and IDNR are provided in **Appendix C**.

Alternatives Screening

On August 31, 2006, FHWA and INDOT held a meeting with the agencies to review and receive agency comments on Section 4's Preliminary Alternatives Evaluation and Screening package, which was submitted to the agencies on July 26, 2006. Agencies represented at the meeting in addition to FHWA and INDOT were USEPA and USFWS. Issues that were the primary focus of discussion included the screening methodology, the locations and conceptual configurations for potential interchanges, and the preliminary recommendations for mainline alternatives to be advanced for detailed study. General questions/comments from USEPA and USFWS were: a clarification of "key resources" that were used in the development of the Preliminary Alternatives, questions about the methodology that will be used for selecting interchanges, questions about possible impacts that may result from secondary development for the proposed Greene County/Monroe County Line interchange, concerns about subsections with only one alignment being recommended for detailed study (especially those that would impact wetlands),

[17] As described in Section 1.2.3, *Tier 1 Re-evaluation*, INDOT provided to FHWA a Tier 1 Re-evaluation in June 2006 which considered the potential of toll funding to significantly accelerate the construction of this project. Based upon the findings of the Re-evaluation and subsequent public and agency input, INDOT withdrew the Re-evaluation in a letter to FHWA dated November 22, 2006. In subsequent correspondence FHWA accepted the withdrawal of the tolling proposal and determined that there would not be a supplemental Tier 1 EIS.

questions about area-wide traffic issues, and the status of the proposed toll road option for I-69. **Appendix C** contains the agency package and the minutes of the meeting.

Written comments on the Section 4 Preliminary Alternatives Analysis and Screening package were received from USEPA, Region 5 (September 26, 2006) and IDNR, Environmental Unit, Division of Fish and Wildlife (September 28, 2006). The letters are in **Appendix C**. USEPA commented on the mainline alternatives for three of the subsections, various screening methodologies, and general resource information. USEPA offered specific suggestions for the westernmost subsection alignment along the Section 4 corridor and had various questions about the advantages and disadvantages for the alignment across Black Ankle Creek along with a possible consideration to go outside the Section 4 corridor in the vicinity of the crossing of this creek. The agency also asked for clarification on the eligibility and planning authority for very small and/or unincorporated communities to participate in the Tier 1 mitigation commitment for the Community Planning Grant Program, and asked that NRCS conservation lands be identified and whether such properties fall under the jurisdiction of Section 4(f). The IDNR provided comments on the alternatives along the eight subsections and potential interchanges. Primary IDNR concerns were impacts to large intact forest blocks and potential impacts to groundwater hydrology including continued spring flow. IDNR also provided generalized comments on various resource concerns and efforts that will be required to fully assess impacts and mitigate impacts including further avoidance, minimization, and compensatory replacement. Comments were provided on karst resources including water quality, interior (core) forest habitat, floodway habitat including wetland, wildlife, Indiana bat, successional field habitat, and stream realignments. It also recommended locations for wildlife crossings. A summary and discussion of the USEPA and IDNR comments are provided in Section 11.4.2.2, *Coordination*. Agency comments on specific alignments are identified in Section 3.4.1.

3.2.2.3 Preliminary Alternatives

Preliminary Alternatives were developed that are consistent with both INDOT's *Design Manual (IDM)* and the American Association of Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*. For interstate highway design, desirable and minimum levels of service as identified in the IDM are used, based upon engineering judgment, traffic levels and other considerations. Application of these standards also help improve traffic flow on crossroads in the vicinity of interchanges, which results in fewer air quality impacts and reduces the potential for crashes.

The Preliminary Alternatives included mainline alignment alternatives and interchange options for potential interchanges at SR 45, SR 54 and the Greene County/Monroe County Line. While the potential interchanges at SR 45 and SR 54 were identified in the Tier 1 study, the potential Greene County/Monroe County Line interchange was added during the Tier 2 study. The Greene County/Monroe County Line interchange was added to relieve congestion on SR 45 in Monroe County. Previously, INDOT had proposed to add travel lanes along SR 45 to reduce

congestion (*INDOT Twenty-Five Year Plan*, November 2003).[18] The county line interchange was also added to address public comments about the need for improved access between Bloomington and Bloomfield/Eastern Greene County and to address the concerns of emergency responders in addressing incidents on I-69 and in Eastern Greene County and Western Monroe County due to the distance of 15.7 miles between the potential SR 54 interchange and SR 37 interchange.

The Tier 1 FEIS also identified interchanges at US 231 and SR 37. The US 231 interchange is part of the project in Section 3, for which a Record of Decision (ROD) was approved on January 28, 2010. The SR 37 interchange is being studied as part of the Section 4 project. Alternative configurations were examined for the SR 37 interchange and various treatments of the Victor Pike/SR 37 intersection, including closure, grade separation or continuation of that intersection.

In addition, with construction of I-69 as a limited access facility, many local roads would be severed by the new right-of-way and closed, rerouted, or have a grade separation to go over or under the new roadway. It would also be necessary, in certain locations, to construct short segments of roadway to provide public access to properties, whose access to a public road would otherwise be cut off by the new right-of-way. Therefore, information gathered from preliminary design of the mainline alternatives, environmental evaluations, and public input was used to identify the locations for proposed access facilities such as access roads and overpasses.

Typical Cross Sections

The Section 4 Preliminary Alternatives are represented by the centerline of the mainline alignment. No specific right-of-way or construction limits[19] were designed at this level; however, an initial right-of-way width is anticipated to vary between approximately 300 feet and 500 feet depending on alignment and terrain features. This right-of-way was presented to the public and resource agencies as a frame of reference as to how the topography affects the Section 4 right-of-way in comparison to Sections 1, 2, and 3. It is based on a typical section containing two 12-foot wide lanes in each direction separated by an 84-foot wide depressed median. The median includes two 7-foot wide usable inside shoulders (6 feet paved). To the outside of each pair of travel lanes there is a minimum 35-foot wide outside clear zone[20] containing 11-foot wide usable shoulders (10 feet paved). In addition to the construction limits required for the roadway, median and shoulders, sufficient land is needed to provide for cut and fill slopes, drainage and right-of-way fencing. This typical section is depicted in **Figure 3-6** (p. 3-77). This same typical section was part of the design criteria used as input for Quantm.

[18] Subsequent to this interchange being proposed in the November 2005 *Preliminary Alternatives Package* and the July 2006 *Preliminary Alternatives Evaluation and Screening Package*, this added capacity project was placed by INDOT in the "unfunded" category in the INDOT 2030 Long Range Transportation Plan (June 2007).

[19] Construction limits denote the lateral extent of ground disturbance for construction of the highway. Right-of-way is typically set at or slightly beyond (outside) the construction limits.

[20] A clear zone is the unobstructed, relatively flat area provided beyond the edge of the traveled way. The clear zone is intended to allow errant vehicles to stop or maneuver without striking any fixed objects. The clear zone includes any shoulders and auxiliary lanes.

The only notable difference between the Tier 1 typical cross section and that used in Tier 2 for the screening of alternatives is the median width. In the Tier 1 study, a conceptual desirable median width of 80 feet was used for a typical 4-lane section (two 12-foot-wide lanes in each direction). This is the desirable width in accordance with the IDM. During the Tier 2 studies, the desirable median width was increased to 84 feet to provide for the ability to add a 12-foot-wide interior lane in each direction while maintaining a 60-foot-wide median – the minimum required for interstate highways according to the IDM – should future traffic volumes warrant adding such lanes.

As described in Section 5.1, the typical sections and design criteria for I-69 and related highway features were refined for the alternatives studied in detail. Using these refined design criteria; construction limits and right-of-way were developed and used in the analysis of the Alternatives Carried Forward (see Chapter 5, *Environmental Consequences*).

Section 4 Corridor Subsections

Scenario 6 from the Quantm analysis (see Section 3.1.3) was the primary basis for developing the mainline alignments for the Preliminary Alternatives. At various locations along the corridor, the Quantm analysis showed a convergence of alignments. The points where alignments tended to converge were chosen as subsection breaks in order to allow alternative alignments from different subsections to be "mixed and matched."

There are eight subsections along the Section 4 corridor. For the purposes of reference and analysis, a naming convention was established as follows:

- "4" which represents Section 4 of the I-69 Tier 2 corridor
- "A, B, C" etc., which represents the eight subsections beginning with "A" at US 231 and ending with "H" at SR 37
- "1, 2, or 3" which represents alternative mainline alignments within the particular subsection, numbered from north to south or east to west

For example, the first subsection of Section 4 beginning at US 231 has two alternative alignments. Per the naming convention, these are Alternative 4A-1 and Alternative 4A-2.

As stated earlier in this section, the subsection termini were at locations where the mainline alignments converged. Alternative mainline alignments within one subsection may be connected to any of those in adjoining subsections to form continuous alternatives extending the full length of the corridor.

Mainline Alternatives

Section 4 contains a diverse range of social, economic, environmental and ecological resources. Of these, certain resources merit greater consideration, due either to their federal and state regulatory protection and/or their identification as a public concern. As such, impact avoidance and, when avoidance was not possible, impact minimization to key resources were established as

primary objectives for the initial development of the Section 4 preliminary alternative mainline alignments and potential interchanges.

The following environmental and community resources located within the Section 4 corridor were identified as key resources for impact avoidance and minimization during the development of the Preliminary Alternatives. Preliminary information about these key resources was obtained from the Tier 1 database, coordination with environmental resource agencies, additional research, public input, and technical field inventories. While these resources were considered to be important factors in the initial development of the Preliminary Alternatives, other environmental and community resources were subsequently considered in the analysis and screening of the Preliminary Alternatives and ultimately in the recommendations for the Alternatives Carried Forward.

- **Historic Properties.** Aboveground historic properties were identified by a comprehensive historic site survey that identified properties currently listed on the National Register or determined to be eligible for listing on the National Register. Boundaries for each historic property were established for avoidance by the preliminary alignments.
- **Wetlands.** The location of these sites is based upon a comprehensive corridor reconnaissance and subsequent preliminary wetland determinations.
- **Cemeteries.** Cemeteries were identified by a comprehensive corridor reconnaissance. A 100-foot buffer was established around each cemetery for avoidance by the preliminary alignments.
- **Known Caves and Major Springs.** Karst geologic features and springs are common within Section 4, particularly in Monroe County. Caves and major springs were identified as being important features of the karst system. Caves were identified by a comprehensive field inventory of geologic/karst features and are defined as being large enough for human entry. The mapping of the caves included a 200-foot buffer from each cave entrance as an avoidance area for the development of the preliminary alignments.[21] Springs that have 20 gallons per minute (gpm) or greater estimated discharge were classified as major springs. A 200-foot buffer around each spring was established as an avoidance area for development of the preliminary alignments.

Avoiding potential forest impacts was determined to not be possible for the development of the Preliminary Alternatives due to the expansive forest coverage within the approved corridor (over 65%), including some areas in which forest cover extends across the entire corridor width for considerable distances. Potential forest impacts were considered in the subsequent screening of the Preliminary Alternatives (see Section 3.4.1) and ultimately in the selection of the Preferred Alternative.

[21] Since the publication of the DEIS, ongoing public outreach lead to the identification of a cave with the proposed rights-of-way for all Section 4 Alternatives. This feature did not exist when surveys were completed in 2004 - 2006. It has been identified and added to the impacts for all alternatives. See Section 5.21.3.10 for more information about this cave.

Preliminary information about these key resources was used to develop the Preliminary Alternatives. This information was obtained from the Tier 1 database, coordination with resource agencies, additional research, and technical field inventories. This information was then used in the Quantm analysis as "constraints" for the development of the alternative mainline alignments. The interchange locations used in the Preliminary Alternatives analysis were based upon the Tier 1 study recommendations as well as input received during Tier 2 from the public involvement program.

The Section 4 Preliminary Alternatives are presented in **Table 3-1** and shown in **Figure 3-7** (pp. 3-78 through 3-96). The alignments in **Figure 3-7** are depicted by centerlines. No right-of-way was established for the alignments at the time the preliminary alternatives were developed. Subsection 4A begins at US 231 north of its intersection with SR 45/SR 58 in Greene County.

Table 3-1: Section 4 Preliminary Alternatives

Subsection and Alignment		Length (miles)	Subsection North Terminus	Description
4A	1	1.69	0.27 miles east of Greene County Road (CR) 215E	4A runs in an easterly direction, north of the unincorporated community of Scotland.
	2	1.67		
4B	1	2.28	0.25 miles north of Bogard Creek & 0.25 miles west of CR 440E	4B curves northeast toward the unincorporated community of Koleen and includes a crossing of Dowden Branch.
	2	2.45		
4C	1	1.86	0.13 miles west of Black Ankle Creek	4C curves back to the east crossing Flyblow Branch Creek with alignments north & south of Taylor Ridge Cemetery at the intersection of CR 400E and CR 450S.
	2	1.72		
4D	1	2.86	300 ft. east of CR 360S	4D runs in an easterly direction crossing Black Ankle Creek, Dry Branch, & Plummer Creek with alignments north of Ashcraft & Shoptaw Cemeteries and south of Cooper Cemetery & a major spring.
	2	2.88		
4E	1	4.58	800 ft. east of SR 54	4E runs in a northeasterly direction and begins to curve northward at the east end of the subsection. Along its route it crosses the Little Clifty Branch, SR 45, the Mitchell Branch, & SR 54.
	2	4.62		
	3	4.64		
4F	1	7.61	0.8 miles east of Burch Road & 300 ft. west of Evans Lane	4F runs in a northerly direction, east of Hobbieville, along the Greene County/Monroe County Line & turns easterly south of Stanford. It crosses the meandering Indian Creek 3 times with alignments running west of Carmichael Cemetery and Adams Cemetery.
	2	7.45		
	3	7.50		
4G	1	3.12	150 ft. west of Lodge Road	4G runs in an easterly direction between high density karst areas with alignments avoiding identified cave locations and major springs.
	2	3.13		
4H	1	3.22	SR 37	4H turns to the northeast, crossing two branches of Clear Creek & through a high density karst area with alignments running around several identified caves and springs.
	2	3.33		
	3	3.42		

The shortest preliminary end-to-end mainline alignment from the south terminus at US 231 to the north terminus at SR 37 is 26.9 miles in length. This alignment consists of Subsections 4A-2, 4B-1, 4C-2, 4D-1, 4E-1, 4F-2, 4G-1 and 4H-1. The longest preliminary end-to-end mainline alignment, consisting of Subsections 4A-1, 4B-2, 4C-1, 4D-2, 4E-3, 4F-1, 4G-2 and 4H-3, is 27.7 miles in length.

Because of the preliminary nature of the initial alignments, minor shifts in the alignments were anticipated as the alternative development process continued. Minor shifts of up to approximately 200 feet to either side of the centerline of the alignments were made if they would further avoid and minimize impacts upon community and natural resources, optimize connections between alignment subsections, and enable connections with Section 3 to the south and Section 5 to the north. The preliminary alignments had initial construction limits (identified by Quantm) ranging from about 300 feet to about 500 feet in total width, or an average of approximately 400 feet (200 feet to either side of the proposed centerline). Alignment shifts of up to approximately 200 feet would retain the integrity of the preliminary alignments. The possibility for alignment shifts during subsequent alignment development was conveyed to environmental resource agencies and the public during the project scoping and public involvement process.

Grade separations between the mainline of the interstate and local roads were also a component of the Preliminary Alternatives. Potential grade separations based upon the Tier 1 FEIS Environmental Atlas were proposed at the locations shown in **Table 3-2**. Grade separations at CR 920E/CR 975E (Old Clifty Road) and CR 1250E in Greene County, and Evans Lane and Lodge Road in Monroe County were added for considerations during Tier 2 based upon field review of travel patterns, accessibility considerations, and/or input from local government officials, the Section 4 CAC, and the general public. During the preliminary alternatives development phase, no decisions were made to determine if the interstate roadway would pass over the local crossroad of if the local crossroad would pass over the interstate roadway.

Table 3-2: Potential Grade Separations at the Preliminary Alternatives Phase

Greene County		Monroe County	
Road	**Alternatives**	**Road**	**Alternatives**
CR 215E	4A-1, 4A-2	Carter Road	4F-2, 4F-3
CR 600S	4B-1, 4B-2	Breeden Road	4F-1, 4F-2, 4F-3
CR 475E (Taylor Ridge Road)*	4C-1, 4C-2	Burch Road	4F-1, 4F-2, 4F-3
CR 600E	4D-1, 4D-2	Evans Lane **	4F-1, 4F-2, 4F-3
CR 750E/CR 900E (Dry Branch Road) Road)	4D-1, 4D-2	Harmony Road	4G-1, 4G-2
CR 360S/CR 880E (Mineral-Koleen Road)	4D-1, 4D-2	Rockport Road	4G-1, 4G-2
CR 920E/CR 975E (Old Clifty Road)**	4E-1, 4E-2, 4E-3	Lodge Road **	4H-1, 4H-2, 4H-3

Table 3-2: Potential Grade Separations at the Preliminary Alternatives Phase			
Greene County		**Monroe County**	
Road	**Alternatives**	**Road**	**Alternatives**
CR 1250E**	4E-1, 4E-2, 4E-3	Tramway Road	4H-1, 4H-2, 4H-3
CR 1260E/CR 190S (Hobbieville Road)	4F-1, 4F-2, 4F-3	Bolin Lane	4H-1, 4H-2, 4H-3
CR 35N (Monroe County Carmichael Road, extended)	4F-1, 4F-2, 4F-3		
CR 150N (Monroe County Carter Road, extended)	4F-1		
** includes CR 440E and CR 450S* *** potential local road grade separations added for consideration during the Tier 2 study*			

Interchange Options

Potential interchanges shown in the Tier 1 FEIS Environmental Atlas and retained for further study during the Tier 2 project development are at SR 45, and SR 54 in Greene County and SR 37 in Monroe County. The US 231 interchange is part of the project in Section 3.

An additional potential interchange along the Greene County/Monroe County Line was added to the Preliminary Alternatives during this Tier 2 study. Per the commitment made in Tier 1, this interchange would be entirely located within Greene County.[22] The interchange would include an access-controlled connector road that would intersect SR 45 in Center Township (Greene County). This potential interchange was added as an option at the request of representatives from Greene County, Monroe County, the Section 4 CAC, and the general public.

Five interchange options consisting of various combinations of potential interchanges are shown in **Table 3-3**. No ramp configurations for these potential interchanges were considered during the Preliminary Alternatives phase. The selection of the five interchange options included the following considerations:

- No option included interchanges at all three intermediate interchange locations – SR 45, SR 54, and Greene County/Monroe County Line. The Tier 1 EIS identified a maximum of two interchanges in Section 4 between US 231 and SR 37.
- Limiting interchanges in karst areas. As stated in the Tier 1 Biological Assessment Addendum (February 28, 2006) (p. 14), the Greene/Monroe County Line interchange is being considered; however, this would be not be an additional interchange but would replace one of the Tier 1 identified interchanges.

- At least one intermediate interchange would be included in all options. This decision was based upon the approximate 27-mile spacing between the Section 4 termini interchanges at US 231 and SR 37, and the Tier 1 and Tier 2 Purpose and Need goals regarding personal accessibility,

[22] The Tier 1 FEIS, in the context of minimizing and mitigating for water quality impacts due to new residential development in rural areas of Monroe County, states on p. 7-18, "No interchange will be provided in Monroe County where I-69 is on new alignment."

highway congestion, safety, and local economic development. The five interchange options are presented in **Table 3-3**. All options include interchanges at US 231 (which is addressed in the Section 3 Tier 2 EIS) and SR 37.

Table 3-3: Section 4 Interchange Options*

Potential Interchange Locations	1	2	3	4	5
SR 45	X		X	X	
SR 54			X		X
Greene/Monroe County Line	X	X			

*All interchange options include interchanges at US 231 (being studied by Section 3) and SR 37

If interchanges are not developed at SR 45 and/or SR 54, grade separations would be built at these state highway crossings of I-69. The potential interchange along the Greene County/Monroe County Line would be located in the vicinity of CR 35N/Carmichael Road (Monroe County) and CR 150N/Carter Road (Monroe County); however, no direct access would be provided from the potential interchange to these two local roads or to properties adjacent to the road that would connect the interchange with SR 45.

3.3 Detailed Performance Analysis of Preliminary Alternatives

3.3.1 Transportation Performance Indicators

Transportation performance goals in the Section 4 Study Area include improving accessibility, reducing congestion, and improving safety. The following paragraphs discuss the performance measures that determine how well the build alternatives perform under various options in meeting these stated goals (compared to the no-build scenario). Five build scenarios were selected for this analysis. These scenarios were comprised of an end-to-end alignment[23] and the five interchange options with intermediate interchanges between US 231 and SR 37 identified in Section 3.2.2.3. Because the end-to-end alternatives are of comparable length[24] and very near to one another, the different interchange options illustrate the range in purpose and need for the performance of the build alternatives. This analysis was made to determine the performance of different interchange options on purpose and need. All performance measures were calculated for a forecast year of 2030. All calculations assume that I-69 is completed from Evansville to Indianapolis.

3.3.1.1 Accessibility

The performance measures (See Section 2.5, *Project Goals and Performance Measures*) for the goal of improving accessibility are the overall reductions in travel distance and travel time to

[23] The performance measures analysis for all Build Scenarios used an end-to-end alignment comprised of subsections 4A-2, 4B-1, 4C-1, 4D-1, 4E-1, 4F-3, 4G-2 and 4H-1.

[24] The shortest end-to-end alternative is 26.9 miles. The longest end-to-end alternative is 27.7 miles. It was concluded that the 0.78 mile difference (2.9%) between the shortest and longest possible end-to-end alternatives in Section 4 will not have an appreciable difference in the analysis of traffic in the 5-county Study Area.

specific destinations important to citizens and businesses in the project area. The destinations identified as important to persons living, working, and/or operating businesses in the Section 4 Study Area are Indianapolis, Bloomington, and Evansville (See Section 2.5: Goals 2 and 4).

Travel Distance and Travel Time to Selected Destinations

Table 3-4 and **Table 3-5** show the estimated total travel distances and total travel times for trips from each of the communities and employment centers in the Study Area to the selected destinations for the no-build scenario and the build scenarios (as represented by the five Interchange Options that have intermediate interchanges between US 231 and SR 37).

Table 3-4 indicates that the total travel distance from Scotland, Doans, Koleen, Owensburg, Cincinnati, Hobbieville, and Stanford to Indianapolis, Bloomington, and Evansville will be reduced by one to five miles under the Interchange Options. The greatest total travel distance reduction of five miles would occur for trips between Hobbieville and the selected destinations under Interchange Options 3 and 5. Total travel distance from Kirksville to the selected destinations would be reduced under Interchange Options 1, 3, 4, and 5. There would be no increase or decrease in the total travel distances for trips between Bloomfield, Solsberry, and Kirksville (under Interchange Option 2) and the selected destinations.

Table 3-4 also shows total travel distances and total travel times for trips from the Crane NSWC West Gate and North Gate to Indianapolis, Bloomington, and Evansville. Both of these Crane NSWC gates would have a 2 mile total trip reduction to the selected destinations.

Table 3-4: Comparison of Travel Distance to Selected Destinations

Place of Origin (forecasted population or employment)	Total Travel Distances (miles) To Indianapolis, Bloomington and Evansville										
	Sum of Distances to Selected Destinations						No-Build vs. Build Mileage Differences				
	No Build	Build Scenario (Interchange Options)					Build Scenario (Interchange Options)				
		1	2	3	4	5	1	2	3	4	5
Bloomfield (2,677)	193	193	193	193	193	193	0	0	0	0	0
Scotland (26)	199	198	198	198	198	198	-1	-1	-1	-1	-1
Doans (16)	196	194	194	194	194	194	-2	-2	-2	-2	-2
Koleen (98)	191	190	190	190	190	190	-1	-1	-1	-1	-1
Owensburg (87)	191	190	190	190	190	190	-1	-1	-1	-1	-1
Cincinnati (214)	182	178	181	178	178	178	-4	-1	-4	-4	-4
Hobbieville (168)	186	183	185	181	183	181	-3	-1	-5	-3	-5
Solsberry (43)	181	181	181	181	181	181	0	0	0	0	0
Stanford (39)	175	172	173	172	172	172	-3	-2	-3	-3	-3
Kirksville (189)	178	175	178	174	175	174	-3	0	-4	-3	-4
Crane NSWC West Gate (1,743 emp.)	202	200	200	200	200	200	-2	-2	-2	-2	-2

Table 3-4: Comparison of Travel Distance to Selected Destinations											
Place of Origin (forecasted population or employment)	Total Travel Distances (miles) To Indianapolis, Bloomington and Evansville										
	Sum of Distances to Selected Destinations						No-Build vs. Build Mileage Differences				
	No Build	Build Scenario (Interchange Options)					Build Scenario (Interchange Options)				
		1	2	3	4	5	1	2	3	4	5
Crane NSWC North Gate (1,743 emp.)	191	189	189	189	189	189	-2	-2	-2	-2	-2

As shown in **Table 3-5**, all of the origin communities in the Section 4 Study Area would have total travel time reductions for trips to the selected destinations. The total travel time reductions would range from 18 minutes (Bloomfield under Interchange Options 3, 4, and 5) to 34 minutes (Scotland under all Interchange Options).

Total travel time between the Crane NSWC West Gate and the selected destinations would be reduced by 35 minutes under all of the Interchange Options. Total travel time between the Crane NSWC North Gate and the selected destinations would be reduced by 23 minutes (Interchange Option 2) to 29 minutes (Interchange Options 1, 3, 4, and 5).

Table 3-5: Comparison of Travel Time to Selected Destinations											
Place of Origin (forecasted population or employment)	Total Travel Time (minutes) To Indianapolis, Bloomington and Evansville										
	Sum of Time to Selected Destinations						No-Build vs. Build Mileage Differences				
	No Build	Build Scenario (Interchange Options)					Build Scenario (Interchange Options)				
		1	2	3	4	5	1	2	3	4	5
Bloomfield (2,677)	225	206	206	207	207	207	-19	-19	-18	-18	-18
Scotland (26)	228	194	194	194	194	194	-34	-34	-34	-34	-34
Doans (16)	224	195	201	195	195	195	-29	-23	-29	-29	-29
Koleen (98)	226	201	204	201	201	201	-25	-22	-25	-25	-25
Owensburg (87)	222	194	200	194	194	194	-28	-22	-28	-28	-28
Cincinnati (214)	210	181	187	182	182	182	-29	-23	-28	-28	-28
Hobbieville (168)	216	188	194	184	188	184	-28	-22	-32	-28	-32
Solsberry (43)	213	189	192	189	189	189	-24	-21	-24	-24	-24
Stanford (39)	201	173	173	174	174	174	-28	-28	-27	-27	-27
Kirksville (189)	208	180	184	180	180	180	-28	-24	-28	-28	-28
Crane NSWC West Gate (1,743 emp.)	231	196	196	196	196	196	-35	-35	-35	-35	-35
Crane NSWC North Gate (1,743 emp.)	218	189	195	189	189	189	-29	-23	-29	-29	-29

The comparisons between the no-build scenario and the build scenarios demonstrate how a minimal difference in travel distance can accompany a notable savings in travel time. For example, trips from Bloomfield to the selected destinations would have no decrease in total travel distance. However, the total travel time would be reduced by 18 to 19 minutes due to the faster travel on an interstate (the build scenarios) as opposed to slower travel on existing roads (the no-build scenario) to reach the same destinations.

Travel Time and Distance to the Interstate System

Another measure of accessibility was total travel distance and time to the interstate highway system. **Table 3-6** and **Table 3-7** show the improvement in total travel distance and time from each of the communities and employment centers to the interstate highway system for the no-build and build scenarios. For the communities in the Section 4 Study Area, the total travel distance and time to the interstate highway system provided by the tested build scenarios improves substantially compared to existing conditions.

Table 3-6: Comparison of Travel Distance to the Interstate System

Place of Origin (forecasted population or employment)	Travel Distances (miles) Distance to Interstate System No-Build vs. Build Mileage Difference										
	No Build	Build Scenario (Interchange Options)					Build Scenario (Interchange Options)				
		1	2	3	4	5	1	2	3	4	5
Bloomfield (2,677)	38	8	8	8	8	8	-30	-30	-30	-30	-30
Scotland (26)	46	1	1	1	1	1	-45	-45	-45	-45	-45
Doans (16)	49	4	4	4	4	4	-45	-45	-45	-45	-45
Koleen (98)	46	6	9	6	6	6	-40	-37	-40	-40	-40
Owensburg (87)	49	4	11	4	4	4	-45	-38	-45	-45	-45
Cincinnati (214)	41	3	3	2	3	2	-38	-38	-39	-38	-39
Hobbieville (168)	43	5	5	1	5	1	-38	-38	-42	-38	-42
Solsberry (43)	36	7	7	8	9	8	-29	-29	-28	-27	-28
Stanford (39)	38	5	5	6	6	6	-33	-33	-32	-32	-32
Kirksville (189)	42	6	6	6	6	6	-36	-36	-36	-36	-36
Crane NSWC West Gate (1,743 emp.)	48	2	2	2	2	2	-46	-46	-46	-46	-46
Crane NSWC North Gate (1,743 emp.)	49	4	9	4	4	4	-45	-40	-45	-45	-45

Table 3-7: Comparison of Travel Time to the Interstate System

Place of Origin (forecasted population or employment)	Time Comparison (minutes)										
	Time to Interstate System						No-Build vs. Build Time Difference				
	No Build	Build Scenario (Interchange Options)					Build Scenario (Interchange Options)				
		1	2	3	4	5	1	2	3	4	5
Bloomfield (2,677)	44	10	10	10	10	10	-34	-34	-34	-34	-34
Scotland (26)	52	2	2	2	2	2	-50	-50	-50	-50	-50
Doans (16)	54	5	5	5	5	5	-49	-49	-49	-49	-49
Koleen (98)	53	9	13	9	9	9	-44	-40	-44	-44	-44
Owensburg (87)	57	6	13	6	6	6	-51	-44	-51	-51	-51
Cincinnati (214)	47	4	4	3	4	3	-43	-43	-44	-43	-44
Hobbieville (168)	50	6	7	2	6	2	-44	-43	-48	-44	-48
Solsberry (43)	41	8	8	10	11	10	-33	-33	-31	-30	-31
Stanford (39)	42	6	6	7	7	7	-36	-36	-35	-35	-35
Kirksville (189)	46	8	8	8	8	8	-38	-38	-38	-38	-38
Crane NSWC West Gate (1,743 emp.)	53	3	3	3	3	3	-50	-50	-50	-50	-50
Crane NSWC North Gate (1,743 emp.)	56	5	11	5	5	5	-51	-45	-51	-51	-51

With respect to improvements in accessibility, the five build scenarios (with intermediate interchange options) analyzed (which represent the range of performance for alternatives in Section 4) are nearly identical. The distances from some of the local communities to the selected destinations are not decreased with the I-69 build scenarios but each selected local community would have significant travel time savings to the selected destinations with the I-69 build scenarios. The distances from Crane NSWC (West Gate and North Gate) to the selected destinations are reduced with I-69 and travel time savings are also realized. The largest access improvements are to the interstate system. With an I-69 build alternative, substantial reductions in travel distance from the local communities and Crane NSWC (West Gate and North Gate) to the interstate system are seen as well as significant travel time savings are expected. All build scenarios provide a significant level of improved accessibility to population and employment centers served by Section 4, and thereby satisfy the local goals to improve accessibility.

3.3.1.2 Congestion

The performance measure for the goal of reducing congestion is the overall improvement in the vehicle miles traveled (VMT) and vehicle hours traveled (VHT) on congested roads. Congested roads in rural areas are those operating at a level of service D, E or F.[25]

[25] Level of service (LOS) is the method commonly used to evaluate a roadway's functionality. LOS is a measure of operational conditions. These conditions are defined in terms of factors such as speed and travel time, maneuverability, and delay. There are six levels of service, which are designated by the letters "A" through "F." LOS "A" represents the most desirable operating conditions, while LOS "F" defines the least acceptable.

Table 3-8 compares the total daily VMT at a congested level of service for the no-build scenario and the five build options. As shown, the daily total congested VMT under the no-build scenario would be reduced under all five build options. The greatest reduction (182,261 miles) would occur under Option 1 (US 231, SR 45, Greene/Monroe County Line, and SR 37 interchanges). All five build options (with intermediate interchange options) satisfy the local goals to reduce traffic congestion for VMT.

Table 3-8: Congestion Comparison – Vehicle Miles Traveled (VMT)

		Level of Service (miles)			
		LOS D	LOS E	LOS F	Total Congested VMT
No-Build Scenario	Greene County	238,329	140,754	0	379,083
	Lawrence County	137,071	9,164	0	146,235
	Martin County	46,678	279,429	0	326,107
	Monroe County	188,336	170,134	3,598	362,068
	Owen County	200,183	27,163	0	227,346
	Total	810,597	626,644	3,598	1,440,839
Build Scenario (Interchange Options)		**LOS D**	**LOS E**	**LOS F**	**Total Congested VMT**
Option 1	Greene County	218,746	67,247	0	285,993
	Lawrence County	138,000	1,529	0	139,529
	Martin County	12,021	356,492	0	368,513
	Monroe County	220,376	59,415	2,445	282,236
	Owen County	153,117	29,190	0	182,307
	Total	742,260	513,873	2,445	1,258,578
Option 2	Greene County	221,368	74,565	0	295,933
	Lawrence County	138,077	1,529	0	139,606
	Martin County	12,013	355,945	0	367,958
	Monroe County	218,151	63,120	2,441	283,712
	Owen County	153,358	29,106	0	182,464
	Total	742,967	524,265	2,441	1,269,673
Option 3	Greene County	245,663	66,496	0	312,159
	Lawrence County	137,716	1,528	0	139,244
	Martin County	12,039	356,429	0	368,468
	Monroe County	203,920	97,592	2,442	303,954
	Owen County	151,871	26,870	0	178,741
	Total	751,809	548,915	2,442	1,302,566
Option 4	Greene County	250,775	66,491	0	317,266
	Lawrence County	137,952	1,528	0	139,480
	Martin County	12,039	356,560	0	368,599
	Monroe County	203,576	100,002	2,441	306,019
	Owen County	153,134	29,195	0	182,329
	Total	757,476	553,776	2,441	1,313,693
Option 5	Greene County	240,033	78,033	0	318,066
	Lawrence County	137,797	1,528	0	139,325
	Martin County	12,011	356,006	0	368,017

Table 3-8: Congestion Comparison – Vehicle Miles Traveled (VMT)					
		Level of Service (miles)			
		LOS D	LOS E	LOS F	Total Congested VMT
	Monroe County	204,387	103,303	2,443	310,133
	Owen County	151,853	26,954	0	178,807
	Total	746,081	565,824	2,443	1,314,348

Table 3-9 compares the total daily VHT at a congested level of service for the no-build scenario and the five build options. Like the VMT reductions, the total daily congested VHT under the no-build scenario would also be reduced under all five build options. The greatest reduction (3,593 hours) would occur under Option 1 (US 231, SR 45, Greene/Monroe County Line, and SR 37 interchanges). All five build options (with intermediate interchange options) would also satisfy the local goals to reduce traffic congestion for VHT.

Table 3-9: Congestion Comparison – Vehicle Hours Traveled (VHT)					
		Level of Service (hours)			
		LOS D	LOS E	LOS F	Total Congested VHT
No-Build Scenario	Greene County	4,192	2,533	0	6,725
	Lawrence County	2,381	179	0	2,560
	Martin County	796	4,712	0	5,508
	Monroe County	4,703	4,279	169	9,151
	Owen County	3,507	622	0	4,129
	Total	15,579	12,325	169	28,073
Build Scenario (Interchange Options)		**LOS D**	**LOS E**	**LOS F**	**Total Congested VHT**
Option 1	Greene County	3,808	1,184	0	4,992
	Lawrence County	2,396	53	0	2,449
	Martin County	222	5,984	0	6,206
	Monroe County	5,334	2,037	92	7,463
	Owen County	2,728	642	0	3,370
	Total	14,488	9,900	92	24,480
Option 2	Greene County	3,848	1,329	0	5,177
	Lawrence County	2,398	53	0	2,451
	Martin County	222	5,975	0	6,197
	Monroe County	5,290	2,111	92	7,493
	Owen County	2,735	642	0	3,377
	Total	14,493	10,110	92	24,695
Option 3	Greene County	4,289	1,169	0	5,458
	Lawrence County	2,391	53	0	2,444
	Martin County	223	5,983	0	6,206
	Monroe County	5,008	2,803	92	7,903
	Owen County	2,705	574	0	3,279
	Total	14,616	10,582	92	25,290
Option 4	Greene County	4,383	1,169	0	5,552

Table 3-9: Congestion Comparison – Vehicle Hours Traveled (VHT)					
		Level of Service (hours)			
		LOS D	LOS E	LOS F	Total Congested VHT
	Lawrence County	2,396	53	0	2,449
	Martin County	223	5,986	0	6,209
	Monroe County	4,999	2,853	92	7,944
	Owen County	2,727	643	0	3,370
	Total	14,728	10,704	92	25,524
Option 5	Greene County	4,194	1,385	0	5,579
	Lawrence County	2,393	53	0	2,446
	Martin County	222	5,998	0	6,220
	Monroe County	5,011	2,911	93	8,015
	Owen County	2,685	613	0	3,298
	Total	14,505	10,960	93	25,626

3.3.1.3 Safety

In response to comments on the DEIS, the crash rates used to forecast changes in the safety analysis were updated. The crash rates used in the FEIS are based upon reported crashes in 2007 through 2009 in Greene, Monroe, Owen, Martin and Lawrence counties. Due to using these updated rates, the number of forecasted crashes has changed since the DEIS. The number of crashes forecasted in both the build and no-build scenarios generally are lower than were shown in the DEIS. In order to provide a more robust analysis, changes in overall crash rates by county are analyzed in the FEIS, in addition to changes in the raw number of crashes. This metric was added to account for the nearly 20% increase in vehicle travel in the 5-county study area, which is caused by I-69 diverting large volumes of traffic from outside the study area.

The performance measure for the goal of improving safety used in the DEIS was the reduction in the total number of crashes. The number of crashes is forecast by using historical crash rates and the projected volume of traffic on each functional class of road. **Table 3-10** shows the annual crashes[26] projected to occur for the no-build scenario by type and location. Similarly, **Tables 3-10a** through **Table 3-10e** show the annual crashes projected for the five build options (with intermediate interchange options) by type and location. The interstate category includes I-69. SR 37 is classified as an expressway and is therefore included under non-interstate roads.

Compared to the no-build scenario, the vehicle miles traveled within the study area are expected to increase due to drivers choosing routes within the study area over alternate routes outside the area. Future vehicle miles traveled, under the each build option, are predicted to increase by 341 million miles to 352 million miles annually (or 1.03 million to 1.07 million VMT per weekday),

[26] Since crashes are a relatively infrequent occurrence, standard transportation planning practice analyzes them on an annual, rather than daily, basis. Fatal crashes are a particularly rare event, and are shown in this analysis to the nearest tenth (per year). For example, a difference in 0.6 fatal crashes per year means that a difference of one fatal crash about every 20 months is predicted. Since injury and property damage type crashes are comparatively common (in the hundreds per year) those forecasts were rounded to the nearest integer.

which is an approximate 19% increase above the no-build scenario. Since the total number of crashes is dependent on traffic volumes, the build options, which have higher traffic volumes; show a greater total number of crashes. For this reason, the performance of the build options were also measured and compared on the frequency of crashes per vehicle miles traveled. The total number of crashes and VMT's were used to determine a crash rate or crash frequency for the no-build and each build option. The annual VMT projected for the no-build scenario and the calculated crash rates are included in **Table 3-10**. Similarly, **Tables 3-10a** through **Table 3-10e** show the annual VMT projected for the build options along with the calculated crash rates. A safety comparison is then shown for each option with the calculated change in annual crashes, VMT, and crash frequency from the no-build to each build option.

Generally, **Tables 3-10 through 3-10e** show that the construction of I-69 will result in a slight increase in the predicted total number of crashes in the five county study area. This increase is due to the additional one million vehicle miles being traveled on weekdays under the build scenarios. In other words, an additional 6.6 million to 6.8 million vehicle miles are predicted to be diverted to the study area each week with a probability of less than one added crash each week. This shows that you can divert large amounts of traffic from lower functional class roads with higher crash rates and still maintain safety by putting them onto safer facilities. Additionally, as the Tier 1 FEIS noted, there is a significant reduction in crashes in Southwest Indiana as a whole that the above forecasts do not include. Locations around the state (as well as neighboring states) will experience lower traffic volumes and thereby fewer crashes because traffic is diverted to I-69.

The change in crash rates shown for each interchange option also illustrates that the diverted traffic is pushing overall crash rates in the study area down from about 342 crashes per 100 million VMT to about 290 crashes per 100 million VMT. In other words, everyone traveling a comparable distance in the study area with I-69 is about 15% less likely to be involved in a crash.

Table 3-10: No-Build Scenario - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), and Crash Rates.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.0	0	0	0	7.4	147	613	767	7.4	147	613	767
Lawrence County	0.0	0	0	0	3.4	132	534	669	3.4	132	534	669
Martin County	0.0	0	0	0	3.3	61	253	317	3.3	61	253	317
Monroe County	0.0	0	0	0	12.2	876	3124	4012	12.2	876	3124	4012
Owen County	0.0	0	0	0	5.7	106	404	516	5.7	106	404	516
Total	0.0	0	0	0	32.0	1322	4928	6282	32.0	1322	4928	6282
VMT (100 million VMT)	0.00				18.35				18.35			
Crash Rate (Crashes/100 mill VMT)									**1.74**	**72.04**	**268.55**	**342.33**

Table 3-10a: Interchange Option 1 - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), Crash Rates, and Changes Versus the No-Build Scenario.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.6	14	74	89	6.9	138	572	717	7.5	152	646	806
Lawrence County	0.0	0	0	0	3.4	132	533	668	3.4	132	533	668
Martin County	0.1	0	0	0	3.6	68	276	348	3.6	68	276	348
Monroe County	1.7	42	221	265	10.5	815	2882	3708	12.2	857	3103	3972
Owen County	0.0	0	0	0	5.7	108	410	524	5.7	108	410	524
Total	2.3	56	295	353	30.1	1261	4673	5964	32.4	1317	4968	6317
VMT (100 million VMT)	5.48				16.39				21.87			
Crash Rate (Crashes/100 mill VMT)									**1.48**	**60.22**	**227.15**	**288.83**
Change in Annual Crashes, Vehicle Miles Traveled, and Crash Rates												
Total Change in Crashes	2.3	56	295	353	-1.9	-61	-255	-318	0.4	-5	40	35
Change in VMT (100 million VMT)	5.48				-1.96				3.52			
Crash Rate Change (Crashes/100 mill VMT)									**-0.26**	**-11.82**	**-41.40**	**-53.50**

Table 3-10b: Interchange Option 2 - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), Crash Rates, and Changes Versus the No-Build Scenario.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.5	13	72	86	7.0	140	582	729	7.5	153	654	815
Lawrence County	0.0	0	0	0	3.4	132	534	669	3.4	132	534	669
Martin County	0.0	0	0	0	3.6	68	276	348	3.6	68	276	348
Monroe County	1.7	41	219	262	10.6	817	2889	3717	12.3	858	3108	3978
Owen County	0.0	0	0	0	5.7	108	410	524	5.7	108	410	524
Total	2.2	54	291	347	30.3	1265	4691	5986	32.5	1319	4982	6334
VMT (100 million VMT)	5.39				16.46				21.85			
Crash Rate (Crashes/100 mill VMT)									**1.49**	**60.37**	**228.02**	**289.90**
Change in Annual Crashes, Vehicle Miles Traveled, and Crash Rates												
Total Change in Crashes	2.2	54	291	347	-1.7	-57	-237	-296	0.5	-3	54	52
Change in VMT (100 million VMT)	5.39				-1.89				3.50			
Crash Rate Change (Crashes/100 mill VMT)									**-0.25**	**-11.67**	**-40.53**	**-52.43**

Table 3-10c: Interchange Option 3 - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), Crash Rates, and Changes Versus the No-Build Scenario.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.6	14	75	90	6.8	135	563	705	7.4	149	638	794
Lawrence County	0.0	0	0	0	3.4	132	533	668	3.4	132	533	668
Martin County	0.0	0	0	0	3.6	68	275	347	3.6	68	275	347
Monroe County	1.6	40	213	255	10.8	822	2907	3740	12.4	862	3120	3994
Owen County	0.0	0	0	0	5.5	103	394	503	5.5	103	394	503
Total	2.2	54	288	344	30.1	1260	4672	5962	32.3	1314	4960	6306
VMT (100 million VMT)	5.37				16.43				21.79			
Crash Rate (Crashes/100 mill VMT)									**1.48**	**60.29**	**227.58**	**289.34**
Change in Annual Crashes, Vehicle Miles Traveled, and Crash Rates												
Total Change in Crashes	2.2	54	288	344	-1.9	-62	-256	-320	0.3	-8	32	24
Change in VMT (100 million VMT)	5.37				-1.92				3.44			
Crash Rate Change (Crashes/100 mill VMT)									**-0.26**	**-11.75**	**-40.97**	**-52.99**

Table 3-10d: Interchange Option 4 - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), Crash Rates, and Changes Versus the No-Build Scenario.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.6	14	74	89	6.8	137	571	715	7.4	151	645	803
Lawrence County	0.0	0	0	0	3.4	132	533	668	3.4	132	533	668
Martin County	0.0	0	0	0	3.6	68	276	348	3.6	68	276	348
Monroe County	1.6	40	212	254	10.8	823	2910	3744	12.4	863	3122	3997
Owen County	0.0	0	0	0	5.7	108	410	524	5.7	108	410	524
Total	2.2	54	286	342	30.3	1268	4700	5998	32.5	1322	4986	6341
VMT (100 million VMT)	5.32				16.51				21.83			
Crash Rate (Crashes/100 mill VMT)									**1.49**	**60.55**	**228.38**	**290.45**
Change in Annual Crashes, Vehicle Miles Traveled, and Crash Rates												
Total Change in Crashes	2.2	54	286	342	-1.7	-54	-228	-284	0.5	-0	58	59
Change in VMT (100 million VMT)	5.32				-1.84				3.48			
Crash Rate Change (Crashes/100 mill VMT)									**-0.25**	**-11.49**	**-40.17**	**-51.88**

Table 3-10e: Interchange Option 5 - Annual Crashes by Type and Location, Annual Vehicle Miles Traveled (VMT), Crash Rates, and Changes Versus the No-Build Scenario.

Location	Interstate				Non-Interstate Roads				Total Interstate Plus Non-Interstate			
	F	I	PD	Sub-Total	F	I	PD	Sub-Total	F	I	PD	Sub-Total
Greene County	0.6	14	73	88	6.9	138	576	721	7.5	152	649	809
Lawrence County	0.0	0	0	0	3.4	132	533	668	3.4	132	533	668
Martin County	0.0	0	0	0	3.6	68	275	347	3.6	68	275	347
Monroe County	1.6	39	208	249	10.9	824	2918	3753	12.5	863	3126	4002
Owen County	0.0	0	0	0	5.5	103	395	504	5.5	103	395	504
Total	2.2	53	281	336	30.3	1265	4697	5992	32.5	1318	4978	6329
VMT (100 million VMT)	5.26				16.50				21.76			
Crash Rate (Crashes/100 mill VMT)									**1.49**	**60.57**	**228.77**	**290.86**
Change in Annual Crashes, Vehicle Miles Traveled, and Crash Rates												
Total Change in Crashes	2.2	53	281	336	-1.7	-57	-231	-290	0.5	-4	50	47
Change in VMT (100 million VMT)	5.26				-1.85				3.41			
Crash Rate Change (Crashes/100 mill VMT)									**-0.25**	**-11.47**	**-39.78**	**-51.47**

All five of the build options (with intermediate interchange options) analyzed show a reduction in crash rates when compared to the no-build scenario. Crash rate reductions forecasted in the five-county Study Area for the build options are comparable with annual reductions ranging from 53.50 less crashes per 100 million VMT under Option 1 to 51.47 less crashes per 100 million VMT under Option 5. The build options with two intermediate interchanges between US

231 and SR 37 (i.e., Options 1 and 3) are predicted to have the lowest number of additional crashes. However, the Greene/Monroe County Line interchange diverts more traffic than the SR 45 interchange and has the greatest reduction in crash frequency of all the build options. Again, this is considered a conservative estimate of the project's potential safety benefits since it does not take into account the total reduction in crashes forecasted for the entire length of the Tier 2 corridor or the reduction in crashes in Southwest Indiana as a whole when all traffic changes due to I-69 are taken into account.

Since there are currently no interstate highways in Greene and Monroe counties in the no-build case, there is an "increase" in interstate crashes in the build case. On the other hand, as I-69 draws traffic from lower functional class facilities with higher crash rates, the number of crashes on non-interstate facilities is reduced. The total reduction in crashes for non-interstate traffic (from 284 to 320 fewer crashes per year) represents the annual savings in crashes on the local (non-interstate) highway network in the five-county Study Area. Furthermore, as the severity of the crashes is also decreased in the build alternative there is an overall annual savings in crash cost as shown in **Section 5.5, Table 5.5-4**.

3.3.1.4 Transportation Performance Measures Summary

All of the Section 4 Build Alternatives, as represented by the five interchange options (with intermediate interchange options between US 231 and SR 37 and a common mainline alignment), provide significant benefits on performance measures addressing the Tier 2 local purpose and need goals (see Section 2.5, Chapter 2, *Purpose and Need*). All Build Alternatives (based on the five interchange options with intermediate interchanges and a common mainline alignment) provide essentially equal benefits for accessibility-related measures (see **Table 3-4** through **Table 3-7**), and the safety measure of improved crash frequency, local purpose and need Goal 4, performance measure G4-B (see **Table 3-10** through **Table 3-10e**). While the Build Alternatives all provide improved crash frequency; due to the increased traffic forecast for each alternative, only the non-interstate road system is predicted to have a reduction in the total number of accidents, performance measure G4-A (see **Table 3-10** through **Table 3-10e**). Finally, all build alternatives provide substantial benefits on performance measures regarding local purpose and need goals related to congestion (see **Table 3-8** and **Table 3-9**). The following describes the results from the preceding tables:

- Interchange Option 1 (US 231, SR 45, Greene/Monroe County Line, and SR 37 interchanges) would provide the greatest congestion relief and reduction in crash frequency in the five-county Study Area. This option would reduce total congested (LOS D, E and F) vehicle miles traveled in the five-county Study Area by about 12.6% and total congested (LOS D. E and F) vehicle hours traveled by about 12.8% as compared to the no-build scenario. This option would provide the greatest annual reduction in crashes at 53.50 less crashes per 100 million VMT in the Study Area. Interchange Option 5 (US 231, SR 54 and SR 37 interchanges) would provide the least amount of congestion relief and least safety improvement. This option would reduce total congested vehicle miles traveled in the five-county Study Area by about 8.8% and total congested vehicle hours traveled by about 8.7% as compared to the no-build scenario. This option would provide the least annual reduction

in crashes at 51.47 less crashes per 100 million VMT in the Study. Interchange Option 4 (US 231, SR 45 and SR 37 interchanges) had similar, although slightly more effective, congestion relief and safety improvement.

- Interchange Option 2 (US 231, Greene/Monroe County Line and SR 37 interchanges) is not as effective as Option 1 in providing congestion relief and safety improvement, but is more effective in providing congestion relief than Options 3, 4, and 5. The option offers greater safety benefits than Options 4 and 5 although slightly less than Option 3. Interchange Option 3 (US 231, SR 45, SR 54 and SR 37 interchanges has similar, although less, congestion relief.

Overall, the Greene/Monroe County Line interchange would have the greatest effect upon congestion relief and crash frequency reduction in the five-county Study Area. This interchange is one of the two intermediate interchanges included in Interchange Option 1. Also, as a single intermediate interchange (Interchange Option 2), the Greene/Monroe County Line interchange would provide greater congestion relief as compared to Interchange Option 3, which has two intermediate interchanges (SR 45 and SR 54). Interchange Option 2 would also have greater congestion relief and safety benefits as compared to the other single intermediate interchange options (Interchange Options 4 and 5).

3.3.2 Economic Development Indicators

The analysis of economic conditions in Southwest Indiana during the Tier 1 study indicated a need to enhance economic development opportunities in the region. The study evaluated the role an improved transportation system could play in addressing this need, and concluded that improving the transportation system can lead to enhanced economic growth (See Tier 1 FEIS, Section 3.4.4, *Economic Development Indicators*). Supporting local economic development initiatives is one of Section 4's local goals, based on input from the local officials, economic development groups, the Section 4 Community Advisory Committee, and the public (See Chapter 2, *Purpose and Need*). The performance indicators for this goal include:

- Increase in access of area businesses to the Interstate system.
- Reduce travel time to regional business destinations: Evansville, Crane NSWC, Bloomington and Indianapolis.

Improving access to the interstate system would allow workers to choose from a wider selection of employers and provide businesses with a wider pool of qualified employees from which to choose. To evaluate the ability of each build alternative to provide business access to the Interstate system, travel distance and travel time to the interstate system from the Study Area communities and selected businesses were measured as described in Section 3.3.1.1. The present distance and travel time from the local communities and Crane NSWC to the nearest Interstate interchange were compared with the distance and travel time to the nearest interstate interchange upon completion of I-69. **Table 3-6** and **Table 3-7** show the results of these comparisons.

Improving accessibility by reducing travel time to regional destinations – particularly Indianapolis, Bloomington, and Evansville – was identified as important to persons and

businesses in the Section 4 Study Area for reasons that include having better access to regional employment centers and business markets. **Table 3-4** and **Table 3-5** show the estimated total travel distance and time for trips from each of the communities and employment centers in the Study Area to the regional destinations for the no-build and the five build scenarios (i.e., interchange options with intermediate interchanges between US 231 and SR 37 and a common mainline alignment).

The build scenarios would have essentially equal performance in improving travel distances and times to the interstate system from the communities and employment centers in the Study Area.

In sum, each build scenario would provide a similar and substantial reduction in total distance and travel time to employment centers and business markets. As with the transportation performance measures, economic development indicators are generally equal for the build alternatives; therefore, factors such as environmental impacts and cost will be used to differentiate among the alternatives and to identify a preferred alternative for Section 4.

3.4 Description of Alternatives Carried Forward

The alternatives that will be studied in detail in the Tier 2 DEIS are called the Alternatives Carried Forward. These consist of end-to-end alternatives for the mainline alignments in **Table 3-1**, potential grade separations in **Table 3-2**, and preliminary Interchange Options in **Table 3-3**.

The screening analysis of the mainline alignments along the eight subsections for the Preliminary Alternatives is presented in Section 3.4.1. This analysis included the preliminary recommendations for each subsection mainline alignment that were presented to the public and resource agencies through the scoping process. The final selection of the mainline alignments to be carried forward for detailed study includes any applicable modifications of the alignments for avoiding/minimizing potential impacts per input received through the scoping process. Four alternatives under the build condition, comprised of end-to-end combinations of the Alternatives Carried Forward, are described at the end of Section 3.4.1. Possible grade separations and local road closures associated with these alternatives are also identified.

Section 3.4.2 presents the Interchange Options that will be studied in detail. This includes an analysis of the preliminary Interchange Options as previously presented in **Table 3-3** of Section 3.2.2.3.

Section 3.4.3 presents project cost estimates. This includes preliminary cost estimates for the four Build Alternatives Carried Forward and maintenance cost estimates.

3.4.1 Mainline Alternatives

The screening analysis was performed to identify disproportionate impacts along alternative alignments within each subsection. The identification of disproportionate, or substantial, impacts

upon the selected resources was used to recommend which alignment alternatives would be studied in detail in the Tier 2 DEIS as Alternatives Carried Forward.

Continued development of the Preliminary Alternatives indicated that at least a 400-foot wide right-of-way would likely be needed to accommodate the construction limits shown by Quantm for the highway development along most of the Section 4 corridor. Accordingly, the screening of the mainline alternatives assumed a right-of-way extending 200 feet to each side of the centerline. In some locations, the right-of-way would need to be wider in order to accommodate highway sections that require more extensive cuts and fill, which will be common in Section 4. Thus, a maximum right-of-way extending 300 feet to each side of the centerline (a total of 600 feet in width) was also used to identify potential impacts for the Preliminary Alternatives screening. A typical section to calculate right-of-way was not used for impact calculations until the analysis of Alternatives Carried Forward for detailed study in Chapter 5. See Section 5.1 for a discussion of the typical sections used in the alternatives carried forward for detailed study.

In the development of the Preliminary Alternatives, subsection alignments were generated to avoid historic properties, wetlands, cemeteries, known caves and major springs where possible. The screening of the Preliminary Alternatives included an analysis of potential impacts upon these and several additional resources, along with input on the preliminary alternatives from resource agencies, public agencies, and the general public. As appropriate, professional judgment was applied to environmental, engineering, and planning issues. The resources considered in the Preliminary Alternatives screening were:

- **Subsection Lengths and Construction Cost Estimates**. Construction cost estimates were developed using Quantm[27] for only the I-69 mainline components. Since each Quantm construction cost estimate is based upon development of the highway along the entire length of Section 4, such cost estimates were not used in the screening analysis and are presented for informational purposes only.
- **Wetland**. The development of the preliminary alternatives avoided many wetlands within the Section 4 corridor. Some wetlands, however, could not be completely avoided. These wetlands included those located in the Black Ankle Creek floodplain (Subsection 4D), some very small (< 0.1 ac) isolated wetlands, and riparian wetlands along streams that cross the entire corridor. The preliminary alternatives screening includes identification of potential wetland impacts and recommendations for possible alignment shifts to further avoid and minimize wetland impacts.
- **Forests and Core Forest**. Forest impacts were calculated using the forest land cover mapping unit of the upland habitat land use category. As described in Section 5.20, the alternative analysis used more detailed forest data (based upon analysis of aerial photos and follow-up field surveys) to estimate impacts for alternatives carried forward for detailed study. Forested wetland was classified as a wetland resource during the alternatives

[27] Costs identified by Quantm are appropriate for comparing mainline construction cost components, but do not include all costs. Costs which Quantm does not estimate include interchanges, some drainage structures, local road improvements, right-of-way, design engineering, construction engineering, utility relocation, and environmental mitigation. Once the subsection alternatives were screened, and the engineering for the end-to-end alternatives was further defined, more detailed cost estimates were generated for each of the remaining subsections.

screening and thus is not included in the forest land cover. The screening analysis also includes direct impacts upon core forests.[28] Indirect core forest impacts[29] that would occur due to changes in the core forest buffer zones were not estimated at the screening stage, but will be assessed in the alternatives analysis (see Chapter 5). It is noted that the total forest acres shown in the summary tables for each subsection also includes any core forest acreage which is directly impacted.

- **Agricultural Lands and Prime Farmland**. Agricultural lands, based upon the land use/land cover field survey, consist of row crops, pasture, orchards, groves, nurseries, specialty crops, and agricultural operations. Farming (row crops and pasture) is a primary land use in the Greene County portion of the corridor between US 231 and Black Ankle Creek. Pasture is a secondary agricultural activity along and near the Greene County/Monroe County Line and near the north (east) end of the corridor in Monroe County. Potential impacts to prime farmland were determined for those lands being used for agricultural crop production and which were also classified as NRCS prime farmland soils. It is noted that the total farmland acres shown in the summary tables for each subsection also include the prime farmland acreage.
- **Managed Properties**. Classified forests and classified wildlife habitats[30] were identified per information received from the IDNR (classified forest) and signs posted on individual properties designating classified wildlife habitats.
- **Floodplains**. IDNR 100-year floodplain mapping was available and used for Doans Creek, Black Ankle Creek, Dry Branch, Plummer Creek, Mitchell Branch, Indian Creek and an unnamed tributary of Clear Creek.
- **Streams**. Streams were identified by the number of streams (or stream segments) and the total linear feet of the streams occurring within each subsection analysis area (the 200 to 300 foot area on either side of the center line, as described above). Stream information is classified as perennial, intermittent or ephemeral. No further determinations were made at this screening stage (e.g., actual linear feet of impacts, stream relocations).
- **Ponds**. All ponds within the Section 4 corridor are man-made. "Major" pond impacts were identified where ponds would be filled for the highway development. "Partial" pond impacts[31] were identified where a portion of the pond may be filled. No jurisdictional determinations of these ponds as "waters of United States" were made at this phase of the project development.
- **Subsurface Drainage Features**. The preliminary alternatives avoided all known cave entrances[32] and major springs (> 20 gpm discharge) including the buffer zones extending 200 feet (radius) from the center of the caves and major springs. Other subsurface drainage

[28] If the project right-of-way impacts land which now is identified as core forest, it is a "direct impact" to core forest.
[29] If the project impacts forest within 100 meters of a core forest, that core forest decreases in size. These "indirect" impacts to core forest are analyzed in Chapter 5.
[30] Subsequent to the preliminary alternatives screening, the IDNR merged its classified forests and classified wildlife habitats programs into a new program titled classified forest and wildlands (see Chapter 5.22).
[31] Subsequent impact analysis in Section 5.19 determined that any impact to a pond would be calculated as a total pond impact.
[32] Since the publication of the DEIS, ongoing public outreach lead to the identification of a cave with the proposed rights-of-way for all Section 4 Alternatives. This feature did not exist when surveys were completed in 2004 - 2006. It has been identified and added to the impacts for all alternatives. See Section 5.21.3.10 for more information about this cave.

features that were evaluated during the screening were minor springs (5 to 20 gpm discharge), small springs (< 5 gpm discharge), sinkholes, swallets, and sinking streams as identified by the geology/karst inventory. Springs west of Taylor Ridge (subsections 4A, 4B, and part of 4C) in Greene County are non-karst system springs.

- **Historic Properties**. The development of the preliminary alternatives avoided all historic properties within Section 4; however, the possibility of adverse impacts was not evaluated at this stage. Distances from historic properties, as identified by the historic property survey, were determined from the edge of both the 200-foot and 300-foot screening limits to the edge of each historic boundary.
- **Cemeteries**. The centerlines for the preliminary alignments avoided the 100-foot buffer around all cemeteries. Cemetery distances were calculated for the distance between the limit of the 100-foot buffer and both the 200-foot and 300-foot screening limits. For example, a "150 – 50" value means that the 200-foot screening limit is 150 feet outside the cemetery buffer and the 300-foot screening limit is 50 feet outside the cemetery buffer. Along some alignments, the screening limits may fall within the cemetery buffer. At those locations, a negative value is presented. For example, a "-25" value indicates that the alignment is 25 feet within the limit of the 100-foot buffer around the cemetery, or 75 feet from the actual boundary of the cemetery.
- **Residential and Business Displacements.** Residences and businesses were considered a potential displacement if located within the 200-foot screening limits, 300-foot screening limits, or if access to the property may be eliminated and no alternative means of access were apparent at the time of the screening analysis.

Potential impacts were identified using the GIS mapping of resources, the digital terrain mapping (including contour elevations), aerial photographs, and the engineering development modeling. Most of the potential impacts are shown as ranges which occur when the particular resource is located within 200 feet of the alignment centerline and 300 feet from the alignment centerline. For example, "1 – 3" resource impacts indicate 1 resource impacted within the 400-foot right-of-way and up to 3 resources impacted within the 600-foot right-of-way. The first value indicated in the range is for the 400-foot right-of-way (200-foot screening distance from the centerline) and the second value indicated in the range is for the 600-foot right-of-way (300-foot screening distance from the centerline).

Figure 3-8 (pp. 3-97 through 3-122) presents maps of the Alternatives Carried Forward along the eight subsections. In the discussion which follows, references are provided to specific **Figure 3-8** map pages which depict the alternative alignments in each subsection.[33] The maps also show the centerline for each of the Preliminary Alternatives and an approximate right-of-way that incorporates alignment shifts recommended for the Alternatives Carried Forward by the screening analysis.

[33] Minor adjustments to the subsection break lines that were established for the Preliminary Alternatives were made following the recommendations for Alternatives Carried Forward in order to accommodate additional engineering development of the alignments.

Subsection 4A

Subsection 4A begins at the northern limits of Section 3's US 231 interchange and ends approximately 0.3 miles east of CR 215E in Greene County. The US 231 interchange is included in the Section 3 study of I-69. This subsection is primarily farmland with interspersed woodlots.

Two Preliminary Alternatives were proposed. Alternative 4A-1 intersects US 231 north of the midpoint of the corridor while Alternative 4A-2 intersects US 231 south of the midpoint of the corridor. These intersection points at US 231 were established based upon the Preliminary Alternatives proposed by Section 3. The results of the screening analysis for subsection 4A are shown in **Table 3-11**. **Figure 3-7** (pp. 3-78 and 3-79) shows the centerlines of the preliminary alternatives in Subsection 4A.

Table 3-11: Subsection 4A Screening Analysis

Resource		Subsection Impacts by Alternative	
		4A-1	4A-2
Length (mi)		1.69	1.67
Construction Cost Estimate ($M)		15.5	17.1
Wetlands (ac)		None	0.8 – 1.9
Forest (ac)		30 – 48	47 – 70
Core Forest (ac)		2 – 3	None
Agricultural Land (ac)		36 – 51	20 – 30
Prime Farmland (ac)		13 – 19	6 – 10
Managed Properties (ac)		8 – 13	0 – 1
Floodplain (ac)		1.3 – 2.1	5.0 – 7.1
Streams (no./ft)	Perennial	0/0 – 1/214	1/1,091 – 1/1,614
	Intermittent	2/940 – 2/1,536	9/2,495 – 10/3,640
	Ephemeral	4/1,859 – 5/2,483	7/2,200 – 9/2,909
Ponds (ac)	Major Impact	0.5	None
	Partial Impact	1.0	1.0
Subsurface Drainage Features	Small Springs	None	3 – 5
	Minor Springs	None	None
	Sinkholes	None	None
	Swallets	None	None
	Sinking Streams	None	None
Historic Properties (ft)	Blackmore Store	3,400 – 3,300	2,350 – 2,250
	Scotland Hotel	3,550 – 3,450	2,500 – 2,400
Cemeteries (ft)		None	None
Residential Displacements		1 – 2	0 – 1
Business Displacements		None	None
US 231 interchange impacts are not included.			

Subsequent to the development of the preliminary alternatives for Subsection 4A and prior to the screening of these alternatives, Section 3 completed its Preliminary Alternatives screening and recommended an alternative that intersects US 231 south of the midpoint of Corridor 3C. As a result of this selection in Section 3, Alternative 4A-1 does not have a direct connection with the mainline alternative in Section 3 and would require some modifications to this mainline alternative in Section 3. Alternative 4A-1 has more potential impacts to prime farmland and managed properties. It also impacts core forest, would require filling of a 0.5 acre pond, and would have either one or two residential displacements. Alternative 4A-2 would have possible impacts to wetlands located along CR 215E and may impact three to five small springs. Dowden Farm abuts the south edge of Alternative 4A-2 along the west side of CR 215E. This property is noted because Section 106 consulting party members suggested that this farmstead should be treated as eligible for the National Register of Historic Places. The Section 106 evaluation of potential historic properties, however, determined that this farmstead is not eligible for listing in the National Register. The Keeper of the National Register of Historic Places confirmed this determination. See **Appendix N**, *Section 106 Documentation*, for details. An unconfirmed infant burial site is also reported to be located on this property.[34]

Agency Comments:[35] USEPA suggested that a new alignment be considered in Subsection 4A that would connect the west end of Alternative 4A-2 with the middle and eastern portions of the Alternative 4A-1 alignment. This new alternative was suggested in order to minimize possible wetland and forest impacts that may occur along Alternative 4A-2, as identified by the screening analysis. IDNR indicated concerns about forest loss and fragmentation along Alternative 4A-2. Because of the USEPA and IDNR concerns, a new alignment in Subsection 4A was considered to be a reasonable alternative for evaluation. This new alignment is presented as Hybrid 4A-1/4A-2

Hybrid Alternative 4A-1/4A-2 begins at US 231 on the common alignment with Alternative 4A-2 and proceeds east across Doans Creek. At a point approximately 1100 feet east of US 231, the alignment diverges from Alternative 4A-2 and proceeds to the northeast. Hybrid Alternative 4A-1/4A-2 then intersects the alignment for Alternative 4A-1 at a point about 1000 feet west of CR 200E and continues east along the preliminary alignment for Alternative 4A-1. The preliminary right-of-way for Hybrid Alternative 4A-1/4A-2 is shown on **Figure 3-8** (pp. 3-97 and 3-98).

Potential impacts for Alternative 4A-1, 4A-2 and Hybrid Alternative 4A-1/4A-2 are summarized in **Table 3-12**. The impact calculations for Hybrid Alternative 4A-1/4A-2 were performed as described in the initial paragraphs of Section 3.4.1.

[34] For additional information about the unconfirmed infant burial, see pages 14, 175, and 177 of the Historic Properties Report, **Appendix N**.

[35] Unless otherwise indicated, all references to agency comments here and in the description of other subsections refer to comments provided at the August 31, 2006 agency webcast to review the Section 4 Screening of Alternatives package; USEPA comment letter on the Screening of Alternatives package, dated September 26, 2006; or IDNR comment letter on Screening of Alternatives package, dated September 28, 2006. A meeting summary and these agency letters may be found in **Appendix N**.

Table 3-12: Alternatives 4A/1, 4A-2 and Hybrid 4A-1/4A-2 Screening Analysis				
Resource		Subsection Impacts by Alternative		
		4A-1	4A-2	Hybrid 4A-1/A-2
Length (mi)		1.69	1.67	1.72
Construction Cost Estimate ($M)		15.5	17.1	16.7
Wetlands (ac)		None	0.8 – 1.9	0.2 – 0.7
Forest (ac)		30 – 48	47 – 70	32 – 50
Core Forest (ac)		2 – 3	1 – 2	None
Agricultural Land (ac)		36 – 51	20 – 30	30 – 43
Prime Farmland (ac)		13 – 19	6 – 10	13 – 18
Managed Properties (ac)		8 – 13	0 – 1	7 – 13
Floodplain (ac)		1.3 – 2.1	5.0 – 7.1	4.8 – 6.9
Streams (no./ft)	Perennial	0/0 – 1/214	1/1,091 – 1/1,614	1/1,091 – 1/1,425
	Intermittent	2/940 – 2/1,536	9/2,495 – 10/3,640	3/1,281 – 3/1,964
	Ephemeral	4/1,859 – 5/2,483	7/2,200 – 9/2,909	5/2,120 – 7/2,818
Ponds (ac)	Major Impact	0.5	None	1.0
	Partial Impact	1.0	1.0	None
Subsurface Drainage Features	Small Springs	None	3 – 5	2
	Minor Springs	None	None	0-1
	Sinkholes	None	None	None
	Swallets	None	None	None
	Sinking Streams	None	None	None
Historic Properties (ft)	Blackmore Store	3,400 – 3,300	2,350 – 2,250	3,400 – 3,300
	Scotland Hotel	3,550 – 3,450	2,500 – 2,400	3,550 – 3,450
Cemeteries (ft)		None	None	None
Residential Displacements		1 – 2	0 – 1	1 – 2
Business Displacements		None	None	None

Based upon the screening analysis, Hybrid Alternative 4A-1/4A-2 can reduce potential wetland and forest impacts as compared to the potential impacts along Alternative 4A-2. Approximately 0.2 to 0.7 acres of wetland impacts would occur along the common alignment for Alternative 4A-2 and Hybrid Alternative 4A-1/4A-2 in the Doans Creek floodplain just east of US 231. No wetland impacts east of the Doans Creek floodplain would occur along Hybrid Alternative 4A-1/4A-2. Approximately 0.6 to 1.2 acres of wetland impacts could occur along Alternative 4A-2 just west of CR 215E based upon the screening analysis. A possible minimization of these wetland impacts, however, was recognized during the screening analysis and an alignment shift to the north along the mid and east portions of the Alternative 4A-2 alignment was recommended.

Potential forest impacts along Hybrid Alternative 4A-1/4A-2 are expected to be approximately 15 to 20 acres less than Alternative 4A-2. No core forest impacts are anticipated along Hybrid Alternative 4A-1/4A-2. Up to 2 acres of core forest may be impacted along Alternative 4A-2.

While Hybrid Alternative 4A-1/4A-2 may have less wetland, forest and core forest impacts as compared to Alternative 4A-2, it would impact up to approximately 23 acres more farmland and 12 acres more prime farmland. Hybrid Alternative 4A-1/4A-2 would also fully impact an approximate 1.0 acre pond just west of CR 215E and may require up to two residential displacements. Alternative 4A-2 may partially impact the pond and may only require one residential displacement.

Recommendation: Based upon the screening analysis, both Alternative 4A-2 and Hybrid Alternative 4A-1/4A-2 were recommended for detailed study. The recommendation to carry Alternative 4A-2 forward for detailed study includes a recommendation to shift the alternative to the north between CR 200E and CR 215E along with any minor alignment adjustments to match the Section 3 alternative at the west terminus of the subsection. The northerly shift east of CR 200E was made to minimize potential wetland impacts and potential impacts to the small springs. Additionally, the shift to the north avoids the house and outbuildings on the Dowden Farm and the reported location of the unconfirmed infant burial. The recommendation to carry Hybrid Alternative 4A-1/4A-2 forward for detailed study is conditioned upon the ability of this alternative to satisfy the required engineering criteria along the transition between the 4A-1 and 4A-2 mainline alignments, to accommodate the US 231 interchange ramps, and to avoid a major overhead electric transmission line.

Figure 3-8 (pp. 3-97 and 3-98) shows the centerlines for preliminary Alternatives 4A-1 and 4A-2 and the right-of-way for Alternative 4A-2 and Hybrid Alternative 4A-1/4A-2 carried forward for detailed study. The right-of-way reflects the alignment shifts described above.

Subsection 4B

Subsection 4B extends from just east of CR 215E to 0.25 miles north of Bogard Creek. This subsection is primarily farmland with interspersed woodlots. The results of the screening analysis for subsection 4B are shown in **Table 3-13**. **Figure 3-7** (pp. 3-79 through 3-81) shows the centerlines of the preliminary alternatives in Subsection 4B.

Table 3-13: Subsection 4B Screening Analysis

Resource		Subsection Impacts by Alternative	
		4B-1	4B-2
Length (mi)		2.28	2.45
Construction Cost Estimate ($M)		15.1	14.4
Wetlands (ac)		0 – 0.1	0.1 – 0.3
Forest (ac)		44 – 66	60 – 91
Core Forest (ac)		8 – 12	14 – 22
Agricultural Land (ac)		51 – 79	48 – 71
Prime Farmland (ac)		30 – 45	19 – 28
Managed Properties (ac)		None	22 – 32
Floodplain (ac)		None	None
Streams (no./ft)	Perennial	None	None

Table 3-13: Subsection 4B Screening Analysis			
Resource		**Subsection Impacts by Alternative**	
		4B-1	**4B-2**
	Intermittent	2/917 – 2/1,216	3/1,184 – 3/1,540
	Ephemeral	10/3,310 – 13/5,058	16/5,451 – 19/8,166
Ponds (ac)		None	None
Subsurface Drainage Features	Small Springs	None	None
	Minor Springs	None	None
	Sinkholes	None	None
	Swallets	None	None
	Sinking Streams	None	None
Historic Properties (ft)		None	None
Cemeteries (ft)	Hasler	300 – 200	850 – 750
Residential Displacements		None	1
Business Displacements		None	None

Alternative 4B-1 has more potential impacts to prime farmland. Alternative 4B-2 would have greater potential impacts to core forest and managed properties. It also would have one residential displacement. Both alternatives have minimal wetland impacts.

Agency Comments: IDNR indicated its concern about forest (woodlot) impacts along Alternative 4B-1.

Recommendation: Alternative 4B-1 would have less potential forest, core forest, and stream impacts and is recommended to be carried forward for detailed study. The wetland that may be impacted by this alternative is located near the edge of the right-of-way and can be avoided by a slight alignment shift. The design criteria for development of the highway limit the ability to establish horizontal alignments that avoid all resources. At the same time, vertical grades must also attempt to balance earthwork (cuts and fills) in order to maintain reasonable construction costs. These factors combined with the objective to minimize wetland impacts near the east end of Subsection 4A would result in impacts to some small woodlots along Alternative 4B-1. Overall, forest impacts along Alternative 4B-1 would be less than Alternative 4B-2.

Figure 3-8 (pp. 3-97 through 3-99) shows the centerlines for preliminary Alternatives 4B-1 and 4B-2 and the preliminary right-of-way for Alternative 4B-1 carried forward for detailed study. The right-of-way reflects the alignment shift described above.

Subsection 4C

Subsection 4C begins about 0.25 miles north of Bogard Creek and ends about 0.1 miles west of Black Ankle Creek. The subsection has a mix of farmland and forest. The major geographic feature in this subsection is Taylor Ridge. The results of the screening analysis for Subsection 4C are shown in **Table 3-14**. **Figure 3-7** (pp. 3-80 through 3-82) shows the centerlines of the preliminary alternatives in Subsection 4C.

Table 3-14: Subsection 4C Screening Analysis			
Resource		Subsection Impacts by Alternative	
		4C-1	4C-2
Length (mi)		1.86	1.72
Construction Cost Estimate ($M)		14.5	13.5
Wetlands (ac)		None	None
Forest (ac)		61 – 91	62 – 92
Core Forest (ac)		27 – 39	17 – 24
Agricultural Land (ac)		23 – 34	15 – 23
Prime Farmland (ac)		11 – 19	9 – 15
Managed Properties (ac)		9 – 13	3 – 5
Floodplain (ac)		None	None
Streams (no./ft)	Perennial	None	None
	Intermittent	3/1,556 – 4/2,049	None
	Ephemeral	10/3,831 – 12/4,592	12/3,585 – 15/5,498
Ponds (ac)	Major Impact	0.25	None
	Partial Impact	None	None
Subsurface Drainage Features	Small Springs	3 – 4	1
	Minor Springs	None	None
	Sinkholes	None	None
	Swallets	None	None
	Sinking Streams	None	None
Historic Properties (ft)		None	None
Cemeteries (ft)	Taylor Ridge	50 – -50	100 – 0
	Ruth (Old 16)	1,200 – 1,100	2,400 – 2,300
Residential Displacements		1	1
Business Displacements		None	None

Alternative 4C-1 has comparable, yet slightly more potential impacts to core forest, farmland, managed properties, and some small springs as compared to Alternative 4C-2. It also is located very close to or possibly within the 100-foot buffer around Taylor Ridge Cemetery.

While Alternative 4C-2 has less potential impacts upon several resources,, it does have a complex and potentially significant engineering issue where the alternative crosses the 'T' intersection of CR 475E and CR 450S. Both of these roads are important for local travel, and a grade separation is recommended which keeps both roads open. Additional engineering assessment of the alignment and local road intersection would need to be performed during detailed development of the mainline alignments. This alternative is also located near to the 100-foot buffer around Taylor Ridge Cemetery. Access to the cemetery could be impacted.

Agency Comments: IDNR noted forest impacts along both alternatives in Subsection 4C with slightly reduced impacts along Alternative 4C-2. Because of these impacts, IDNR indicated

general support for Alternative 4C-2 and recommended additional efforts to minimize forest impacts.

Recommendation: Alternatives 4C-1 and 4C-2 are both recommended to be carried forward for detailed study. This recommendation will include an evaluation of a slight shift for Alternative 4C-1 to the north near Taylor Ridge Cemetery and a southerly shift of this alternative east of CR 475E in order to avoid a possible major terrain conflict along the north edge of the right-of-way. Additional engineering evaluation will be performed for the CR 475E/CR 450S intersection along Alternative 4C-2. Such evaluation will need to maintain the alternative within the approved corridor while at the same time avoiding the 100-foot buffer around Taylor Ridge Cemetery and maintaining access to the cemetery. The engineering evaluation of Alternative 4C-2 will also assess the effects of maintaining travel south along CR 440E.

Figure 3-8 (pp. 3-99 through 3-101) shows the centerlines for Preliminary Alternatives 4C-1 and 4C-2 and preliminary right-of-way for Alternatives 4C-1 and 4C-2 carried forward for detailed study. The preliminary right-of-way reflects the alignment shift described above.

Subsection 4D

Subsection 4D extends from just west of Black Ankle Creek to CR 360S/CR 880E (Mineral-Koleen Road). It is dominated by the Black Ankle Creek floodplain and extensive forest. The subsection includes crossings of Black Ankle Creek, Dry Branch, and Plummer Creek. This subsection has the greatest amount of elevation variance within Section 4. A major spring is located along the south edge of the corridor near the junction of CR 580E and CR 600E. The results of the screening analysis for Subsection 4D are shown in **Table 3-15**. **Figure 3-7** (pp. 3-82 through 3-84) shows the centerlines of the preliminary alternatives in Subsection 4D.

Table 3-15: Subsection 4D Screening Analysis

Resource		Subsection Impacts by Alternative	
		4D-1	4D-2
Length (mi)		2.86	2.88
Construction Cost Estimate ($M)		43.0	43.6
Wetlands (ac)		5.3 – 9.2	5.6 – 8.5
Forest (ac)		113 – 169	119 – 177
Core Forest (ac)		79 – 120	76 – 115
Agricultural Land (ac)		12 – 20	11 – 18
Prime Farmland (ac)		None	None
Managed Properties (ac)		21 – 30	21 – 30
Floodplain (ac)		8.3 – 12.4	5.8 – 8.2
Streams (no./ft)	Perennial	2/1,861 – 2/2,513	2/1,814 – 2/2,383
	Intermittent	5/3,637 – 5/4,912	3/2,953 – 3/3,621
	Ephemeral	10/3,381 – 11/4,742	8/5,227 – 9/6,593
Ponds (ac)		None	None

Table 3-15: Subsection 4D Screening Analysis			
Resource		**Subsection Impacts by Alternative**	
		4D-1	**4D-2**
Subsurface Drainage Features	Small Springs	2	3 – 5
	Minor Springs	None	None
	Sinkholes	None	None
	Swallets	1	0 – 1
	Sinking Streams	None	None
Historic Properties (ft)		None	None
Cemeteries (ft)	Cooper	500 – 400	1,250 – 1,150
	Old Ashcraft	1,000 – 900	1,000 – 900
Residential Displacements		1 – 2	1 – 2
Business Displacements		None	None

Potential resource impacts are very comparable along both alternatives. Wetland impacts would occur within the Black Ankle Creek floodplain. Other potential wetland impacts may occur along the riparian corridors associated with Dry Branch and Plummer Creek. Due to the extensive forested nature of the subsection, substantial core forest impacts would occur. With most potential resource impacts along Alternatives 4D-1 and 4D-2 being comparable, the screening analysis focused primarily upon potential impacts to subsurface drainage and engineering considerations.

Agency Comments: USEPA suggested that consideration be given to alignments outside the corridor in the vicinity of the Black Ankle Creek valley (Subsections 4C and 4D) in order to minimize potential wetland, forest, and core forest impacts. IDNR noted comparable forest impacts along Alternatives 4D-1 and 4D-2. IDNR indicated that Alternative 4D-1 is an acceptable alternative and that additional minimization of impacts will be required, especially along riparian corridors.

The Tier 1 ROD provides flexibility to consider alternatives outside the selected corridor during the Tier 2 Study in order to avoid significant impacts (See ROD, Section 2.3.5). A corridor to the north of this area was considered and recommended for Alternatives 3A, 3B, and 3C in the Tier 1 DEIS. At the request of the IDNR, the corridor was subsequently shifted to the south in the Tier 1 FEIS in order to avoid the Combs Unit of the Martin State Forest (See Section 6.3.5, Post-DEIS Alignment Shifts). The corridor shift was made following a comparison of potential impacts before and after the proposed shift. It was noted that forest impacts and residential relocations would be reduced under the proposed shift and that wetland and farmland impacts would slightly increase. Core forest impacts were not reviewed.

During the Tier 2 study, a visual reconnaissance along the Black Ankle Creek valley verified the continuation of wetlands north and south of the corridor and that an alignment shift outside the corridor would not significantly reduce potential wetland impacts. The presence of the recharge area for a major spring south/southeast of the corridor also precluded consideration for an alignment to the south outside the corridor. Forest and core forest dominate the landscape

adjacent to Subsection 4D east of the Black Ankle Creek valley and are unavoidable. Because of the Combs Unit of the Martin State Forest north of Subsections 4C and 4D, the continuation of wetlands north and south along the Black Ankle Creek valley, the major spring recharge area south of the corridor, and the extensive forest and core forest east of the of the Black Ankle Creek valley, it was determined that an alignment shift outside the approved corridor would not significantly reduce potential wetland, forest, and core forest impacts in the vicinity of the Black Ankle Creek valley.

Recommendation: Alternative 4D-1 is recommended to be carried forward for detailed study. This alternative is preferred due to its greater avoidance of the recharge area of a major spring and its potential for development of independent lane group alignments which may reduce the extent of cut and fill and thus possibly reduce construction costs.

On-going geology studies being performed at the time of the screening indicated that the primary recharge area for a major spring is located along the south edge of the corridor and further to the south/southeast. Portions of Alternative 4D-2 may impact this recharge area. Conversely, Alternative 4D-1 is located on slightly lower elevations to the north of Alternative 4D-2. The subsurface drainage along portions of this alternative is believed to be more closely associated with several small springs and minor springs near Plummer Creek and thus may not be a primary recharge area for the major spring.

Because a portion of Alternative 4D-1 is located on slightly lower hilltops and ridgelines as compared to parallel segments of Alternative 4D-2, and because part of Alternative 4D-1 is also situated along some sideslopes, consideration will be given to developing some of this alternative with variable median widths and differing elevations for the highway lane groups. Such potential engineering developments could minimize cuts and fills along a portion of the alignment and enable the highway grade to more closely follow the terrain and thus possibly reduce construction costs. The potential use of variable median widths along Alternative 4D-1 will be further evaluated during subsequent development of this alternative. If a variable median width is not feasible, the amount of cut and fill along Alternative 4D-1 is still expected to be less than Alternative 4D-2.

Figure 3-8 (pp. 3-101and 3-102) shows the centerlines for Preliminary Alternatives 4D-1 and 4D-2, and a preliminary right-of-way for Alternative 4D-1carried forward for detailed study.

Subsection 4E

Subsection 4E begins at CR 360S/CR 880E (Mineral-Koleen Road) and ends just east of SR 54. A possible interchange is being considered at SR 45. The subsection has considerable elevation variances and is primarily forested. Mitchell Branch is located just west of SR 54. Some small farm parcels are located near the northern (eastern) end of the subsection. The subsection passes through the south edge of the Clifty Hills Subdivision which is generally located between CR 360S and CR 920E/CR 975E (Old Clifty Road). Subsurface drainage features typically associated with karst begin to appear along Subsection 4E. The results of the screening analysis

for subsection 4E are shown in **Table 3-16**. **Figure 3-7** (pp. 3-83 through 3-86) shows the centerlines of the preliminary alternatives in Subsection 4E.

Table 3-16: Subsection 4E Screening Analysis

Resource		Subsection Impacts by Alternative		
		4E-1	4E-2	4E-3
Length (mi)		4.58	4.62	4.64
Construction Cost Estimate ($M)		68.4	34.3	32.4
Wetlands (ac)		0.2 – 0.3	0.3	0.1 – 0.2
Forest (ac)		165 – 245	161 – 245	155 – 236
Core Forest (ac)		74 – 108	82 – 121	70 – 100
Agricultural Land (ac)		34 – 53	43 – 61	26 – 39
Prime Farmland (ac)		20 – 33	22 – 32	4 – 6
Managed Properties (ac)		59 – 88	70 – 103	68 – 92
Floodplain (ac)		0.9 – 1.3	0.8 – 1.4	0.8 – 1.4
Streams (no./ft)	Perennial	1/515 – 1/735	1/477 – 1/706	1/983 – 1/1,536
	Intermittent	6/2,072 – 8/3,292	6/4,585 – 7/5,999	6/2,357 – 21/8,910
	Ephemeral	18/6,558 – 23/10,023	15/6,080 – 22/9,182	21/8,910 – 22/11,805
Ponds (ac)	Major Impact	0.25	0.25	2.75
	Partial Impact	0.75 at 300 ft	0.5 at 300 ft	None
Subsurface Drainage Features	Small Springs	None	1 – 2	3 – 4
	Minor Springs	None	None	None
	Sinkholes	3 – 4	1 – 3	0 – 1
	Swallets	None	None	None
	Sinking Streams	None	1	1
Historic Properties (ft)	Clifty Church	2,400 – 2,300	3,050 – 2,950	3,700 - 3,600
Cemeteries (ft)	Shoptaw	200 – 100	150 – 50	150 – 50
	Ashcraft	550 – 450	450 – 350	450 – 350
	Dobbins	900 – 900	1,500 – 1,400	1,800 – 1,700
Residential Displacements		5 – 9	7 – 10	9 – 12
Business Displacements		None	None	None

All three preliminary alternatives have comparable potential impacts upon core forests and managed lands. Minor wetland impacts may also occur along all three alternatives.

Each of the alternatives has specific resource concerns. These include conflicts with a sinking stream and other karst features along Alternatives 4E-2 and 4E-3, a major spring-fed pond located along Alternative 4E-3, and prime farmland along Alternatives 4E-1 and 4E-2. Constructability relative to the terrain and potential residential displacements are also primary factors that differentiate these three preliminary alternatives.

Similar to Subsection 4D, the undulating terrain along this subsection is prominent, especially between the south (west) terminus and CR 1200E. Alternatives 4E-2 and 4E-3 have potential engineering issues due to the terrain and some intermittent drainageways in the area between CR 360S and CR 920E/CR 975E (Old Clifty Road). Unlike the transverse crossing of most

intermittent drainageways along Subsection 4D, the intermittent drainageways near the south (west) end of this subsection are located longitudinally to these two alternatives. Alternatives 4E-2 and 4E-3 are very close to the 100-foot buffer around Shoptaw Cemetery, though access to the cemetery would not be impacted. In this same general area of Subsection 4E, Alternative 4E-1 is considered to be more desirable relative to constructability in the extant terrain. It also is located slightly farther from Shoptaw Cemetery. All three alternatives would cross some developed and undeveloped lots within the Clifty Hills Subdivision.

The majority of the potential residential displacements along this subsection would occur at the crossings of SR 45 and SR 54. It appears that the least number of potential displacements at SR 45, either as an interchange or as a grade separation would occur along Alternative 4E-2. At SR 54, all three alternatives are converging near the north (east) end of the subsection and would have comparable residential displacements.

After completion of the preliminary screening, it was decided to consider a new hybrid alternative that would avoid/minimize the various specific resource concerns along portion of Alternatives 4E-1 and 4E-2. This new alternative is Hybrid Alternative 4E-1/4E-2. The hybrid alternative would follow Alternative 4E-1 from the south (west) terminus at Mineral-Koleen Road to a point near a major electric transmission corridor west of SR 45. The use of Alternative 4E-1 in this area is preferred due to constructability concerns and a probable impact to a sinking stream along the parallel portions of Alternatives 4E-2 and 4E-3. Alternative 4E-3 would also require filling a large spring-fed pond in this area of the Subsection 4E.

Between the electric transmission corridor and SR 45, the recommended hybrid alternative would shift to the alignment of Alternative 4E-2. This shift would avoid and/or minimize potential wetland impacts and residential displacements that may occur along the parallel portion of Alternative 4E-1.

East of SR 45, the recommended hybrid alternative would generally follow the preliminary alignment depicted by Alternative 4E-2. Near the midpoint of this alternative, between SR 45 and SR 54, consideration would be made to shift the hybrid alternative slightly to the north towards or along Alternative 4E-1 in order to minimize potential impacts upon a large farm. The alignments for Alternatives 4E-1 and 4E-2 in this area are approximately 400 feet apart or less and thus remain consistent with the intent of the preliminary alternative development. The hybrid alternative would follow the preliminary alignment for Alternative 4E-2 across SR 54 to the subsection terminus.

Agency Comments: IDNR asked that impacts for the recommended Hybrid 4E-1/4E-2 be calculated for comparison with the other three alternatives along Subsection 4E. IDNR noted that Hybrid 4E-1/4E-2 is an acceptable alternative and recommended that the Hybrid 4E-1/4E-2 alignment between SR 45 and SR 54 follow the Alternative 4E-2 alignment in order to reduce forest impacts.

Potential impacts for Hybrid Alternative 4E-1/4E-2 are shown in **Table 3-17**. The impact calculations for Hybrid Alternative 4E-1/4E-2 were performed as described in the initial paragraphs of Section 3.4.1.

Table 3-17: Alternatives 4E-1, 4E-2, 4E-3 and Hybrid 4E-1/4E-2 Screening Analysis

Resource		Subsection Impacts by Alternative			
		4E-1	4E-2	4E-3	4E-1/4E-2
Length (mi)		4.58	4.62	4.64	4.59
Construction Cost Estimate ($M)		68.4	34.3	32.4	33.1
Wetlands (ac)		0.2 – 0.3	0.3	0.1 – 0.2	0.2 – 0.3
Forest (ac)		165 – 245	161 – 245	155 – 236	164 – 243
Core Forest (ac)		74 – 108	82 – 121	70 – 100	68 – 100
Agricultural Land (ac)		34 – 53	43 – 61	26 – 39	34 – 53
Prime Farmland (ac)		20 – 33	22 – 32	4 – 6	19 – 31
Managed Properties (ac)		59 – 88	70 – 103	68 – 92	58 – 86
Floodplain (ac)		0.9 – 1.3	0.8 – 1.4	0.8 – 1.4	0.6 – 0.8
Streams (no./ft)	Perennial	1/515 – 1/735	1/477 – 1/706	1/983 – 1/1,536	1/539 – 1/752
	Intermittent	6/2,072 – 8/3,292	6/4,585 – 7/5,999	6/2,357 – 21/8,910	5/2,458 – 8/3,950
	Ephemeral	18/6,558 – 23/10,023	15/6,080 – 22/9,182	21/8,910 – 22/11,805	19/7,226 – 23/11,348
Ponds (ac)	Major Impact	0.25	0.25	2.75	0.4
	Partial Impact	0.75 at 300 ft	0.5 at 300 ft	None	None
Subsurface Drainage Features	Small Springs	None	1 – 2	3 – 4	0 – 1
	Minor Springs	None	None	None	None
	Sinkholes	3 – 4	1 – 3	0 – 1	2 – 2
	Swallets	None	None	None	None
	Sinking Streams	None	1	1	None
Historic Properties (ft)	Clifty Church	2,400 – 2,300	3,050 – 2,950	3,700 – 3,600	2,400 – 2,300
Cemeteries (ft)	Shoptaw	200 – 100	150 – 50	150 – 50	200 – 100
	Ashcraft	550 – 450	450 – 350	450 – 350	550 – 450
	Dobbins	900 – 900	1,500 – 1,400	1,800 – 1,700	900 – 800
Residential Displacements		5 – 9	7 – 10	9 – 12	6 – 8
Business Displacements		None	None	None	None

Potential wetland impacts along Hybrid Alternative 4E-1/4E-2 are comparable to Alternatives 4E-1 and 4E-2. An opportunity to further reduce potential impacts to two small wetlands between Mitchell Branch and SR 54 will be evaluated during subsequent development of Hybrid Alternative 4E-1/4E-2.

Potential forest, prime farmland, floodplain, and stream impacts are comparable along Hybrid Alternative 4E-1/4E-2, Alternative 4E-1, and 4E-2. Potential impacts upon core forest, agricultural land, managed properties, historic properties, and cemeteries are comparable

between Hybrid Alternative 4E-1/4E-2 and Alternative 4E-1 and less than Alternative 4E-2. IDNR commented that Hybrid Alternative 4E-1/4E-2 reduces overall forest fragmentation and impacts less forest between SR 45 and SR 54.

Total potential pond impacts along Hybrid Alternative 4E-1/4E-2 would be less as compared to Alternatives 4E-1 and 4E-2. Alternative 4E-1 could impact up to a total of 1.0 acres of ponds while Alternative 4E-2 could impact up to a total of 0.75 acres of ponds. Hybrid Alternative 4E-1/4E-2 would impact up to approximately 0.4 acres of ponds.

Hybrid Alternative 4E-1/4E-2 would avoid a small sinking stream located along Alternative 4E-2. It also could have up to three less residential displacements as compared to Alternative 4E-1.

Recommendation: Hybrid Alternative 4E-1/4E-2 was recommended to be carried forward for detailed study. Based upon the screening analysis, Hybrid Alternative 4E-1/4E-2 would have comparable or less overall impacts to several resources as individually compared to Alternatives 4E-1 and 4E-2. Hybrid Alternative 4E-1/4E-2 also avoids constructability concerns along the west end of Alternative 4E-2 and may possibly minimize operational impacts to a large farm located between SR 45 and SR 54.

Figure 3-8 (pp. 3-102 through 3-105) shows the centerlines for Preliminary Alternatives 4E-1, 4E-2 and 4E-3 and preliminary right-of-way for hybrid alternative 4E-1/E-2 carried forward for detailed study.

Subsection 4F

Section 4 of the approved corridor turns north and follows the Greene County/Monroe County Line in Subsection 4F. This is the longest subsection of Section 4 and extends from just northeast of SR 54 in Greene County to a point just east of Burch Road in Monroe County.

In general, the subsection has rolling hills with large forest tracts, small farms and rural residences. All three Preliminary Alternatives would cross meandering Indian Creek at three locations (south, middle, and north crossings). A potential interchange along the Greene County/Monroe County Line that would connect with SR 45 is under consideration in Greene County in the vicinity of CR 150N (Carter Road in Monroe County). Timber Trace Subdivision is located along the west edge of the corridor near the point where the subsection alternative turns east into Monroe County. Whippoorwill Estates is located in the center of the corridor just west of the county line along CR 35N (Carmichael Road in Monroe County). The results of the screening analysis for subsection 4F are shown in **Table 3-18**. **Figure 3-7** (pp. 3-86 through 3-92) shows the centerlines of the preliminary alternatives in Subsection 4F.

Table 3-18: Subsection 4F Screening Analysis

Resource	Subsection Impacts by Alternative		
	4F-1	4F-2	4F-3
Length (mi)	7.61	7.45	7.50
Construction Cost Estimate ($M)	65.1	57.4	58.0
Wetlands (ac)	2.2 – 2.8	0.1 – 0.7	0.1 – 0.5

Table 3-18: Subsection 4F Screening Analysis				
Resource		**Subsection Impacts by Alternative**		
		4F-1	**4F-2**	**4F-3**
Forest (ac)		264 – 386	219 – 318	212 – 313
Core Forest (ac)		86 – 131	52 – 84	41 – 64
Agricultural Land (ac)		63 – 99	76 – 115	94 – 145
Prime Farmland (ac)		24 – 38	37 – 56	40 – 64
Managed Properties (ac)		28 – 44	23 – 35	24 – 38
Floodplain (ac)		15.8 – 23.7	33.9 – 49.1	18.0 – 28.0
Streams (no./ft)	Perennial	3/1,528 – 3/2,372	3/2,505 – 3/4,728	3/1,307 – 3/1,890
	Intermittent	6/3,718 – 6/4,894	8/6,716 – 8/9,893	7/5,947 – 8/8,178
	Ephemeral	49/16,423 – 57/24,011	49/17,956 – 63/27,602	43/16,683 – 54/25,375
Ponds (ac)	Major Impact	1.0	1.0	0.5
	Partial Impact	None	0.25 at 300 ft	2.25 at 300 ft
Subsurface Drainage Features	Small Springs	4	None	None
	Minor Springs	None	2	None
	Sinkholes	10 – 13	9 – 12	7 – 10
	Swallets	2 – 3	0 – 1	0 – 1
	Sinking Streams	None	1	0 – 1
Historic Properties (ft)	Greene County Bridge #31	1,750 – 1,850	2,850 – 2,950	3,500 – 3,600
Cemeteries (ft)	Freeman	850 – 750	400 – 300	1,000 – 900
	Storm	850 – 750	1,600 – 1,500	2,100 – 2,000
	Carmichael	1,300 – 1,200	600 – 500	1,750 – 1,650
	Fodrill	6,000 – 5,900	5,000 – 4,900	5,950 – 5,850,
	Sparks	0 – -100	300 – 200	300 – 200
	Adams	700 – 600	150 – 50	150 – 50
Residential Displacements		6 – 14	15 – 20	4 – 10
Business Displacements		None	None	None

Alternative 4F-1 has the greatest potential core forest impacts of the subsection. The core forest impacts are offset by the lowest amount of potential prime farmland impacts. Potential wetland impacts would occur at the south and middle crossings of Indian Creek. Alternative 4F-1 passes very close to or possibly within the 100-foot buffer around Sparks Cemetery which is located just north of the middle crossing of Indian Creek. Access to the cemetery may be impacted. An approximate 1.0 acre pond would be impacted.

Alternative 4F-2 has several small potential wetland impacts and has a potential impact upon a major sinking stream that is believed to have the greatest inflow volume of any sinking stream within Section 4. It also has the highest potential residential displacements, most of which would occur in Whippoorwill Estates and along Carter Road. The southernmost crossing of Indian Creek is skewed to the creek and the alternative would be located within the 100-year floodplain for approximately 0.5 to 0.75 miles. The alignment for Alternative 4F-2 is close to Adams Cemetery but would not encroach into the 100-foot buffer around the cemetery. An approximate 1.0 acre pond would be impacted.

Alternative 4F-3 has several small potential wetland impacts. This alternative has the lowest potential impacts to core forests and the lowest number of potential residential displacements. The greatest potential impacts to prime farmland would occur along Alternative 4F-3. This alternative may impact the same sinking stream located along Alternative 4F-2. Also like Alternative 4F-2, this alternative is close to Adams Cemetery but would not encroach into the 100-foot buffer around the cemetery. An approximate 0.5 acre pond would be impacted.

Agency Comments: IDNR recommended Alternative 4F-3 be carried forward for additional study for Subsection 4F.

Recommendation: Alternatives 4F-1 and 4F-3 are recommended to be carried forward for detailed study. Alternative 4F-2 was discarded due to the potential impact upon a major sinking steam, highest number of potential residential displacements, possible neighborhood impacts in Whippoorwill Estates, the skewed crossing of Indian Creek near the south end of the subsection, and construction in a floodplain.

The alignments for Alternatives 4F-1 and 4F-3 cross just south of CR 150N. This allows the creation of two hybrid alternatives in subsection F, which potentially can use the portions of Alternatives 4F-1 and 4F-3 with the least impacts. The two additional alternatives being carried forward for detailed study are Alternatives 4F-4 and 4F-5.

- Alternative 4F-4 uses Alternative 4F-1 south of the crossover and Alternative 4F-3 north of the crossover near CR 150N.
- Alternative 4F-5 uses Alternative 4F-3 south of the crossover and Alternative 4F-1 north of the crossover near CR 150N.

Figure 3-9 (p. 3-53) shows the centerlines for the four Alternatives Carried Forward in Subsection 4F. This includes the new Alternatives 4F-4 and 4F-5 which are combinations of Alternatives 4F-1 and 4F-3.

The alternatives that will be carried forward for detailed study also include three minor alignment shifts. The first shift is along Alternative 4F-1. This shift would avoid impacts to Sparks Cemetery just north of the middle crossing of Indian

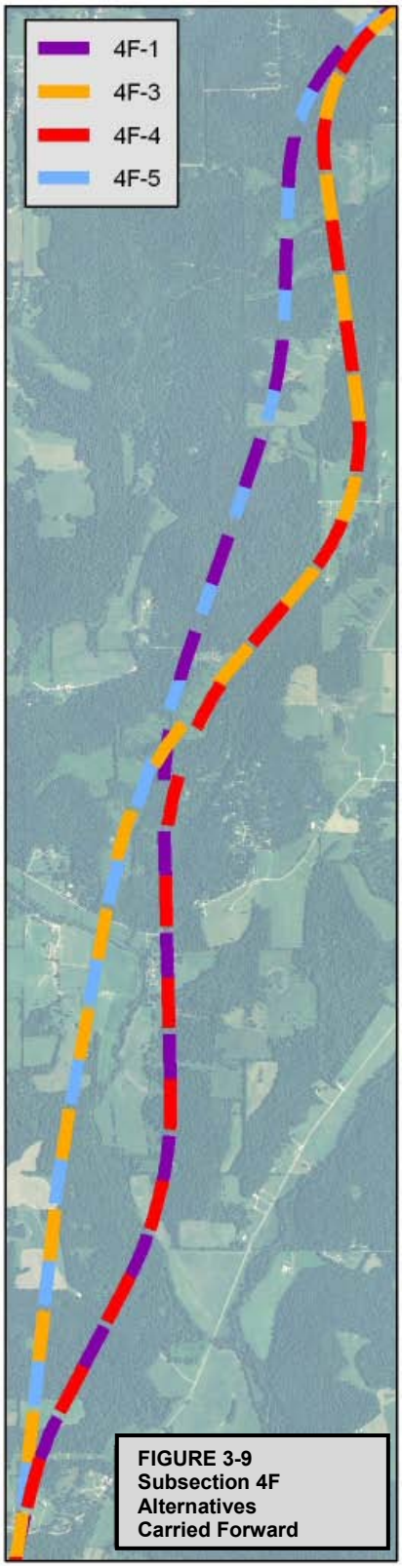

FIGURE 3-9
Subsection 4F
Alternatives
Carried Forward

Creek. The second shift would merge Alternative 4F-1 with Alternative 4F-3 just west of Breeden Road. This shift would minimize potential impacts to Timber Trace Subdivision. The third shift is along Alternative 4F-3. This shift is proposed so as to completely avoid the major sinking stream. Appropriate shifts would also be made for Alternatives 4F-4 and 4F-5, as applicable.

Figure 3-7 (pp. 3-86 through 3-92) shows the centerlines for Preliminary Alternatives 4F-1, 4F-2 and 4F-3. Preliminary right-of-way for Alternatives 4F-1 and 4F-3 carried forward for detailed study are shown in **Figure 3-8** (pp. 3-105, 3-107, 3-109, 3-111, 3-113, 3-115, and 3-117). Preliminary right-of-way for Alternatives 4F-4 and 4F-5 carried forward for detailed study are shown in **Figure 3-8** (pp. 3-106, 3-108, 3-110, 3-112, 3-114, 3-116, and 3-118). The preliminary right-of-way also reflects the alignment shifts described above.

Subsection 4G

Subsection 4G extends from east of Burch Road to Lodge Road in Monroe County. This subsection is primarily forest with rural residences. Subsection 4G has extensive karst features. However, all known cave entrances and major springs are avoided by the preliminary alternatives. The results of the screening analysis for Subsection 4G are shown in **Table 3-19**. **Figure 3-7** (pp. 3-92 through 3-94) shows the centerlines of preliminary alternatives in Subsection 4G.

Table 3-19: Subsection 4G Screening Analysis

Resource		Subsection Impacts by Alternative	
		4G-1	4G-2
Length (mi)		3.12	3.13
Construction Cost Estimate ($M)		16.4	18.4
Wetlands (ac)		None	None
Forest (acres)		117 – 171	117 – 174
Core Forest (ac)		37 – 58	42 – 68
Agricultural Land (ac)		4 – 8	3 – 6
Prime Farmland (ac)		3 – 5	3 – 5
Managed Properties (ac)		None	None
Floodplain (ac)		None	None
Streams (no./ft)	Perennial	None	None
	Intermittent	7/3,756 – 7/5,754	7/4,017 – 8/5,285
	Ephemeral	21/4,516 – 25/11,616	27/10,974 – 29/14,627
Ponds (ac)	Major	0.25	0.25
	Minor	None	None
Subsurface Drainage Features	Small Springs	1	2 – 3
	Minor Springs	None	None
	Sinkholes	12 – 15	2 – 4
	Swallets	4	2 – 3

Table 3-19: Subsection 4G Screening Analysis			
Resource		**Subsection Impacts by Alternative**	
		4G-1	**4G-2**
	Sinking Streams	None	None
Historic Properties (ft)	John May House*	100 – 0	800 – 700
	Koontz House	1,950 – 1,850	1,250 – 1,150
Cemeteries (ft)		None	None
Residential Displacements		14	14 – 15
Business Displacements		1	1
* The John May House was destroyed by an accidental fire after the alternatives screening.			

Most of the potential impacts in this subsection are comparable. Alternative 4G-1, however, would impact the greatest number of sinkholes and is located very close to the boundary for the National Register eligible John May House.

Agency Comments: IDNR noted that Alternative 4G-2 is an acceptable alternative for detailed study along Subsection 4G.

Update on Resource Status: Subsequent to the screening of alternatives and agency coordination conducted in 2006, the John May house was destroyed in an accidental fire. Since this time, field work has continued to analyze resources in Subsection 4G in greater detail. Some of these studies (of aquatic resources) were confined to the right-of-way and immediate vicinity of Alternative 4G-2, and do not offer any added information regarding Alternative 4G-1. However, subsequent field studies of cave biota and karst features serve to reconfirm the selection of Alternative 4G-2 as the only alternative carried forward in this subsection.

Appendix FF, *Post-Screening Analysis in Subsection 4G*, contains an analysis of the results of these subsequent field studies and what they show about the comparative impacts of Alternative 4G-1 and 4G-2. In summary, Alternative 4G-1 would have greater impacts to karst resources and endangered cave biota. For those karst resources which are impacted, the topography and soil features in this area make Alternative 4G-1 likely to have greater runoff impacts to impacted features than Alternative 4G-2. In the portion of Subsection G between Harmony Road and Mt. Zion Road, the number of high and medium soil infiltration features is very problematic for the stability of a roadway along Alternative 4G-1. Finally, Alternative 4G-1 would impact a greater number of karst features with linkages to a cave which has been identified as habitat for a state endangered (SE) species.

Recommendations: Alternative 4G-2 is recommended to be carried forward for detailed study. It has fewer impacts to karst features and to a cave in which state endangered cave biota have been found. Karst features along a portion of Alternative 4G-1 make it very problematic for the placement of a roadway. It appears that slight adjustments to Alternative 4G-2 may be possible so as to avoid some of the potential impacts to karst features.

Figure 3-8 (pp. 3-117 through 3-120) shows the centerlines for Preliminary Alternatives 4G-1 and 4G-2, and a preliminary right-of-way for Alternative 4G-2 carried forward for detailed study. Alignment adjustments are also shown as discussed above.

Subsection 4H

Subsection 4H is located between Lodge Road and SR 37. An interchange will be constructed at SR 37. This subsection is a mix of forest, open field, farmland, rural residences, and small remnant limestone quarries. It has the most extensive karst formations found in Section 4. Farmers Field Acres Subdivision and Rolling Glen Estates Subdivision are located along Bolin Lane near the north end of the subsection. The results of the screening analysis for subsection 4H are shown in **Table 3-20**. **Figure 3-7** (pp. 3-93 through 3-96) shows the centerlines of the preliminary alternatives in Subsection 4H.

Table 3-20: Subsection 4H Screening Analysis

Resource		Subsection Impacts by Alternative		
		4H-1	4H-2	4H-3
Length (mi)		3.22	3.33	3.42
Construction Cost Estimate ($M)		30.7	27.3	25.0
Wetlands (ac)		None	None	None
Forest (ac)		69 – 99	53 – 84	69 – 105
Core Forest (ac)		15 – 22	15 – 22	16 – 24
Agricultural Land (ac)		58 – 86	81 – 111	68 – 91
Prime Farmland (ac)		11 – 18	25 – 33	14 – 21
Managed Properties (ac)		None	None	None
Floodplain (ac)		None	2.7 – 3.5	2.7 – 3.5
Streams (no./ft)	Perennial	2/991 – 2/1,614	2/1,292 – 2/1,610	2/878 – 2/1,153
	Intermittent	4/1,591 – 6/2,634	4/1,915 – 5/3,205	1/499 – 3/5,235
	Ephemeral	15/7,989 – 20/10,182	8/1,996 – 12/4,993	9/2,509 – 14/5,235
Ponds (ac)	Major Impact	None	1.0	0.25
	Partial Impact	None	None	None
Subsurface Drainage Features	Small Springs	3	4 – 7	4 – 8
	Minor Springs	1 – 2	1 – 2	1 – 2
	Sinkholes	43 – 61	47 – 67	45 – 62
	Swallets	None	1	1
	Sinking Streams	None	1	1
Historic Properties (ft)	Stipp-Bender Farm	2,450 – 2,350	2,050 – 1,950	2,050 – 1,950
	Harris Ford Bridge	44,450 – 4,350	4,100 – 4,000	4,100 – 4,000
	Murphy-May House*	4,550 – 4,450	4,650 – 4,550	4,650 – 4,550
	Monroe County Bridge #83	3,600 – 3,700	3,050 – 2,950	2,950 – 3,050
	Maurice Head House	350 - 450	350 - 450	350 - 450
Cemeteries (ft)		None	none	None

Table 3-20: Subsection 4H Screening Analysis			
Resource	Subsection Impacts by Alternative		
	4H-1	4H-2	4H-3
Residential Displacements	6 – 7	3 – 5	3 – 5
Business Displacements	None	None	None
* The Murphy-May House has been vacant and in poor condition during the I-69 Tier 1 and earlier potions of Tier 2 studies; since the alternatives screening it has collapsed.			

Potential impacts along this subsection are comparable for all three subsection alternatives. Known cave entrances and major springs were avoided by the development of the preliminary alternatives;[36] however, a considerable number of sinkholes would be impacted by each alternative. A low inflow volume sinking stream would be impacted along Alternatives 4H-2 and 4H-3. The greatest potential residential displacements would occur along Alternative 4H-1. This alternative may also impact several undeveloped lots in the Farmers Field Acres Subdivision. Some undeveloped lots in the Rolling Glen Estates Subdivision may be impacted by Alternatives 4H-2 and 4H-3.

Agency Comments: IDNR commented that additional information on potential impacts for all three alternatives along Subsection 4H is needed.

Recommendations: Alternatives 4H-1, 4H-2 and 4H-3 are recommended to be carried forward for detailed study. Additional detailed study of each alternative is necessary to further evaluate potential impacts upon karst features. Also, all three alternatives are being carried forward in order to evaluate the SR 37 interchange configurations and potential impacts associated with this interchange.

Figure 3-8 (pp. 3-119 through 3-122) shows the centerlines for Preliminary Alternatives 4H-1, 4H-2 and 4H-3. It also includes the preliminary right-of-way for Alternatives 4H-1, 4H-2 and 4H-3.

3.4.2 Interchange Options

Interchange options to be advanced as Alternatives Carried Forward were recommended based upon a review of several factors. These were the results of the performance measures analyses, compliance with interchange spacing policies, predicted interchange use, potential environmental impacts, and input from environmental resource agencies and the public.

Five interchange options for the build condition were proposed for Section 4. As previously noted in Section 3.2.2.3, no option included interchanges at all three intermediate interchange locations – SR 45, SR 54, and Greene County/Monroe County Line. The Tier 1 EIS identified a maximum of two interchanges in Section 4 between US 231 and SR 37. Also, as stated in the

[36] Since the publication of the DEIS, ongoing public outreach lead to the identification of a cave with the proposed rights-of-way for all Section 4 Alternatives. This feature did not exist when surveys were completed in 2004 - 2006. It has been identified and added to the impacts for all alternatives. See Section 5.21.3.10 for more information about this cave.

Tier 1 Biological Assessment Addendum (BA, February 28, 2006, p. 14), the Greene/Monroe County Line interchange would be not be an additional interchange but would replace one of the Tier 1 identified interchanges. The County Line interchange and SR 54 interchange would both place an interchange in a karst area, and the BA committed to providing only one interchange in a karst area. Finally, at least one intermediate interchange would be included in all options. This decision was based upon the approximate 27 mile spacing between the Section 4 termini interchanges at US 231 and SR 37, and the Tier 1 and Tier 2 Purpose and Need goals regarding personal accessibility, highway congestion, safety, and local economic development.

Potential Interchange Options:

Option 1 – US 231*, SR 45, Greene/Monroe County Line, and SR 37
Option 2 – US 231*, Greene/Monroe County Line, and SR 37
Option 3 – US 231*, SR 45, SR 54, and SR 37
Option 4 – US 231*, SR 45, and SR 37
Option 5 – US 231*, SR 54, and SR 37
****US 231 interchange is included in the Section 3 study***

3.4.2.1 Transportation Performance Measures

As presented in Section 3.3.1.1, all of the Section 4 Build Alternatives, as represented by the five interchange options (with intermediate interchanges and a common mainline alignment), provide essentially equal benefits for accessibility-related measures. Travel distances and travel times to both selected destinations and the interstate system were very comparable between the interchange options and no substantive differences were identified.

As presented in Section 3.3.1.2 and Section 3.3.1.3, all interchange options provide substantial benefits on performance measures regarding local purpose and need goals related to congestion and safety measures. However, unlike accessibility-related measures, there are some discernable differences between the interchange options relative to congestion relief and crash reduction. Interchange Option 1 would provide the greatest congestion relief and the most crash reduction. Interchange Option 5 would provide the least amount of congestion relief and the least amount of crash reduction.

Overall, the Greene/Monroe County Line interchange would have the greatest improvement in congestion relief and reduced crash frequencies compared to the no-build in the five-county Study Area as discussed in Sections 3.3.1.2 and 3.3.1.3. Interchange options containing the Greene/Monroe County Line interchange are effective in providing congestion relief to two-lane SR 45 from SR 445 to Curry Pike achieving a LOS B compared to LOS E under the No Build condition (see **Table 5.6-1** in Section 5.6.3). This interchange is included in Interchange Option 1 and Interchange Option 2.

For the two interchange options that have two intermediate interchanges, Interchange Option 1 would reduce daily congestion by about 182,000 vehicle miles traveled and about 3,600 vehicle hours traveled when compared to congested travel conditions under the No-Build scenario. By comparison, Interchange Option 3 would reduce daily congestion by about 138,000 vehicle miles

traveled and about 2,800 vehicle hours traveled. Overall, Interchange Option 1 would have about 32% more congestion relief for daily vehicle miles traveled and about 29% more congestion relief for daily vehicle hours traveled as compared to Interchange Option 3(see **Table 3-8** and **Table 3-9**). Both options also reduce non-interstate crashes and the overall crash frequencies.

Interchange Option 2 would also have greater congestion relief as compared to the other single intermediate interchange options (Interchange Options 4 and 5). Interchange Option 2 would reduce daily congestion by about 171,000 vehicle miles traveled when compared to congested travel conditions under the No-Build scenario. Interchange Options 4 and 5 would reduce daily congestion by about 127,000 and 126,000 vehicle miles traveled, respectively, when compared to congested travel conditions under the No-Build scenario. Overall, Interchange Option 2 would have about 26% more congestion relief for daily vehicle miles traveled as compared to Interchange Options 4 and 5. With regards to daily vehicle hours traveled, under congested travel conditions, Interchange Option 2 would be about 3,400 hours less when compared to congested travel conditions under the No-Build scenario. Interchange Options 4 and 5 would be about 2,500 and 2,400 hours less, respectively. By comparison, Interchange Option 2 would have about 26% and 29% more congestion relief for daily vehicle hours traveled as compared to Interchange Options 4 and 5. The single intermediate interchange options all reduce non-interstate crashes and the overall crash frequencies. However, without the Greene/Monroe County Line interchange, SR 45 is forecasted to operate at LOS E from SR 445 to Curry Pike.

3.4.2.2 Interchange Spacing

The AASHTO *Policy on Geometric Design of Highways and Streets (2004)* states that interchange spacing has a pronounced effect on freeway operations. The *Indiana Design Manual* further indicates that when interchanges are spaced farther apart, freeway operations are improved. The spacing of interchanges should allow for adequate distance for an entering driver to adjust to the freeway environment, to allow for proper weaving maneuvers between entrance and exit ramps, and to allow for adequate advance and turnoff signing. 23CFR 625.4 incorporates by reference the *AASHTO Policy on Geometric Design of Highways and Streets (2001)* as setting design standards for routes which are part of the National Highway System. It also incorporates by reference another AASHTO publication, *A Policy on Design Standards Interstate System (2005)* to address design issues specific to the Interstate Highway System.

The two AASHTO *Geometric Design* publications (2001, 2004) set two miles as the minimum spacing for rural freeway[37] interchanges. Both design policies allow for minimum interchange spacing, between interchange crossroads, of 1 mile in urban areas. Also, in urban areas a spacing of less than 1 mile may be developed by grade separated ramps or by adding collector-distributor roads.

[37] A freeway is a fully access-controlled, divided highway. Not all freeways are designated as part of the Interstate Highway system.

The AASHTO publication, *A Policy on Design Standards Interstate System (2005) (p.5)*, states that, "As a rule, minimum spacing should be…5 km (3 mi) in rural areas". The INDOT manual also indicates that "In rural areas, interchanges should not be spaced less than 3 mi apart on the Interstate system"[38].

Table 3-21 identifies the spacing for potential interchanges in Section 4. The distances are along the center of the approved Section 4 corridor and are measured from potential interchange crossroad to potential interchange crossroad. The interchange spacing north and south of the potential Greene County/Monroe County Line interchange were based upon an interchange located 3000 feet north of CR 35N/Carmichael Road.

Table 3-21: Interchange Spacing

Potential Interchange Locations		Interchange Spacing (Mile)
South	North	
US 231*	SR 45	11.3
SR 45	SR 54	1.8
SR 54	Greene County/Monroe County Line	5.4
Greene County/Monroe County Line	SR 37	10.3

* The US 231 interchange is included in the Tier 2 Section 3 study.

The spacing between the US 231 and SR 45 interchanges, the SR 54 and Greene County/Monroe County Line interchanges, and the Greene County/Monroe County Line and SR 37 interchanges all exceed the minimum rural interchange spacing policies. The spacing between the SR 45 and SR 54 interchanges, however, is over one mile less than the minimum rural interchange spacing under both the AASHTO and IDM policies for Interstates.

Earlier this year (2011), the National Cooperative Highway Research Program (NCHRP) published NCHRP Report 687, *Guidelines for Ramp and Interchange Spacing*. Table 3-2 in this report lists minimum interchange spacing specified in the highway design/traffic engineering manuals in six states, as representative of state-level recommended interchange spacing. It shows the following minimum interchange spacings for rural highways:

- California – 2 miles
- Florida – 3 to 6 miles
- Illinois – 3 miles
- New Jersey – 2 miles
- Oregon – 6 miles
- Pennsylvania – 2 miles

The spacing for the SR 45 and SR 54 interchanges (1.8 miles) is below the minimum spacing guidelines for rural interchanges in all six states.

[38] Indiana Design Manual (updated Feb. 18, 2011), Section 48-1.04 Grade Separation Versus Interchange, Item 3 Interchange Spacing.

3.4.2.3 Interchange Traffic Volumes

Total predicted 2030 daily traffic volumes for the five interchange options (with intermediate interchanges between US 231 and SR 37) are shown in **Table 3-22**. The volumes are based upon the total entering and exiting traffic on all interchange ramps. Traffic forecasts for Interchange Options 1 and 2, which include a Greene County/Monroe County Line interchange, assume a north route for the connector road between the interchange and SR 45. The predicted traffic volumes along a south connector road between the interchange and SR 45 are very comparable and would not substantially alter the traffic volume analysis.

Table 3-22: Total Interchange Volumes

Interchange Locations	Interchange Options (vehicles per day)				
	1	2	3	4	5
SR 45	2,729	n/a	3,183	3,435	n/a
SR 54	n/a	n/a	1,859	n/a	2,534
Greene County / Monroe County Line	5,391	6,727	n/a	n/a	n/a
SR 37	28,080	28,075	27,623	27,754	27,552
Sub-Total Intermediate Interchange Volumes	8,120	6,727	5,042	3,435	2,534
Total Interchange Option Volumes	36,200	34,802	32,665	31,189	30,086

The highest predicted total interchange volumes would occur under Interchange Option 1. This option would have over 36,000 vehicles per day entering and exiting the interchanges along Section 4. The lowest predicted total interchange volume would occur under Interchange Option 5 with just over 30,000 vehicles per day.

Since all five options include an interchange at SR 37, a major consideration for recommending interchange options as Alternatives Carried Forward was the predicted traffic volumes for the intermediate interchanges – SR 45, SR 54 and Greene County/Monroe County Line. The predicted volumes for all five options are comparable for the SR 37 interchange (about 27,500 to 28,100 vehicles per day).

Interchange Options 1 and 3 each have two proposed intermediate interchanges. The highest predicted intermediate interchange traffic volumes would occur under Interchange Option 1 with approximately 8,100 vehicles per day. This option has intermediate interchanges at SR 45 and Greene/Monroe County Line. Interchange Option 3, with proposed intermediate interchanges at SR 45 and SR 54, has considerably smaller intermediate interchange traffic volumes, only about 5,000 vehicles per day. Overall, Interchange Option 1 would have about 61% more traffic entering/exiting I-69 Section 4 each day at the intermediate interchanges, as compared to Interchange Option 3.

Interchange Options 2, 4, and, 5 each have one proposed intermediate interchange. The highest predicted intermediate interchange traffic volume for these three options would occur under Interchange Option 2 with approximately 6,700 vehicles per day using the Greene/Monroe

County Line interchange. Of Interchange Options 4 and 5, Interchange Option 4 has a higher predicted traffic usage of approximately 3,400 vehicles per day using the SR 45 interchange as compared to approximately 2,500 vehicles per day using the SR 54 interchange under Interchange Option 5. Nearly 96% more traffic would enter/exit I-69 Section 4 each day at the Greene/Monroe County Line interchange under Interchange Option 2 as compared to SR 45 under Interchange Option 4. This difference increases to over 165% when comparing Interchange Option 2 to the traffic usage at SR 54 under Interchange Option 5. Comparing Interchange Options 4 and 5, Interchange Option 4 would have about 900 more vehicles each day, or almost 36% more intermediate interchange traffic, as compared to Interchange Option 5.

3.4.2.4 Environmental Impacts

Conceptual interchanges at SR 45, SR 54, Greene/Monroe County Line, and SR 37 were presented to the public at the November 16, 2005 Public Information Meeting, to resource agencies in their July 26, 2006 Preliminary Alternatives Evaluation and Screening package, and at the August 31, 2006 meeting with resource agencies. The purpose of the conceptual interchanges was to provide an initial perspective of the possible configurations that would be evaluated and the spatial coverage of the interchanges at these locations. These conceptual interchanges did not represent definitive design configurations, and additional engineering development was performed after the initial concepts were presented to the public and resource agencies in order to identify potential environmental impacts as described herein. Because of the differences in spatial coverage, impact comparison between the interchanges was not a primary purpose of this environmental review. Rather, this environmental review provided an opportunity to identify potentially significant or substantive environmental impacts for the screening and recommendations of interchange options to be advanced as Alternatives Carried Forward.

The conceptual interchange configurations are shown in **Figure 3-10** (pp. 3-123 through 3-126). The potential Greene/Monroe County Line interchanges are shown along Alternative 4F-1 and 4F-3 mainline alignments which have been selected for detailed study. Both the North Connector Road and South Connector Road corridors between the Alternatives 4F-1 and 4F-3 mainline alignments (interchanges) and SR 45 are also shown. The SR 37 conceptual interchanges include traditional interchange configurations (I-69 mainline and SR 37) and non-traditional configurations (I-69 mainline, SR 37 and local road access).

Potential environmental impacts for the conceptual SR 45, SR 54, and Greene/Monroe County Line interchanges were identified using a methodology that was similar to the methodology used for the Preliminary Alternatives screening analysis of the mainline alignments as discussed in Section 3.4.1. The primary difference for the interchange analysis was that the analysis used an approximate right-of-way limit in lieu of the 200-foot and 300-foot screening zones. The identification of potential impacts was based upon GIS mapping of resources, the digital terrain mapping, aerial photographs, and the engineering development modeling. The analysis for the County Line interchange used the proposed interchange location along Alternative 4F-3. The potential environmental impacts for the four conceptual interchanges are summarized in **Table 3-23**.

Table 3-23: Interchange Alternatives

Resource		Interchange Impacts			
		SR 45	SR 54	County Line North Connector	County Line South Connector
Area (ac)		47	44	59	68
Wetlands (ac)		0	0	0	0
Forest (ac)		30	20	34	50
Core Forest (ac)		9	0	11	18
Agricultural Land (ac)		7	11	18	7
Prime Farmland (ac)		0	3	7	5
Managed Properties (ac)		20	1	0	0
Floodplain (ac)		0	0	6	5
Streams (no./ft)	Perennial	0	0	1/790	1/810
	Intermittent	2/1,280	1/1,260	1/780	0
	Ephemeral	2/880	4/1,000	10/4,943	7/3,550
Ponds (no./ac)	Major Impact	0	1/0.2 acre	0	0
	Partial Impact	0	0	0	0
Subsurface Drainage Features	Small Springs	0	1	0	0
	Minor Springs	0	0	0	0
	Sinkholes	0	0	0	0
	Swallets	0	0	0	0
	Sinking Streams	0	0	0	0
Historic Properties (ft)		none	None	None	none
Cemeteries (ft)	Storm	15,200	6,600	n/a	n/a
	Freeman	11,500	2,500	n/a	n/a
	Dobbins	6,200	15,100	n/a	n/a
Residential Displacements		3	5	3	1
Business Displacements		0	0	0	1

The SR 45 and SR 54 interchanges would require approximately 47 acres and 44 acres of right-of-way, respectively. The County Line interchanges require more right-of-way, approximately 59 acres with the North Connector Road and 68 acres with the South Connector Road. Because of these acreage differences, the comparison of potential environmental impacts is best summarized when comparing the SR 45 interchange with the SR 54 interchange and the Greene/Monroe County Line interchange using the North Connector Road with the same interchange using the South Connector Road. None of the four conceptual interchanges would impact key resources (historic properties, wetlands, cemeteries, known caves and major springs).

The SR 45 conceptual interchange would impact more forest, core forest, and managed lands as compared to the SR 54 conceptual interchange. Conversely, the SR 54 interchange would have a major impact upon an approximate 0.2 acre pond, a small spring, and two additional residential

displacements as compared to the SR 45 conceptual interchange. Overall, none of the potential environmental impacts were considered substantial for preferring or discarding one of these interchange locations.

The Greene/Monroe County Line conceptual interchange configuration that uses the North Connector Road would impact more agricultural land and streams as compared to the South Connector Road. It may also require two additional residential displacements. The South Connector Road would impact more forest and core forest and may require one business displacement as compared to the North Connector Road. None of these potential environmental impacts were considered substantial for preferring or discarding one of the connector road alignments.

3.4.2.5 Resource Agency and Public Input

Consultation with USFWS has been on-going since the issuance of the Tier 1 ROD. It has expressed concerns about possible indirect development impacts in karst areas. To limit interchanges in karst areas, the Tier 1 Biological Assessment Addendum (February 28, 2006) (BA) (p. 14), committed to adding the Greene/Monroe County Line interchange only as a replacement of one of the Tier 1 identified interchanges. The County Line interchange and SR 54 interchange would both place an interchange in a karst area and USFWS concurred with this commitment reiterating on August 24, 2006, that "if an interchange is built along the county line, then an interchange would not be built at SR 54."[39] USEPA also expressed concerns about secondary (indirect) development for the proposed Greene County/Monroe County Line interchange at the April 26, 2006, meeting on Section 4's Preliminary Alternatives Evaluation and Screening. IDNR comments on the proposed interchanges (September 28, 2006) noted that the possible interchange at SR 54 appears to have fewer impacts than an interchange at SR 45 and that, if an interchange at Greene County/Monroe County Line is determined necessary, their recommended location is along Alternative 4F-3. IDNR also indicated that additional analysis is needed for the various SR 37 interchange options.

Considerable public input has been received on the potential SR 45, SR 54 and Greene/Monroe County Line interchanges through the public involvement and scoping process with local governments, the Section 4 CAC, and the general public. This included support for all three interchanges, especially the Greene/Monroe County Line interchange.

3.4.2.6 Interchange Options Carried Forward

All of the Section 4 Build Alternatives, as represented by the five interchange options (with intermediate interchanges between US 231 and SR 37), provide essentially equal benefits for accessibility-related measures. Interchange Option 1 would provide the greatest congestion relief and the highest overall crash rate reduction. Interchange Option 5 would provide the least amount of congestion relief. The Greene/Monroe County Line interchange, which is included in

[39] See **Appendix DD**, *Revised Programmatic Biological Opinion*, FWS, August 24, 2006, p. 29.

Interchange Options 1 and 2, would provide the greatest improvement in congestion relief and crash rate reductions in the 5-county study area of the interchanges studied.

None of the interchange options have significant potential environmental impacts that would result in their discarding as an Alternative Carried Forward. Also, none of the interchange options clearly avoid/minimize environmental impacts to the extent that they should be selected as an Alternative Carried Forward for additional study.

Based upon the analysis described above, the following interchange options were discarded:

- Interchange Option 3 – Interchange Options 1 and 3 each have two intermediate interchanges between the Section 4 termini interchanges at US 231 and SR 37. Overall, Interchange Option 3 would have noticeably less congestion relief as compared to Interchange Option 1 for both daily vehicle miles traveled and daily vehicle hours traveled within the 5-county Section 4 Study Area. Finally, Interchange Option 3 has a travel demand that is about 3,100 vehicles per day, or about 38%, less than Interchange Option 1. In addition to these disadvantages, Interchange Option 3 also does not meet the desired rural interchange spacing per INDOT policy. The 1.8-mile spacing between the SR 45 and SR 54 interchanges falls well below the minimum 3-mile spacing in rural areas as set forth in the *Indiana Design Manual* and adopted in the *Tier 2 Project Guidance Manual.* For these reasons, Interchange Option 3 is not carried forward as an interchange alternative for detailed study.
- Interchange Option 5 – Interchange Options 2, 4, and 5 each have one intermediate interchange. While daily congestion relief and safety benefits would be comparable for Interchange Options 4 and 5 and would be noticeably less than Interchange Option 2, the lowest level of benefits for these transportation performance measures would occur under Interchange Option 5. Interchange Option 5 has the lowest forecasted traffic of these three single interchange options. For these reasons, Interchange Option 5 is not carried forward as an interchange alternative for detailed study.

Interchange Options 1, 2, and 4 were selected as interchange alternatives for detailed study. Interchange Option 1 has interchanges at SR 45, Greene/Monroe County Line, and SR 37. This option had the highest overall interchange demand volume and generally demonstrated the greatest congestion relief and crash reduction per vehicle mile travelled in the study area, as shown by the transportation performance measures analysis. An interchange at the Greene/Monroe County Line has had considerable local government and public support in providing accessibility for emergencies along I-69 and in eastern Greene and western Monroe County, providing improved access between Bloomfield and Bloomington for commuters, and providing relief to SR 45 between SR 445 and Curry Pike. Interchange Options 2 and 4 were also selected for detailed study in the Tier 2 DEIS. These are the "single intermediate interchange" options for the interchanges included in Interchange Option 1 – Greene/Monroe County Line or SR 45 with an interchange at SR 37.

The three interchange options that were recommended for detailed study as an Alternative Carried Forward are summarized in **Table 3-24**.

Table 3-24: Alternatives Carried Forward – Interchange Options			
Alternatives Carried Forward		Discarded Options	
Interchange Option	Interchanges	Interchange Option	Interchanges
1	US 231 SR 45 Greene/Monroe County Line SR 37	3	US 231 SR 45 SR 54 SR 37
2	US 231 Greene/Monroe County Line SR 37	5	US 231 SR 54 SR 37
4	US 231 SR 45 SR 37		

3.4.2.7 Alternatives

Once the analysis and screening of the Preliminary Alternatives was completed and the Alternatives Carried Forward within the eight subsections were selected, end-to-end alternatives that extend from the southern terminus of Section 4 just east of US 231 in Greene County to the northern terminus at SR 37 in Monroe County under the build condition were identified for detailed analysis in this DEIS. Four end-to-end alternatives were developed for the detailed analysis. Each alternative uses a different alternative alignment within Subsection 4F (a minimum of four alternatives were required) and uses different combinations of alternative alignments within Subsections 4A, 4C, and 4H. Also, each alternative uses Interchange Option 1 (SR 45, Greene/Monroe County Line, and SR 37 interchanges). The four end-to-end alternatives are representative of the 48 possible end-to-end alternatives that could be established due to the multiple mainline alignments in Subsections 4A, 4C, 4F, and 4H. The selection of the four alternatives included:

- Two alternative mainline alignments were selected for detailed study in Subsection 4A. Alternative 4A-2 was used in three of the alternatives because this alignment is a continuation of the mainline alignment selected in the Section 3 study. Alternative Hybrid 4A-1/4A-2 was used in one alternative.
- Two alternative mainline alignments were selected for detailed study in Subsection 4C. These are Alternatives 4C-1 and 4C-2. Each alignment is in two alternatives.
- Four alternative mainline alignments were selected for detailed study in Subsection 4F. These are Alternatives 4F-1, 4F-3, 4F-4 and 4F-5. Each alternative is used in one alternative.
- Three alternative mainline alignments were selected for detailed study in Subsection 4H. These are Alternatives 4H-1, 4H-2, and 4H-3. Alternative 4H-1, which generally follows along the west edge of Subsection 4H, and Alternative 4H-3, which generally follows along the east edge of Subsection 4H, were each used in one alternative. Alternative 4H-2, which partially follows along the alignment of Alternative 4H-1 and Alternative 4H-3, was in two alternatives.

- Subsections 4B, 4D, 4E, and 4G each have only one alternative mainline alignment for detailed study. Alternatives 4B-1, 4D-1, Hybrid 4E-1/4E-2, and 4G-2 were used in each of the four alternatives.
- Interchange Option 1 is used for the detailed study of all four alternatives. This interchange option consists of interchanges at SR 45, Greene/Monroe County Line, and SR 37. The South Connector Road for the Greene/Monroe County Line interchange will be used with each of the four alternatives. Interchange Option 1, which includes the individual intermediate interchanges under Interchange Options 2 and 4, was selected to provide a conservative estimate of interchange-related impacts, since its impacts are higher than those for Options 2 and 4.

The alternatives, identified in **Table 3-25**, are the subject of the detailed analysis presented in this DEIS (see Chapter 5, *Environmental Consequences* and Chapter 6, *Comparison of Alternatives*). The detailed analysis of potential impacts along Alternatives 4A-2 and Hybrid 4A-1/4A-2 would be confined to the area east of a break line between Section 3 and Section 4 (see **Figure 3-8,** pp. 3-97 and 3-98). Potential impacts to the west of the break line are assessed by Section 3. Potential impacts in the overlap area between Section 4 and Section 5, however, are assessed in the Section 4 study as part of the SR 37 interchange (in Subsection 4H) and extend north to a break line within Section 5 just north of That Road (see **Figure 3-8**, p. 3-122).

Table 3-25: Section 4 Alternatives

Mainline Subsections	Alternatives			
	1	2	3	4
4A-2	X	X		X
Hybrid 4A-1/4A-2			X	
4B-1	X	X	X	X
4C-1	X			X
4C-2		X	X	
4D-1	X	X	X	X
Hybrid 4E-1/4E-2*	X	X	X	X
4F-1**	X			
4F-3**		X		
4F-4**			X	
4F-5**				X
4G-2	X	X	X	X
4H-1***	X			
4H-2***		X		X
4H-3***			X	

*Includes SR 45 Interchange
**Includes Greene/Monroe County Line Interchange with South Connector Road
***Includes SR 37 Interchange

Access roads would be necessary in Section 4 in order to provide land access to areas that currently are accessed by local roads but which may be cut off by the new highway or for

realignments of local roads that may be impacted by the new highway. No potential access roads, however, were identified for Section 4 during the selection of Alternatives Carried Forward or the identification of the four end-to-end alternatives.

Table 3-26 identifies possible grade separations and road closures proposed for each Alternative at the conclusion of the screening process. Additional detailed analysis of possible grade separations and road closures is included in this DEIS. Section 5.3, *Land Use and Community Impacts*, describes access-related issues identified in the Section 4 Study Area. Information regarding access is provided in Section 5.6, *Traffic Impacts*. The proposed grade separations and road closures identified in the Draft EIS are further evaluated in this Final EIS. This evaluation considers public input, system continuity, and cost feasibility. See Chapter 5, Section 5.6.3.2 for further evaluation and Chapter 11, Section 11.2.1.1, and 11.2.2.10 for summaries of the public input received.

Table 3-26: Possible Grade Separations and Road Closures by Alternative

State Highways / Local Roads	Alternatives			
	1	2	3	4
Greene County				
CR 200 E	C	C	C	C
CR 215 E	O	O	O	O
CR 600 S	O	O	O	O
CR 440 E	N/A	C	C	N/A
CR 450 S	N/A	O*	O*	N/A
CR 475 E	O	O*	O*	O
CR 580 E / CR 600 E	O	O	O	O
CR 750E/CR 900E (Dry Branch Road)	O	O	O	O
CR 360S/CR 880E (Mineral-Koleen Road)	O	O	O	O
CR 920E/CR 975E (Old Clifty Road)	O	O	O	O
SR 45	O	O	O	O
CR 1200 E	C	C	C	C
CR 1250 E	O	O	O	O
SR 54	O	O	O	O
CR 1260E/CR 190S (Hobbieville Road)	O	O	O	O
CR 35 N (Carmichael Road)	O	O	O	O
CR 150 N	O	N/A	N/A	O
Monroe County				
Carmichael Road	O	O	O	O
Carter Road	N/A	O	O	N/A
Breeden Road	O	O	O	O
Burch Road	O	O	O	O
Evans Lane	O	O	O	O
Harmony Road	O	O	O	O
West Evans Lane (west of Rockport Road)	C	C	C	C

Table 3-26: Possible Grade Separations and Road Closures by Alternative				
State Highways / Local Roads	Alternatives			
	1	2	3	4
Rockport Road	O	O	O	O
Lodge Road	O	O	O	O
Tramway Road	O	O	O	O
Bolin Lane	O	O	O	O
O: Open by proposed grade separation *C: Closed at the new highway right-of-way* *N/A: Not affected by the Build Alternative* **Proposed grade separation connecting CR 450 S and CR 475 E*				

3.4.3 Project Cost Estimates

3.4.3.1 Project Cost Estimates

Preliminary project costs were developed using Quantm[40] for all of the Preliminary Alternatives within each subsection, as well as for Alternatives 1 through 4. The purpose of these preliminary construction cost estimates is to enable the comparison of mainline subsection and end-to-end alternatives as one of the considerations in the evaluation of alternatives as set forth in Section 3.4.1. These preliminary construction costs do not include the construction cost for interchanges, grade separations, access roads and other local road improvements, and some drainage structures. Further, these preliminary construction costs are not to be confused with total project cost estimates that include all construction costs plus right-of-way, utility relocation, design engineering, construction engineering and environmental mitigation costs.

As with the preliminary impact data presented in **Table 3-11**, **Table 3-13** through **Table 3-16**, and **Table 3-18** through **Table 3-20**, these costs were provided in the *Preliminary Alternatives Analysis and Screening* package dated July 26, 2006. Preliminary project cost estimates for Alternatives Hybrid 4A-1/4A-2, Hybrid 4E-1/4E-2, 4F-4, and 4F-5 were developed after the August 31, 2006, meeting on Section 4's Preliminary Alternatives Evaluation and Screening and were not provided to the resource agencies. The cost estimates will be further refined (see Chapter 6, *Comparison of Alternatives*) once additional engineering of the end-to-end alternatives is completed.

Table 3-27 provides the preliminary construction cost estimates for each Preliminary Alternative and **Table 3-28** provides the estimates for the four alternatives derived from various combinations of preliminary alternatives.

[40] Costs identified by Quantm are appropriate for comparing mainline construction cost components, but do not include all costs. Costs which Quantm does not estimate include interchanges, some drainage structures, local road improvements, right-of-way, design engineering, construction engineering, utility relocation, and environmental mitigation. Once the subsection alternatives were screened, and the engineering for the end-to-end alternatives was further defined, more detailed cost estimates were generated for each of the remaining subsections.

Table 3-27: Preliminary Alternatives Cost Estimates*

Subsection	Alternatives	Length (miles)	Construction Cost Estimate (millions)
4A	4A-1	1.69	$15.5
	4A-2	**1.67**	**$17.1**
	Hybrid 4A-1/4A-2	**1.72**	**$16.7**
4B	**4B-1**	**2.28**	**$15.1**
	4B-2	2.45	$14.4
4C	**4C-1**	**1.86**	**$14.5**
	4C-2	**1.72**	**$13.5**
4D	**4D-1**	**2.86**	**$43.0**
	4D-2	2.88	$43.6
4E	4E-1	4.58	$68.4
	4E-2	4.62	$34.3
	4E-3	4.64	$32.4
	Hybrid 4E-1/4E-2	**4.59**	**$33.1**
4F	**4F-1**	**7.61**	**$65.1**
	4F-2	7.45	$57.4
	4F-3	**7.50**	**$58.0**
	4F-4	**7.56**	**$60.5**
	4F-5	**7.39**	**$59.1**
4G	4G-1	3.12	$16.4
	4G-2	**3.13**	**$18.4**
4H	**4H-1**	**3.22**	**$30.7**
	4H-2	**3.33**	**$27.3**
	4H-3	**3.42**	**$25.0**

** The preliminary construction cost estimates do not include the cost of interchanges, overpasses, access roads and local road improvements, some drainage structures, design engineering, right-of-way, utility relocation, environmental mitigation, construction engineering and other administrative costs.*

Subsection alternatives carried forward for detailed analysis in the DEIS are shown in bold type and light green shading.

Table 3-28: End-to-End Alternatives Cost Estimates*

End-to-End Alternatives	Subsection Alternatives	Length (miles)	Construction Cost Estimate (millions)
1	4A-2 + 4B-1 + 4C-1 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-1 + 4G-2 + 4H-1	27.22	$237.0
2	4A-2 + 4B-1 + 4C-2 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-3 + 4G-2 + 4H-2	26.68	$225.5
3	Hybrid 4A-1/4A-2 + 4B-1 + 4C-2 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-4 + 4G-2 + 4H-3	27.28	$225.3
4	4A-2 + 4B-1 + 4C-1 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-5 + 4G-2 + 4H-2	27.11	$227.6

** Preliminary cost estimates in this table do not include interchanges, access roads, grade separations and overpass design refinements, environmental mitigation, right-of-way, utility relocation, design and construction engineering or other administrative costs because those costs were not determined until the subsection alternatives were screened and end-to-end alternatives were finalized.*

3.4.3.2 Maintenance Cost Estimates

In addition to the capital costs associated with the construction of the project, the new road added to the system would result in an increase in the annual maintenance costs for INDOT. Since all of the mainline alternatives are essentially the same in construction type, the only variable influencing maintenance costs is length of the mainline. For purposes of comparison the unit costs of $3,000 per lane mile[41] for maintenance was used. **Table 3-29** and **Table 3-30** show comparisons of the maintenance costs for the Preliminary Alternatives and the four alternatives.

Table 3-29: Preliminary Alternatives - Estimates of Annual Maintenance Costs*

Subsection	Alternatives	Lane Miles	Maintenance
4A	4A-1	6.76	$20,280
	4A-2	**6.68**	**$20,040**
	Hybrid 4A-1/4A-2	**6.88**	**$20,640**
4B	**4B-1**	**9.12**	**$27,360**
	4B-2	9.8	$29,400
4C	**4C-1**	**7.44**	**$22,320**
	4C-2	**6.88**	**$20,640**
4D	**4D-1**	**11.44**	**$34,320**
	4D-2	11.52	$34,560
4E	4E-1	18.32	$54,960
	4E-2	18.48	$55,440
	4E-3	18.56	$55,680
	Hybrid 4E-1/4E-2	**18.36**	**$55,080**
4F	**4F-1**	**30.44**	**$91,320**
	4F-2	29.8	$89,400
	4F-3	**30.0**	**$90,000**
	4F-4	**30.24**	**$90,720**
	4F-5	**29.56**	**$88,680**
4G	4G-1	12.48	$37,440
	4G-2	**12.52**	**$37,560**
H	**4H-1**	**12.88**	**$38,640**
	4H-2	**13.32**	**$39,960**
	4H-3	**13.68**	**$41,040**

** **BOLD** and green-shaded text indicates alternatives carried forward for detailed analysis in the DEIS.*

[41] Based upon data published by New Mexico Department of Transportation for year ending June 30, 2006. Annual interstate highway maintenance costs of $13,800 per center-line mile were translated to estimated $3,000 per lane mile for use in this study. For more information, see: http://nmshtd.state.nm.us/upload/images/GTG/Q4_2006/Maintenance_Highway_and_Rest_Area.pdf.

Table 3-30: End-to-End Alternatives - Estimates of Annual Maintenance Costs			
End-to-End Alternatives	**Subsection Alternatives**	**Lane Miles**	**Maintenance**
1	4A-2 + 4B-1 + 4C-1 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-1 + 4G-2 + 4H-1	108.88	$326,540
2	4A-2 + 4B-1 + 4C-2 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-3 + 4G-2 + 4H-2	108.32	$324,860
3	Hybrid 4A-1/4A-2 + 4B-1 + 4C-2 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-4 + 4G-2 + 4H-3	109.12	$327,260
4	4A-2 + 4B-1 + 4C-1 + 4D-1 + Hybrid 4E-1/4E-2 + 4F-5 + 4G-2 + 4H-2	108.44	$325,220

3.5 Preferred Alternative

Alternative 2 was identified in the DEIS as the Preferred Alternative. This was based upon consideration of environmental impacts and costs along subsection alignment alternatives 4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-3, 4G-2, and 4H-2. By analysis of purpose and need goals, environmental impacts, and costs, Interchange Option 1 (with interchanges at SR 45, Greene/Monroe County Line (with the South Connector Road), and SR 37) was chosen at the Preferred Interchange Option. These subsection alternatives and interchange locations are described briefly below and in greater detail in Chapter 6, *Comparison of Alternatives*. **Alternative 2** is shown in **Figure 3-11.**[42]

Refined Preferred Alternative 2 is the preferred alternative as presented in this FEIS. Refined Preferred Alternative 2 is comprised of the same subsection alignment alternatives and Interchange Option 1 as used by DEIS Alternative 2, as modified by minor profile grade and revised local access design changes. These changes for Refined Preferred Alternative 2 are briefly described below. Detailed drawings of Refined Preferred Alternative 2 are shown in **Appendix R**, *Preferred Alternative Plan and Profile Drawings*. The full description of how DEIS Preferred Alternative 2 was modified to produce the Refined Preferred Alternative 2 is given in Section 6.2.1, *Comparison of Alternatives*.

- **Subsection 4A – Alternative 4A-2**: This alternative begins approximately 1,280 feet west of CR 200E and proceeds in an east/northeast direction across CR 215E to a point approximately 1,400 feet east of CR 315E and 1,200 feet south of CR 600S. The south terminus of Section 4 will connect with Section 3's Refined Alternative 3E-1 (selected alternative) and adjacent US 231 interchange. **Figure 3-11** (pp. 3-127 and 3-128) shows Alternative 4A-2.

[42] Two sets of design criteria (Initial Design Criteria and Low-Cost Design Criteria) are under consideration for Section 4 (See Chapter 5.1). **Figure 3-11** presents the right-of-way for both sets of design criteria. Also, minor adjustments to the subsection breaklines that were established for the Alternatives Carried Forward were made to accommodate additional engineering development of the alignments.

The preferred Subsection 4A alignment for Refined Preferred Alternative 2 is Refined Alternative 4A-2. This alignment included the following modifications of Alternative 4A-2:

- Grade separation removed at CR 200E. Cul-de-sacs added at the closing points of CR 200E on each side of the highway.
- Grade separation added at CR 215E (I-69 over CR 215E). Cul-de-sacs removed at the closing points of CR 215E on each side of the highway.
- Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4B – Alternative 4B-1**: This alternative continues northeast across CR 600S to a point approximately 4,100 feet north of CR 600S and 2,400 feet west of CR 440E (Taylor Ridge Road). **Figure 3-11** (pp. 3-128 and 3-131) shows Alternative 4B-1.

  The preferred Subsection 4B alignment for Refined Preferred Alternative 2 is Refined Alternative 4B-1. This alignment included the following modifications of Alternative 4B-1:

  - Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4C – Alternative 4C-2**: This alternative continues northeast toward Taylor Ridge Cemetery. Near Taylor Ridge Road (CR 440E), the alternative turns east across Black Ankle Creek and CR 600E where it ends at a point approximately 700 feet east of CR 600E. **Figure 3-11** (pp. 3-129 through 3-131) shows Alternative 4C-2.

  The preferred Subsection 4C alignment for Refined Preferred Alternative 2 is Refined Alternative 4C-2. This alignment included the following modifications of Alternative 4C-2:

  - Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4D – Alternative 4D-1**: This alternative continues east across CR 750E/CR 900E (Dry Branch Road), CR 360S/CR 880E (Mineral-Koleen Road), and Plummer Creek. The alternative ends approximately 700 feet east of Mineral-Koleen Road. **Figure 3-11** (pp. 3-131 and 3-132) shows Alternative 4D-1.

  The preferred Subsection 4D alignment for Refined Preferred Alternative 2 is Refined Alternative 4D-1. This alignment included the following modifications of Alternative 4D-1:

  - Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4E – Alternative Hybrid 4E-1/4E-2**: This alternative proceeds east/northeast and then turns north/northeast near CR 920E/CR 975E (Old Clifty Road) across SR 45, Mitchell Branch, CR 1250E, and SR 54. The alternative ends approximately 3,000 feet

north/northeast of SR 54. An interchange is proposed at SR 45. **Figure 3-11** (pp. 3-132 through 3-135) shows Alternative Hybrid 4E-1/4E-2.

The preferred Subsection 4E alignment for Refined Preferred Alternative 2 is Refined Alternative Hybrid 4E-1/4E-2. This alignment included the following modifications of Alternative Hybrid 4E-1/4E-2:

- Revised profile grade along the I-69 mainline from east of SR 45 to north of Hobbieville Road (extending into Subsection 4F).
- Reconfiguration of the cul-de-sac at the termination of Spruce Road (Access Road 2).
- New Access Road 6 to provide property access in the northeast quadrant of the SR 45 interchange.
- Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4F – Alternative 4F-3**: This alternative turns north/northeast generally parallel to and west of the Greene/Monroe County Line across CR 1260E/CR 190S (Hobbieville Road), Indian Creek, and CR 35N. About 3,000 feet south of CR 150N, the alternative turns northeast and then north across Carter Road and a second crossing of Indian Creek. Near the southeast corner of Timber Trace Subdivision (Greene County), the corridor turns east into Monroe County across Indian Creek (third crossing) and Breeden Road. The alternative ends approximately 900 feet east of Breeden Road. The proposed Greene/Monroe County Line Interchange is located just southeast of CR 150N. The South Connector Road proceeds west/northwest from the interchange across Indian Creek and intersects SR 45 just south of the existing SR 45/SR 445 intersection. **Figure 3-11** (pp. 3-135 through 3-140) shows Alternative 4F-3.

  The preferred Subsection 4F alignment for Refined Preferred Alternative 2 is Refined Alternative 4F-3. This alignment included the following modifications of Alternative 4F-3:

  - Revised profile grade along the I-69 mainline from north of Carter Road to east of Rockport Road (extending into Subsection 4G).
  - Widened shoulders along Breeden Road at I-69 grade separation.
  - Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4G – Alternative 4G-2**: This alternative continues east/northeast across Burch Road and then turns east across Evans Lane, Harmony Road, and Rockport Road. The alternative then turns northeast and ends approximately 400 feet west of Lodge Road. **Figure 3-11** (pp. 3-140 through 3-142) shows Alternative 4G-2.

  The preferred Subsection 4G alignment for Refined Preferred Alternative 2 is Refined Alternative 4G-2. This alignment included the following modifications of Alternative 4G-2:

  - Grade separation removed at Evans Lane.

- Widened lanes and shoulders along Harmony Road at I-69 grade separation.
- Widened lanes and shoulders along Rockport Road at I-69 grade separation.
- Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

- **Subsection 4H – Alternative 4H-2**: This alternative continues generally to the northeast across Lodge Road, Tramway Road, and Bolin Lane to SR 37. An interchange is proposed at SR 37. The alternative then proceeds to the northwest generally along the SR 37 alignment and ends near That Road. This alternative will connect with alternatives being studied by Section 5. **Figure 3-11** (pp. 3-142 through 3-145) shows Alternative 4H-2.

  The preferred Subsection 4H alignment for Refined Preferred Alternative 2 is Refined Alternative 4H-2. This alignment included the following modifications of Alternative 4H-2:

  - Widened lanes and shoulders along Tramway Road at I-69 grade separation.
  - Glenview Drive extended to Bolin Lane.
  - Widened lanes and shoulders along Bolin Lane at I-69 grade separation.
  - Minor right-of-way adjustments/refinements at various points along the I-69 mainline alignment to address access changes and roadway design revisions and corrections.

Chapter 5, *Environmental Consequences*, presents the detailed evaluation of environmental impacts that were used to arrive at the recommendation of **Alternative 2** as the Preferred Alternative. Chapter 5 also presents impacts for Refined Preferred Alternative 2. Chapter 6, *Comparison of Alternatives*, compares Alternatives 1, 2, 3, and 4, as well as Refined Preferred Alternative 2. This comparison includes environmental impacts, road closures, grade separations and access roads; and estimated design, right-of-way acquisition/relocation, construction, and mitigation costs associated with the alternatives. Detailed drawings of the Preferred Alternative are provided in **Appendix R**, *Preferred Alternative Plan & Profile Drawings*, of this FEIS. Drawings with a topographic background showing the Preferred Alternative are provided in **Figure 3-12** (p. 3-146).

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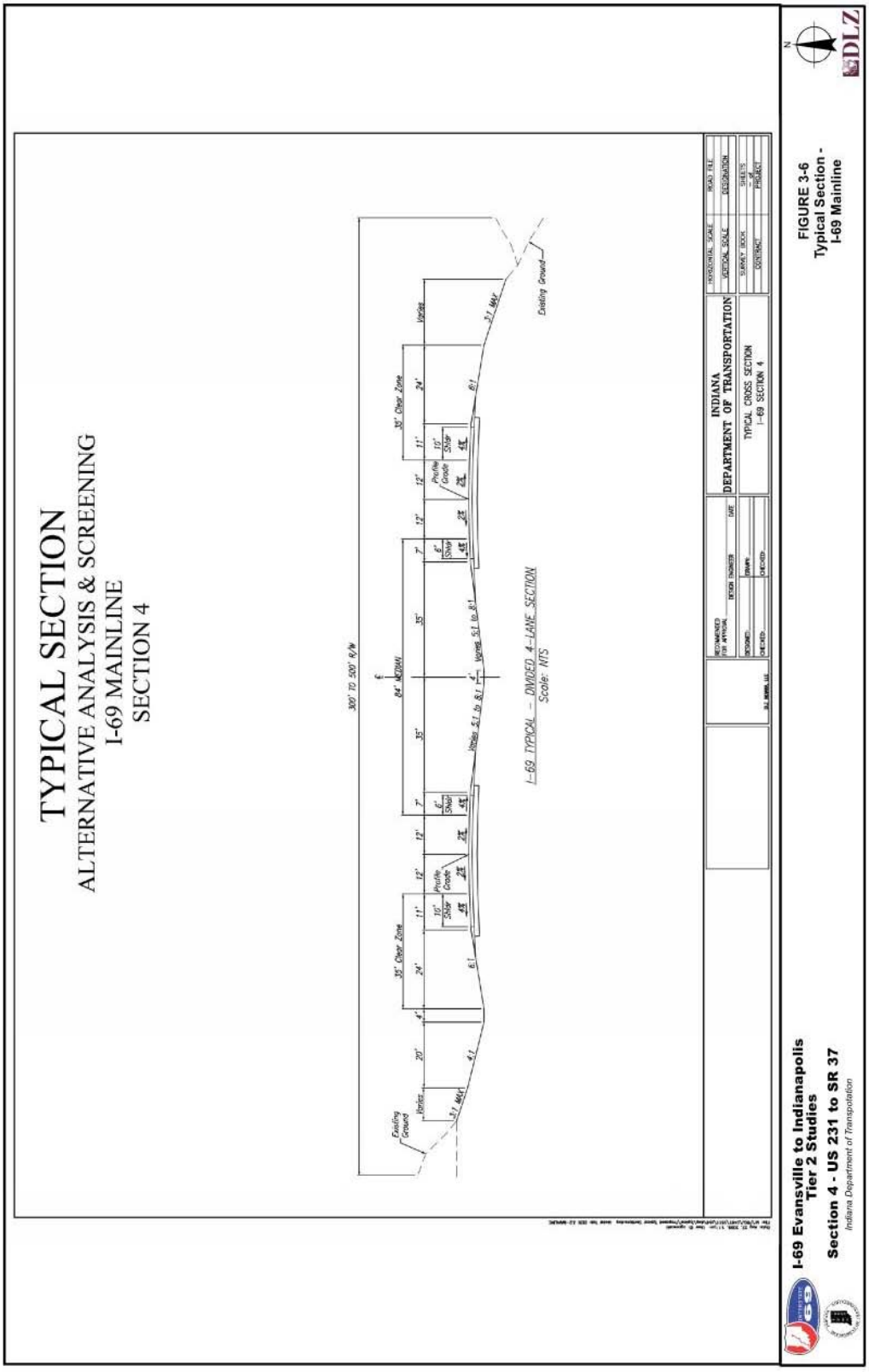
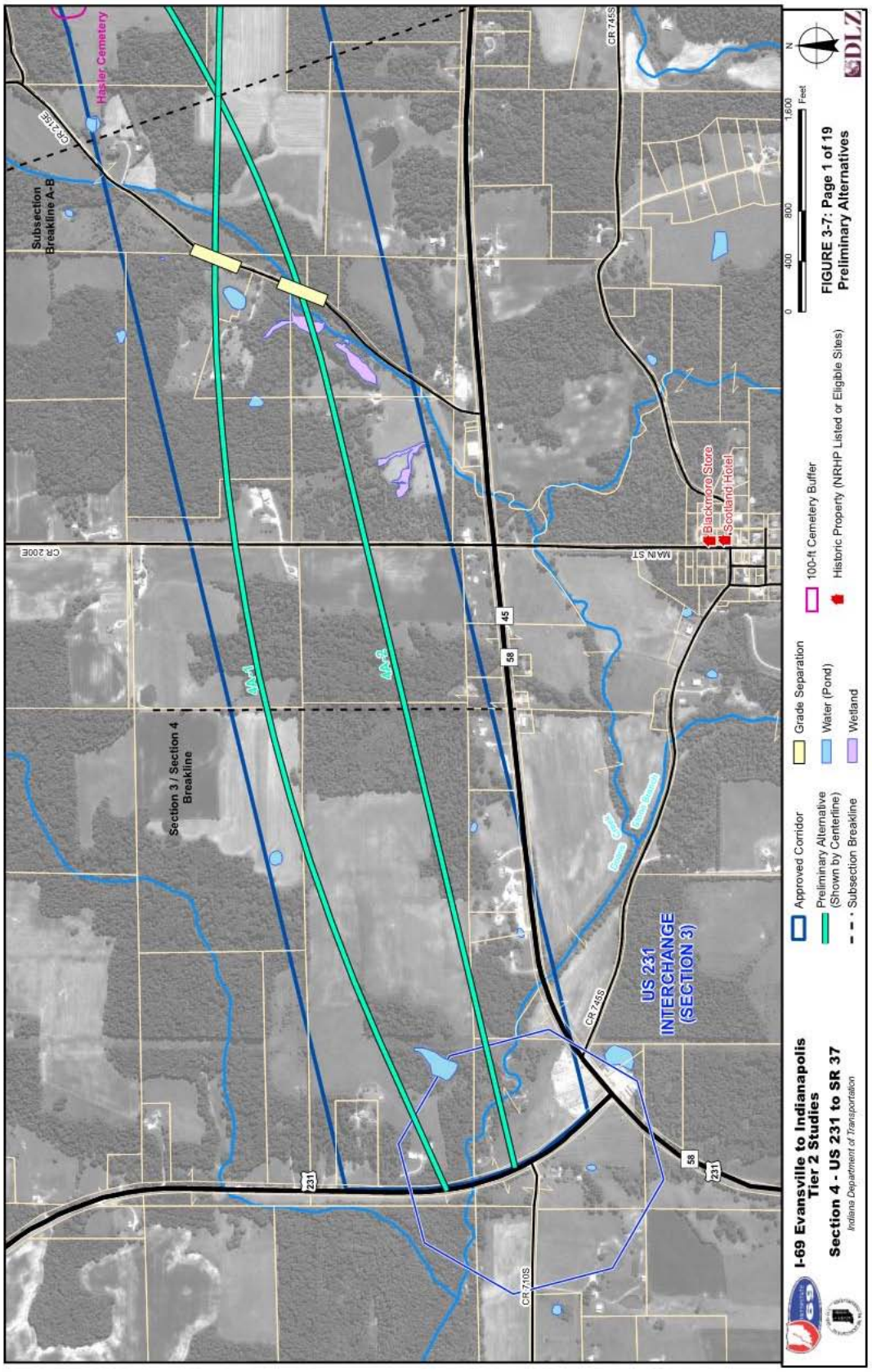
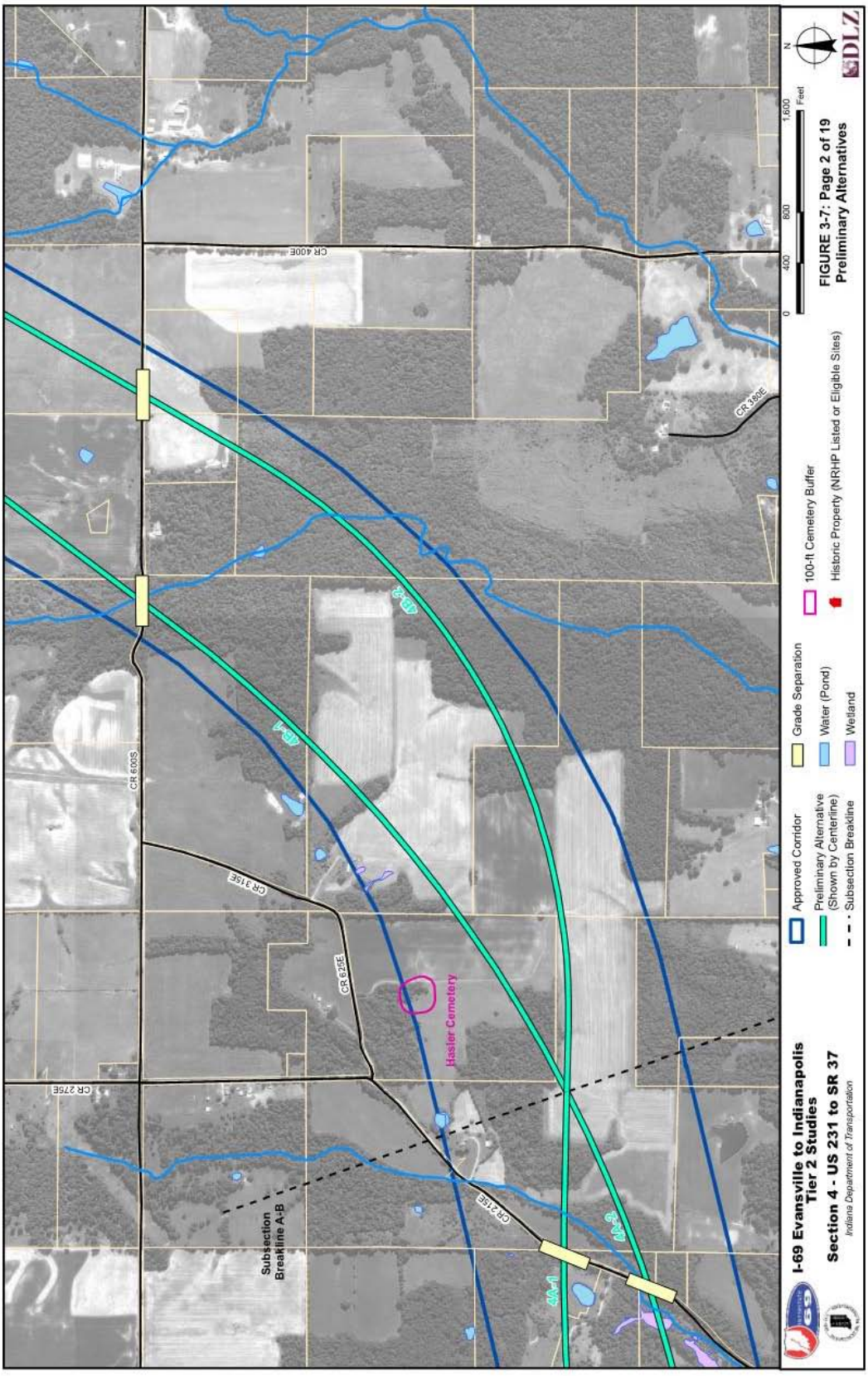
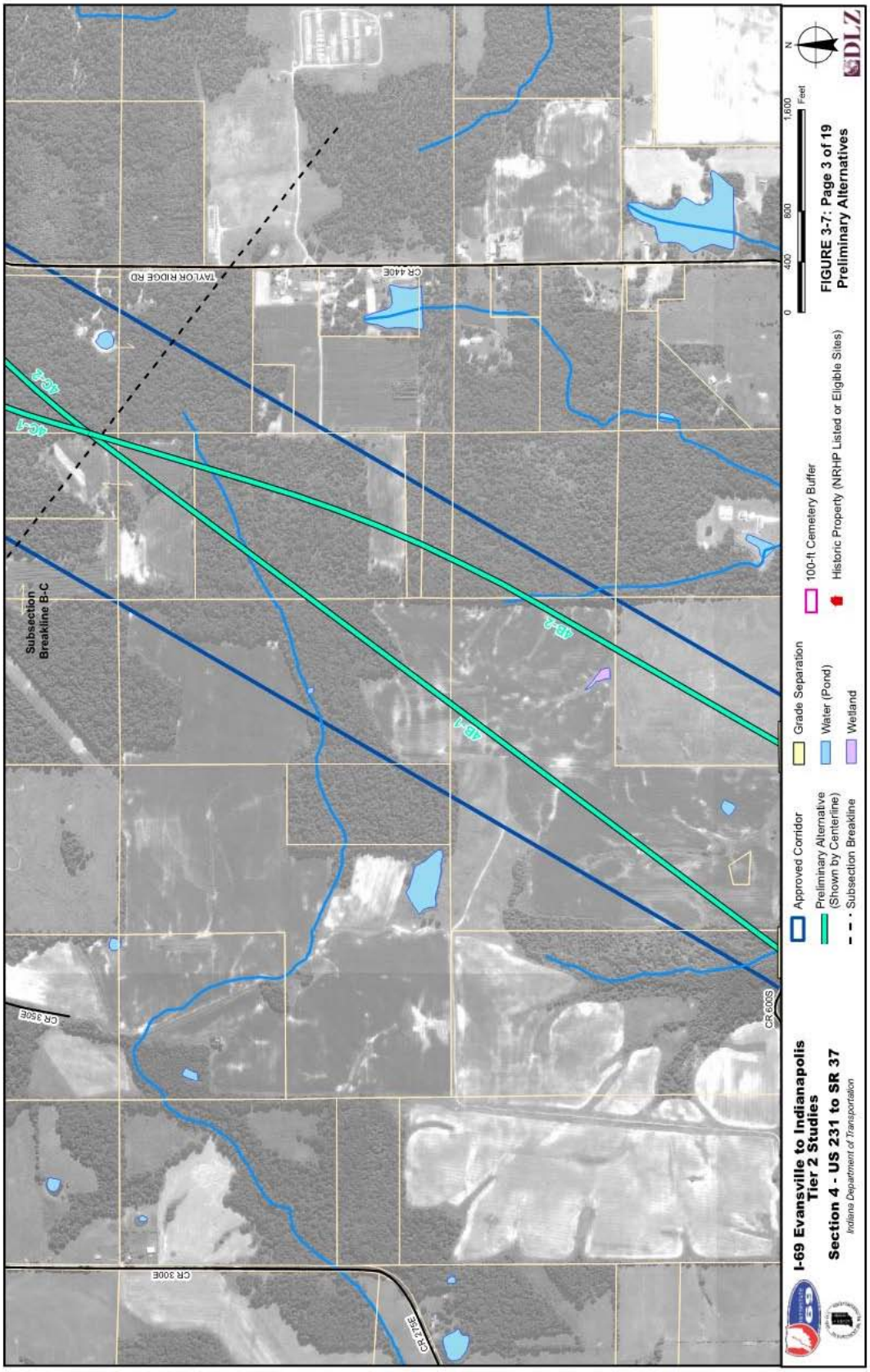


FIGURE 3-6
Typical Section -
I-69 Mainline


Hasler Cemetery
CR 216E
Subsection Breakline A-B
CR 745S
CR 200E
MAIN ST
Blackmore Store
Scotland Hotel
45
58
AA-A
AA-B
Section 3 / Section 4 Breakline
US 231 INTERCHANGE (SECTION 3)
CR 745S
CR 710S
231
58
231
N
0
400
800
1,600
Feet
FIGURE 3-7: Page 1 of 19
Preliminary Alternatives
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
FIGURE 3-7: Page 2 of 19
Preliminary Alternatives
Feet
0
400
800
1,600
N
DLZ
CR 400E
CR 360E
CR 600S
CR 315E
CR 625E
CR 275E
CR 215E
Haster Cemetery
Subsection Breakline A-B
I-69


TAYLOR RIDGE RD
CR 440E
CR 350E
CR 300E
CR 600S
CR 715E
Subsection Breakline B-C
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 3 of 19
Preliminary Alternatives

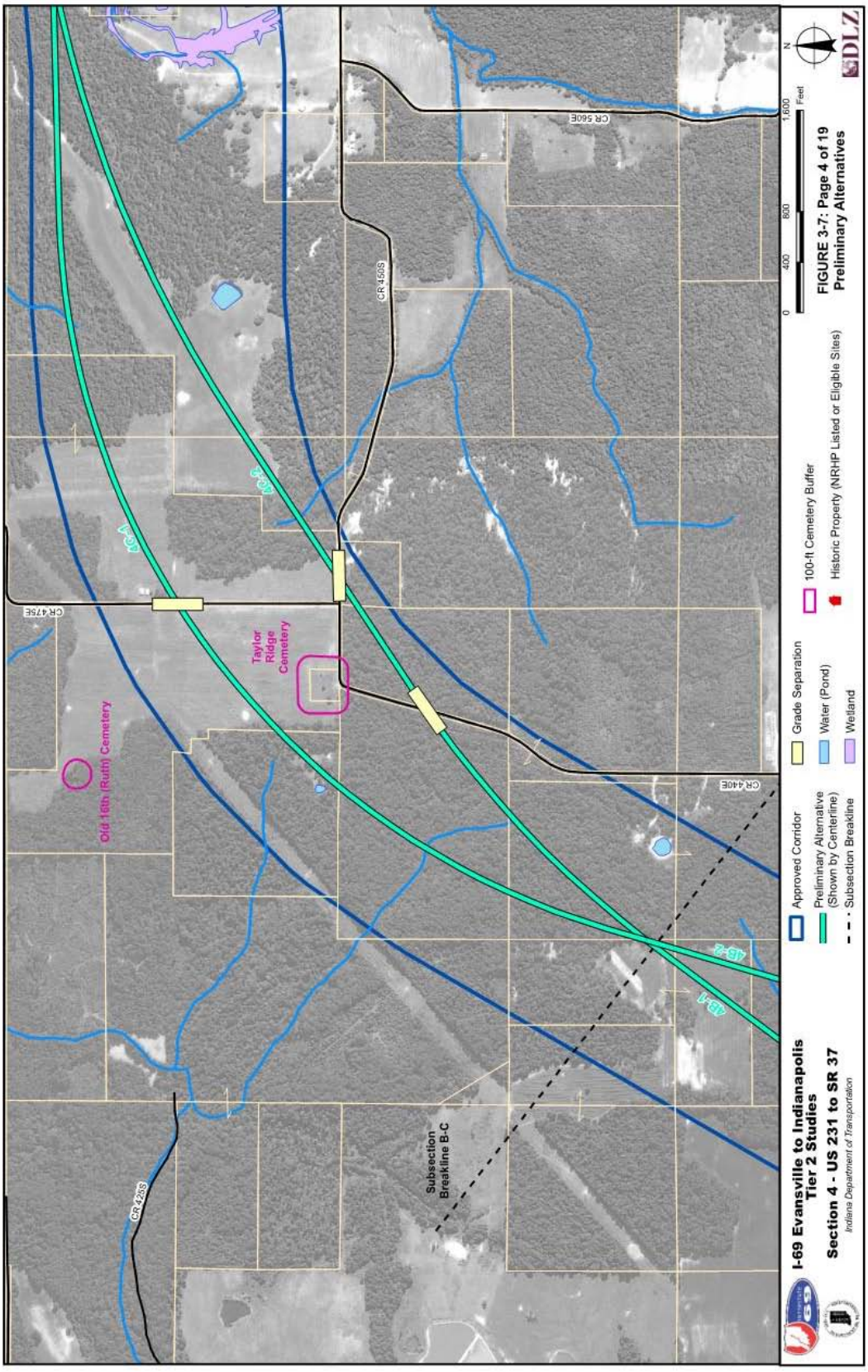
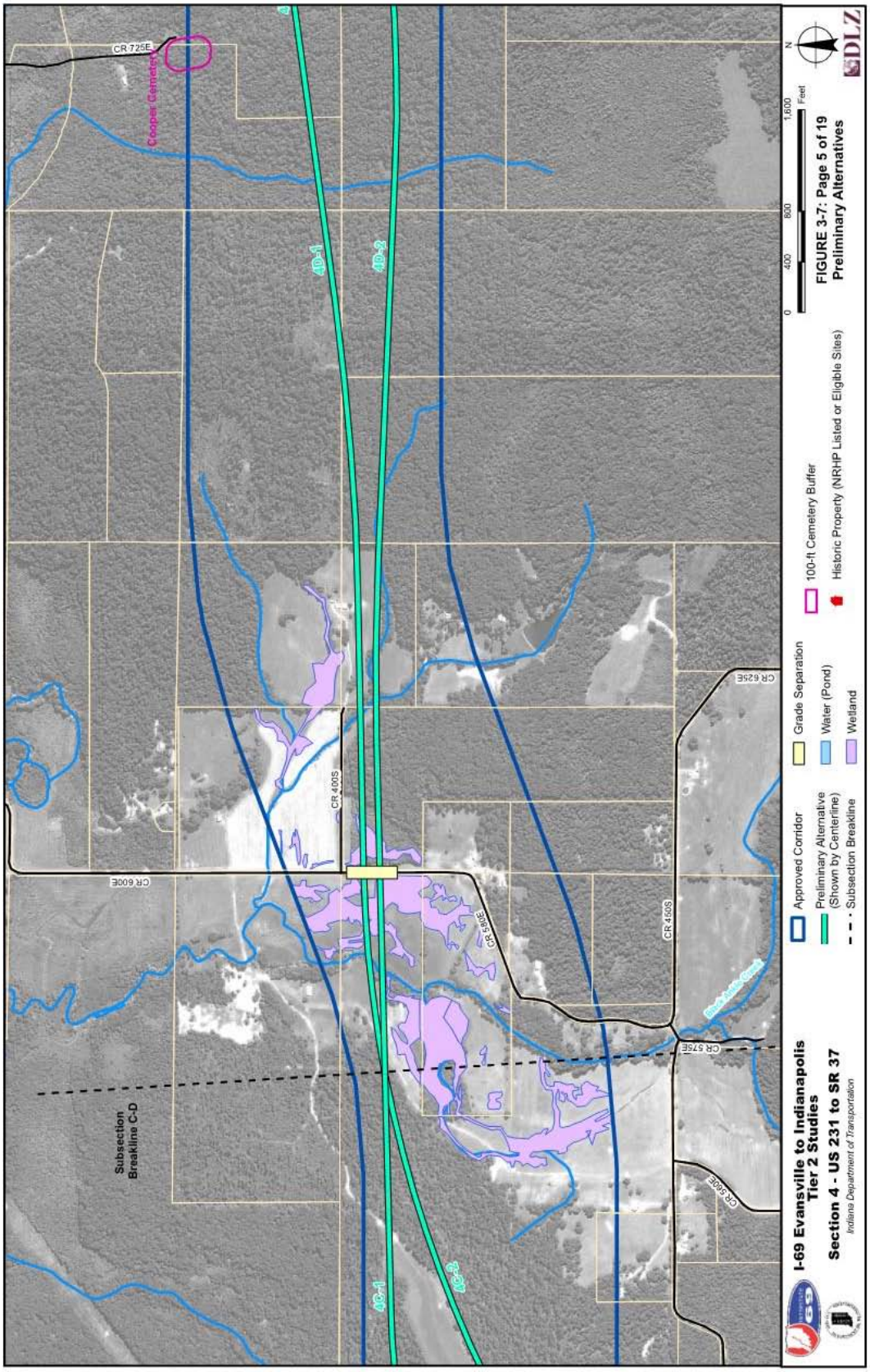


FIGURE 3-7: Page 4 of 19
Preliminary Alternatives
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Taylor Ridge Cemetery
Old 16th (Ruth) Cemetery
Subsection Breakline B-C
CR 560E
CR 456S
CR 476E
CR 440E
CR 428S
4B-2
4B-1
4C-2
4C-1
0
400
800
1,600
Feet
N


CR 725E
Cooper Cemetery
40-1
40-2
CR 625E
CR 400S
CR 600E
CR 500E
CR 400S
CR 575E
Subsection Breakline C-D
40-1
40-2
DLZ
FIGURE 3-7: Page 5 of 19
Preliminary Alternatives
0
400
800
1,600
Feet
N
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Grade Separation
Water (Pond)
Wetland
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

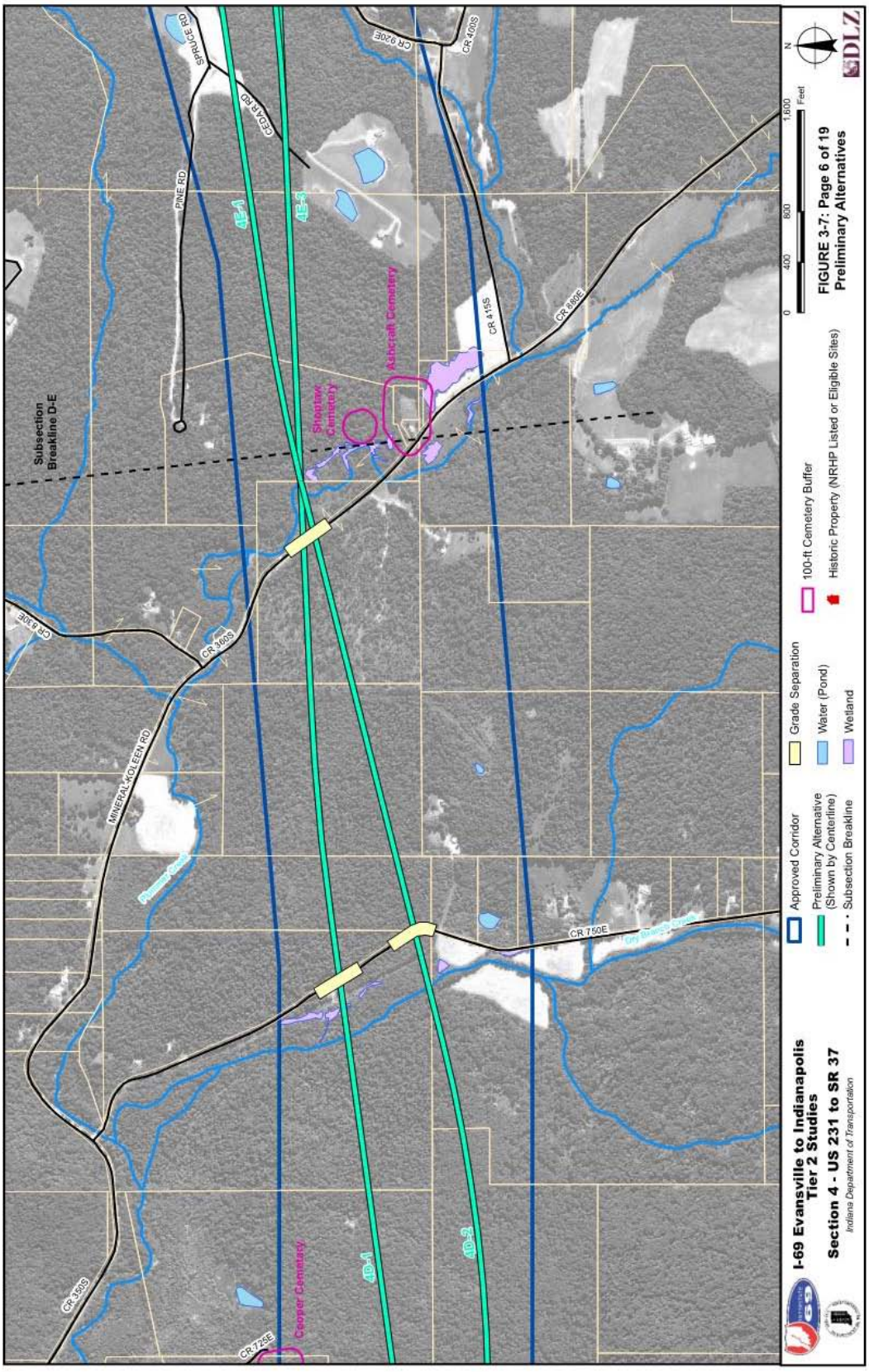
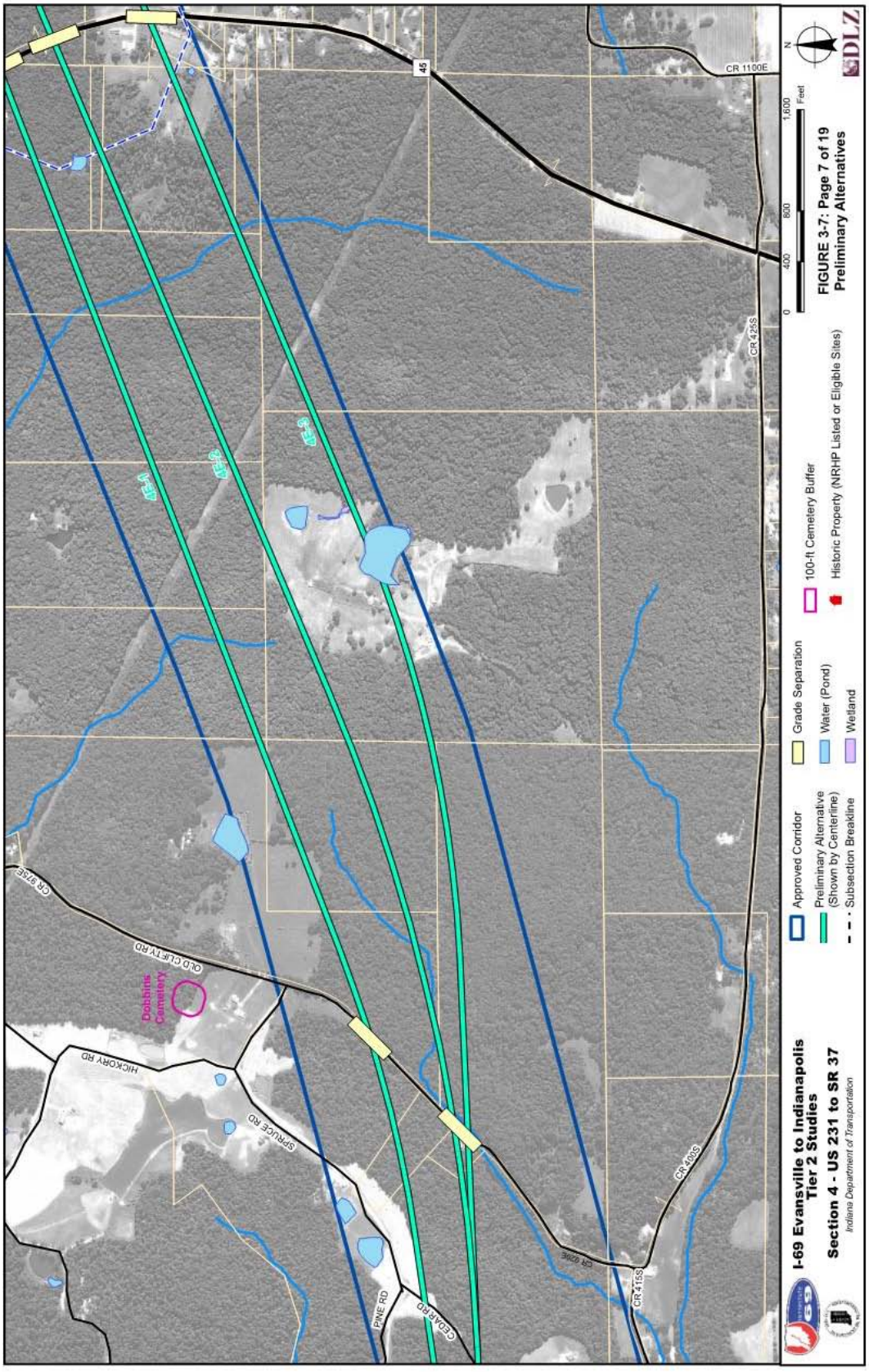
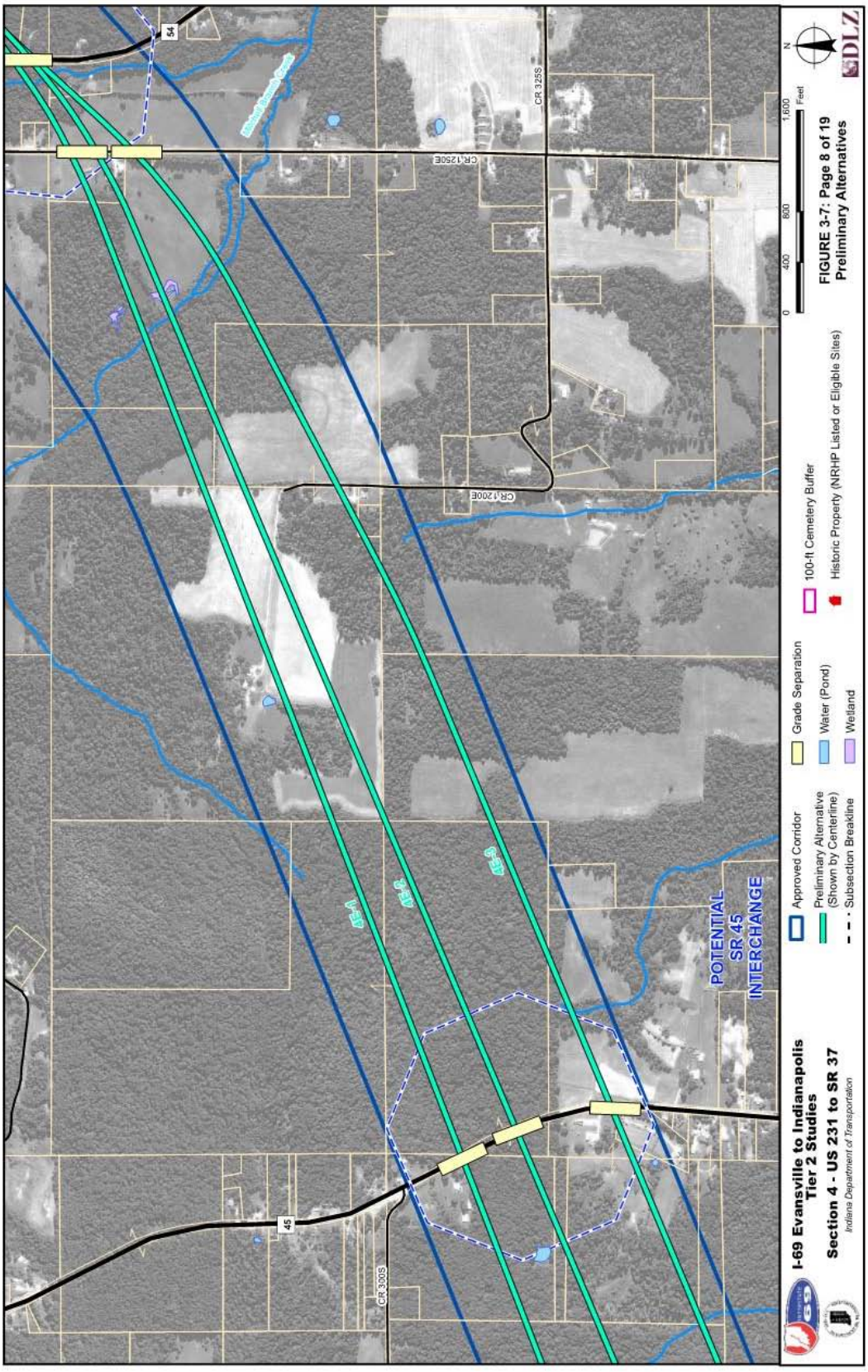
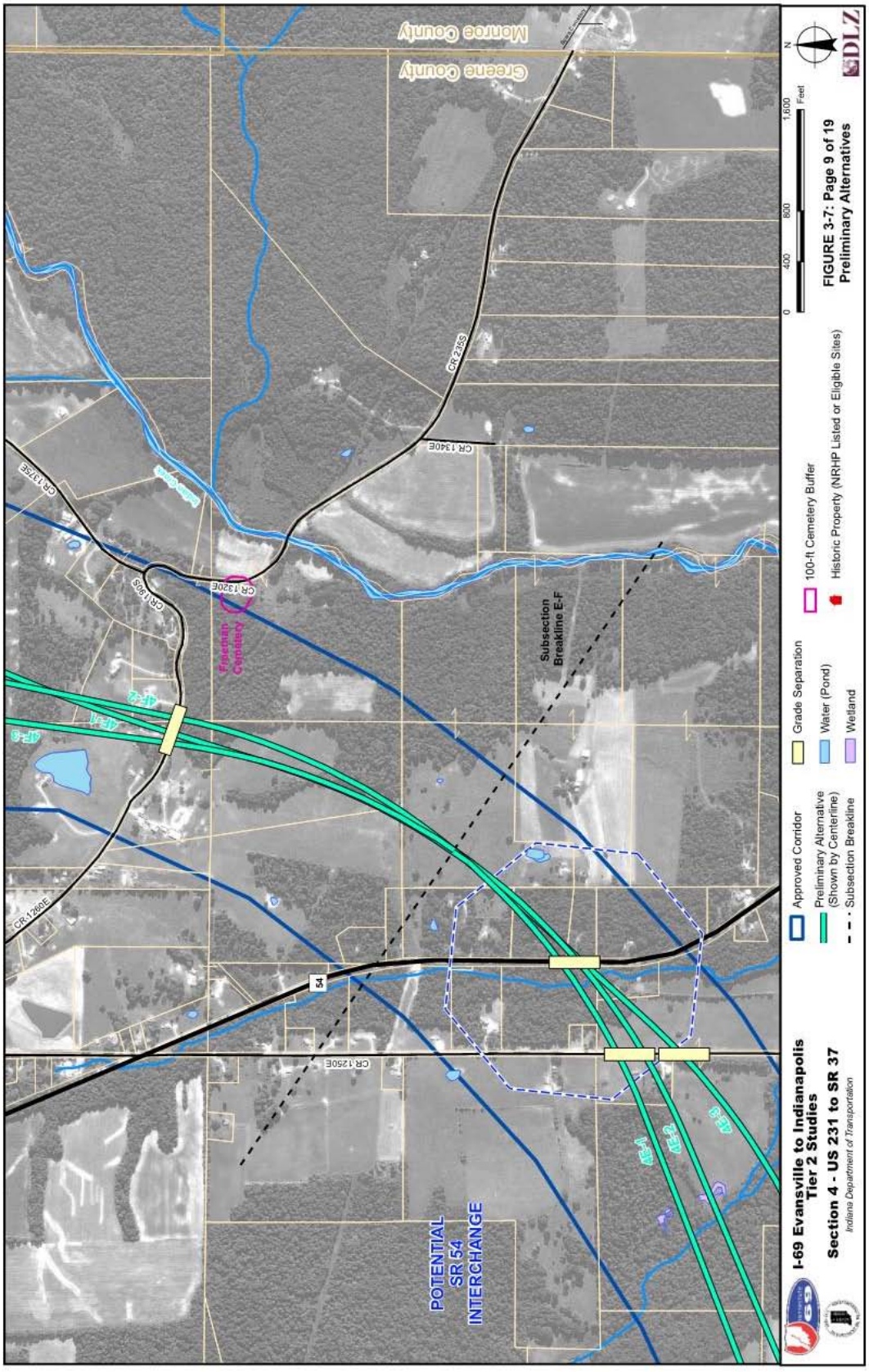
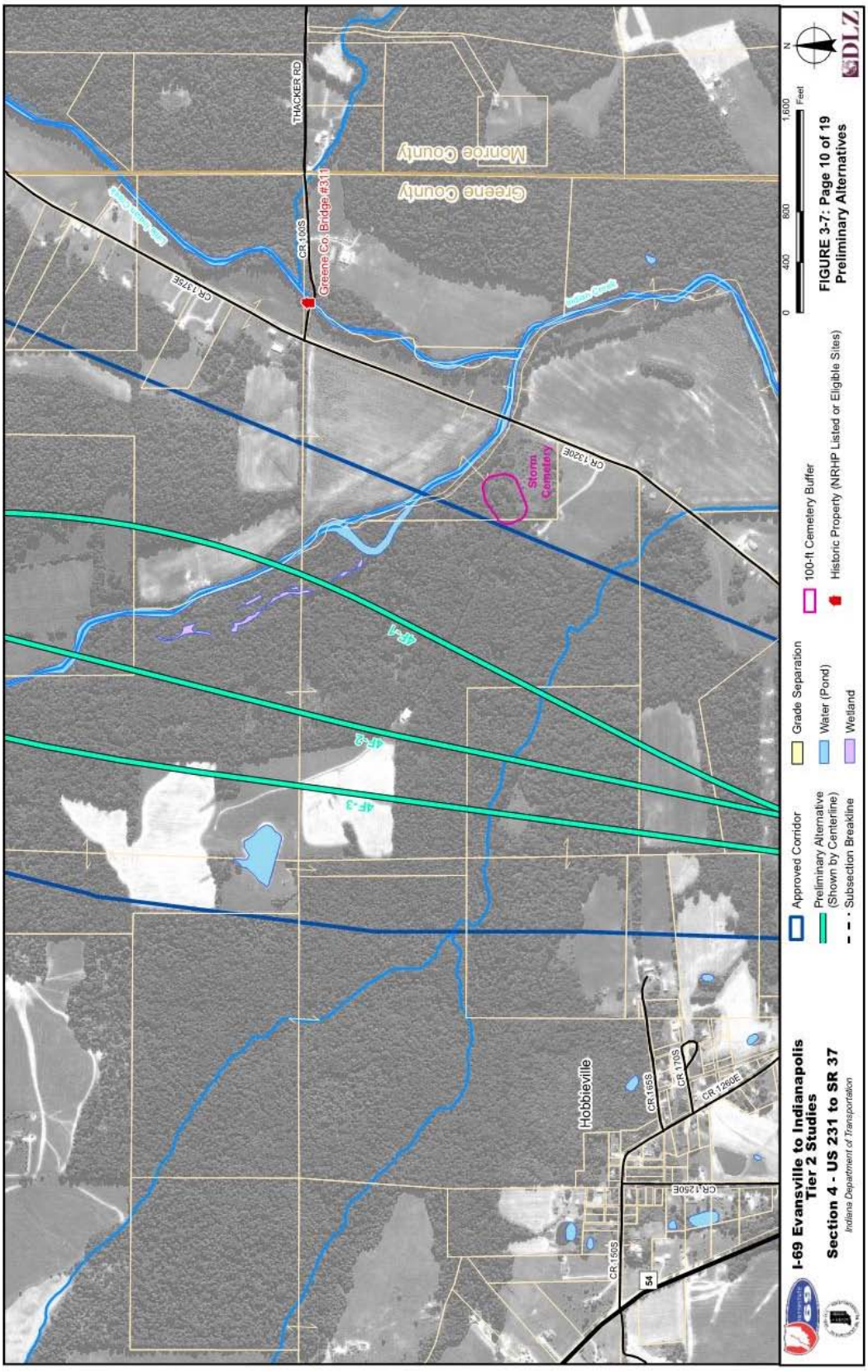


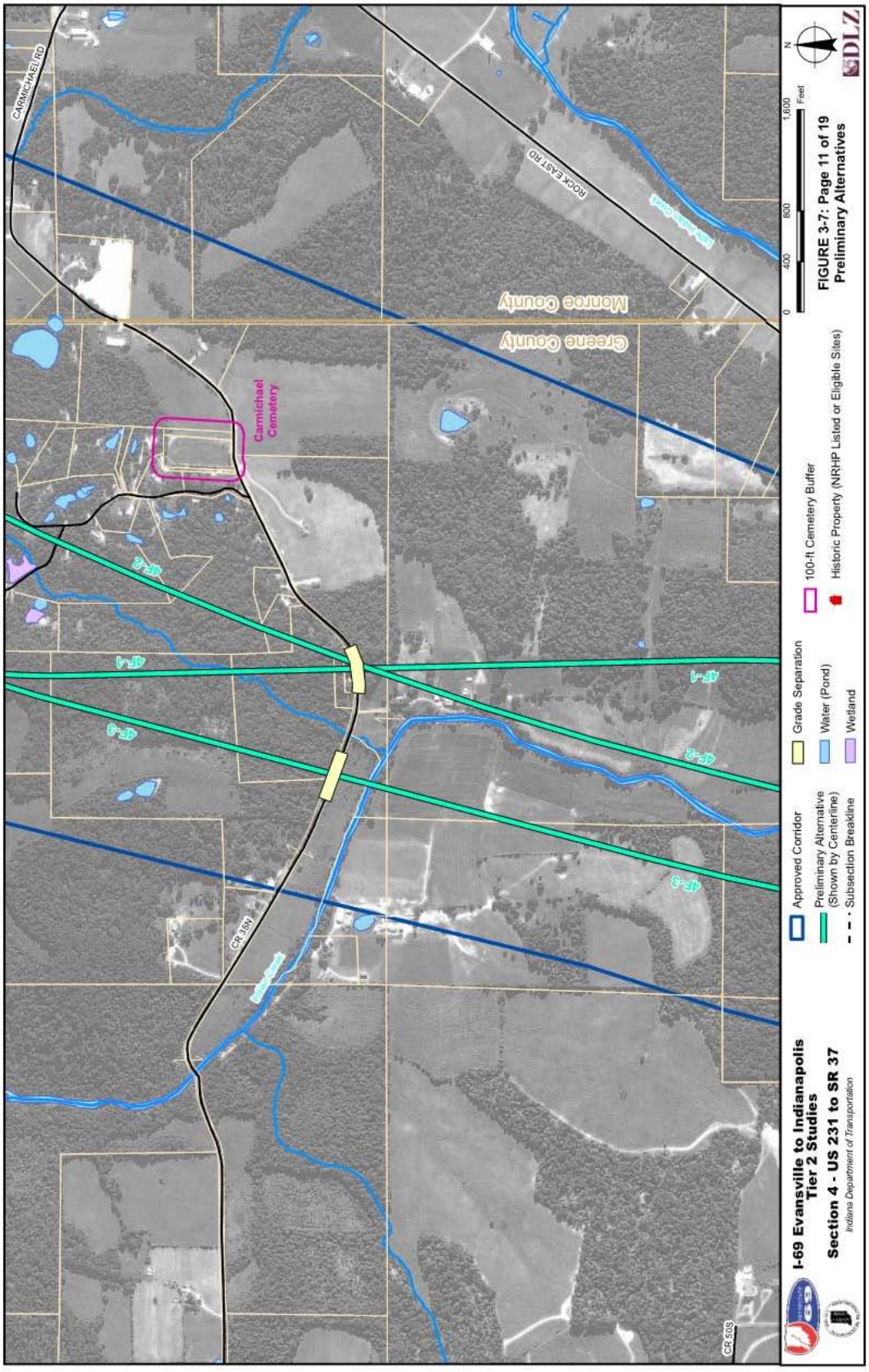
FIGURE 3-7: Page 6 of 19
Preliminary Alternatives
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Subsection Breakline D-E
Shoptaw Cemetery
Ashcraft Cemetery
Copper Cemetery
4E-1
4E-3
4D-1
4D-2
SPRUCE RD
CEDAR RD
PINE RD
CR 920E
CR 400S
CR 415S
CR 880E
CR 830E
CR 360S
MINERAL-KOLEEN RD
CR 750E
CR 350S
CR 125E
Feet
0
400
800
1,600
N

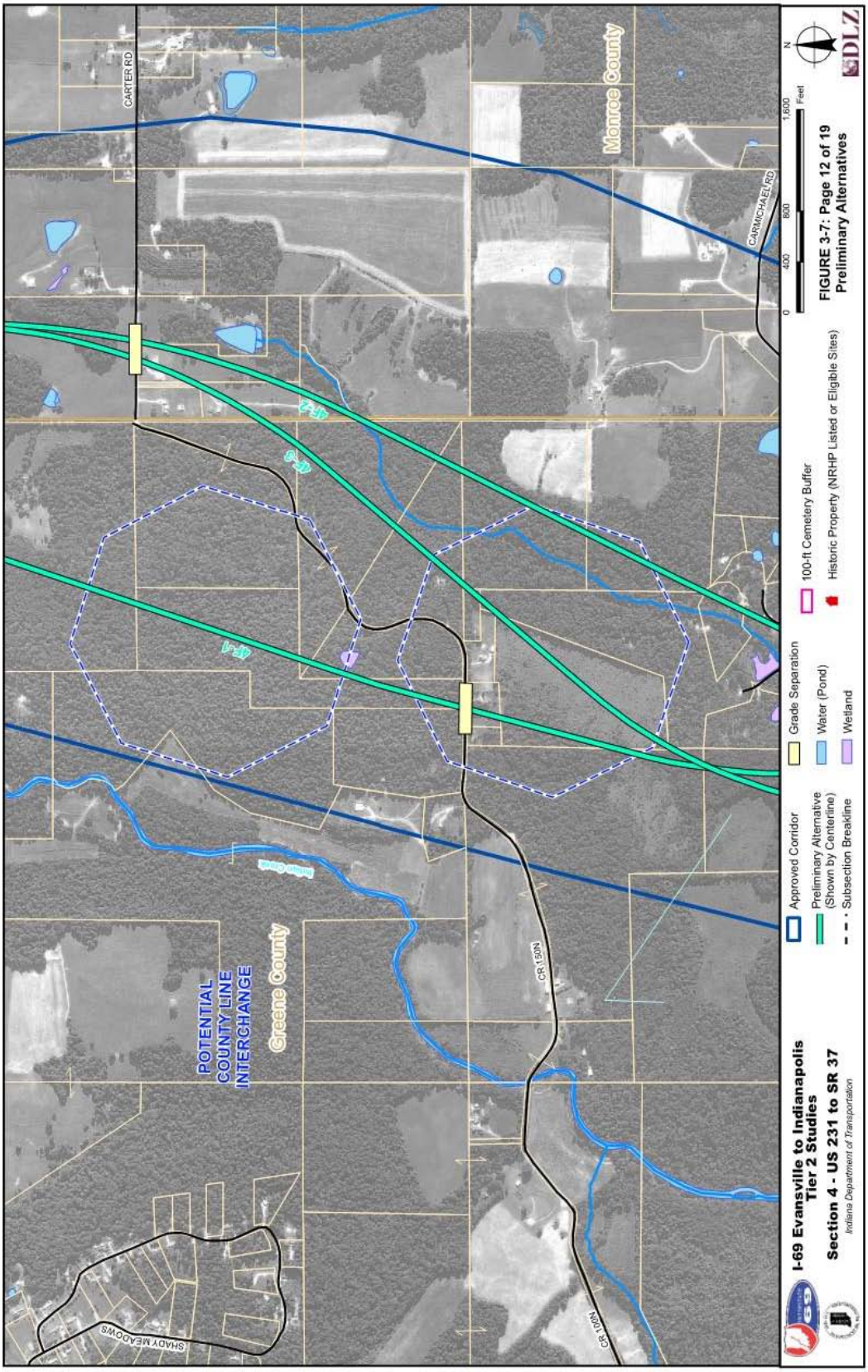

45
CR 1100E
CR 425S
CR 375E
OLD CEMETERY RD
Dobbins Cemetery
HICKORY RD
SPRUCE RD
PINE RD
CEDAR RD
CR 400S
SR 62NE
CR 415S
N
1,600
800
400
0
Feet
DLZ
FIGURE 3-7: Page 7 of 19
Preliminary Alternatives
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

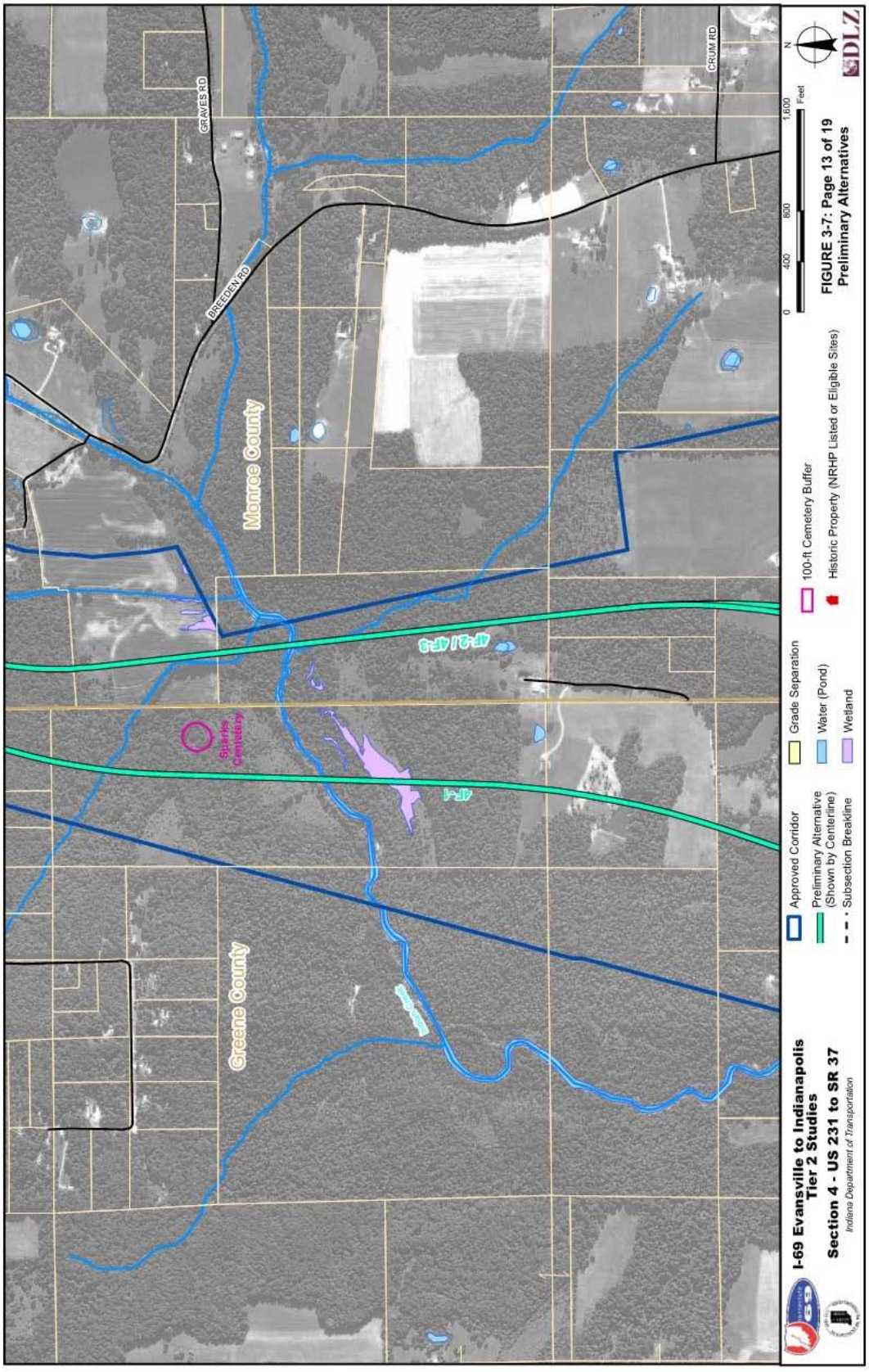

54
45
CR 325S
CR 1250E
CR 1200E
CR 300S
POTENTIAL SR 45 INTERCHANGE
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 8 of 19
Preliminary Alternatives


Monroe County
Greene County
CR 2350
CR 1340E
CR 1320E
CR 1260E
CR 1300S
Freetown Cemetery
Subsection Breakline E-F
CR 1250E
54
POTENTIAL SR 54 INTERCHANGE
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 9 of 19
Preliminary Alternatives
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


THACKER RD
Monroe County
Greene County
CR 100S
Greene Co. Bridge #311
CR 1376E
Indian Creek
CR 1320E
Storm Cemetery
AP-4
AP-2
AP-3
Hobbieville
CR 165S
CR 170S
CR 1260E
CR 250E
CR 150S
54
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 10 of 19
Preliminary Alternatives


CARMICHAEL RD
ROCK EAST RD
Monroe County
Greene County
Carmichael Cemetery
AF-1
AF-2
AF-3
CR 35N
CR 50S
FIGURE 3-7: Page 11 of 19
Preliminary Alternatives
0
400
800
1,600
Feet
N
DLZ
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


CARTER RD
Monroe County
CARMICHAEL RD
POTENTIAL COUNTY LINE INTERCHANGE
Greene County
CR 150N
CR 100W
SHADY MEADOWS
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-7: Page 12 of 19
Preliminary Alternatives


GRAVES RD
BREEDEN RD
CRUM RD
Monroe County
Greene County
Sparks Cemetery
AP-2 / AP-3
AP-1
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 13 of 19
Preliminary Alternatives
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

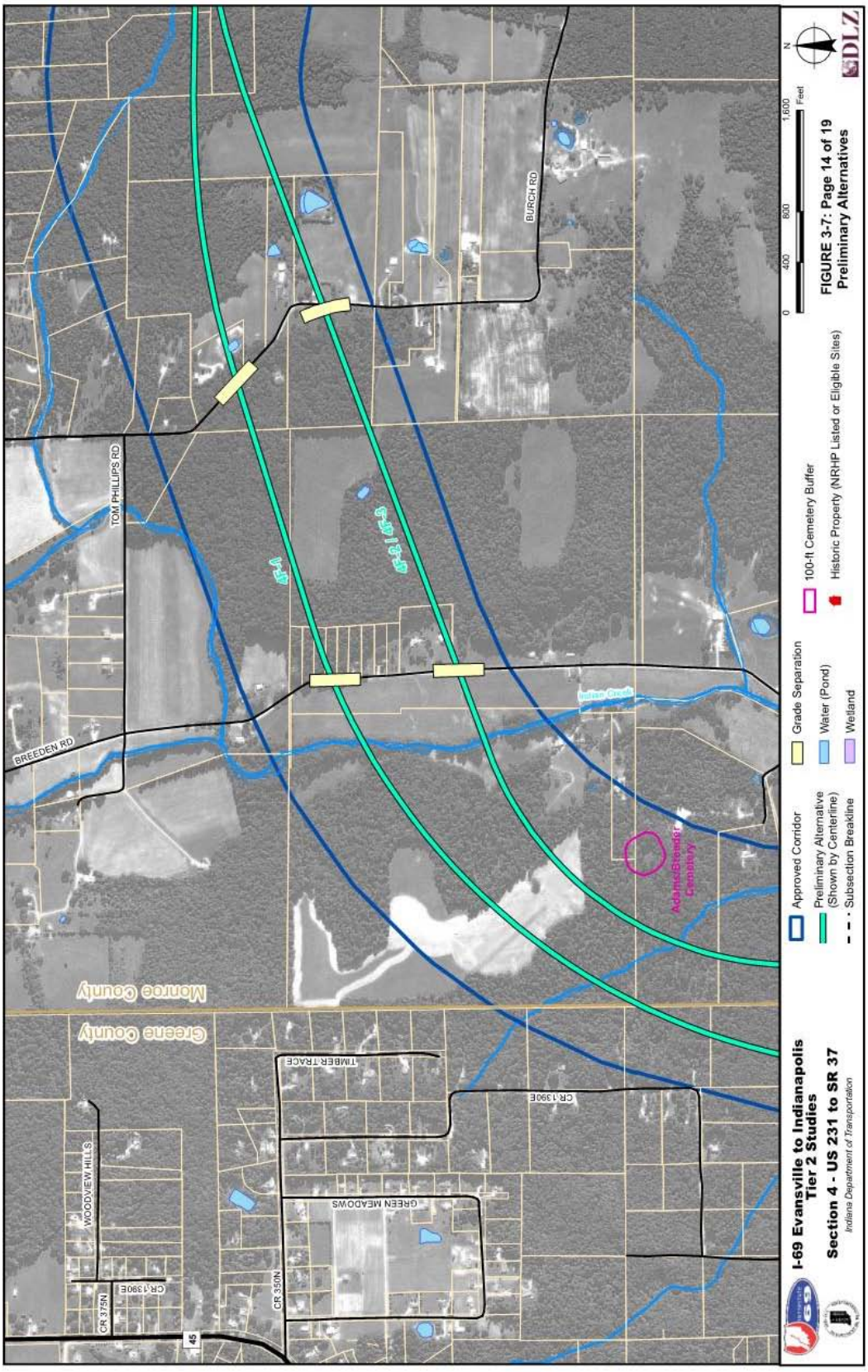
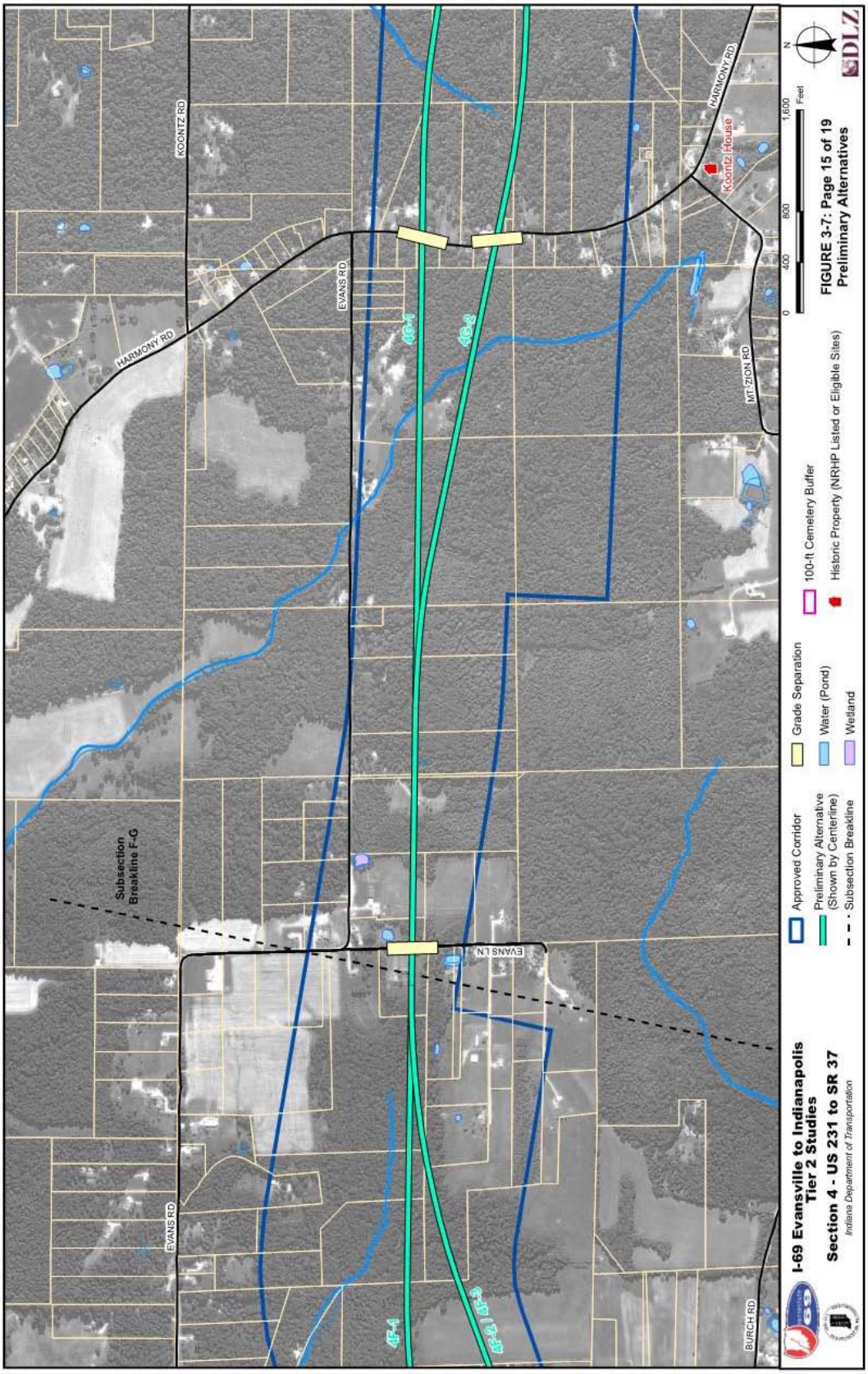
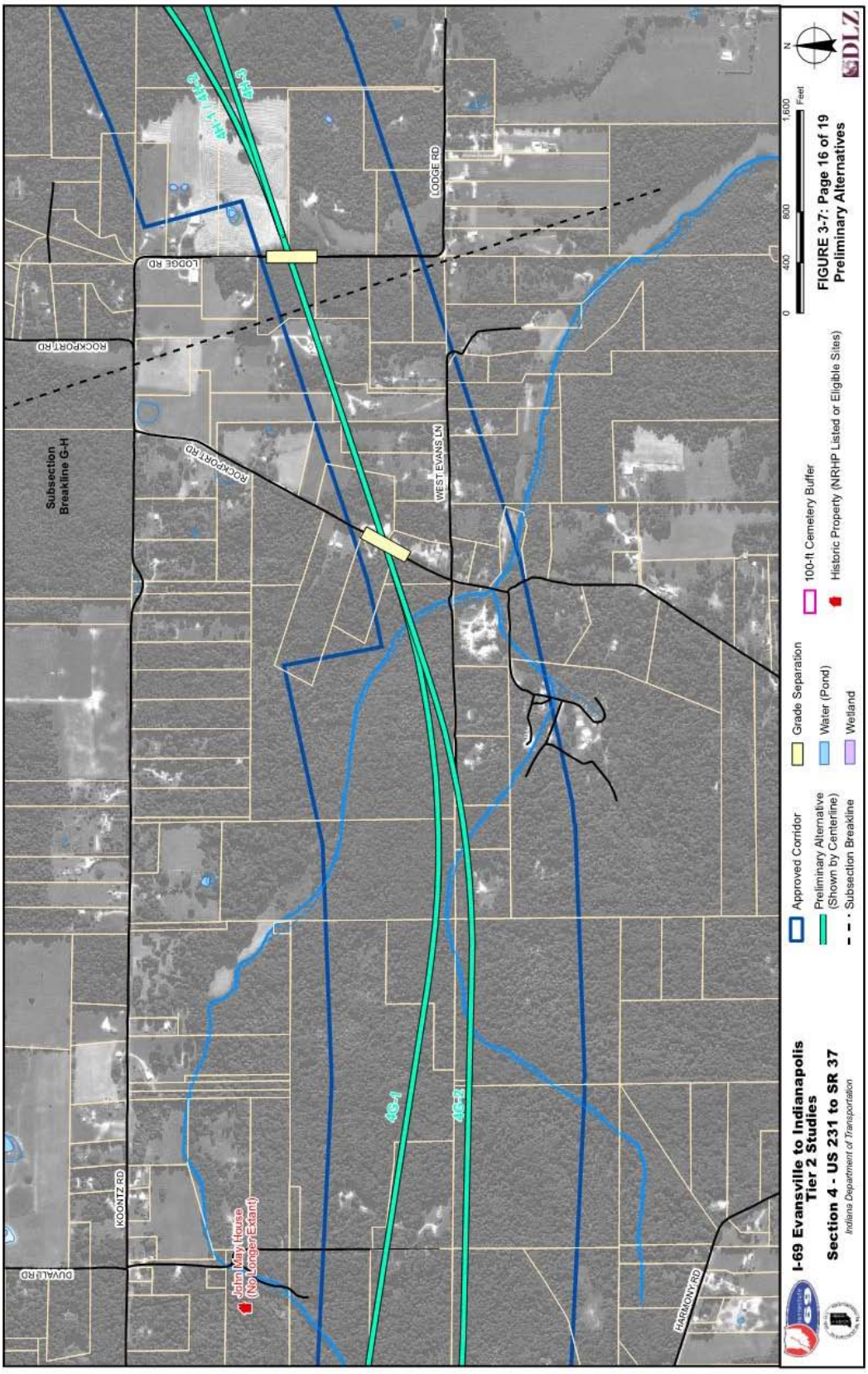
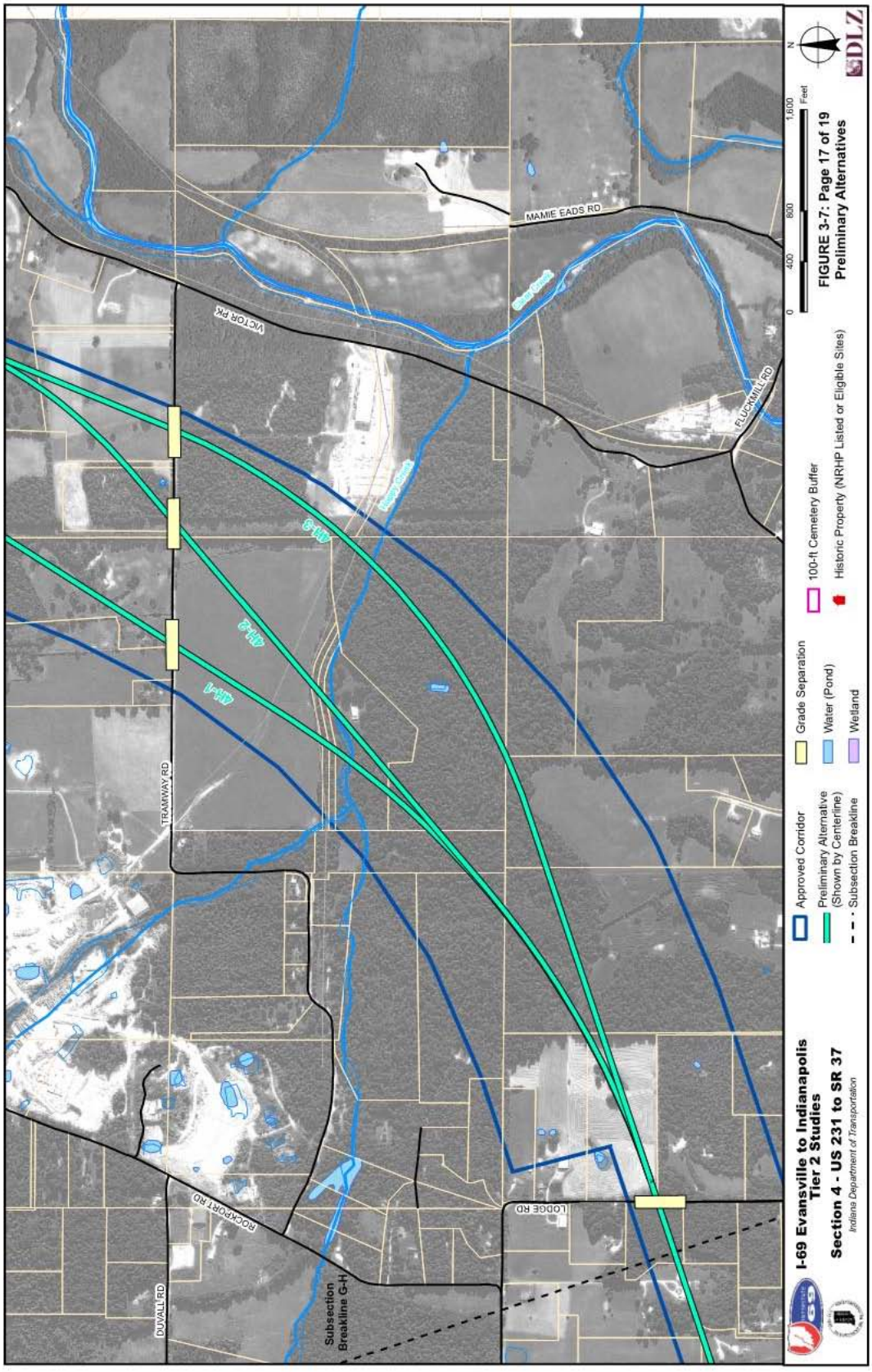
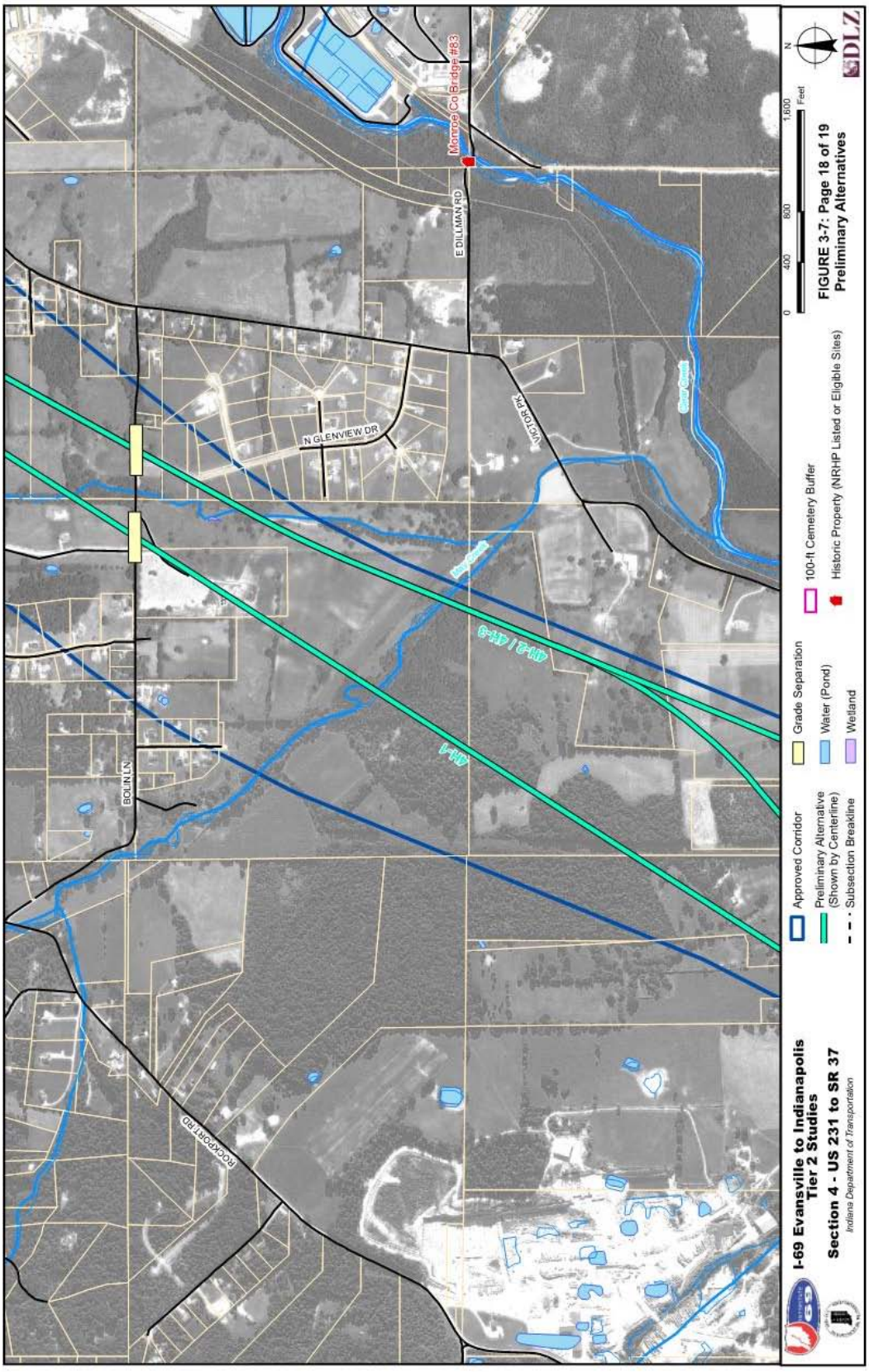


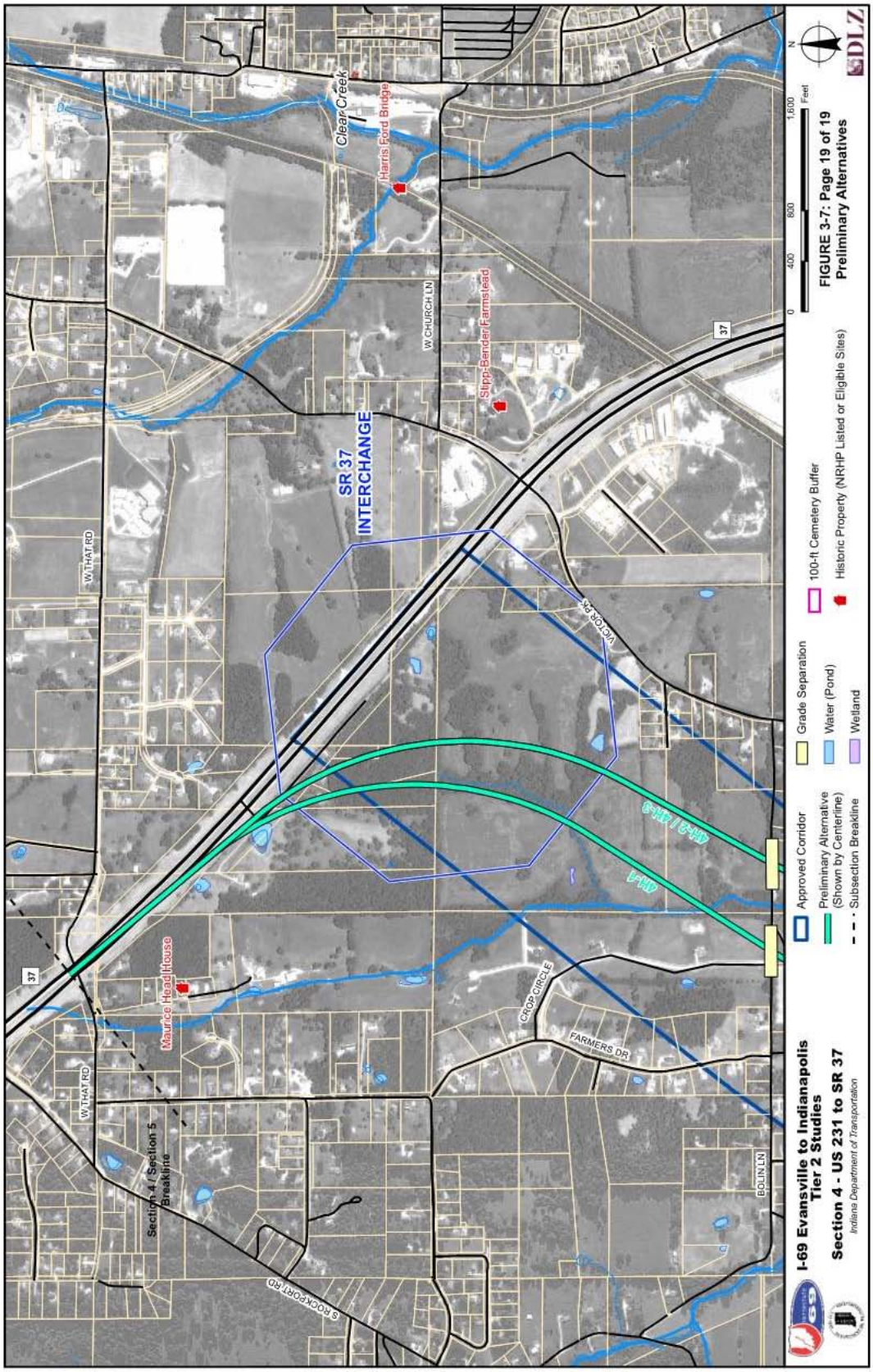
FIGURE 3-7: Page 14 of 19
Preliminary Alternatives
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
I-69
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indian Creek
Adams/Stender Cemetery
Monroe County
Greene County
TIMBER TRACE
CR 1390E
GREEN MEADOWS
WOODVIEW HILLS
CR 375N
CR 350N
45

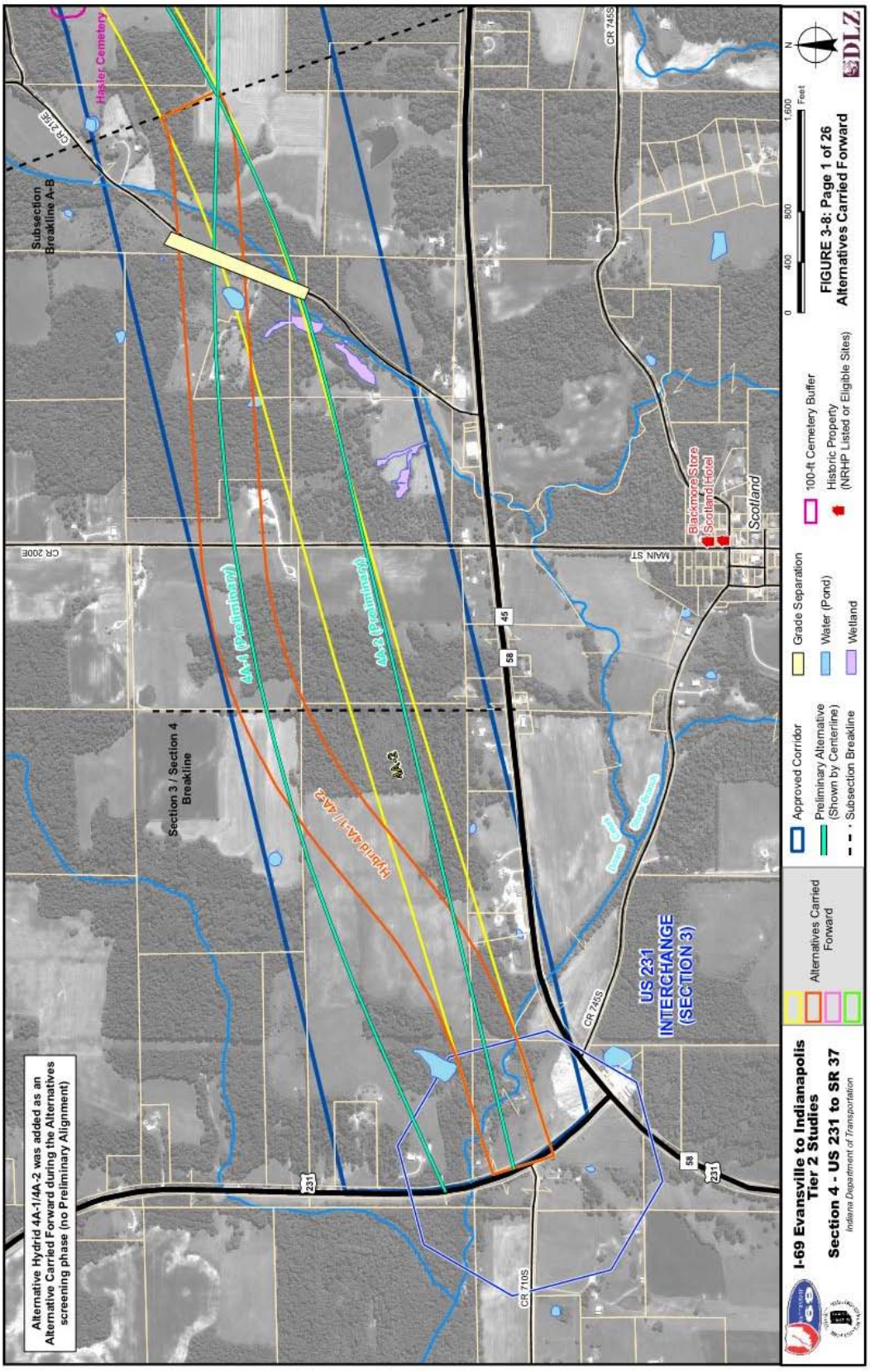

KOONTZ RD
HARMONY RD
EVANS RD
HARMONY RD
Koontz House
MT ZION RD
Subsection Breakline F-G
EVANS LN
EVANS RD
BURCH RD
4F-1
4G-1
4G-2
4F-2
4F-3
N
Feet
0
400
800
1,600
DLZ
FIGURE 3-7: Page 15 of 19
Preliminary Alternatives
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


LODGE RD
ROCKPORT RD
WEST EVANS LN
Subsection Breakline G-H
KOONTZ RD
DUVALL RD
John May House (No Longer Extant)
HARMONY RD
AC-1
AC-2
AC-3
AC-4
SR-1
SR-2
SR-3
SR-4
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 16 of 19
Preliminary Alternatives


MAMIE EADS RD
VICTOR PK
FLUCKHILL RD
TRAMWAY RD
ROCKPORT RD
DUVALL RD
LODGE RD
Subsection Breakline G-H
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 17 of 19
Preliminary Alternatives


Monroe Co Bridge #83
E DILLMAN RD
N GLENVIEW DR
VICTOR PK
Stony Creek
BOLIN LN
ROCKPOINT RD
I-69
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative
(Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-7: Page 18 of 19
Preliminary Alternatives


Clear Creek
Harris Ford Bridge
W CHURCH LN
Stipp-Bender Farmstead
SR 37
INTERCHANGE
W THAT RD
VICTOR PK
Maurice Headhouse
CROP CIRCLE
FARMERS DR
BOLIN LN
S ROCKPORT RD
Section 4 / Section 5 Breakline
37
AH-3 / AH-4
AH-4
FIGURE 3-7: Page 19 of 19
Preliminary Alternatives
0
400
800
1,600
Feet
N
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)


Hasler Cemetery
CR 216E
Subsection Breakline A-B
CR 745S
CR 200E
MAIN ST
Blackmore Store
Scotland Hotel
Scotland
4A-1 (Preliminary)
4A-2 (Preliminary)
45
58
Section 3 / Section 4 Breakline
4A-3
Hybrid 4A-1 / 4A-2
US 231 INTERCHANGE (SECTION 3)
CR 745S
231
58
231
CR 710S
Alternative Hydrid 4A-1/4A-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 1 of 26
Alternatives Carried Forward

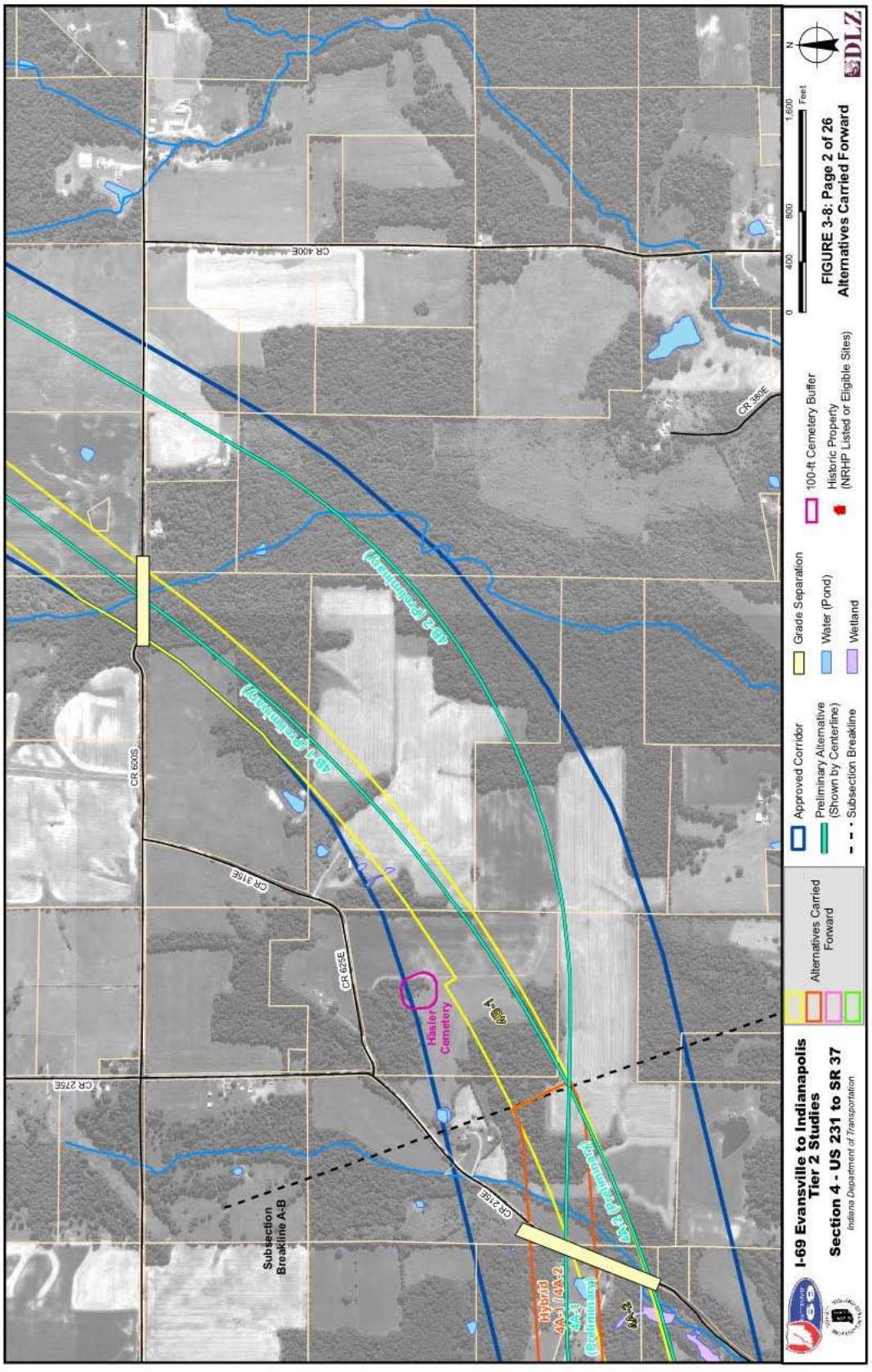


FIGURE 3-8: Page 2 of 26
Alternatives Carried Forward
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Hasler Cemetery
Subsection Breakline A-B
CR 400E
CR 380E
CR 600S
CR 315E
CR 625E
CR 275E
CR 215E
0
400
800
1,600
Feet

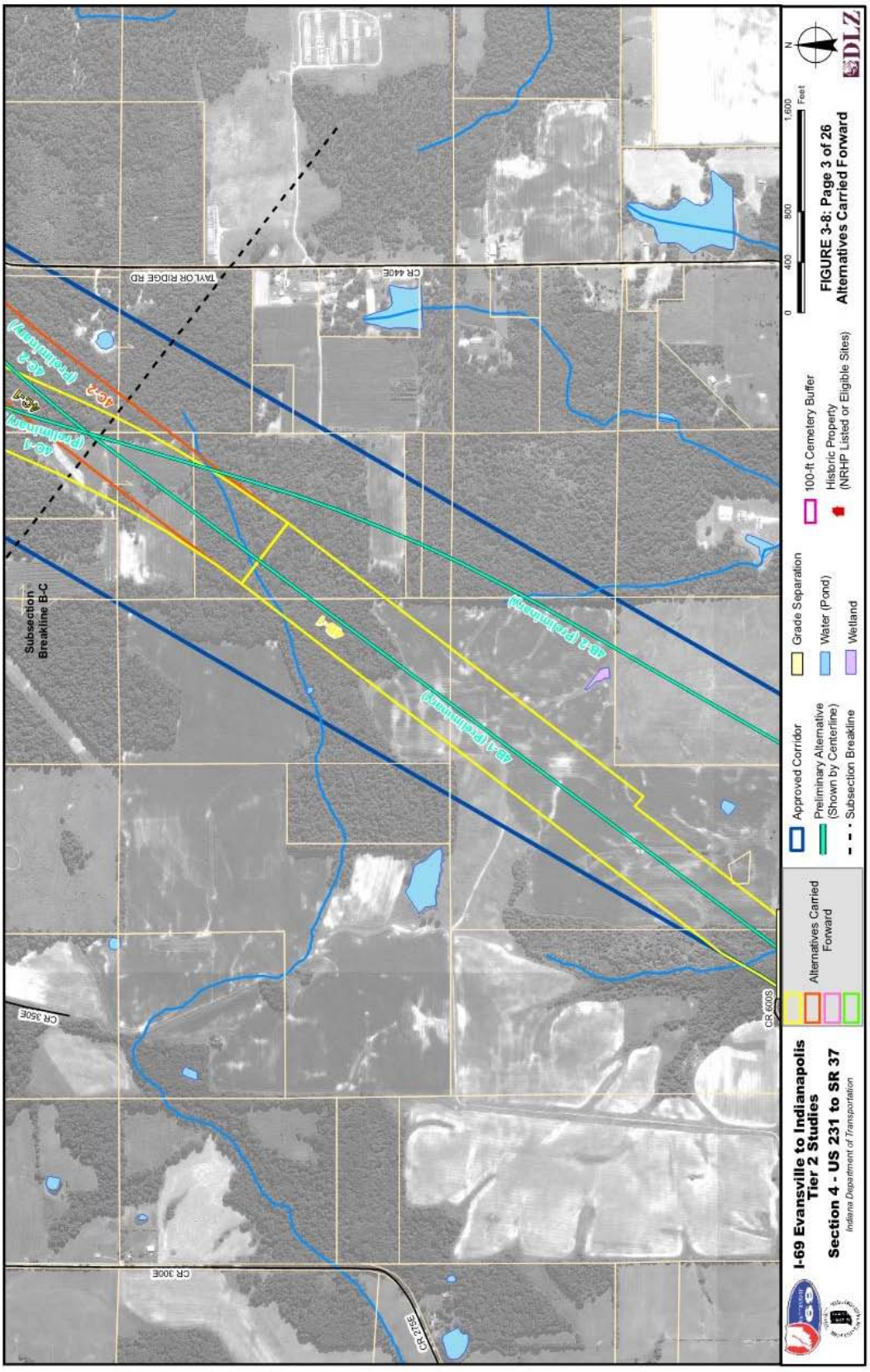


FIGURE 3-8: Page 3 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Subsection Breakline B-C
TAYLOR RIDGE RD
CR 440E
CR 360E
CR 300E
CR 240E
CR 600S
AC-1 Preliminary
AC-2 Preliminary
AB-1 Preliminary
AB-2 Preliminary
0
400
800
1,600
Feet
N

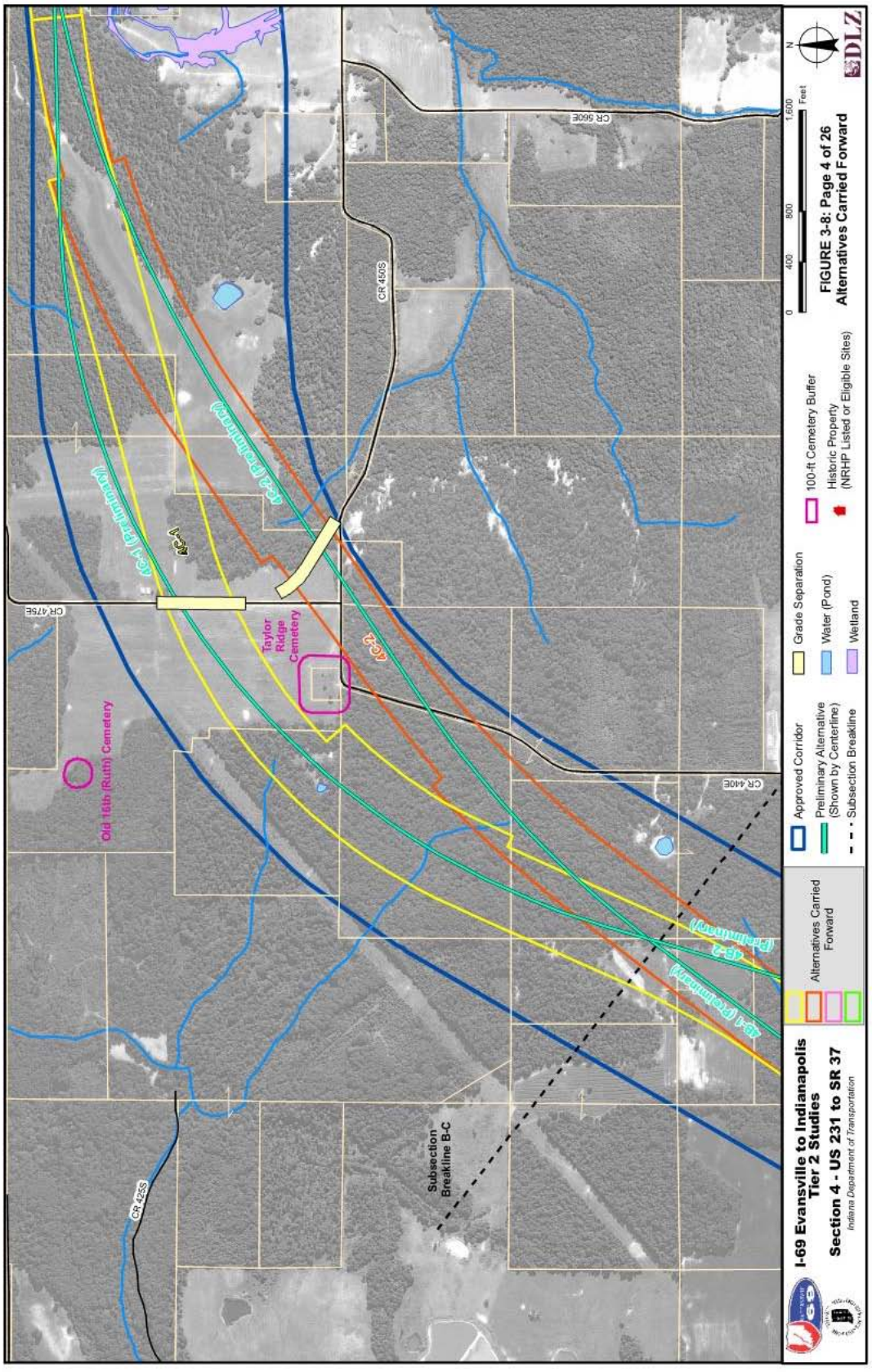
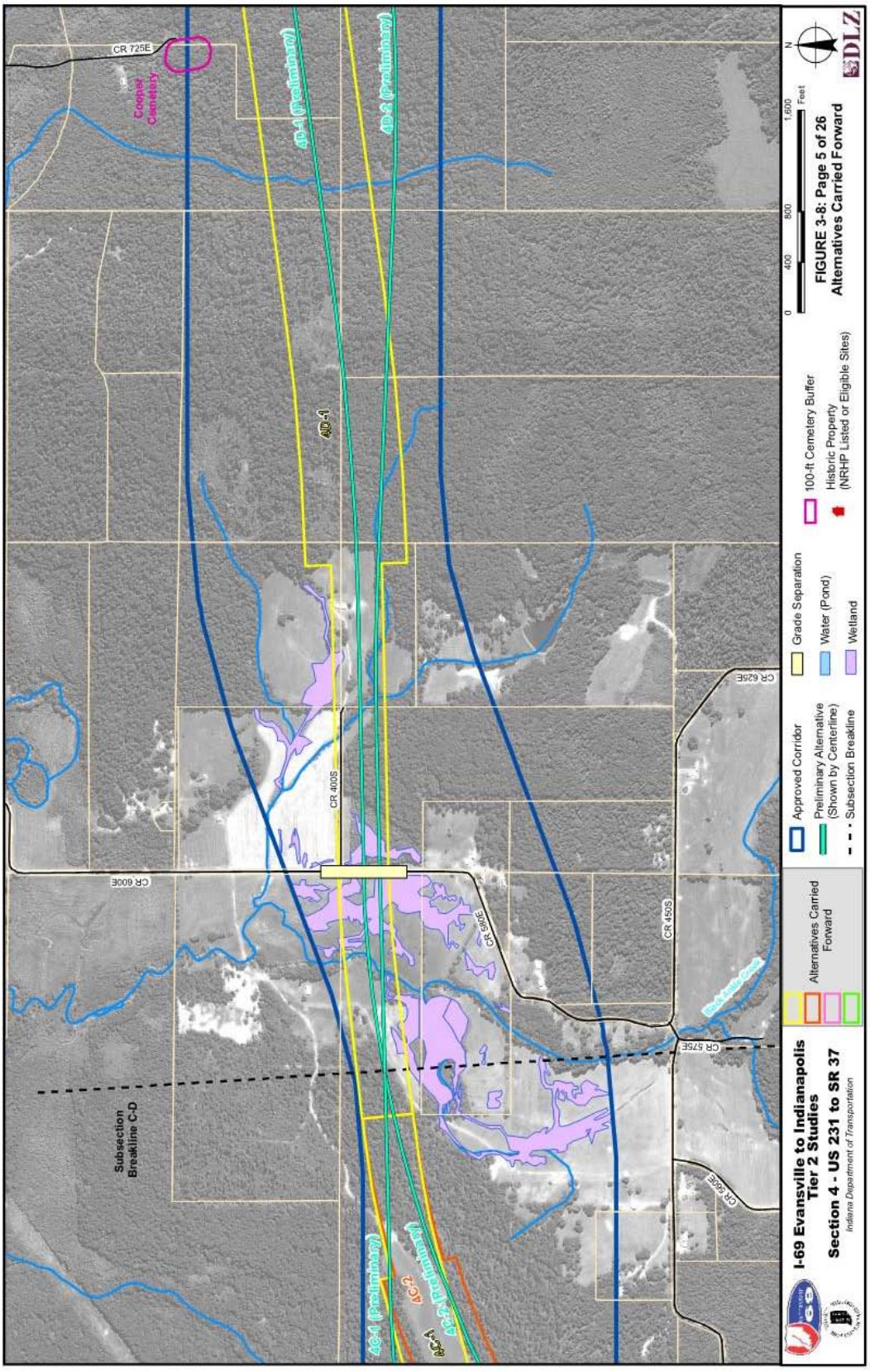
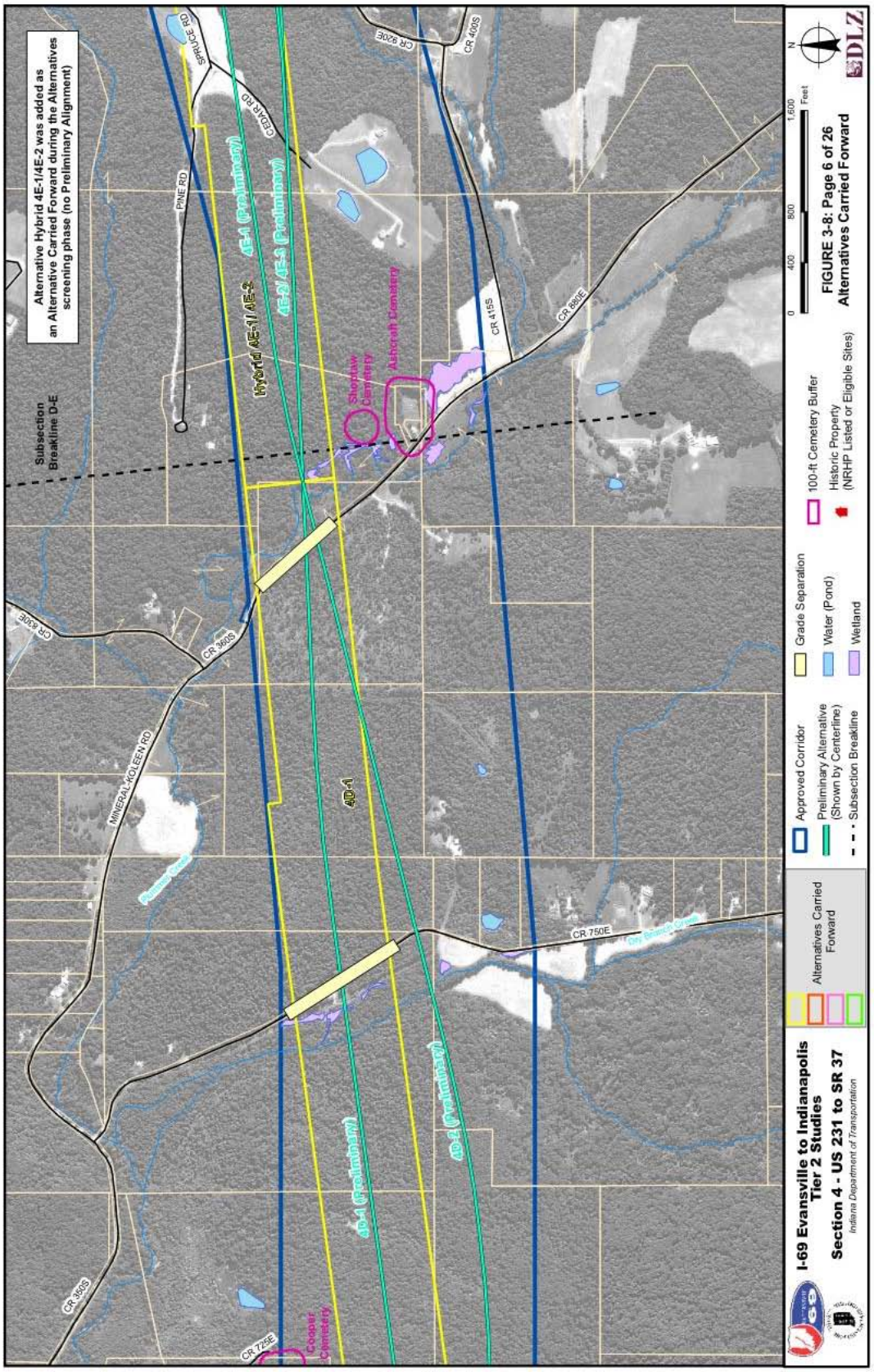
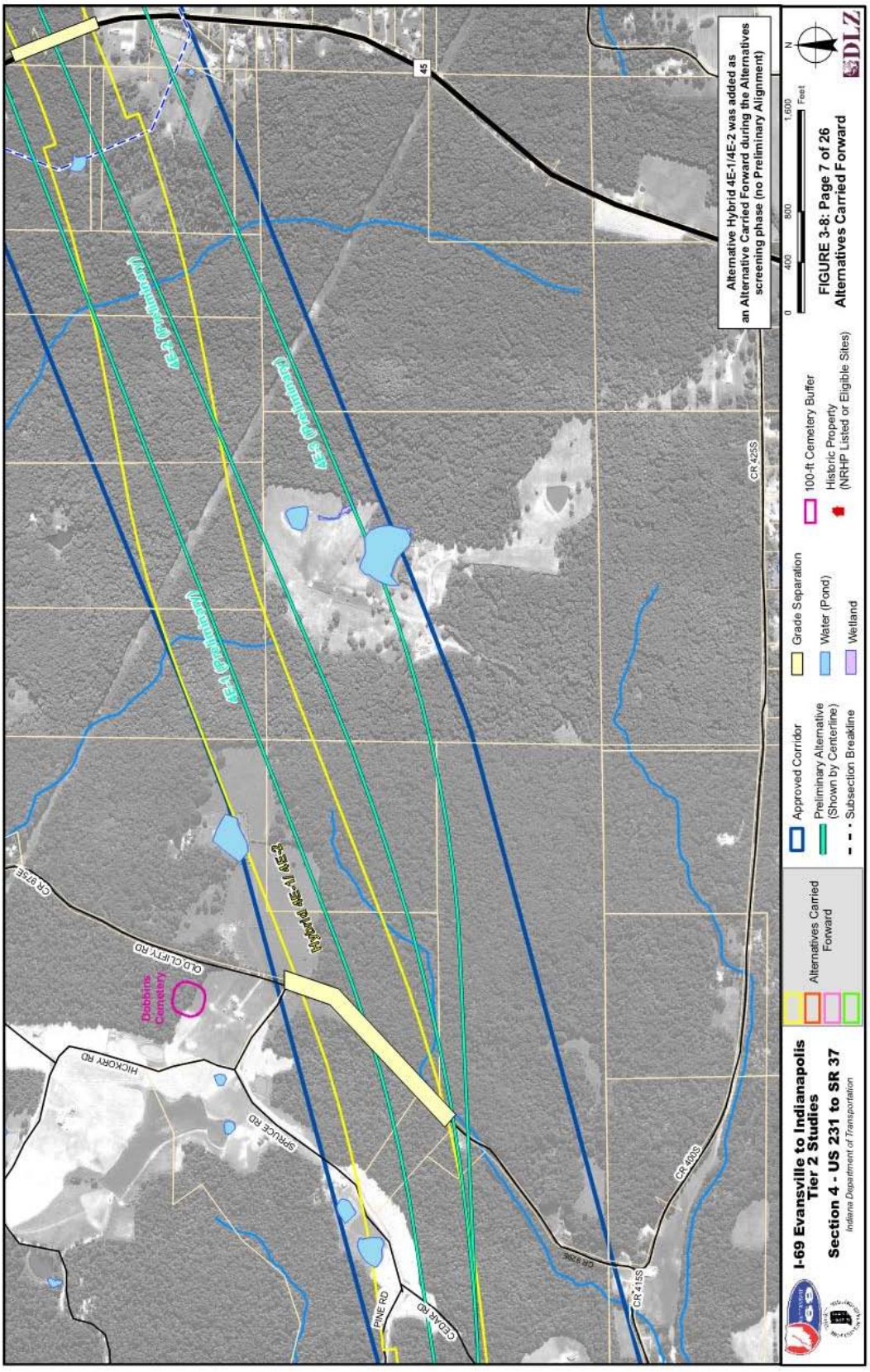
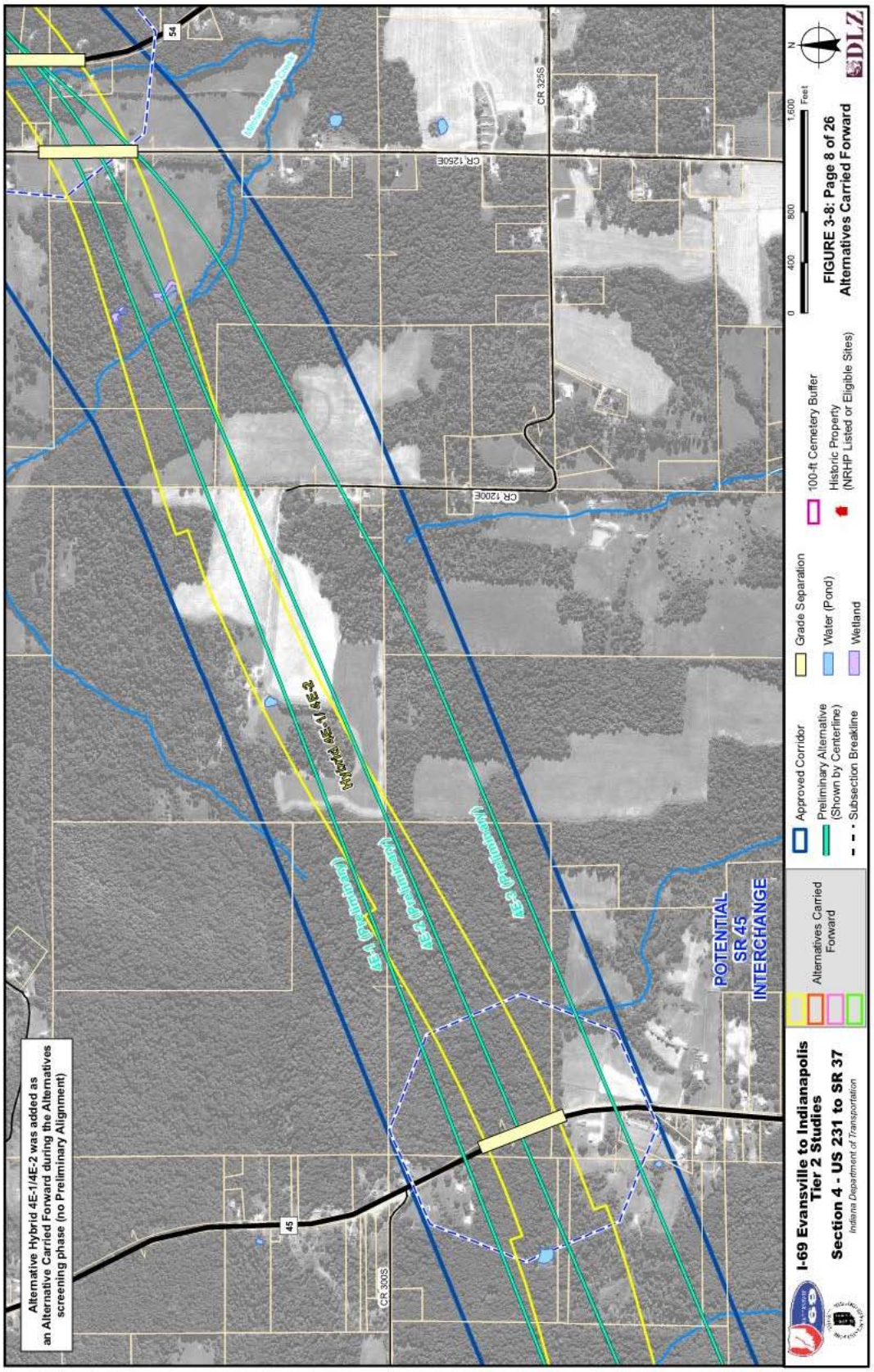


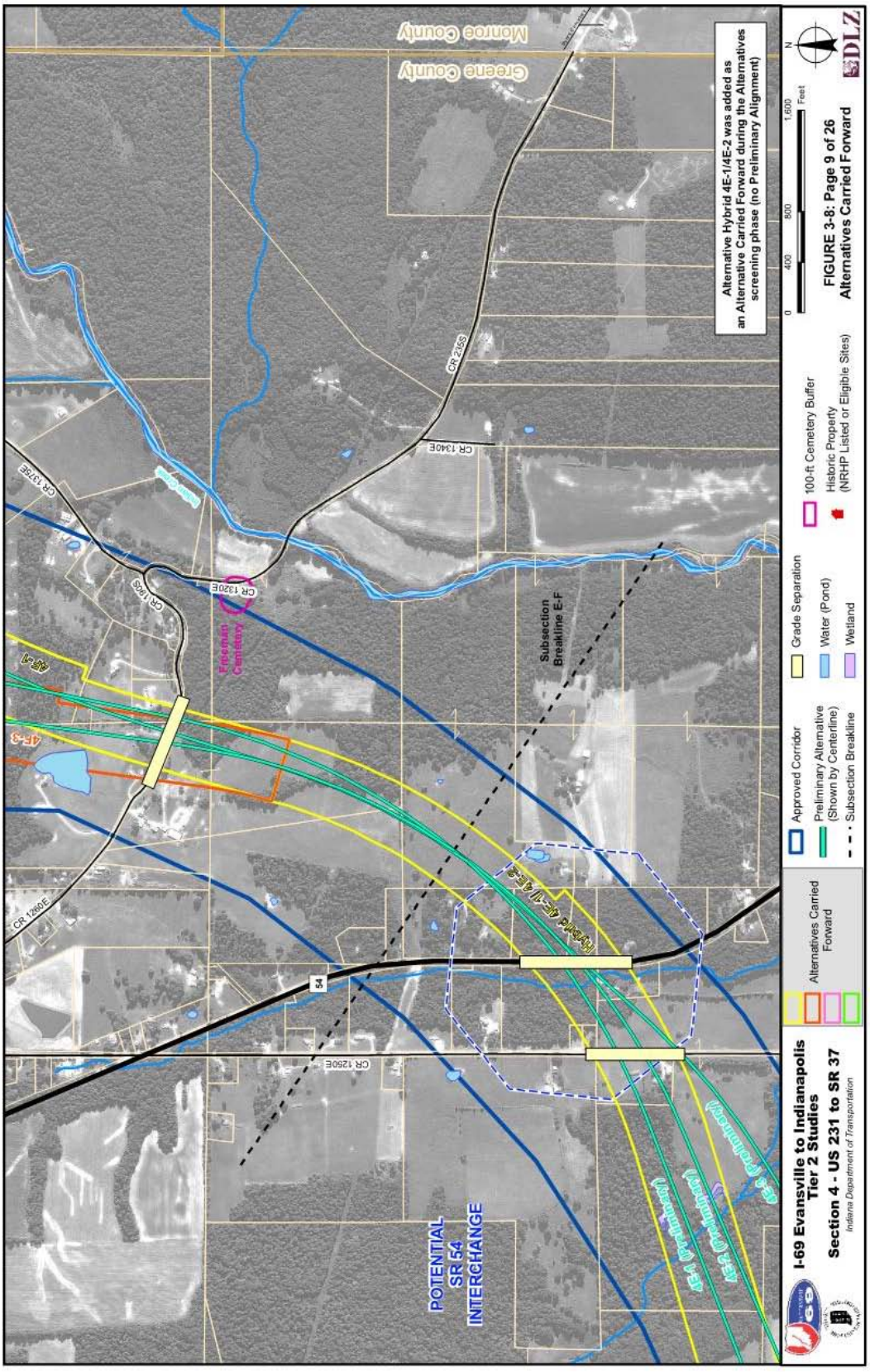
FIGURE 3-8: Page 4 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Taylor Ridge Cemetery
Old 16th (Ruth) Cemetery
Subsection Breakline B-C
CR 450S
CR 475E
CR 440E
CR 425S
CR 560E
DLZ

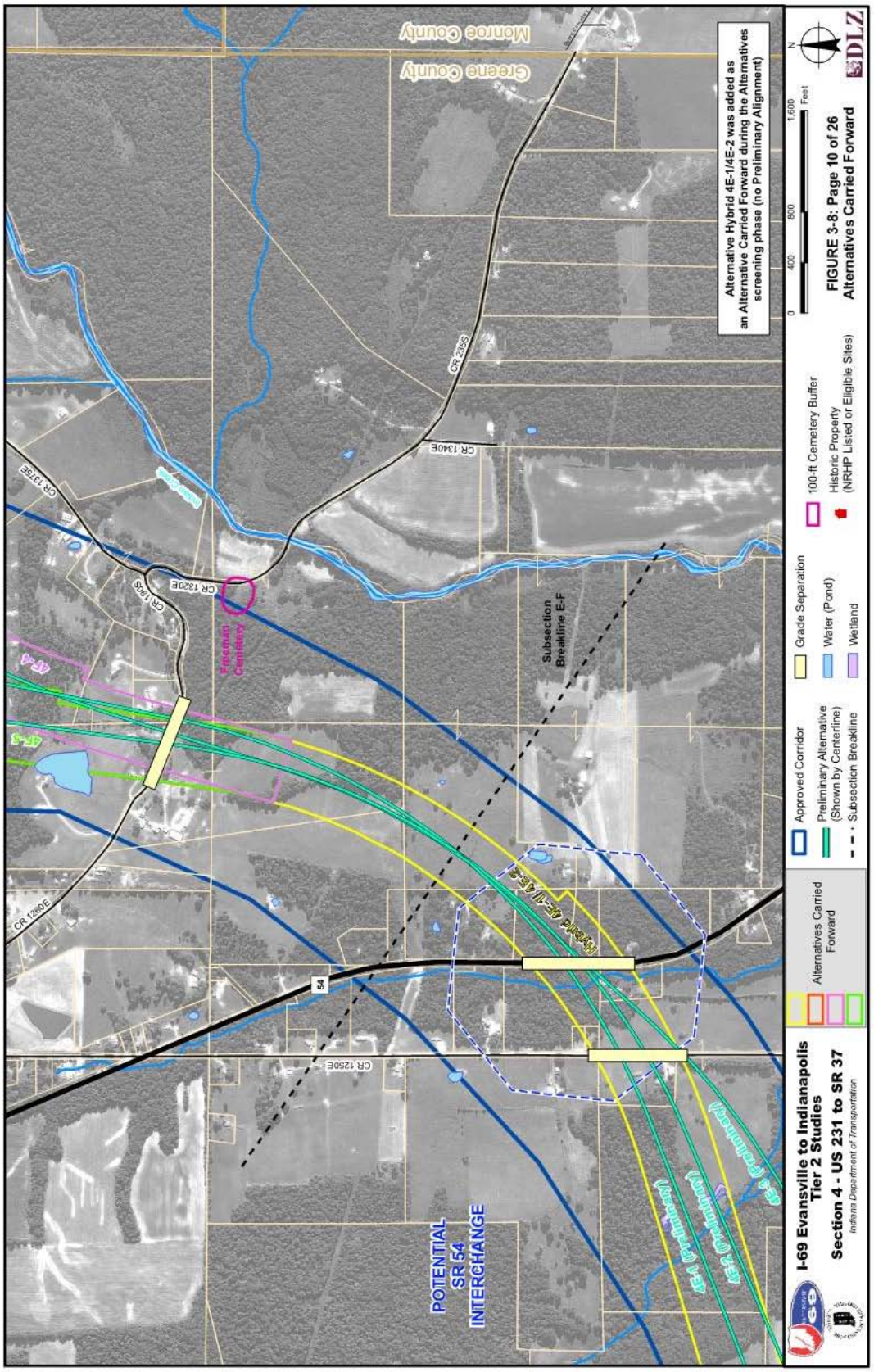

CR 725E
Cooper Cemetery
40-1 (Preliminary)
40-2 (Preliminary)
40-1
CR 400S
CR 600E
CR 500S
CR 450S
CR 575E
CR 625E
Subsection Breakline C-D
40-4 (Preliminary)
40-3 (Preliminary)
40-2 (Preliminary)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
FIGURE 3-8: Page 5 of 26
Alternatives Carried Forward
0
400
800
1,600
Feet
N
DLZ

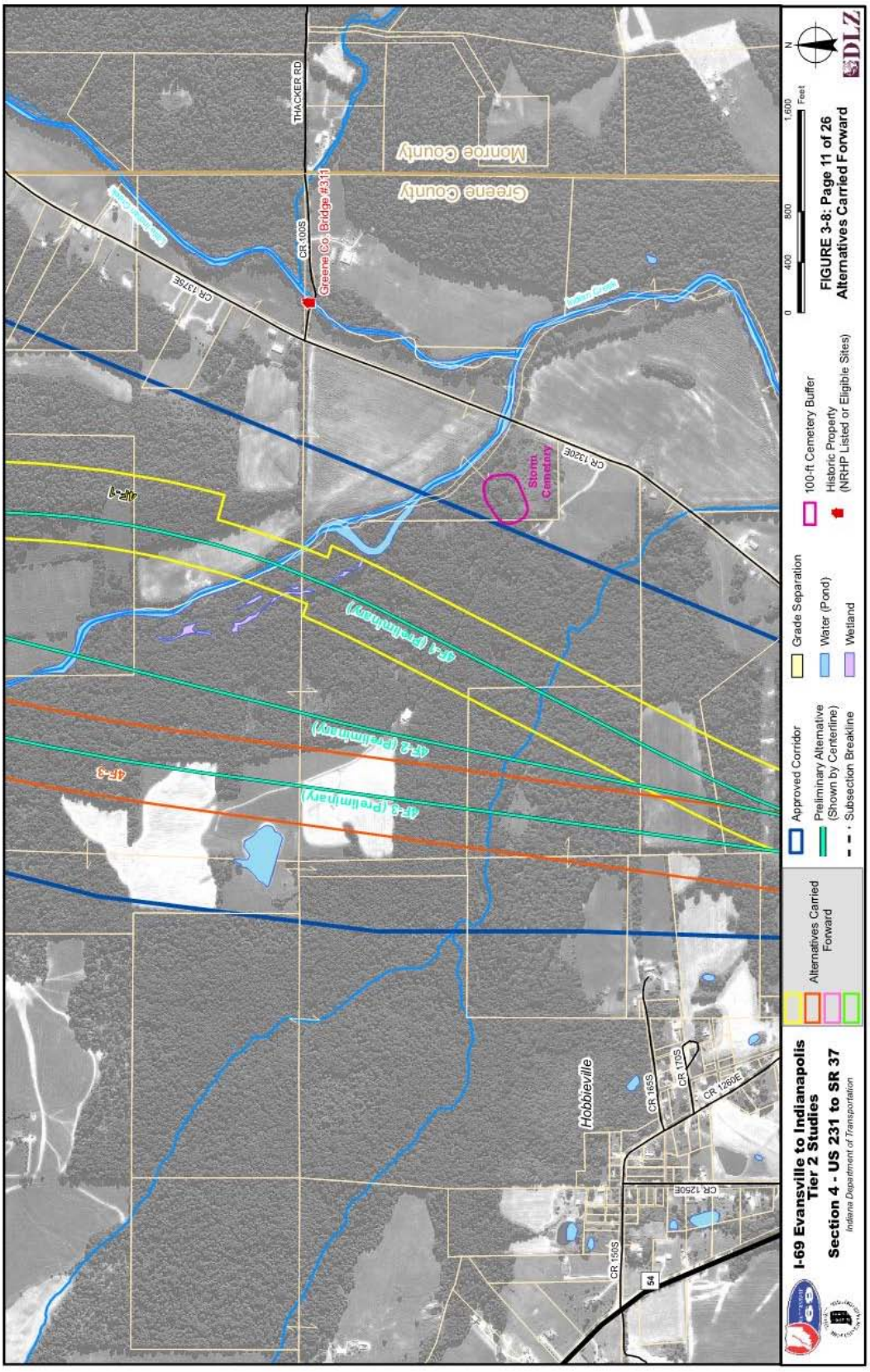

Alternative Hybrid 4E-1/4E-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
Subsection Breakline D-E
Hybrid 4E-1/4E-2
4E-1 (Preliminary)
4E-2/4E-1 (Preliminary)
4D-1
4D-1 (Preliminary)
4D-2 (Preliminary)
Shoaff Cemetery
Ashcraft Cemetery
Cooper Cemetery
SPRUCE RD
CEDAR RD
PINE RD
MINERAL-KOLEEN RD
CR 400S
CR 415S
CR 880E
CR 360S
CR 750E
CR 350S
CR 775E
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
FIGURE 3-8: Page 6 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

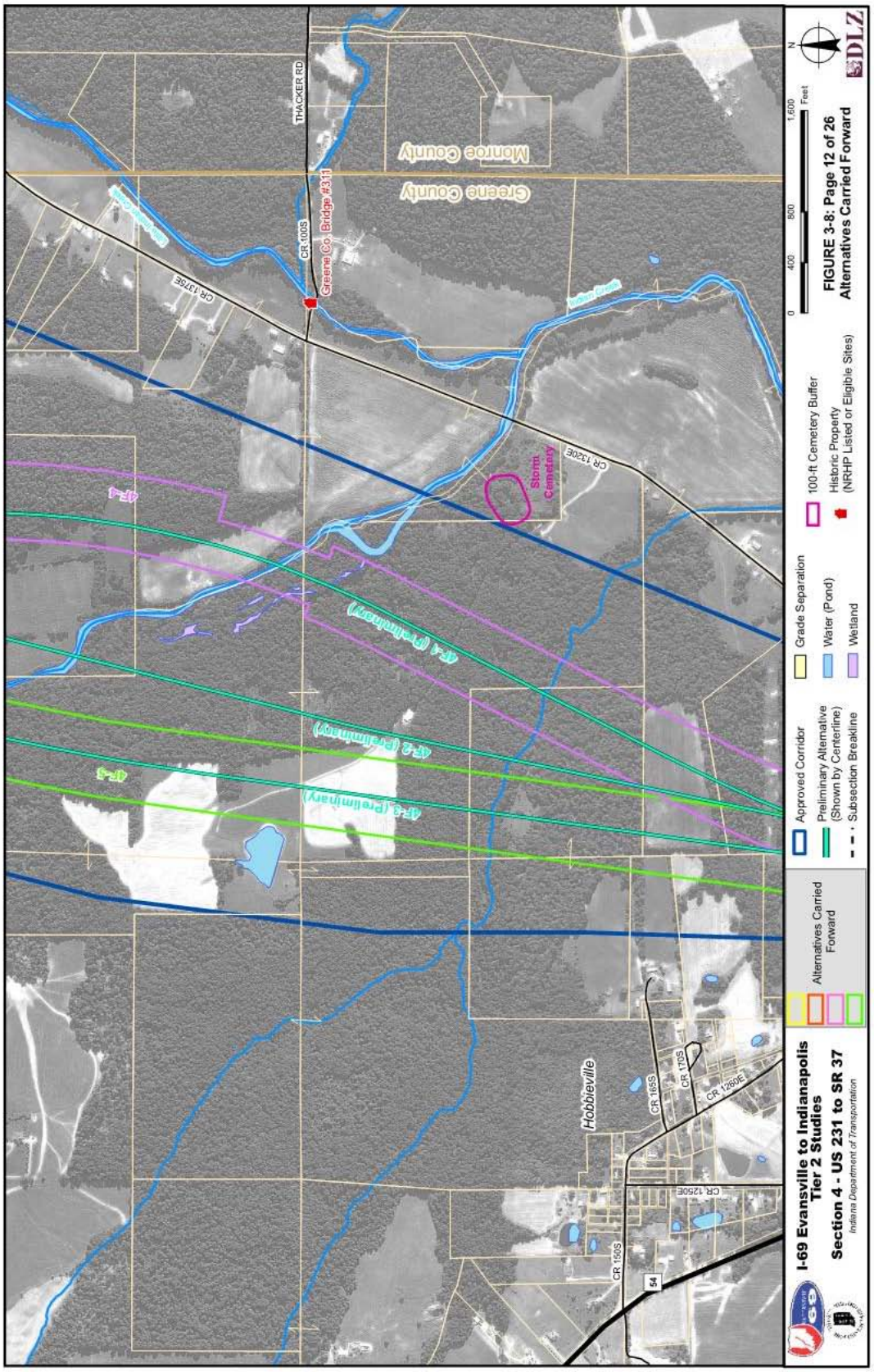

Alternative Hybrid 4E-1/4E-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
FIGURE 3-8: Page 7 of 26
Alternatives Carried Forward
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Feet
0
400
800
1,600
N
45
CR 425S
CR 415S
CR 400S
CR 875E
CR 975E
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
PINE RD
CEDAR RD
Dobbins Cemetery
4E-1 (Preliminary)
4E-2 (Preliminary)
Hybrid 4E-1/4E-2

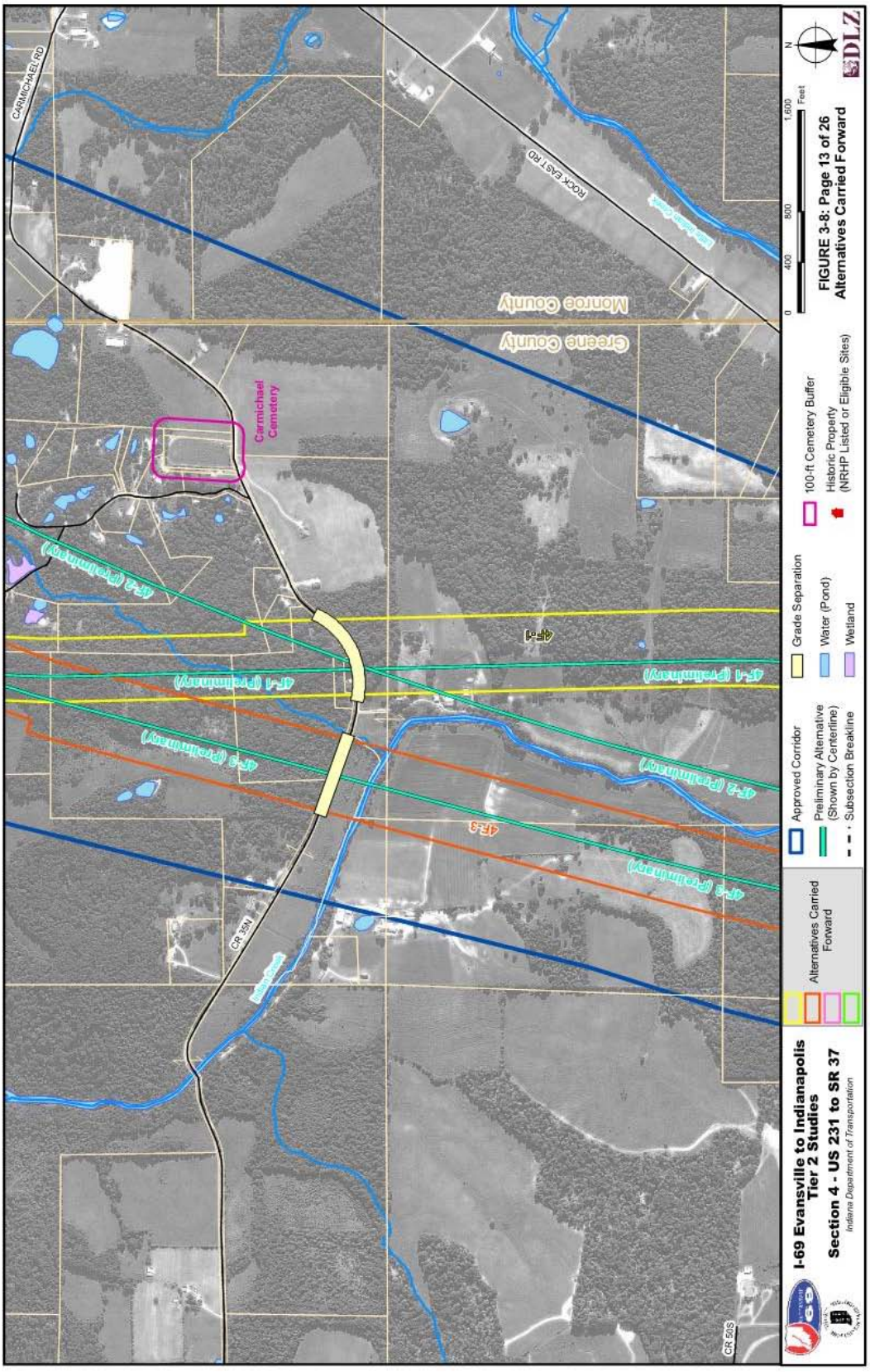

Alternative Hybrid 4E-1/4E-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
POTENTIAL SR 45 INTERCHANGE
Hybrid 4E-1/4E-2
4E-1 (Preliminary)
4E-2 (Preliminary)
4E-3 (Preliminary)
CR 325S
CR 1250E
CR 1200E
CR 300S
54
45
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 8 of 26
Alternatives Carried Forward


Alternative Hybrid 4E-1/4E-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
FIGURE 3-8: Page 9 of 26
Alternatives Carried Forward
DLZ
Monroe County
Greene County
CR 215S
CR 1340E
CR 1370E
CR 1360S
CR 1320E
Ensman Cemetery
Subsection Breakline E-F
4E-1
4E-2
CR 1260E
54
CR 1250E
POTENTIAL SR 54 INTERCHANGE
Hybrid Alternative
4E-1 (Preliminary)
4E-2 (Preliminary)
4E-1 (Preliminary)
4E-2 (Preliminary)
0
400
800
1,600
Feet
N
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Monroe County
Greene County
Alternative Hybrid 4E-1/4E-2 was added as an Alternative Carried Forward during the Alternatives screening phase (no Preliminary Alignment)
CR 235S
CR 1340E
CR 1370E
CR 1320E
CR 1260E
CR 1250E
Ferguson Cemetery
Subsection Breakline E-F
POTENTIAL SR 54 INTERCHANGE
Hybrid 4E-1/4E-2
4E-1
4E-2
4E-3
4E-4
0
400
800
1,600
Feet
N
FIGURE 3-8: Page 10 of 26
Alternatives Carried Forward
DLZ
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


THACKER RD
CR 100S
Greene Co. Bridge #311
Greene County
Monroe County
CR 1375E
CR 1320E
Stone Cemetery
Hobbieville
CR 165S
CR 170S
CR 1260E
CR 1250E
CR 150S
54
AF-1
AF-1 (Preliminary)
AF-2
AF-2 (Preliminary)
AF-3
AF-3 (Preliminary)
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 11 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


THACKER RD
Monroe County
Greene County
CR 100S
Greene Co. Bridge #311
CR 1375E
CR 1320E
Storm Cemetery
AF-1
AF-4 (Preliminary)
AF-2 (Preliminary)
AF-3 (Preliminary)
Hobbieville
CR 165S
CR 170S
CR 1260E
CR 1250E
CR 150S
54
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 12 of 26
Alternatives Carried Forward


CARMICHAEL RD
ROCK EAST RD
Monroe County
Greene County
Carmichael Cemetery
4F-1 (Preliminary)
4F-2 (Preliminary)
4F-3 (Preliminary)
CR 35N
CR 50S
FIGURE 3-8: Page 13 of 26
Alternatives Carried Forward
0 400 800 1,600 Feet
N
DLZ
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Alternatives Carried Forward
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

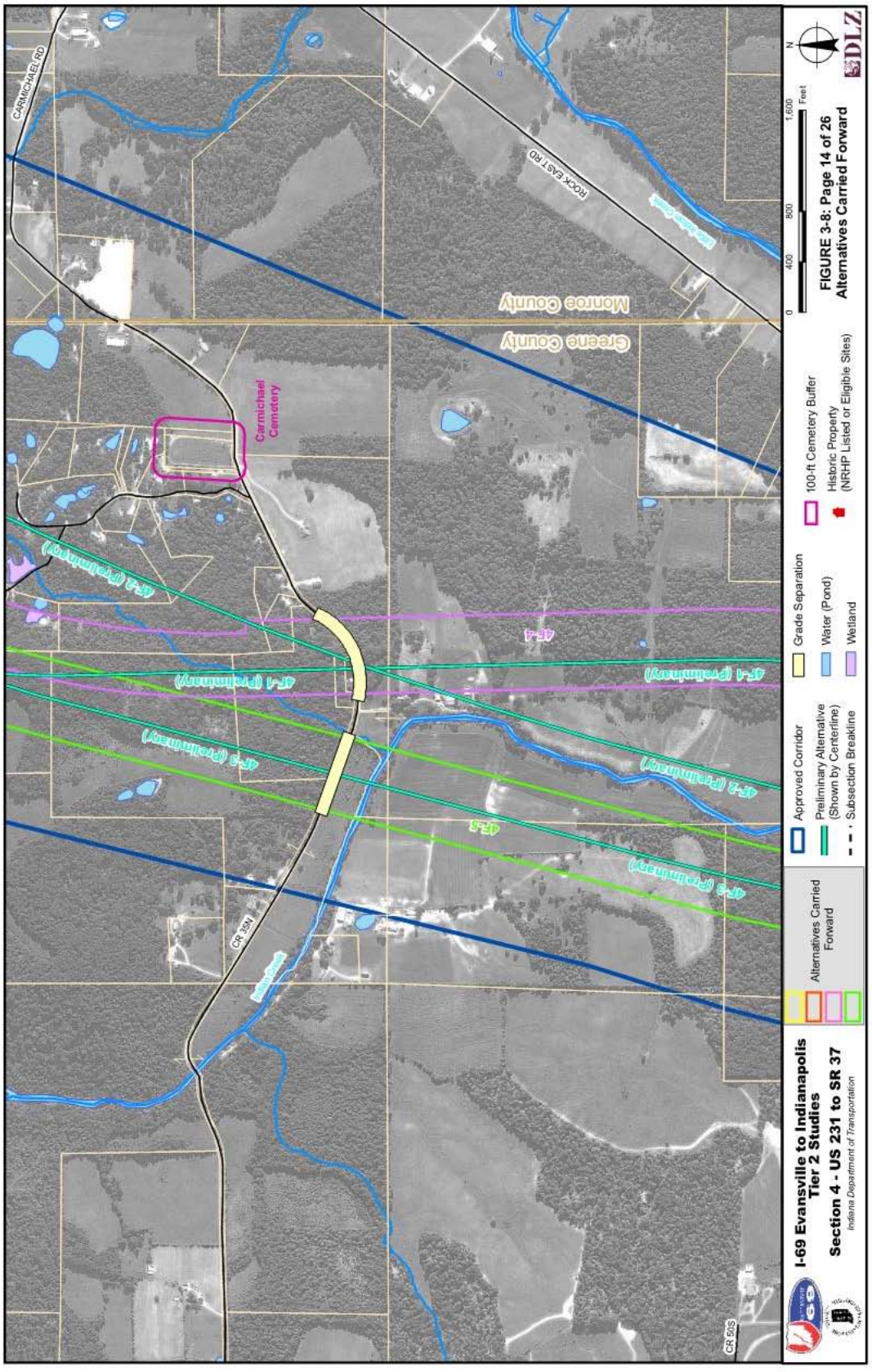
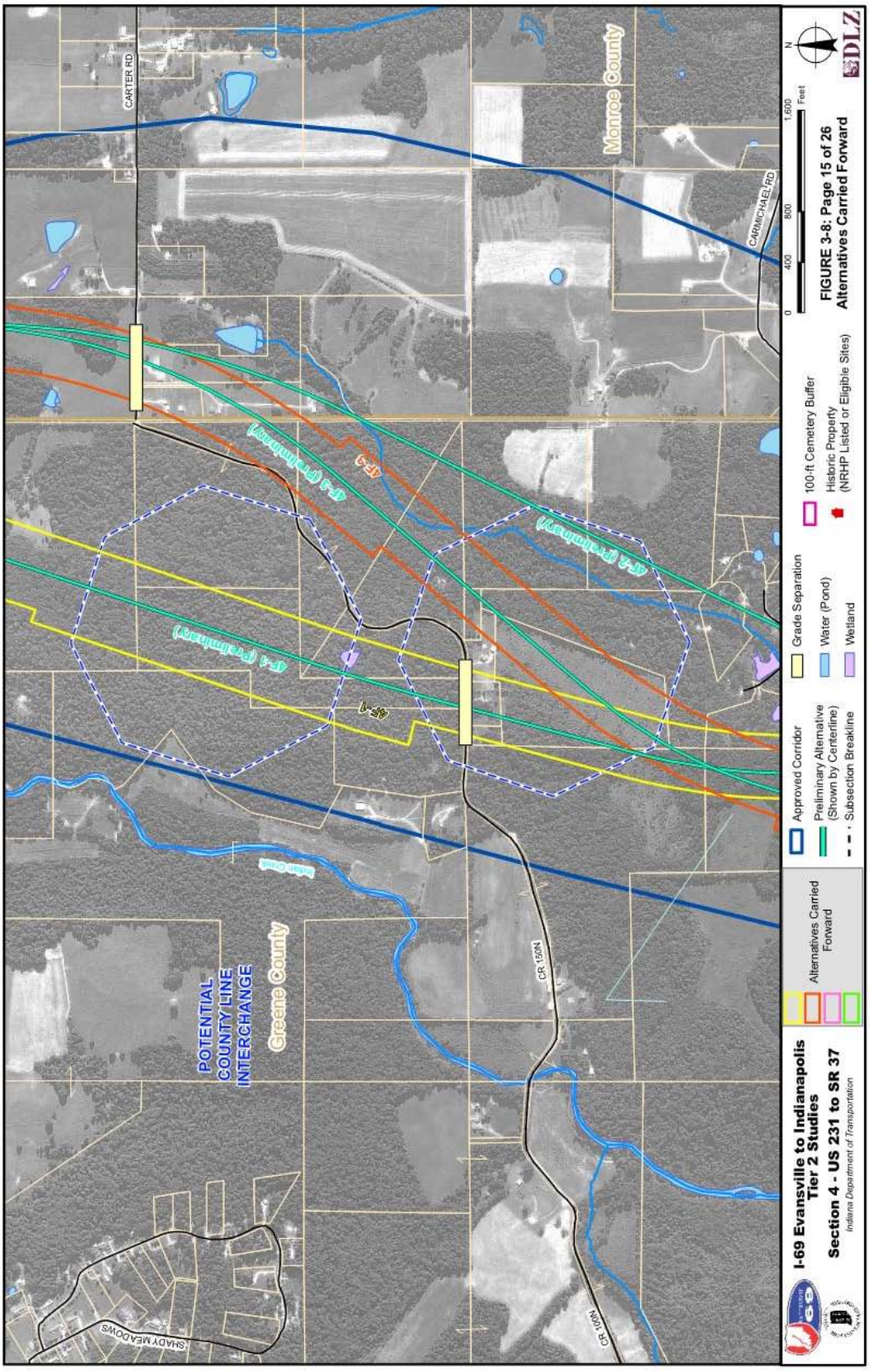
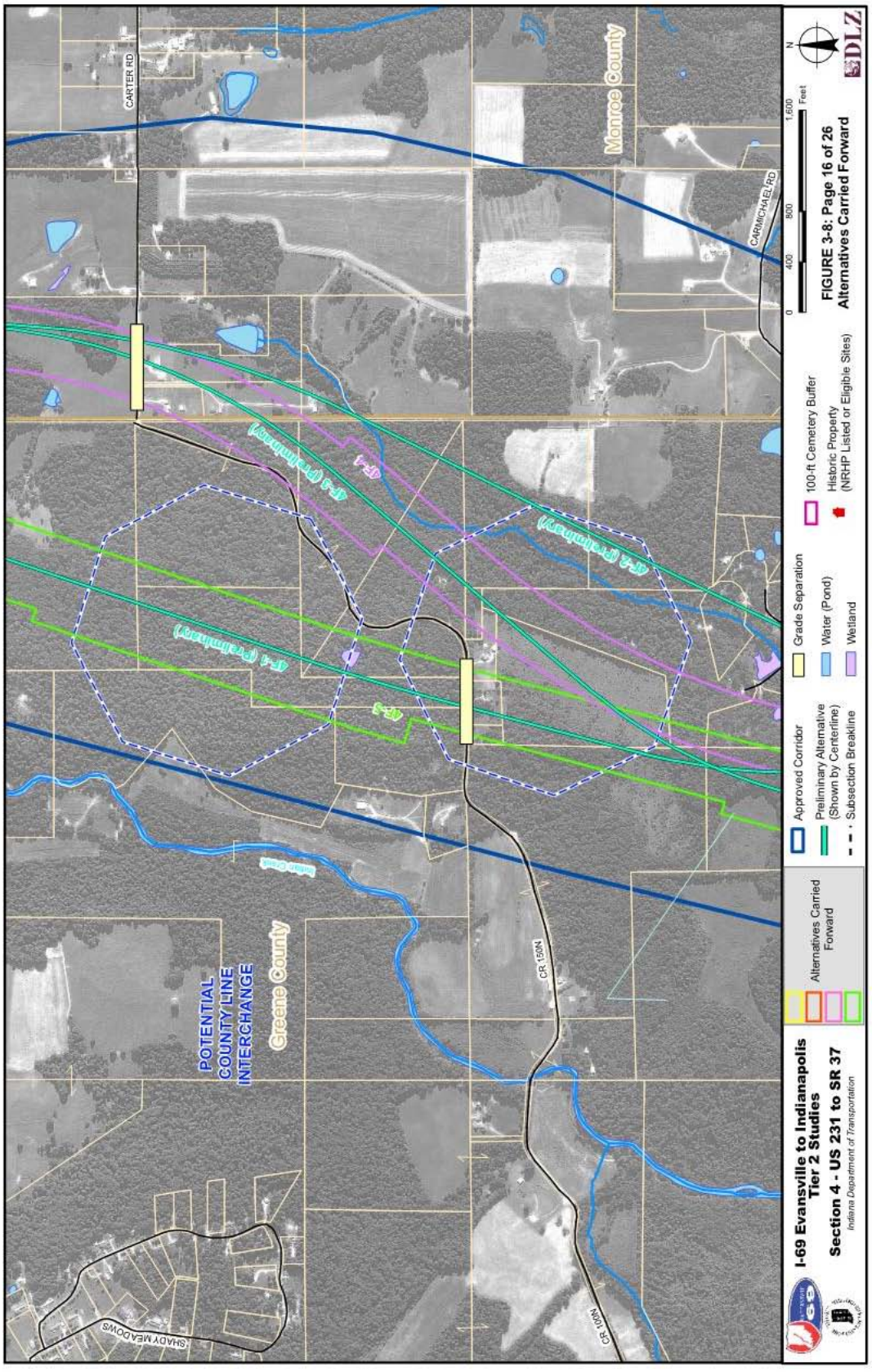
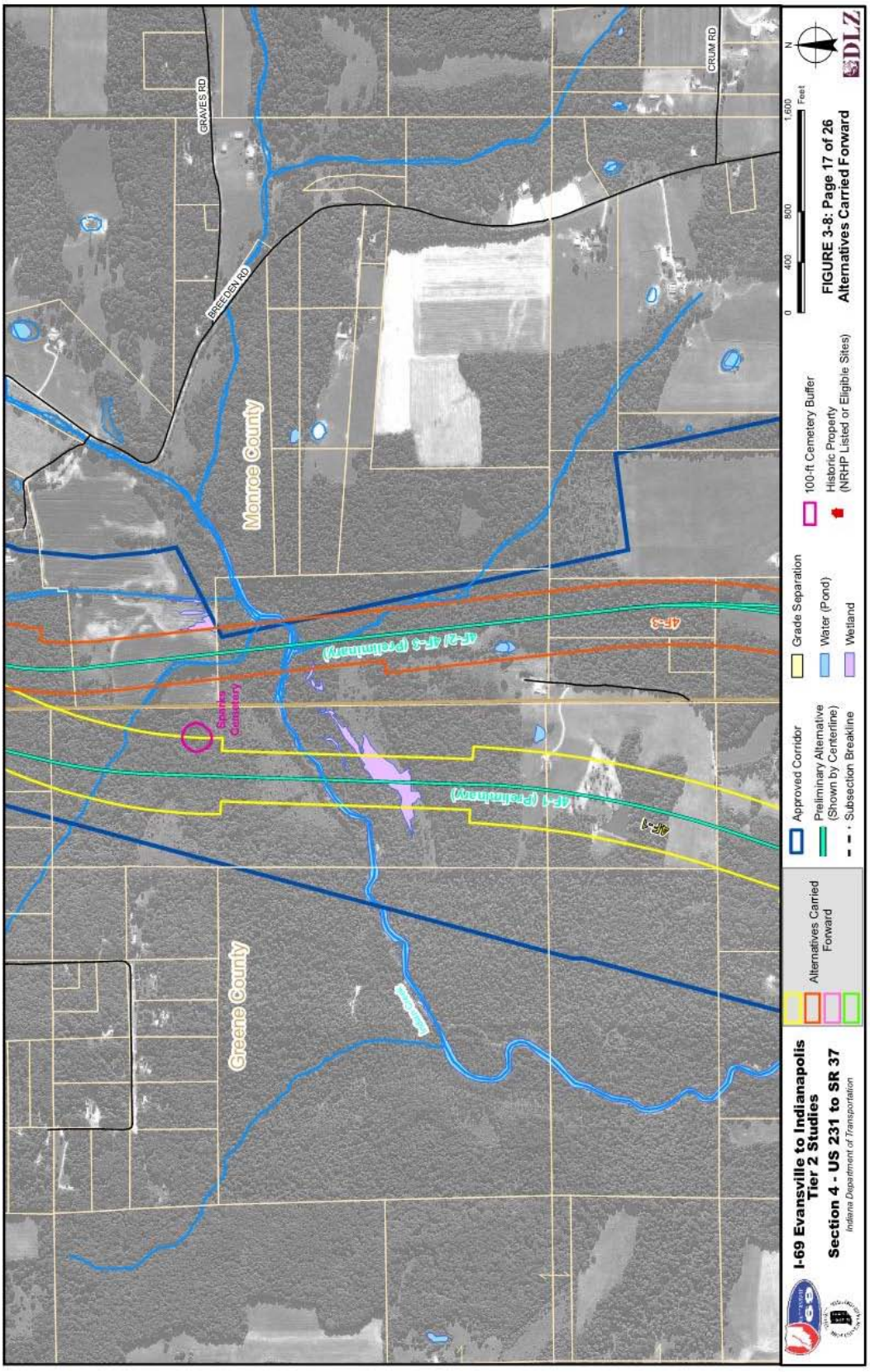
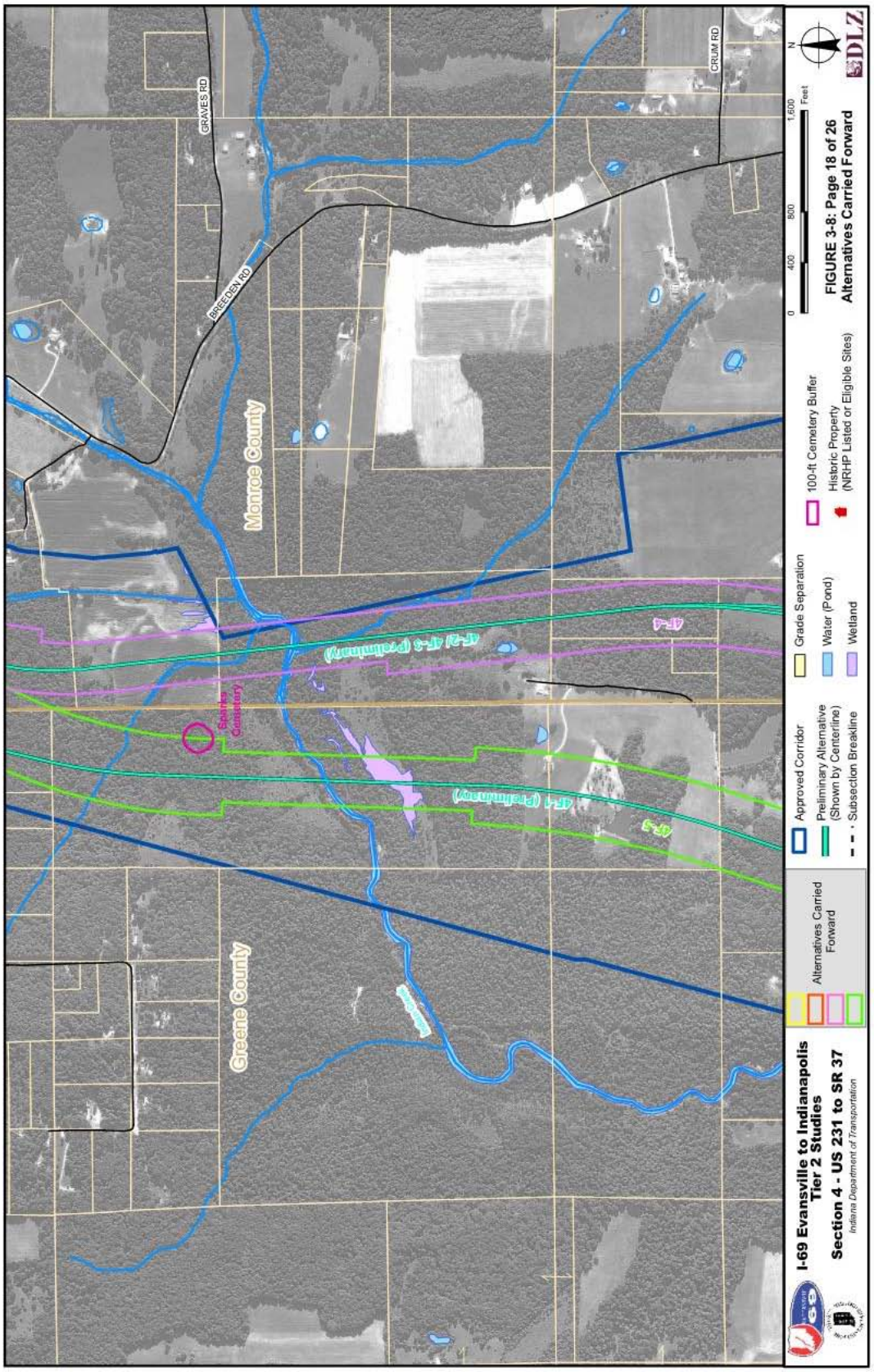


FIGURE 3-8: Page 14 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Carmichael Cemetery
Monroe County
Greene County
CARMICHAEL RD
ROCK EAST RD
CR 35N
CR 50S
DLZ


CARTER RD
Monroe County
CARMICHAEL RD
4F-2 (Preliminary)
4F-2
4F-1 (Preliminary)
4F-1
POTENTIAL COUNTY LINE INTERCHANGE
Greene County
CR 150N
CR 100N
SHADY MEADOWS
N
0
400
800
1,600
Feet
FIGURE 3-8: Page 15 of 26
Alternatives Carried Forward
DLZ
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Monroe County
Greene County
CARTER RD
CARMICHAEL RD
CR 150N
CR 100W
SHADY MEADOWS
POTENTIAL COUNTY LINE INTERCHANGE
DE-1 (Preliminary)
DE-2 (Preliminary)
DE-3
DE-4
N
0
400
800
1,600
Feet
DLZ
FIGURE 3-8: Page 16 of 26
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


GRAVES RD
BREEDEN RD
CRUM RD
Monroe County
Greene County
Stanley Cemetery
4F-3
4F-2 / 4F-3 (Preliminary)
4F-1 (Preliminary)
4F-1
N
0
400
800
1,600
Feet
FIGURE 3-8: Page 17 of 26
Alternatives Carried Forward
DLZ
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


GRAVES RD
BREEDEN RD
CRUM RD
Monroe County
Greene County
Stanley Cemetery
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Alternatives Carried Forward
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 18 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

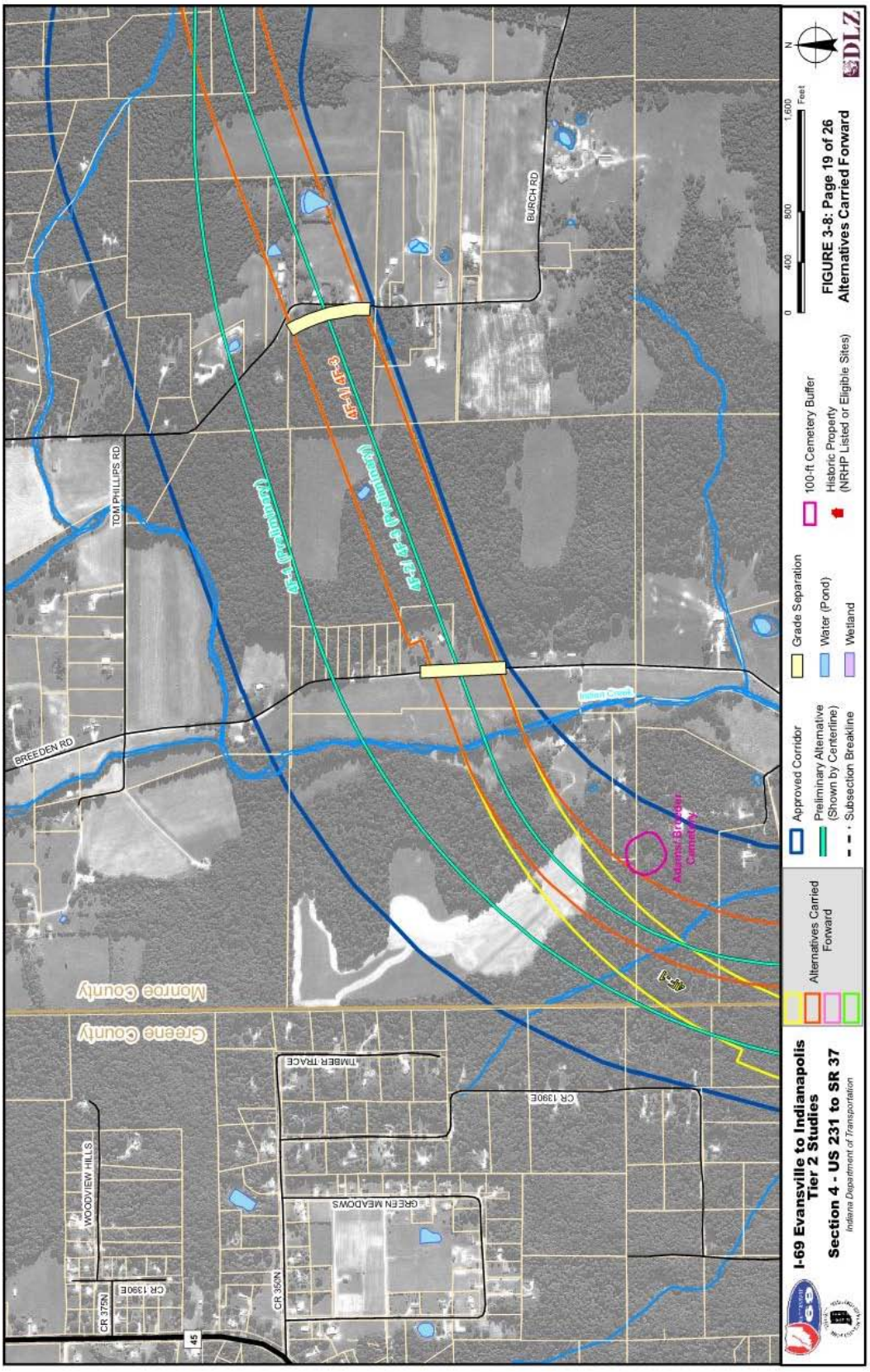
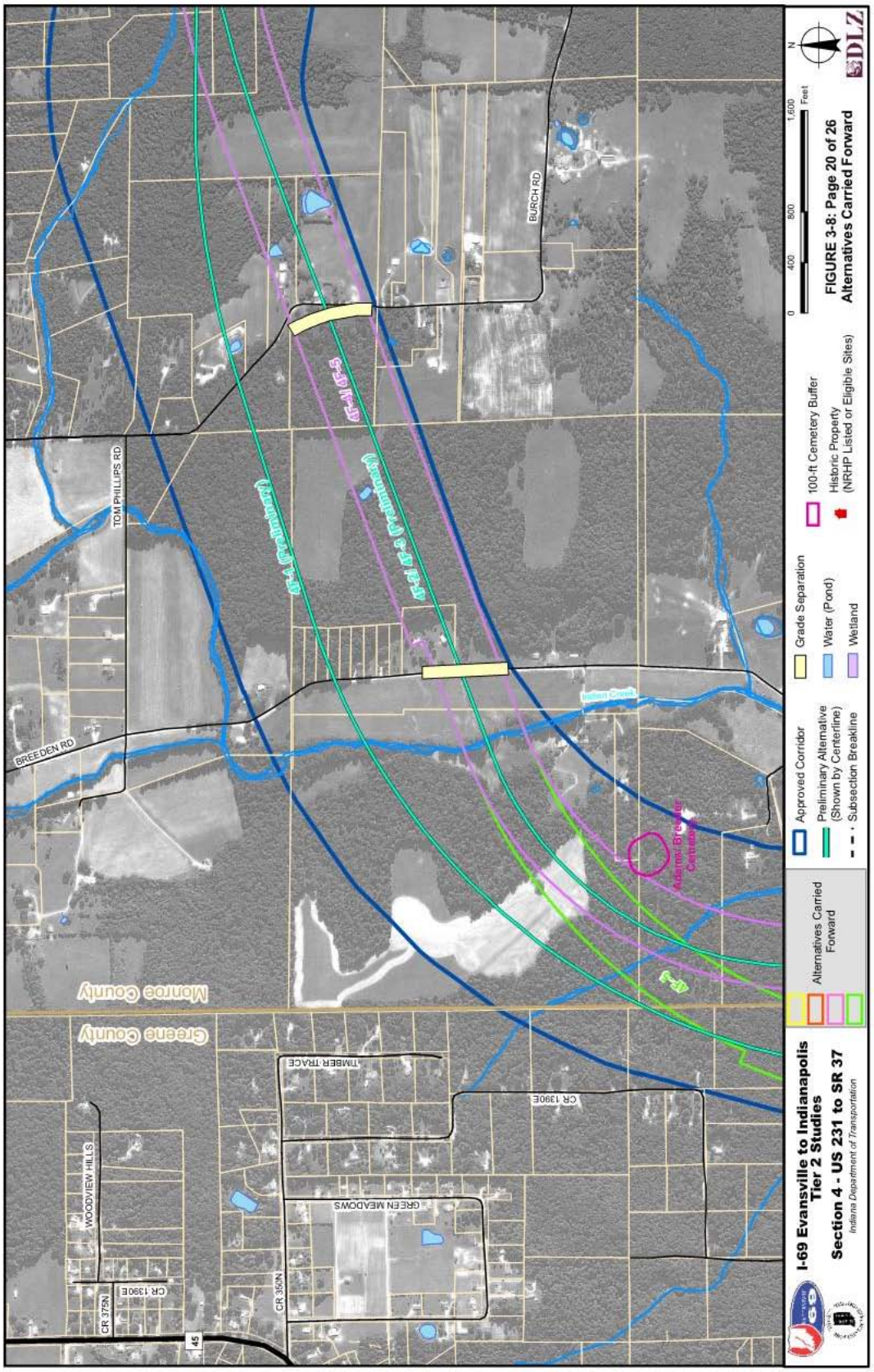
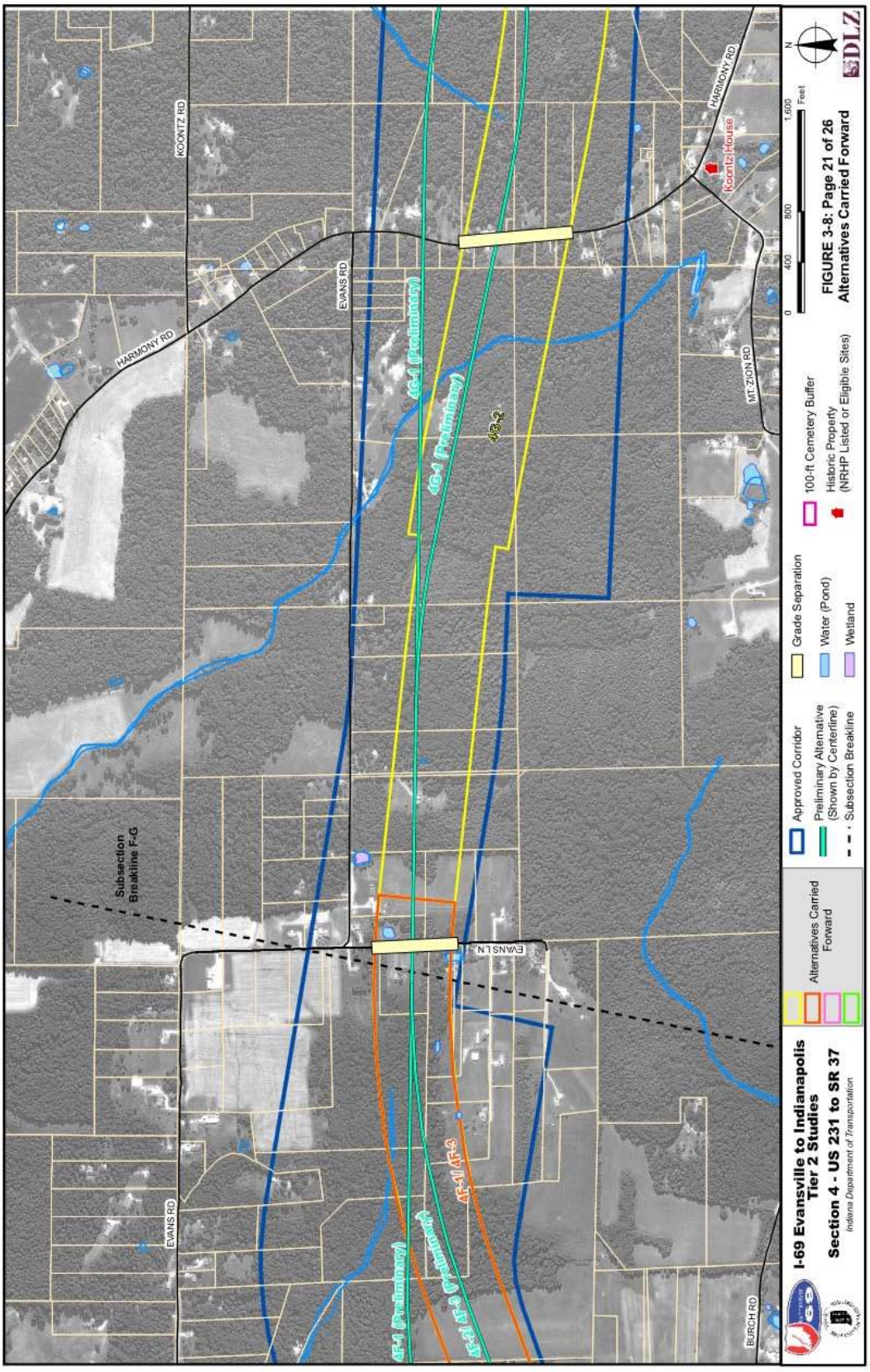
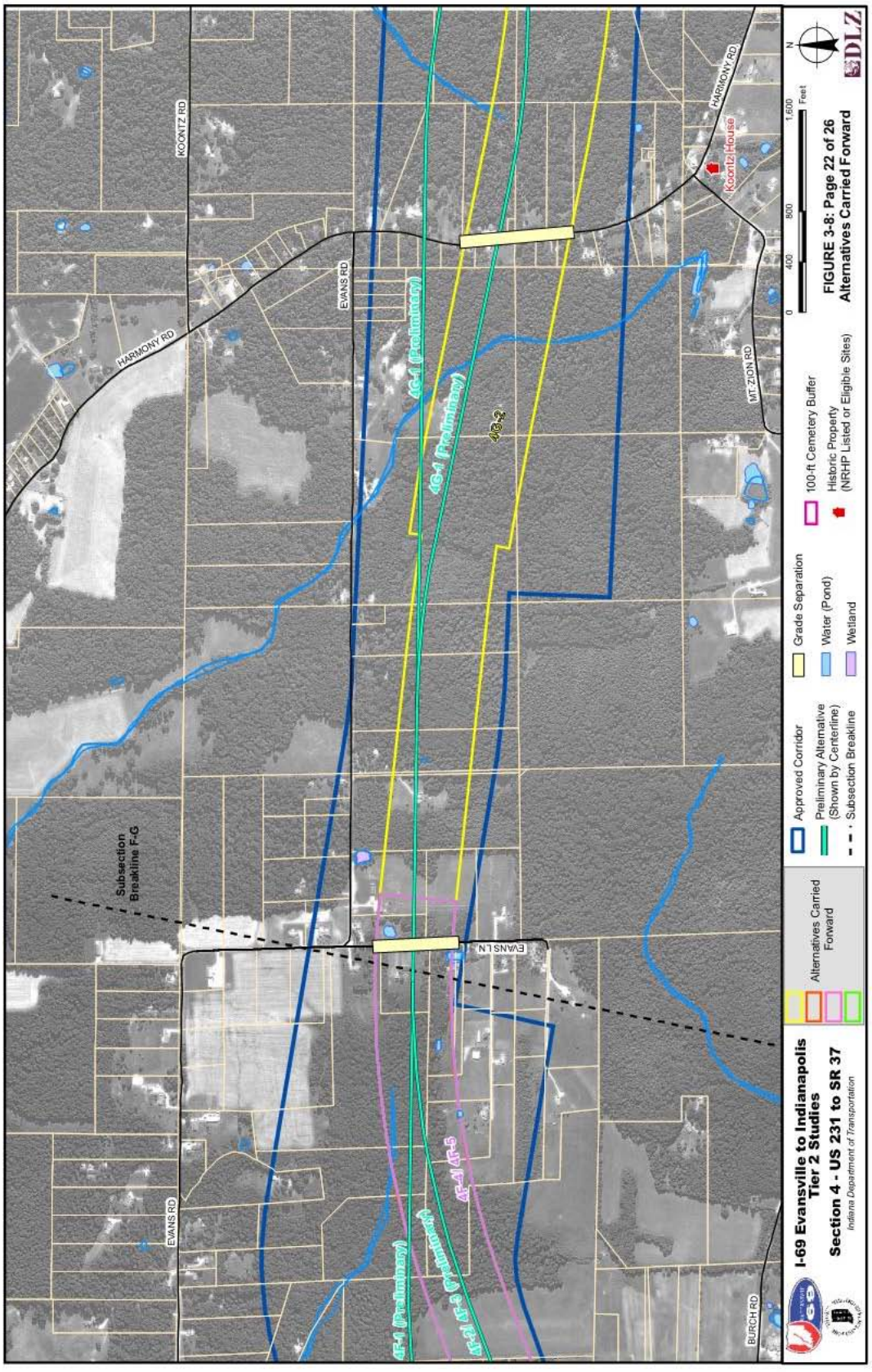
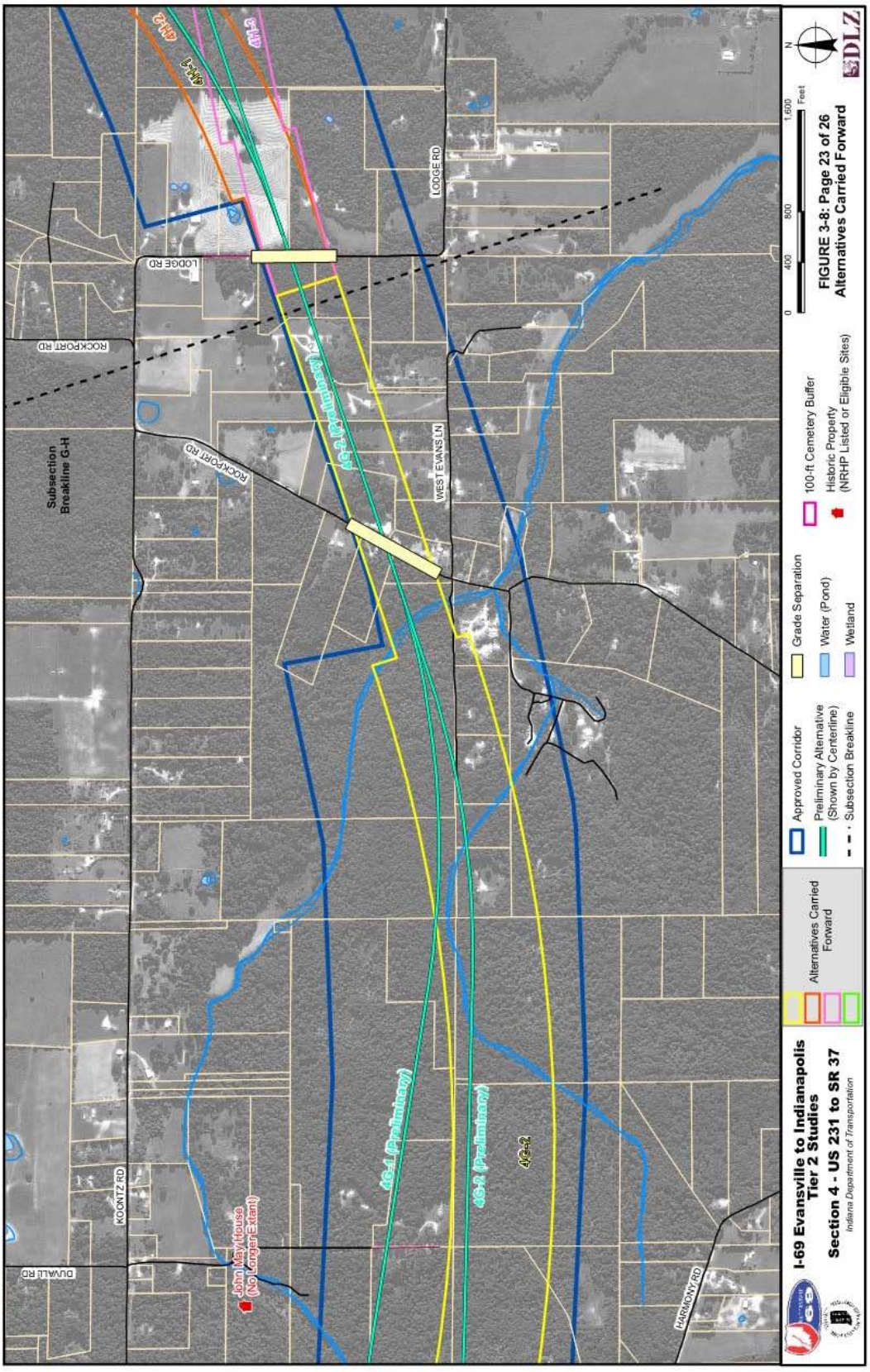


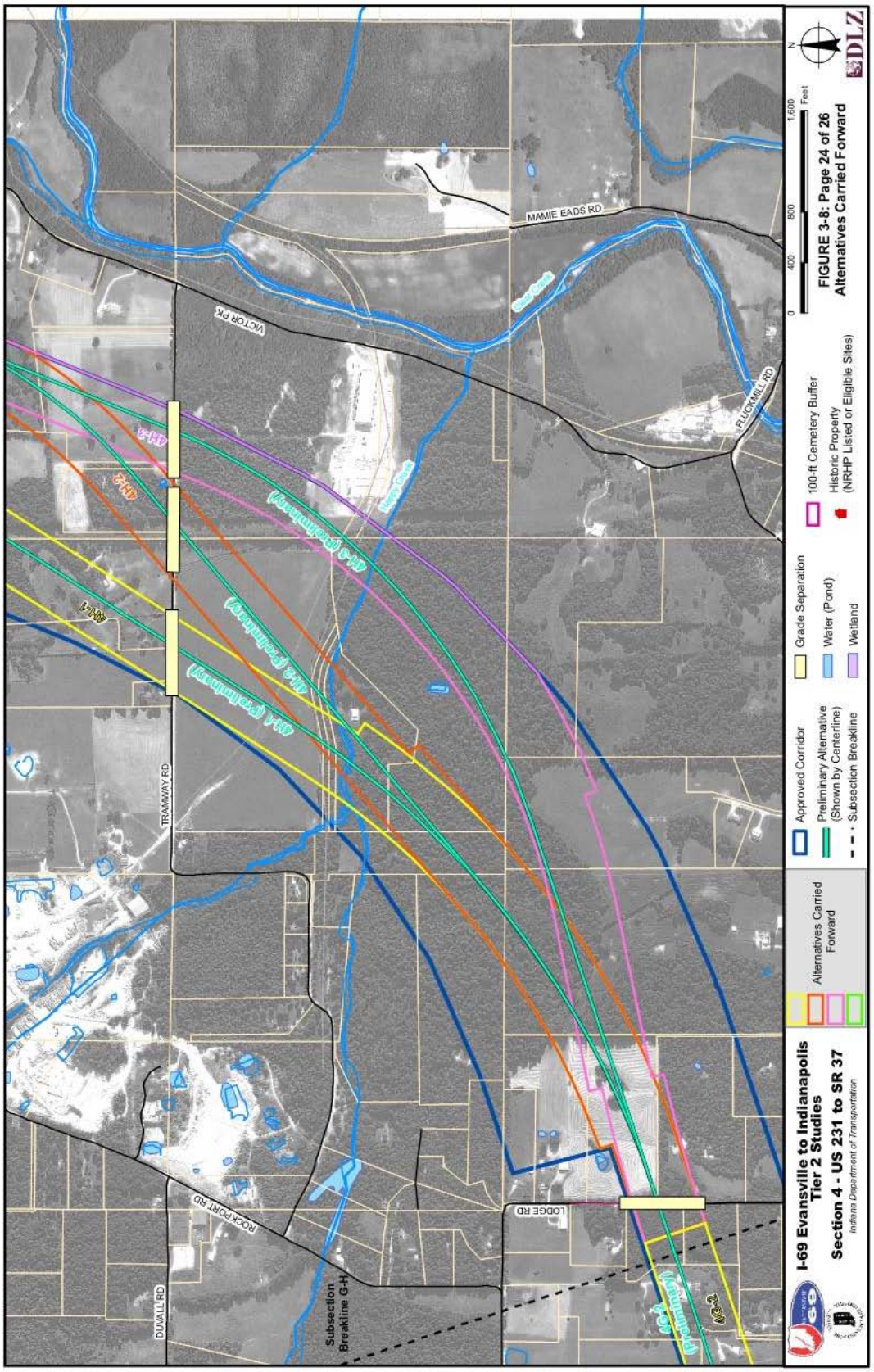
FIGURE 3-8: Page 19 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
4F-4 (Preliminary)
4F-4 (Preliminary)
4F-4 (Preliminary)
4F-4 (Preliminary)
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indian Creek
Adams-Brooker Cemetery
Monroe County
Greene County
TIMBER TRACE
CR 1390E
GREEN MEADOWS
WOODVIEW HILLS
CR 375N
CR 360N
45
Feet
0
400
800
1,600
N

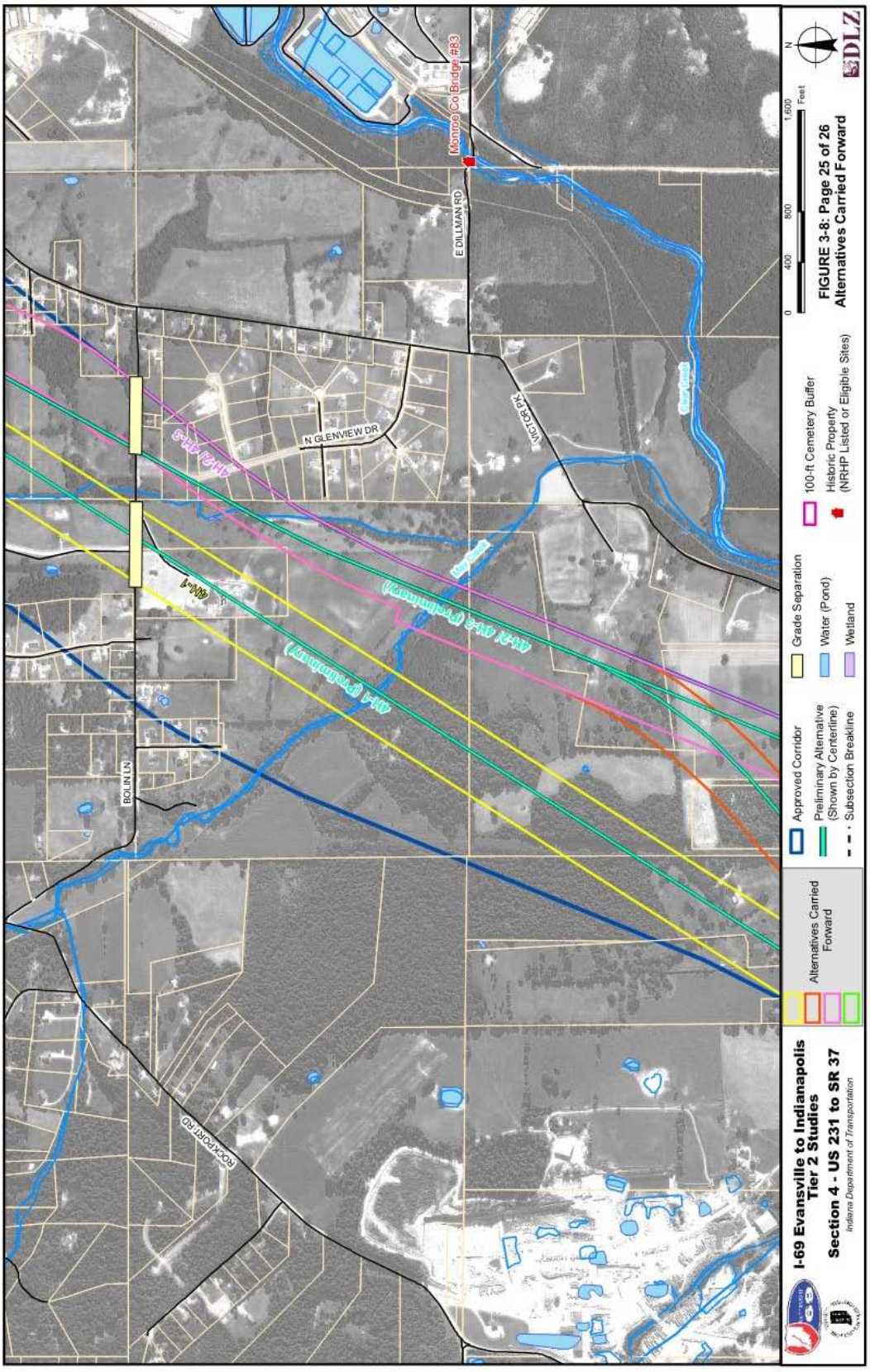

BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indian Creek
TIMBER TRACE
CR 1390E
GREEN MEADOWS
WOODVIEW HILLS
CR 375N
CR 350N
45
Monroe County
Greene County
Alternative 1 (Preferred)
Alternative 2
Alternative 3
Alternative 4
Alternative 5
Alternative 6
Alternative 7
Alternative 8
Alternative 9
Alternative 10
Alternative 11
Alternative 12
Alternative 13
Alternative 14
Alternative 15
Alternative 16
Alternative 17
Alternative 18
Alternative 19
Alternative 20
Alternative 21
Alternative 22
Alternative 23
Alternative 24
Alternative 25
Alternative 26
Adams Grove Cemetery
N
0
400
800
1,600
Feet
FIGURE 3-8: Page 20 of 26
Alternatives Carried Forward
DLZ
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

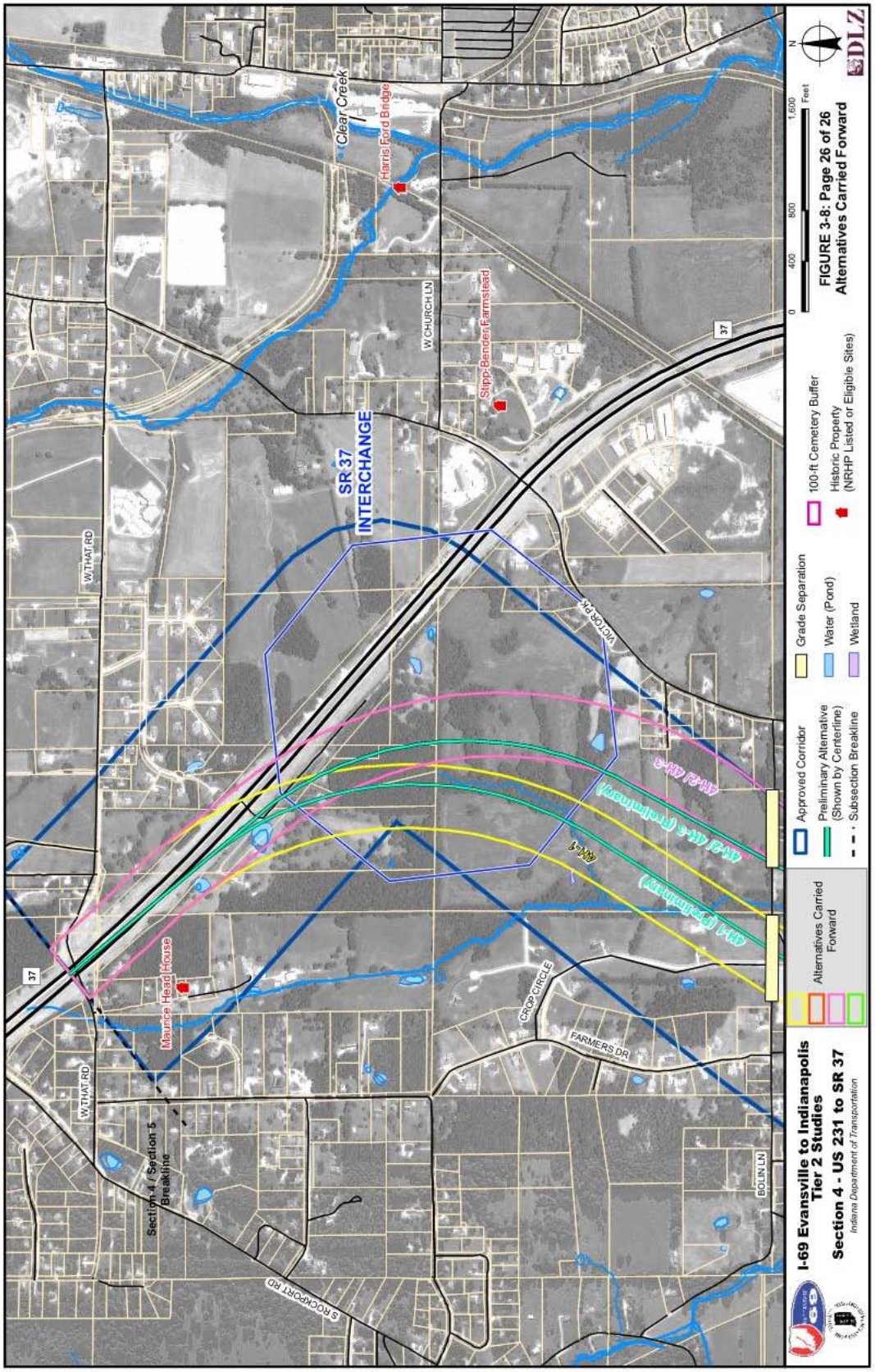

KOONTZ RD
HARMONY RD
EVANS RD
MT ZION RD
Koontz House
46-1 (Preliminary)
46-2
EVANS LN
Subsection Breakline F-G
BURCH RD
45-1 (Preliminary)
45-2 (Preliminary)
45-1/ 45-3
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 21 of 26
Alternatives Carried Forward


KOONTZ RD
HARMONY RD
EVANS RD
HARMONY RD
Koontz House
MT ZION RD
4G-1 (Preliminary)
4G-2
Subsection Breakline F-G
EVANS LN
EVANS RD
BURCH RD
4F-1 (Preliminary)
4F-2 (Preliminary)
4F-1 4R-5
4F-2 4R-5
N
0
400
800
1,600
Feet
DLZ
FIGURE 3-8: Page 22 of 26
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


LODGE RD
ROCKPORT RD
WEST EVANS LN
Subsection Breakline G-H
46-4 (Preliminary)
46-2
46-1 (Preliminary)
KOONTZ RD
DUVALL RD
HARMON RD
John Maytouse (No Longer Extant)
FIGURE 3-8: Page 23 of 26
Alternatives Carried Forward
0 400 800 1,600 Feet
N
DLZ
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
Grade Separation
Water (Pond)
Wetland
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Alternatives Carried Forward
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


MAMIE EADS RD
VICTOR PK
FLUCKHILL RD
TRAMWAY RD
ROCKPORT RD
DUVALL RD
LODGE RD
Subsection Breakline G-H
Preliminary Alternative
FIGURE 3-8: Page 24 of 26
Alternatives Carried Forward
100-ft Cemetery Buffer
Historic Property
(NRHP Listed or Eligible Sites)
Grade Separation
Water (Pond)
Wetland
Approved Corridor
Preliminary Alternative
(Shown by Centerline)
Subsection Breakline
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


Monroe Co Bridge #83
E DILLMAN RD
N GLENVIEW DR
VICTOR PK
BOLIN LN
ROCKPORT RD
AH-1
AH-2
AH-3
AH-1 (Preliminary)
AH-2 AH-3 (Preliminary)
AH-3 (Preliminary)
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-8: Page 25 of 26
Alternatives Carried Forward


Clear Creek
Harris Ford Bridge
W CHURCH LN
Stipp-Bender Farmstead
SR 37
INTERCHANGE
W THAT RD
VICTOR PK
Maurice Head House
CROP CIRCLE
FARMERS DR
BOLIN LN
S ROCKPORT RD
Section 4 / Section 5 Breakline
37
FIGURE 3-8: Page 26 of 26
Alternatives Carried Forward
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alternatives Carried Forward
Approved Corridor
Preliminary Alternative (Shown by Centerline)
Subsection Breakline
Grade Separation
Water (Pond)
Wetland
100-ft Cemetery Buffer
Historic Property (NRHP Listed or Eligible Sites)
DLZ

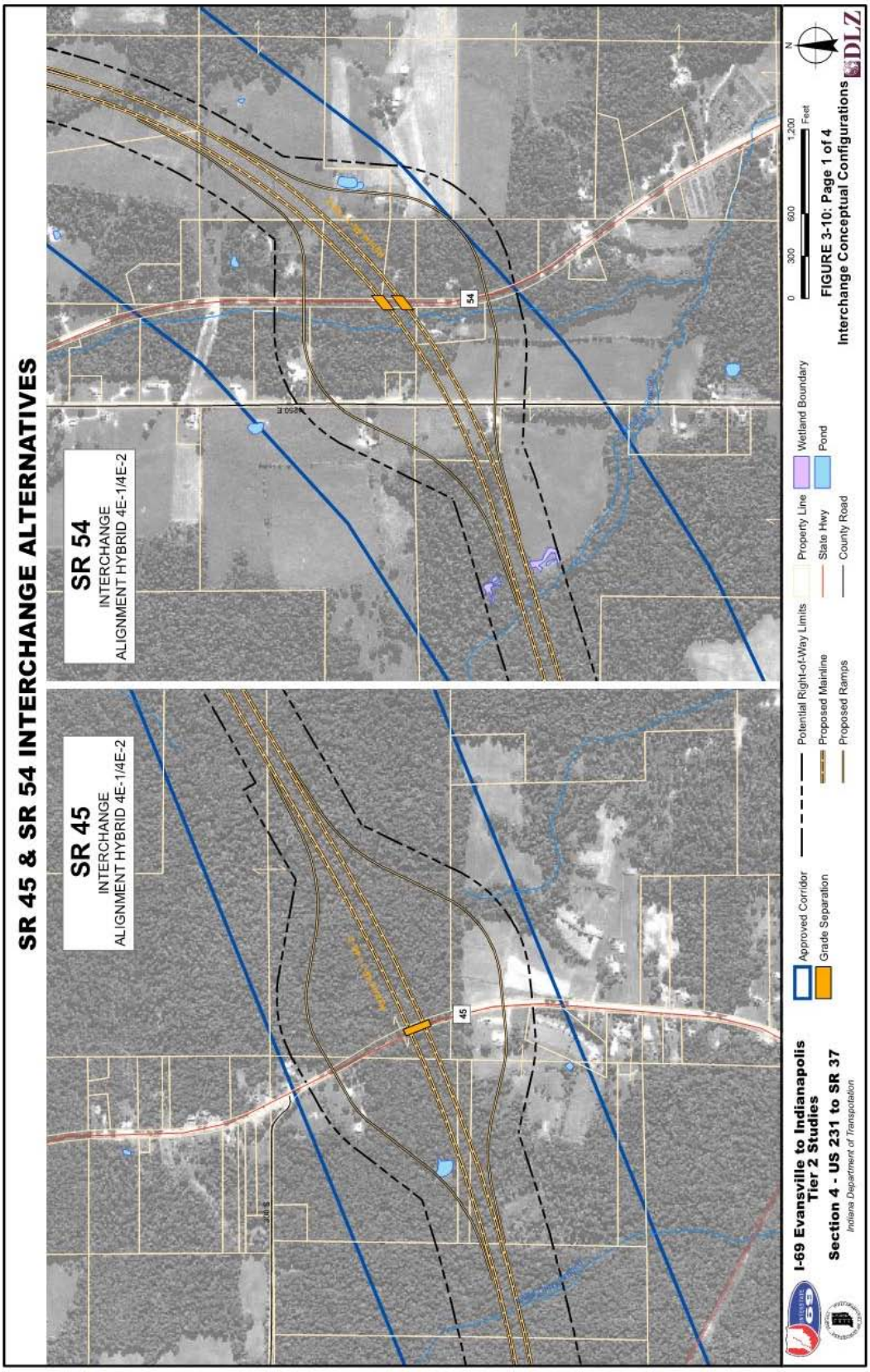
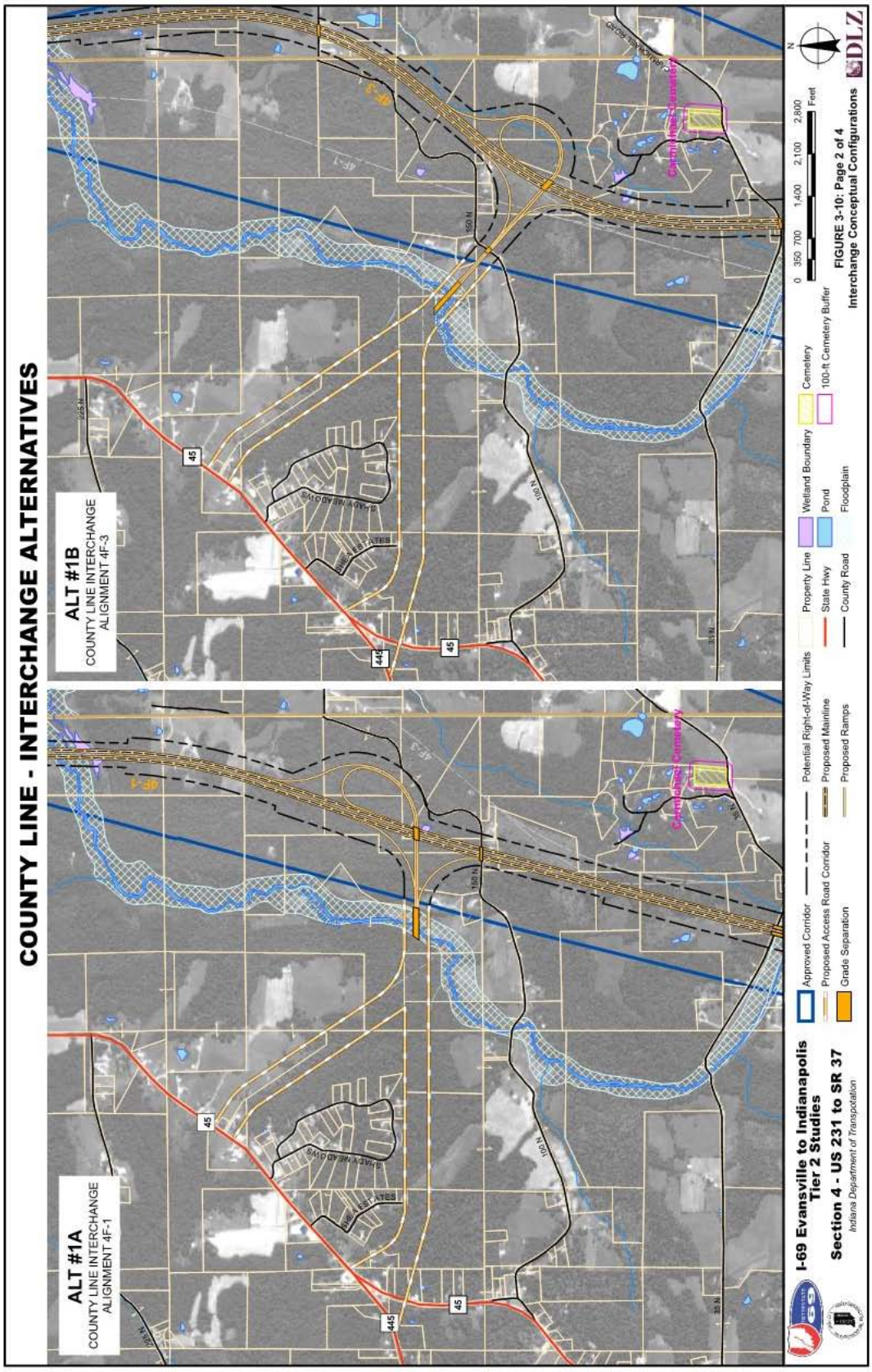
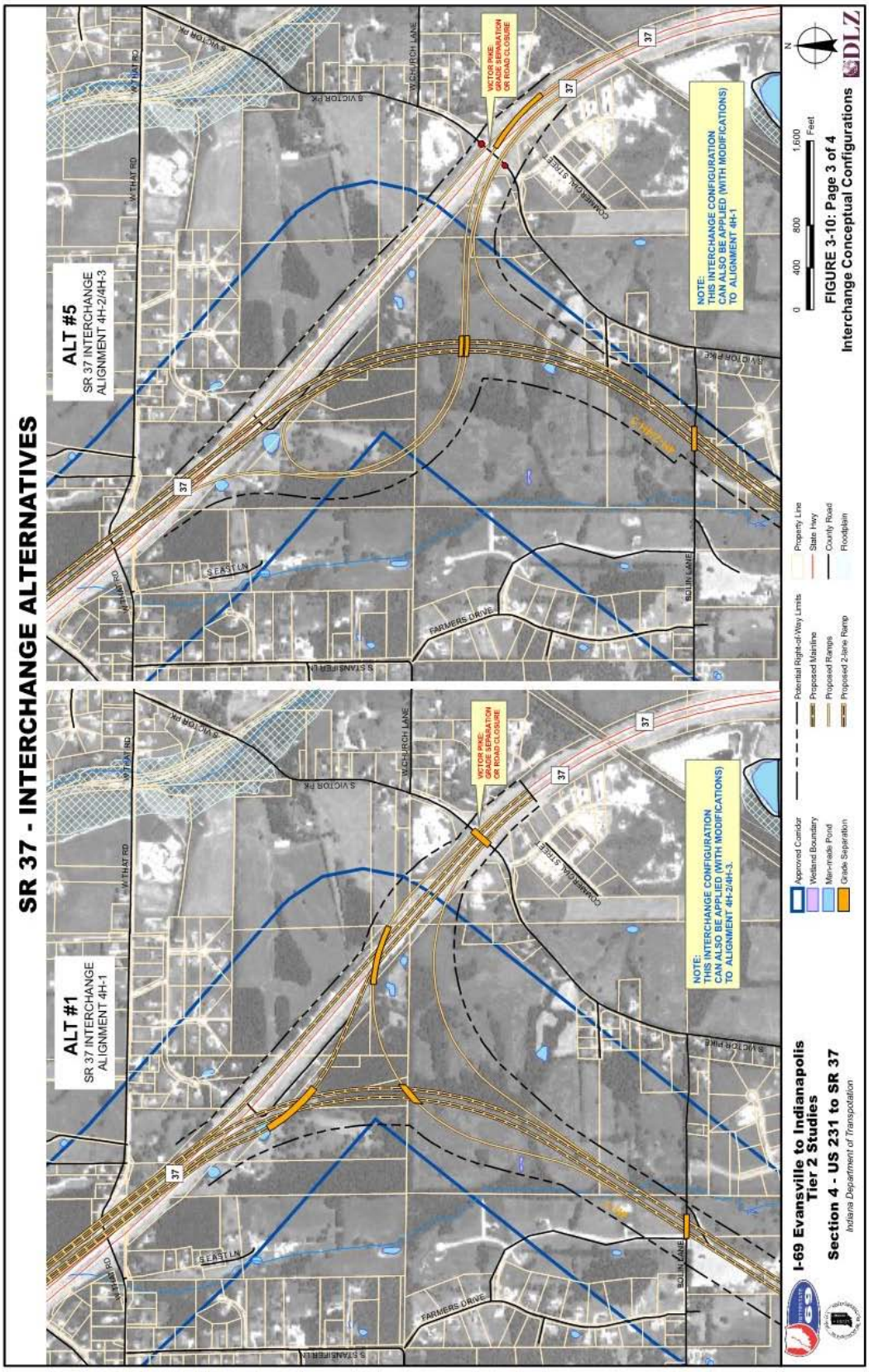
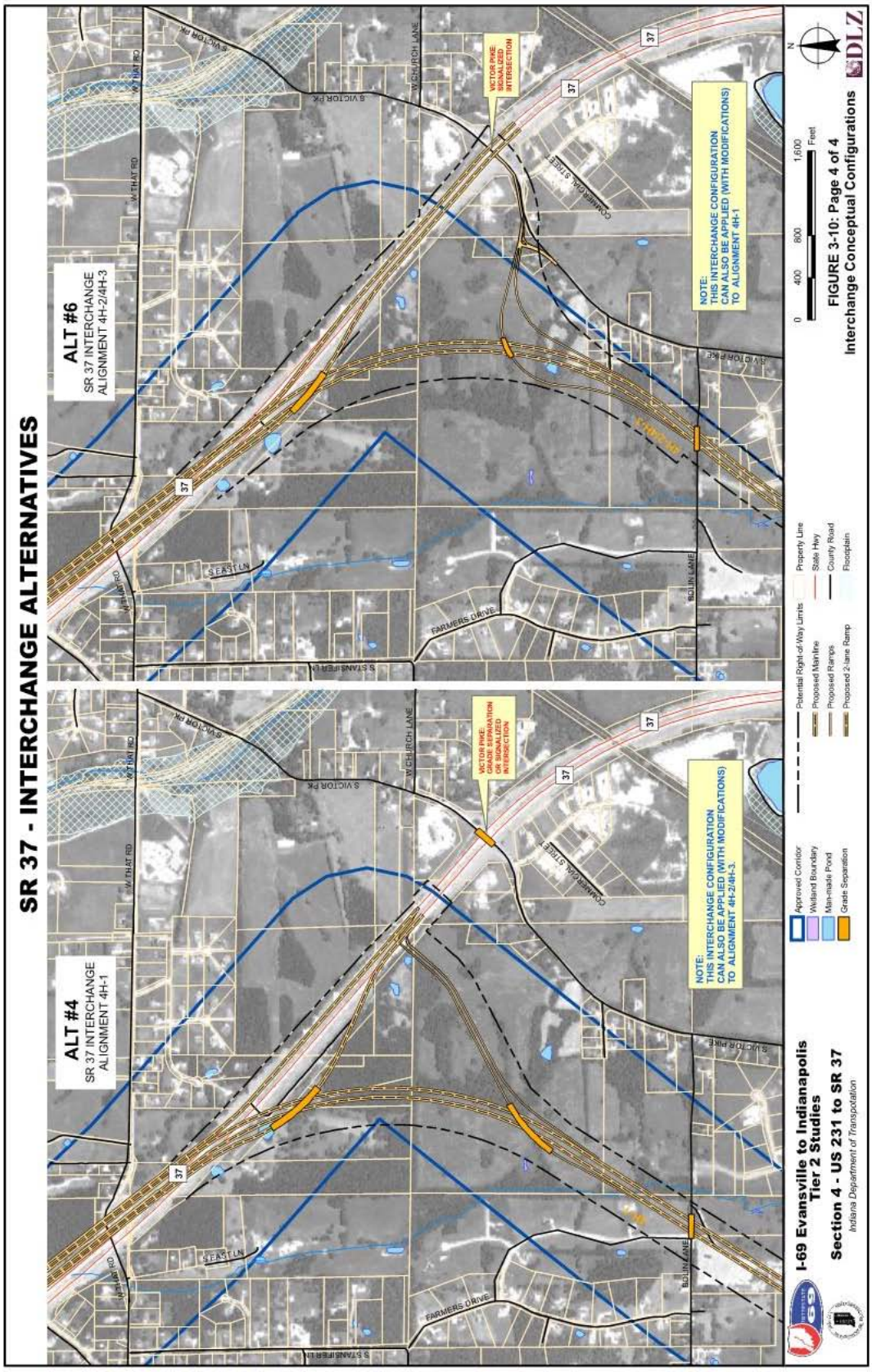
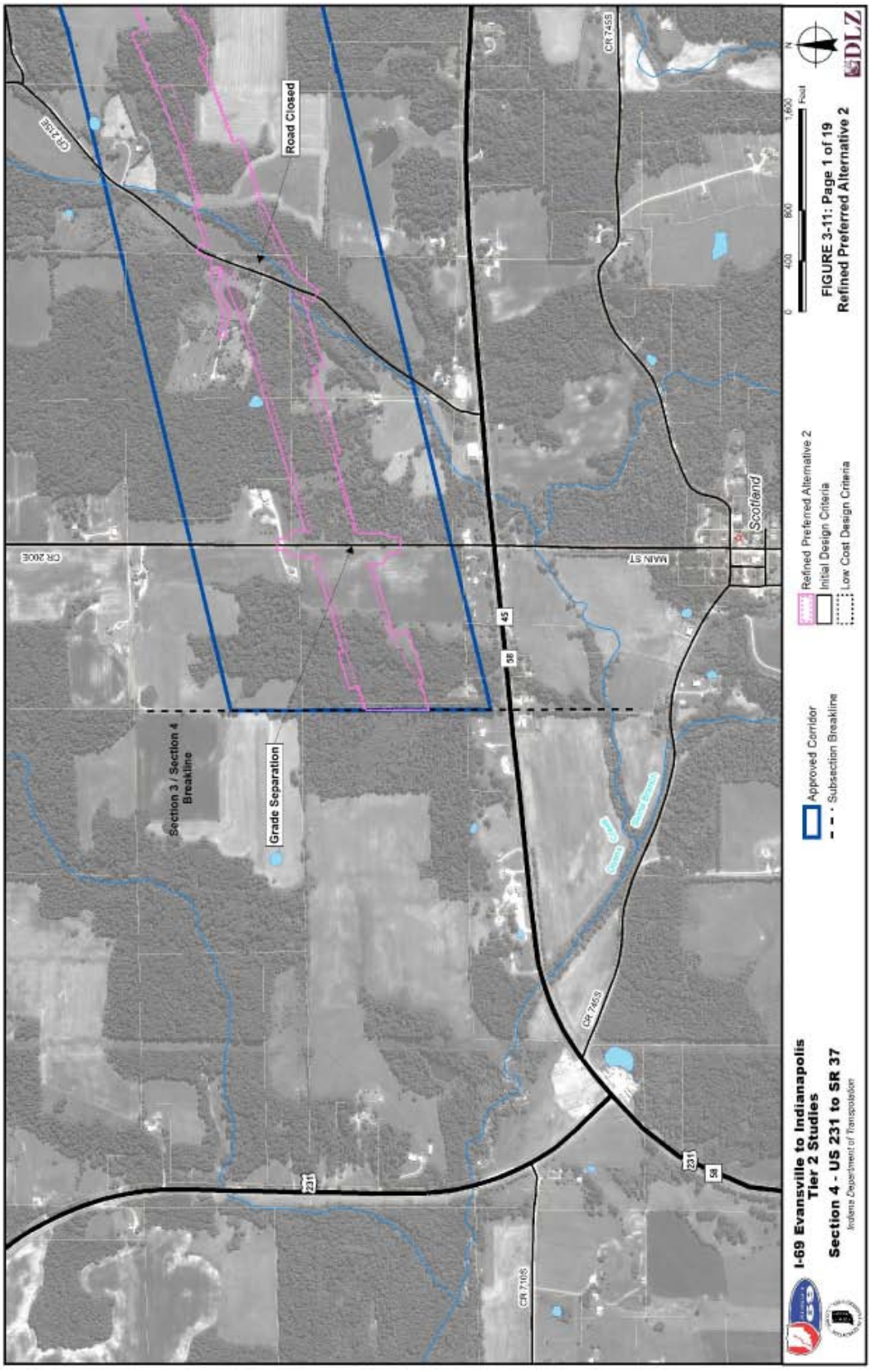


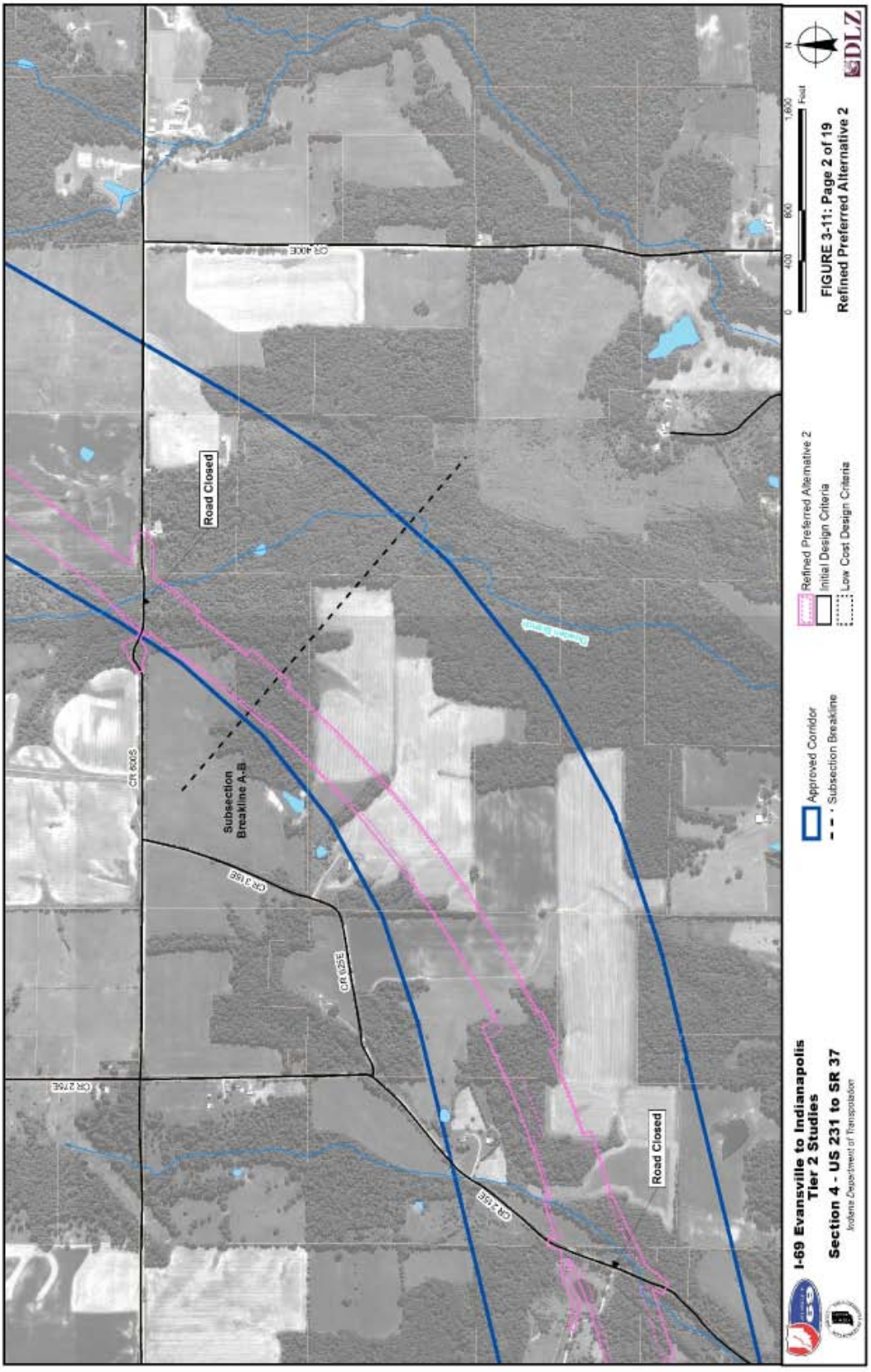
FIGURE 3-10: Page 1 of 4
Interchange Conceptual Configurations

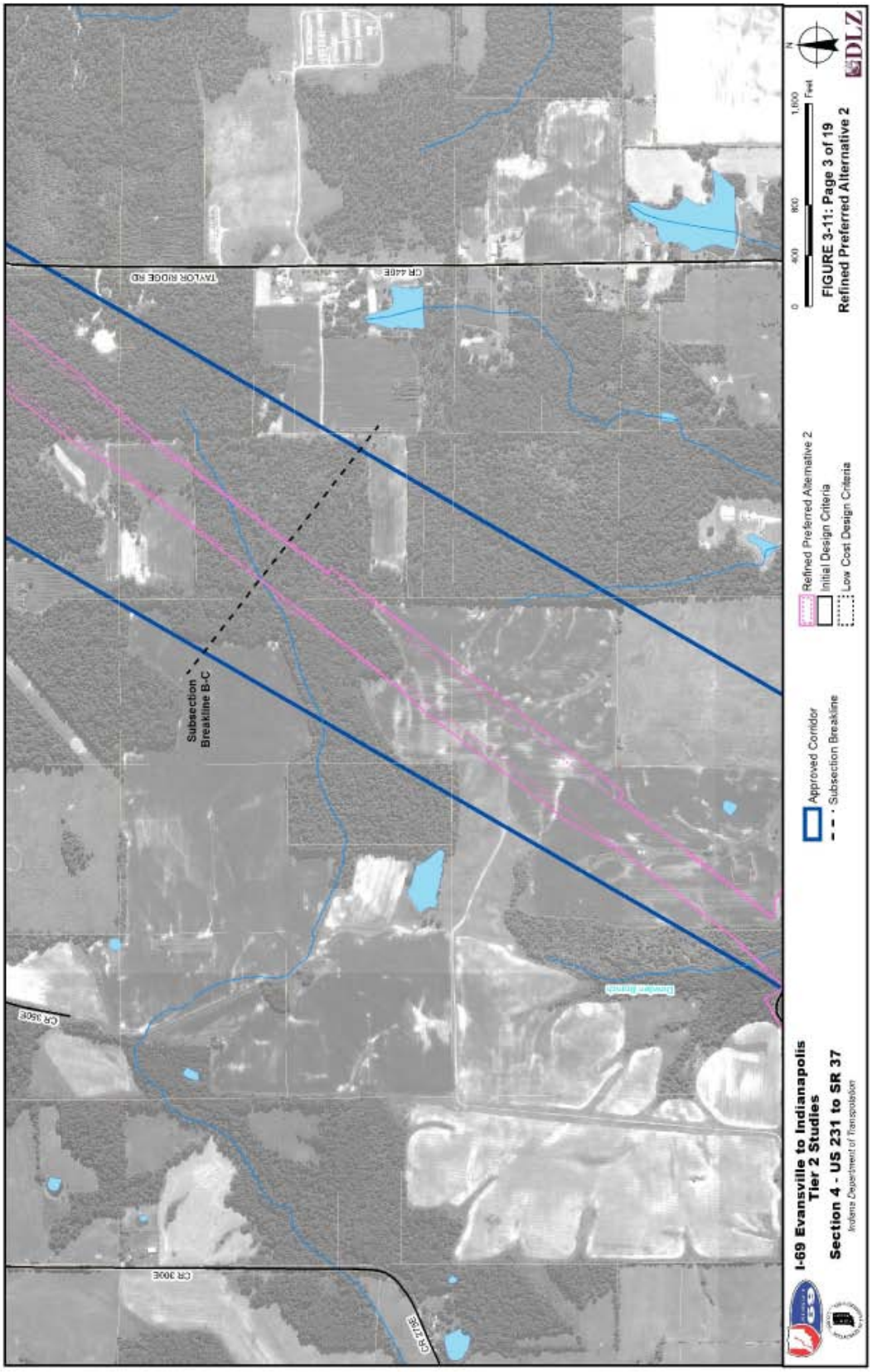

COUNTY LINE - INTERCHANGE ALTERNATIVES
ALT #1B
COUNTY LINE INTERCHANGE
ALIGNMENT 4F-3
ALT #1A
COUNTY LINE INTERCHANGE
ALIGNMENT 4F-1
Approved Corridor
Proposed Access Road Corridor
Grade Separation
Potential Right-of-Way Limits
Proposed Mainline
Proposed Ramps
Property Line
State Hwy
County Road
Wetland Boundary
Pond
Floodplain
Cemetery
100-ft Cemetery Buffer
0 350 700 1,400 2,100 2,800 Feet
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-10: Page 2 of 4
Interchange Conceptual Configurations
DLZ

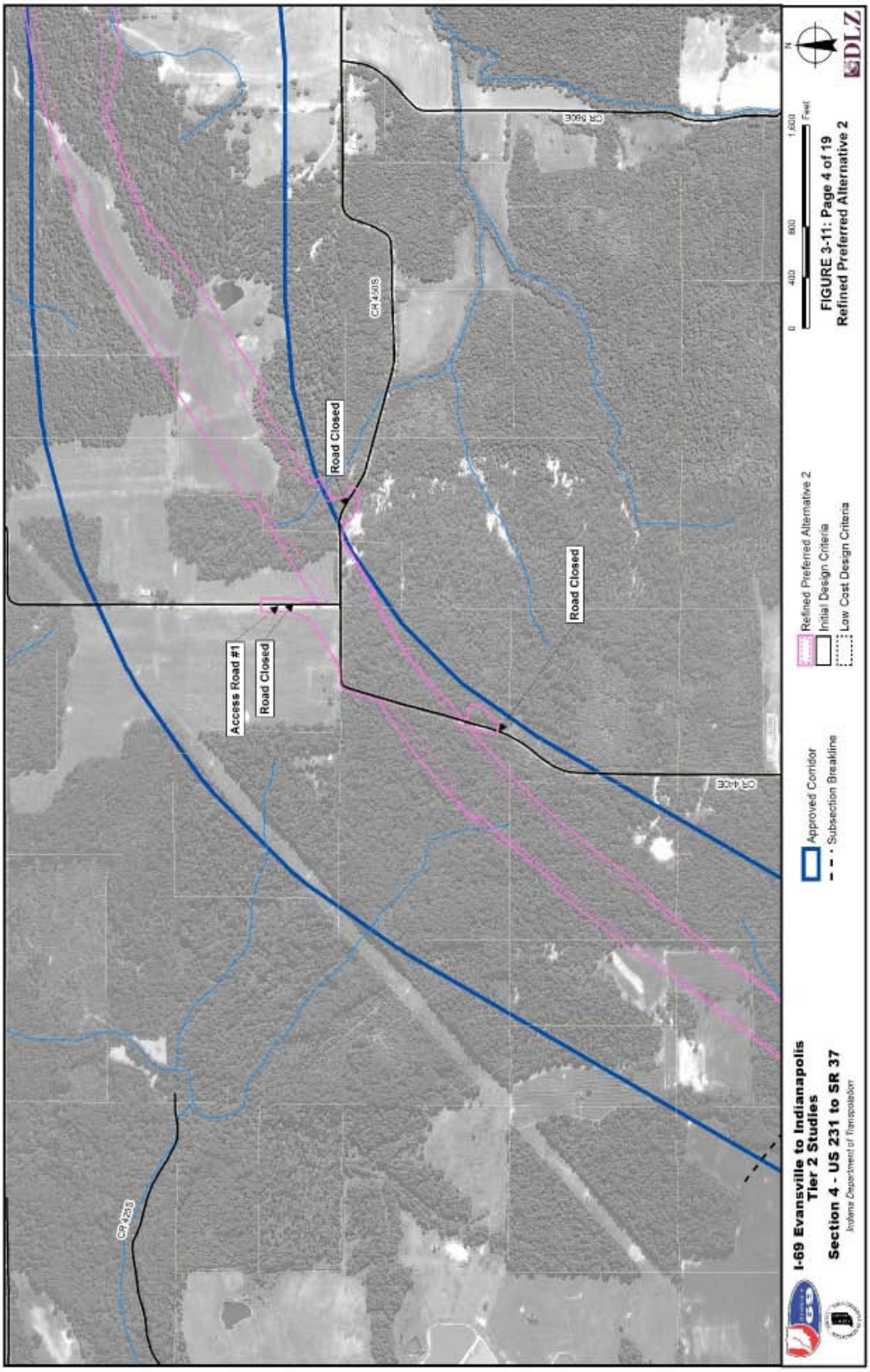

SR 37 - INTERCHANGE ALTERNATIVES
ALT #5
SR 37 INTERCHANGE
ALIGNMENT 4H-2/4H-3
ALT #1
SR 37 INTERCHANGE
ALIGNMENT 4H-1
NOTE:
THIS INTERCHANGE CONFIGURATION
CAN ALSO BE APPLIED (WITH MODIFICATIONS)
TO ALIGNMENT 4H-1
NOTE:
THIS INTERCHANGE CONFIGURATION
CAN ALSO BE APPLIED (WITH MODIFICATIONS)
TO ALIGNMENT 4H-2/4H-3.
VICTOR PIKE:
GRADE SEPARATION
OR ROAD CLOSURE
W THAT RD
S VICTOR PK
W CHURCH LANE
COMMERCIAL STREET
S STANFIELD LN
FARMERS DRIVE
BOLIN LANE
SEAST LN
37
Approved Corridor
Wetland Boundary
Man-made Pond
Grade Separation
Potential Right-of-Way Limits
Proposed Mainline
Proposed Ramps
Proposed 2-lane Ramp
Property Line
State Hwy
County Road
Floodplain
0 400 800 1,600 Feet
N
FIGURE 3-10: Page 3 of 4
Interchange Conceptual Configurations
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

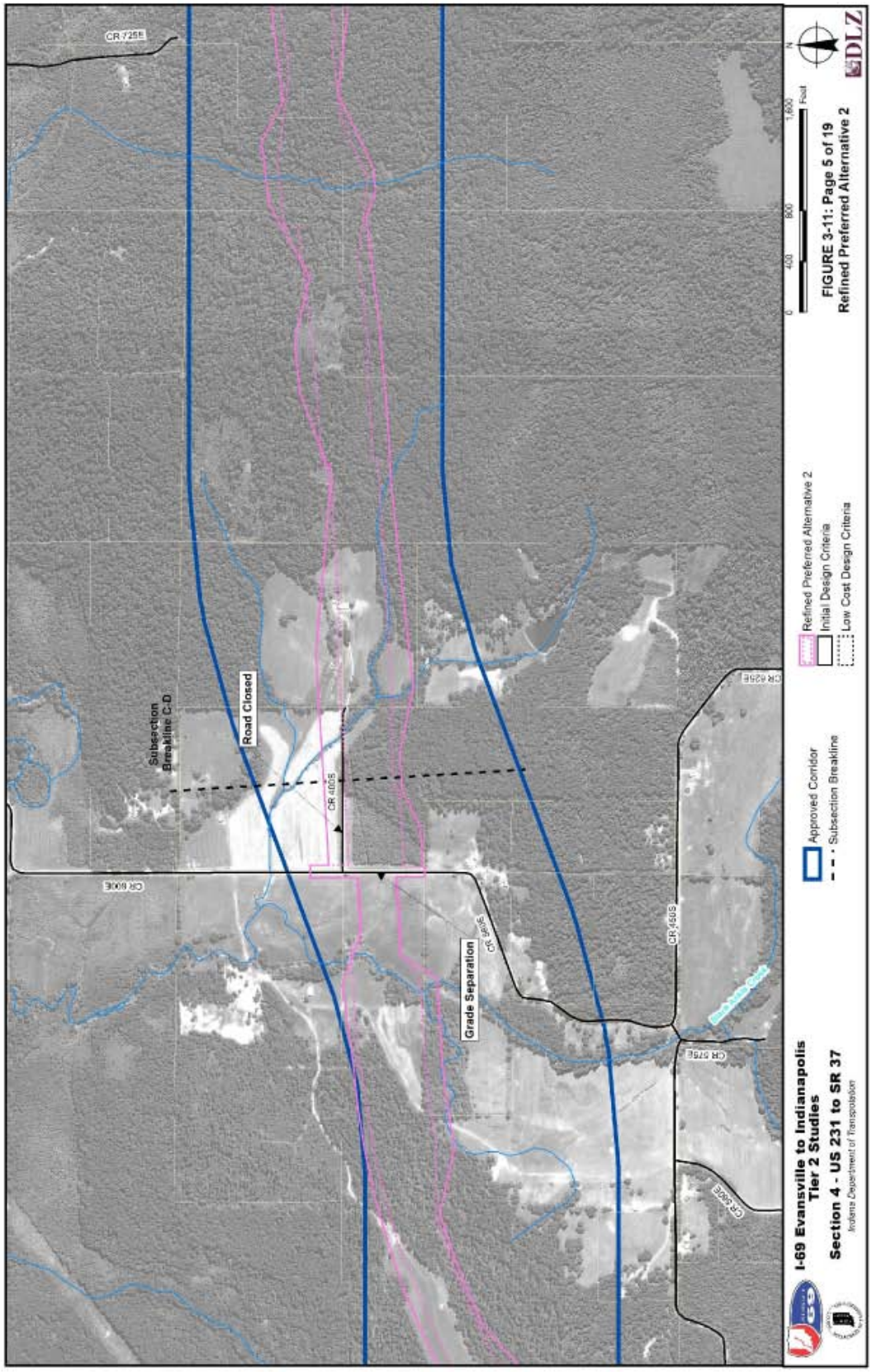

SR 37 - INTERCHANGE ALTERNATIVES
ALT #6
SR 37 INTERCHANGE
ALIGNMENT 4H-2/4H-3
ALT #4
SR 37 INTERCHANGE
ALIGNMENT 4H-1
VECTOR PIKE
SIGNALIZED
INTERSECTION
VECTOR PIKE
ROUNDABOUT
OR SIGNALIZED
INTERSECTION
NOTE:
THIS INTERCHANGE CONFIGURATION
CAN ALSO BE APPLIED (WITH MODIFICATIONS)
TO ALIGNMENT 4H-1
NOTE:
THIS INTERCHANGE CONFIGURATION
CAN ALSO BE APPLIED (WITH MODIFICATIONS)
TO ALIGNMENT 4H-2/4H-3.
W CHURCH LANE
S VICTOR PK
W THAT RD
S EAST LN
FARMERS DRIVE
BOLIN LANE
S STANSIFER LN
37
Approved Corridor
Wetland Boundary
Man-made Pond
Grade Separation
Potential Right-of-Way Limits
Proposed Mainline
Proposed Ramps
Proposed 2-lane Ramp
Property Line
State Hwy
County Road
Floodplain
0 400 800 1,600 Feet
N
FIGURE 3-10: Page 4 of 4
Interchange Conceptual Configurations
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


Road Closed
Grade Separation
Section 3 / Section 4 Breakline
Scotland
MAIN ST
CR 200E
CR 700S
CR 700E
CR 745S
CR 710S
231
45
58
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 1 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Road Closed
Subsection Breakline A-B
Road Closed
CR 400E
CR 600S
CR 275E
CR 325E
CR 375E
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
FIGURE 3-11: Page 2 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


TAYLOR RIDGE RD
CR 440E
CR 350E
CR 300E
CR 175E
Subsection Breakline B-C
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 3 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Road Closed
Road Closed
Road Closed
Access Road #1
CR 450S
CR 425S
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 4 of 19
Refined Preferred Alternative 2


CR 725E
Subsection Breakline C-D
Road Closed
CR 400S
CR 900E
Grade Separation
CR 500E
CR 625E
CR 675E
CR 700E
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
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Section 4 - US 231 to SR 37
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FIGURE 3-11: Page 5 of 19
Refined Preferred Alternative 2
DLZ
N
0
400
800
1,600
Feet

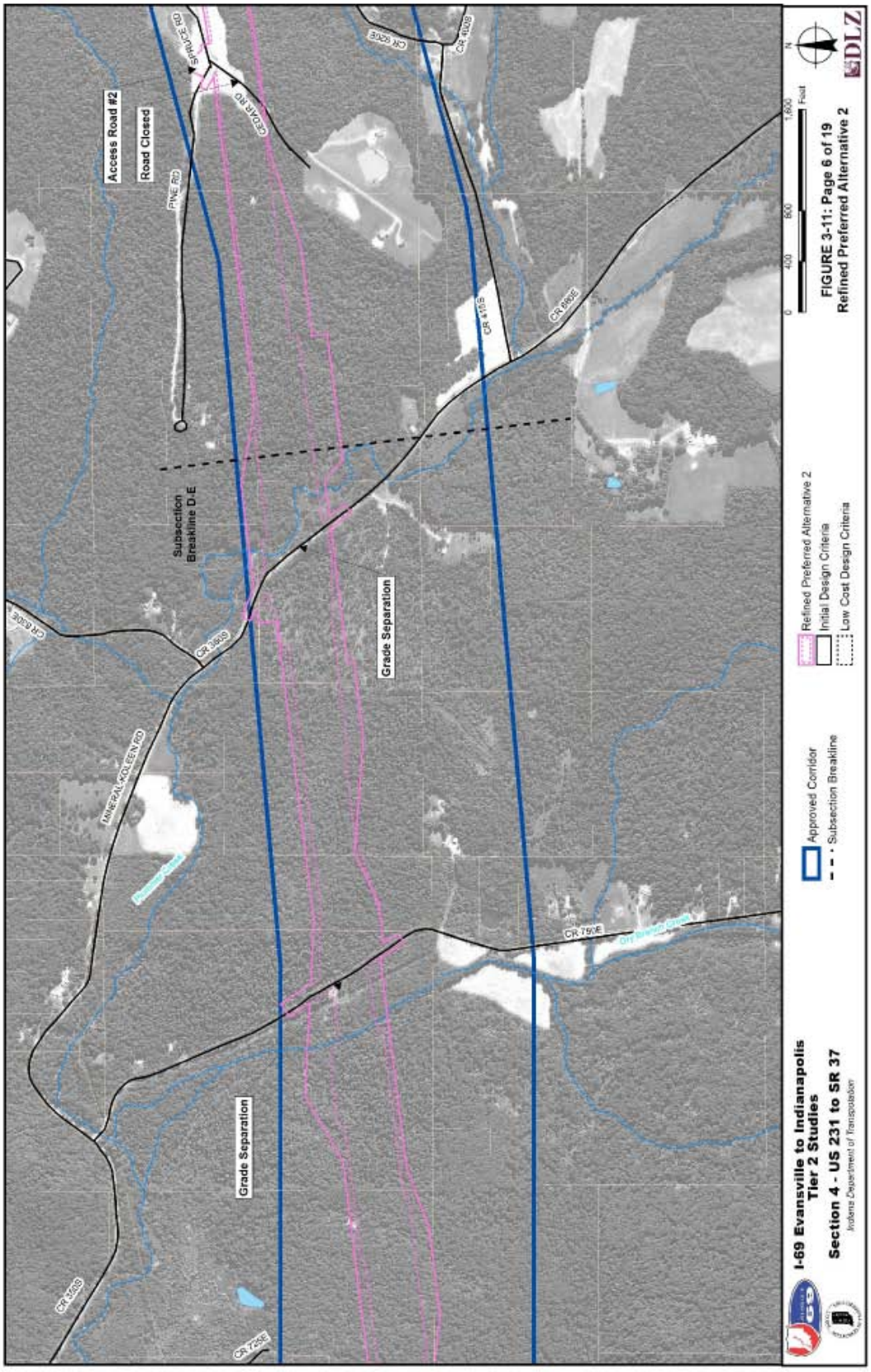
Access Road #2
Road Closed
PINE RD
CEDAR RD
CR 400E
CR 450E
CR 475S
CR 525E
CR 600E
CR 625E
CR 675S
CR 700E
CR 725E
Subsection Breakline D-E
Grade Separation
Grade Separation
MINERAL SPRINGS RD
Patoka River
Otter Branch Creek
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
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FIGURE 3-11: Page 6 of 19
Refined Preferred Alternative 2
0
400
800
1,600
Feet
N
DLZ

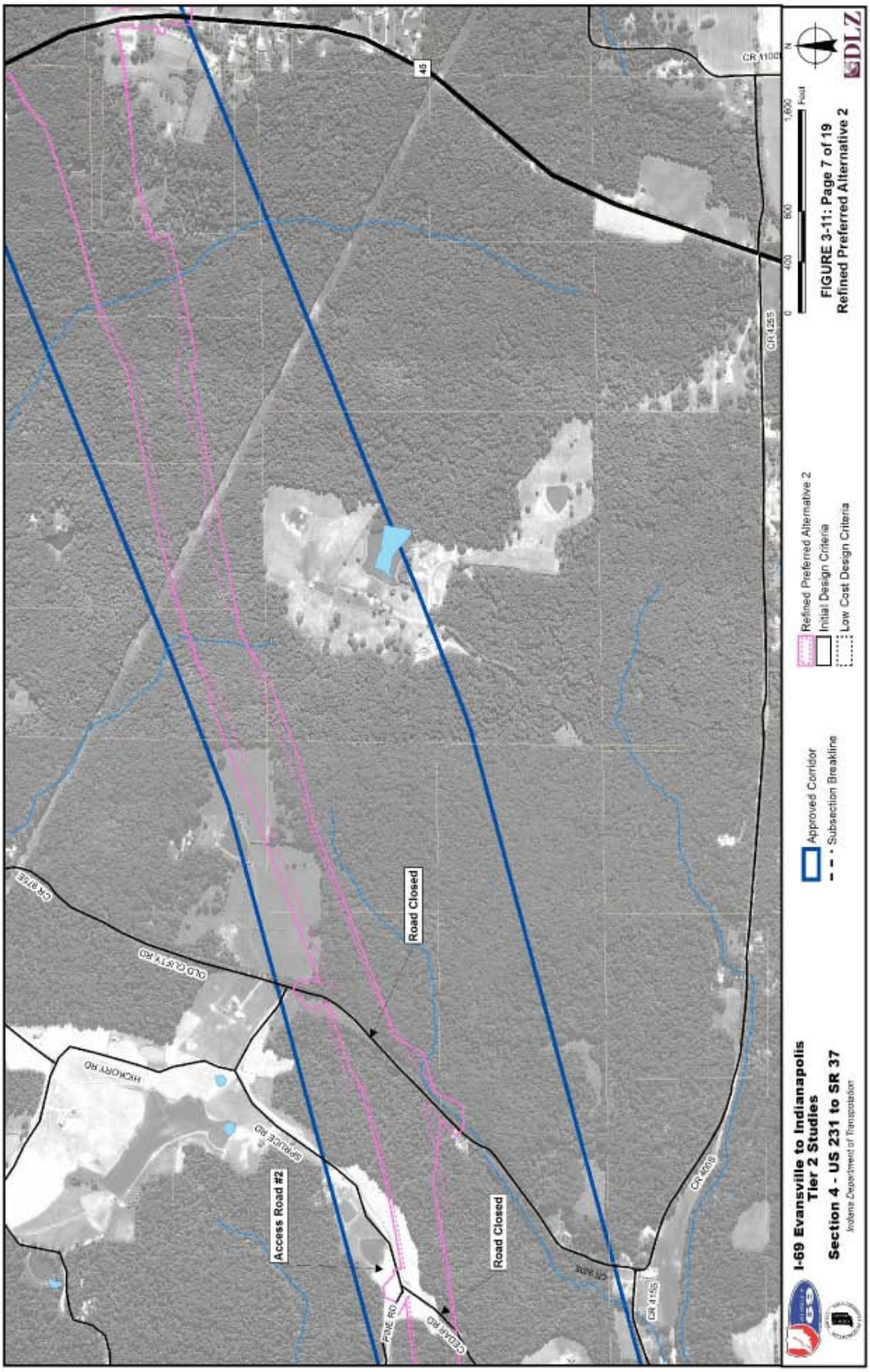
FIGURE 3-11: Page 7 of 19
Refined Preferred Alternative 2
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
Road Closed
Road Closed
Access Road #2
45
CR 1100
CR 1265
CR 1145
CR 1000
OLD CAETY RD
HICKORY RD
CEDAR RD
PINE RD
0
400
800
1,600
Feet
N

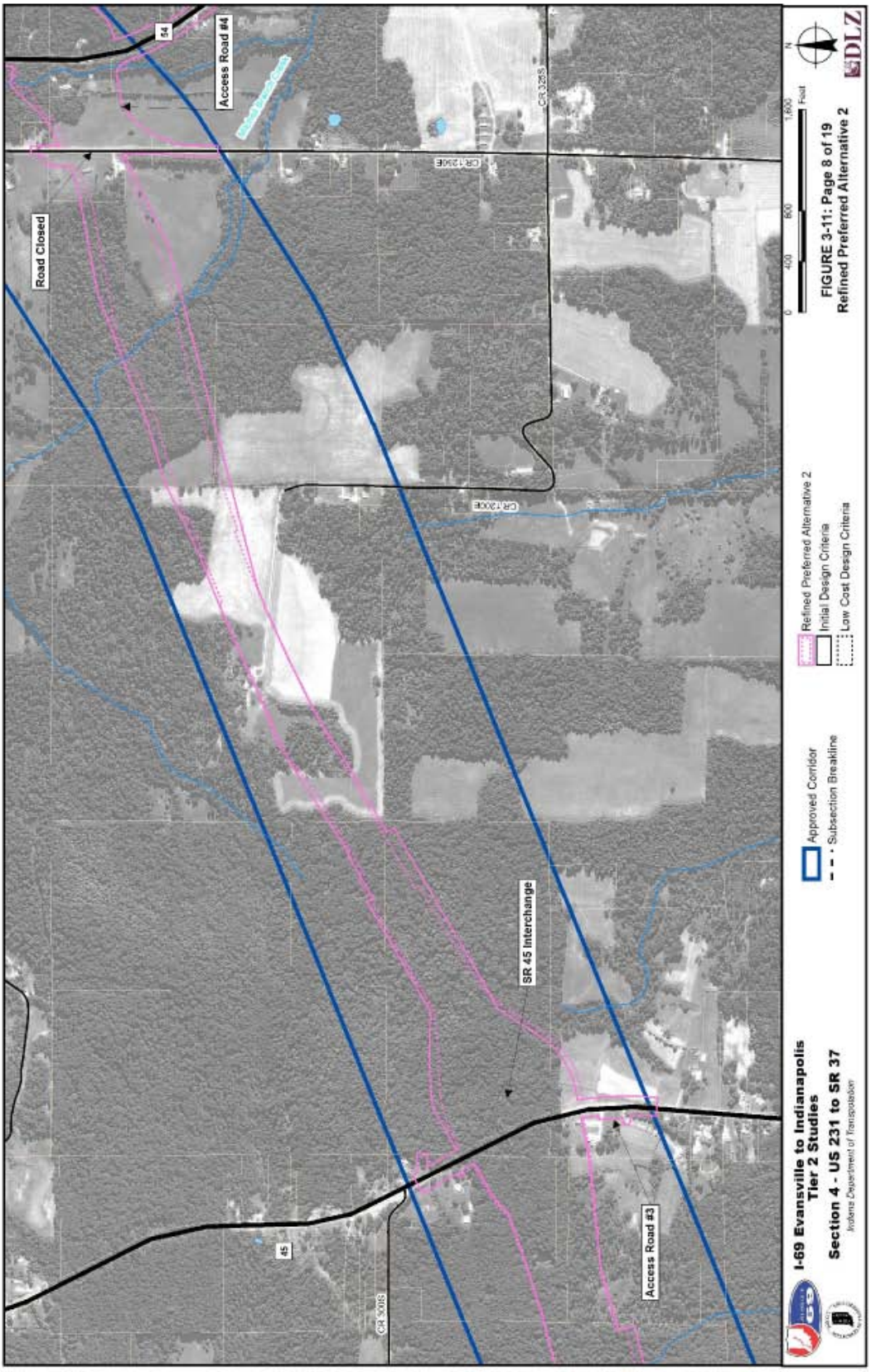
Access Road #4
Road Closed
SR 45 Interchange
Access Road #3
45
CR 300E
CR 325S
CR 300S
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
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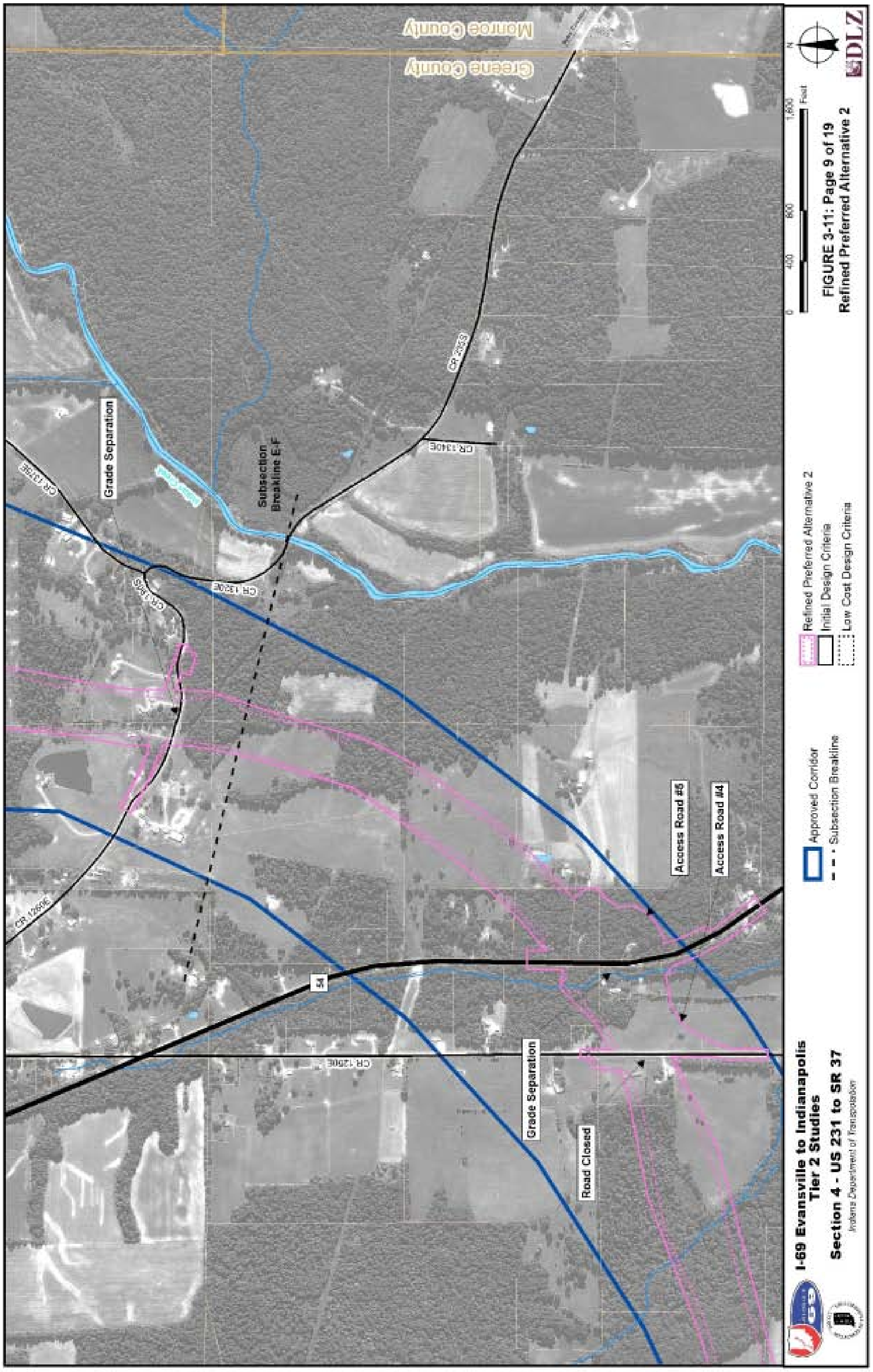
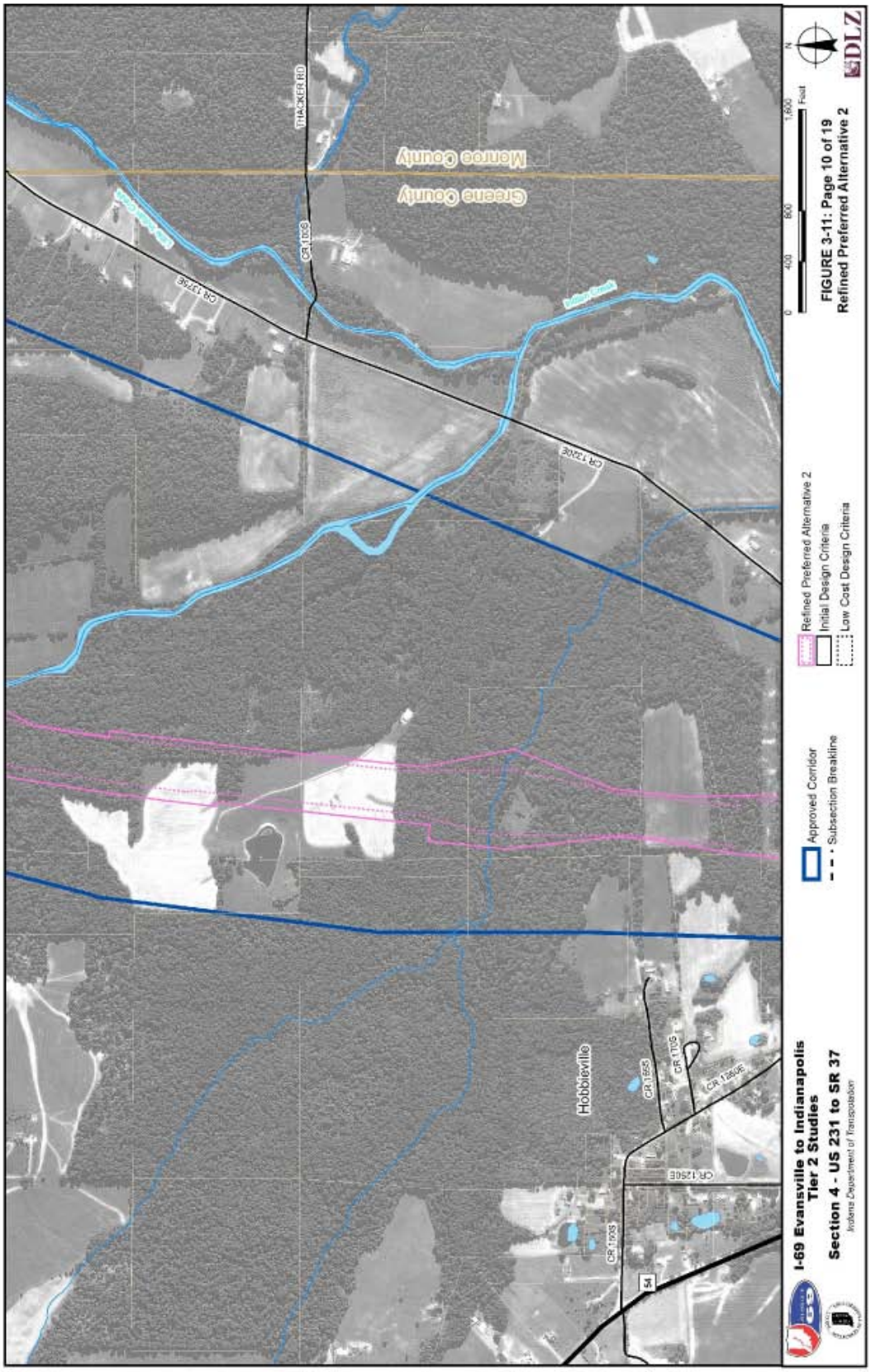
FIGURE 3-11: Page 8 of 19
Refined Preferred Alternative 2
DLZ


Monroe County
Greene County
CR 235S
CR 1340E
CR 1320E
Grade Separation
Subsection Breakline E-F
Access Road #5
Access Road #4
54
CR 1250E
Grade Separation
Road Closed
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
0 400 800 1,600 Feet
FIGURE 3-11: Page 9 of 19
Refined Preferred Alternative 2
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Greene County
Monroe County
TACKER RD
CR 1109
CR 1250E
CR 1250E
Hobbieville
CR 1109
CR 1250E
CR 1100S
54
I-69 Evansville to Indianapolis
Tier 2 Studies
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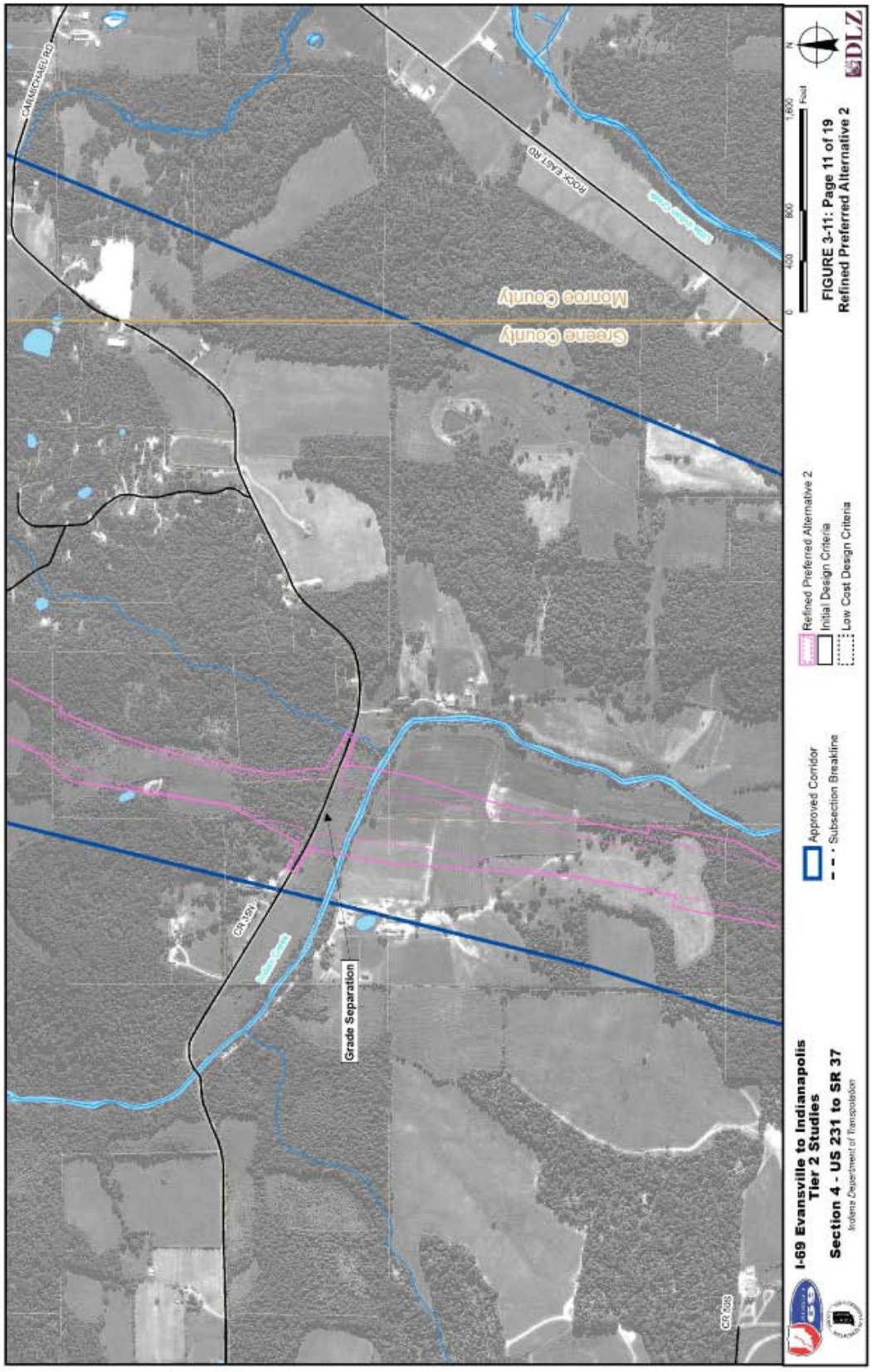
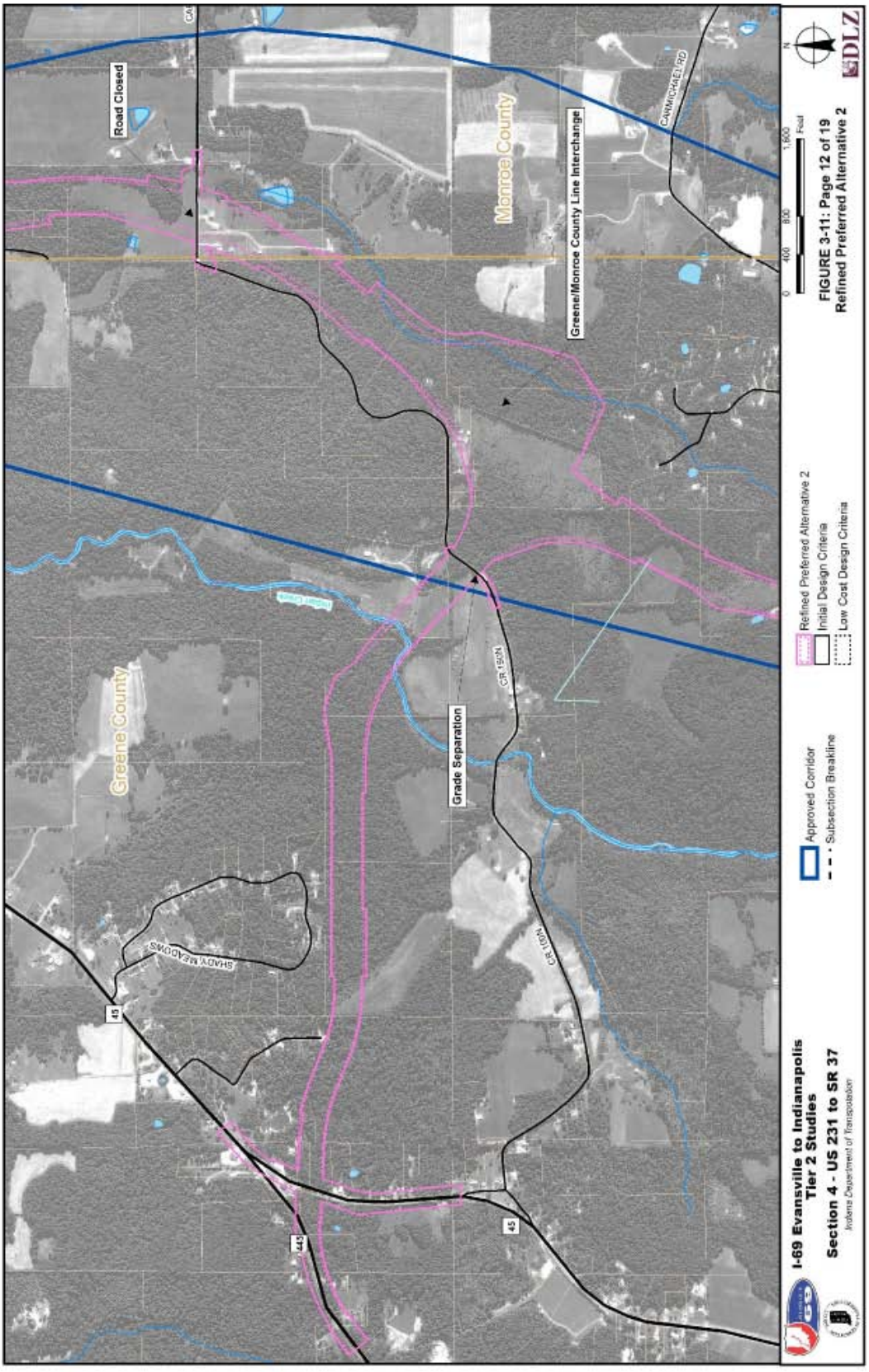
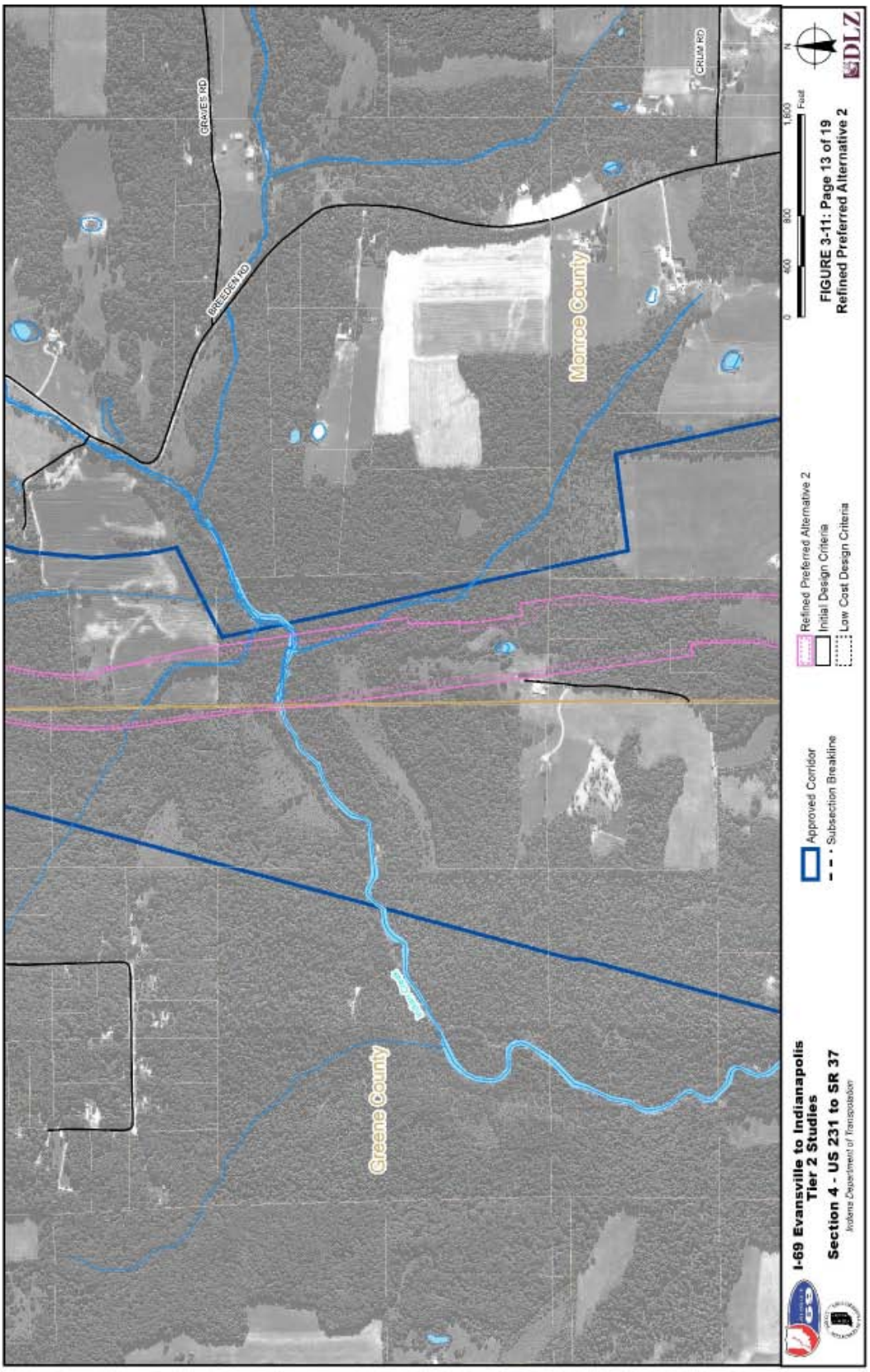
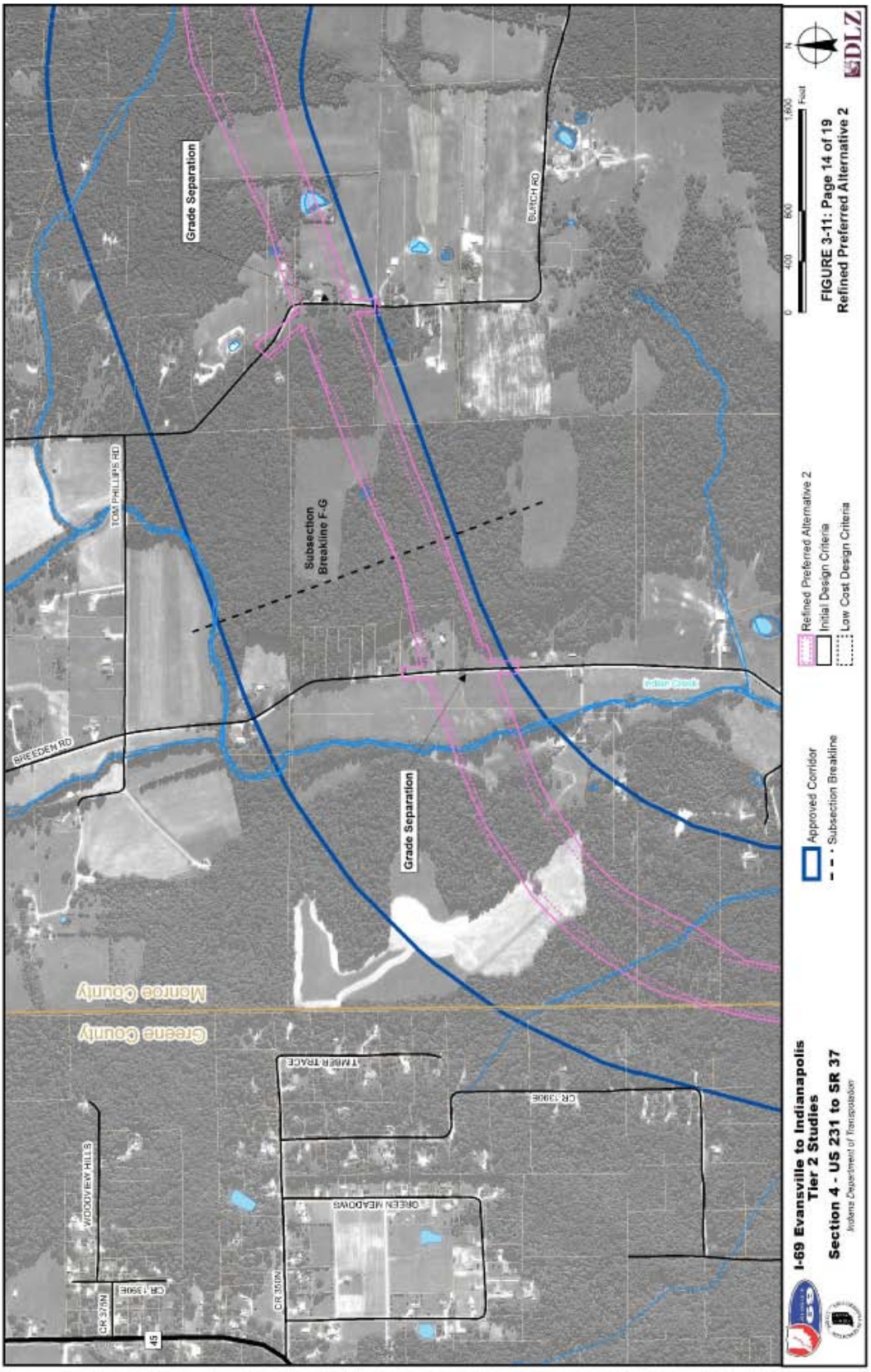
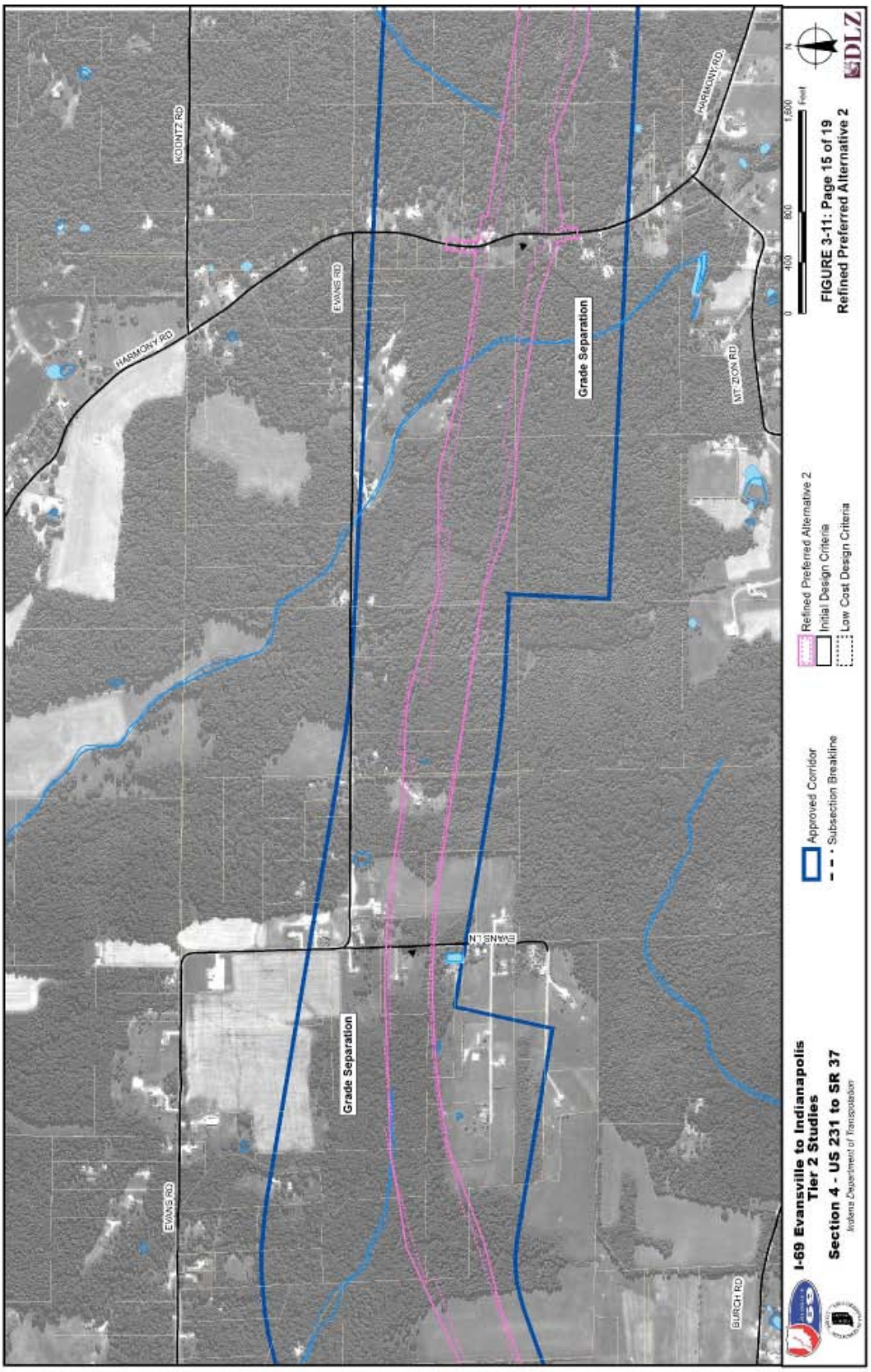
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 10 of 19
Refined Preferred Alternative 2

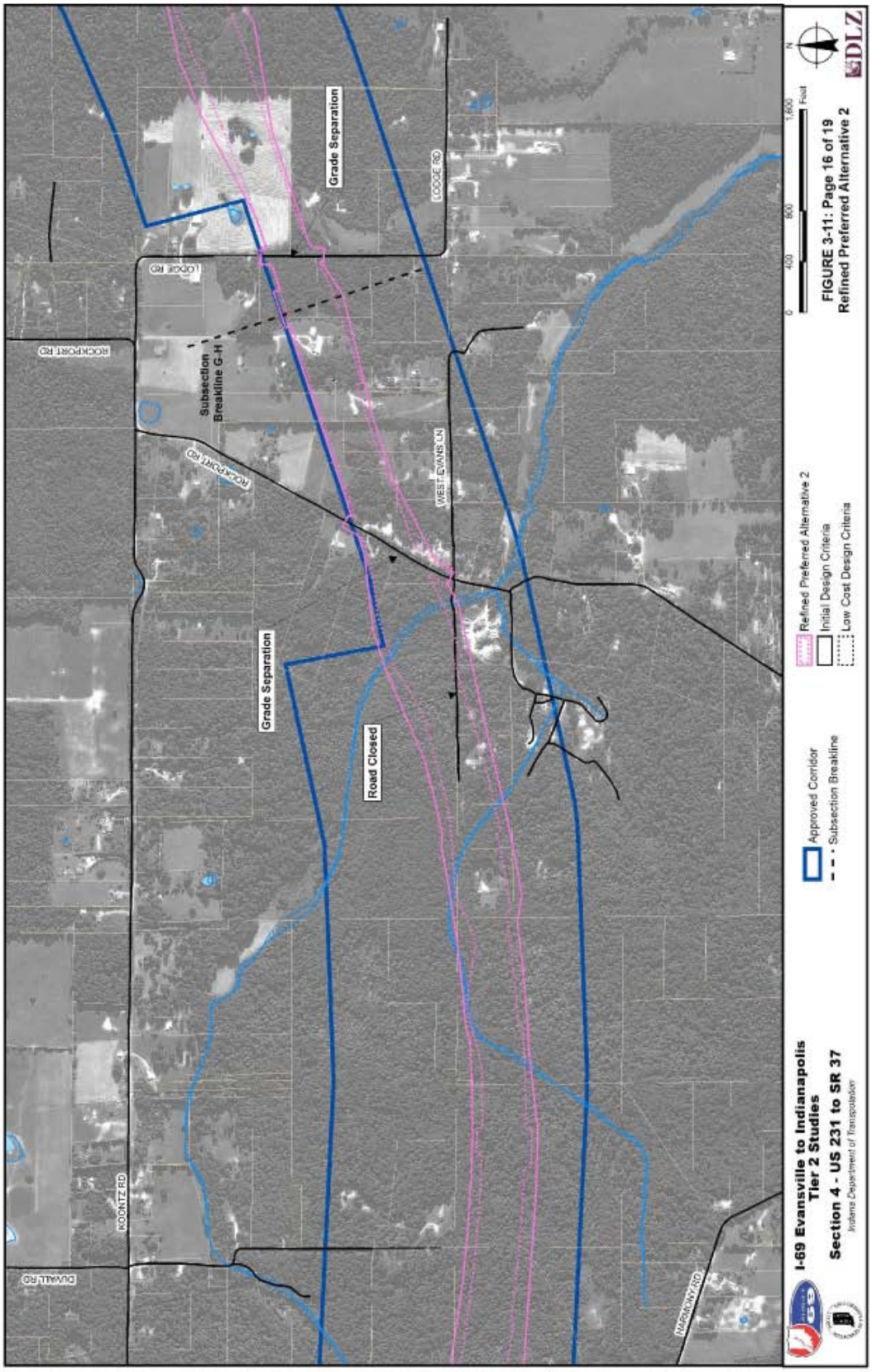

Monroe County
Greene County
Grade Separation
CR 625
CR 450
ROCK EAST RD
CARTERSBURG RD
FIGURE 3-11: Page 11 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
DLZ

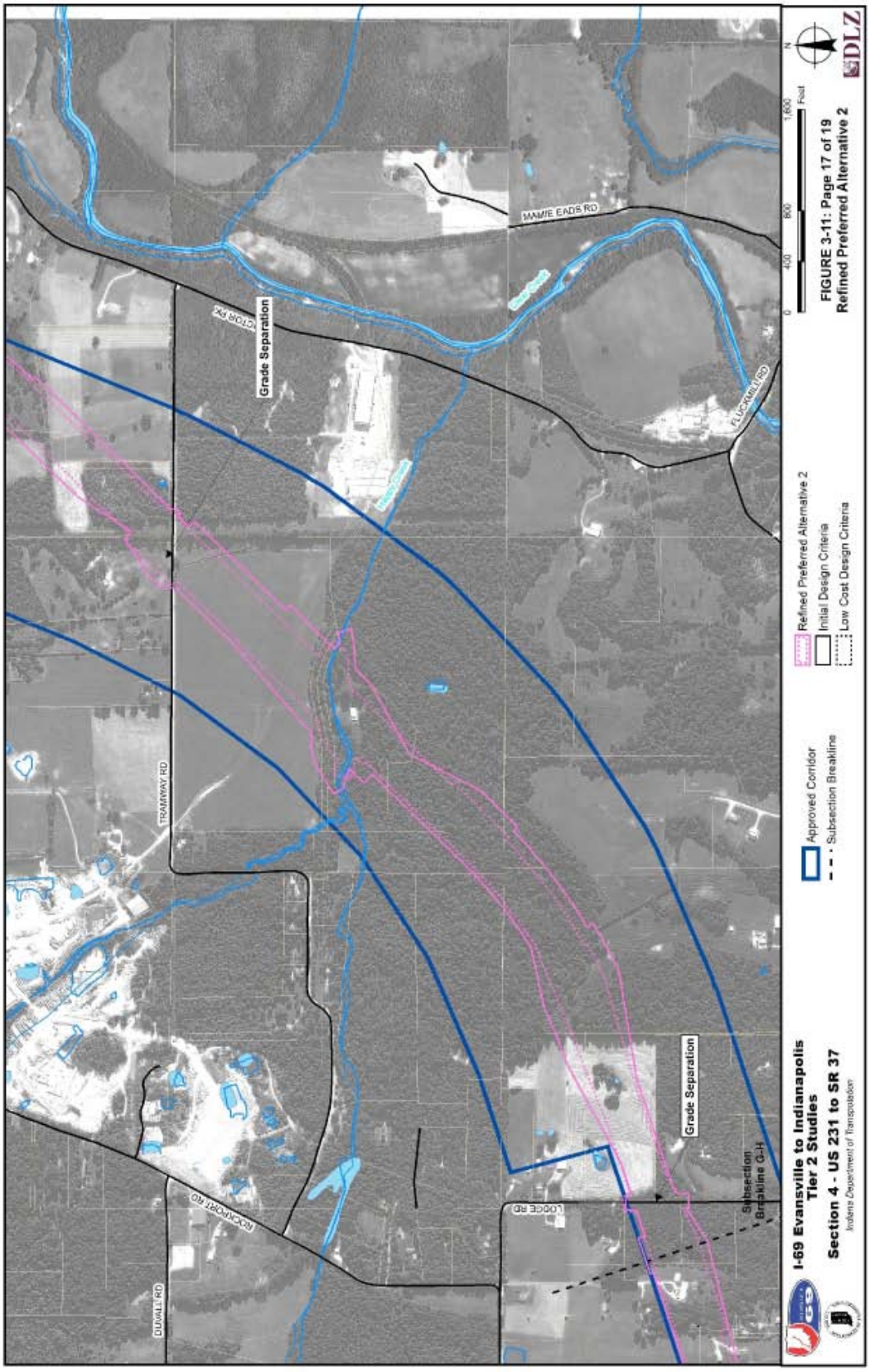

Road Closed
Monroe County
Greene/Monroe County Line Interchange
CANNICHAEL RD
Greene County
Grade Separation
CR 150N
CR 125N
SHADY MEADOWS
45
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 12 of 19
Refined Preferred Alternative 2

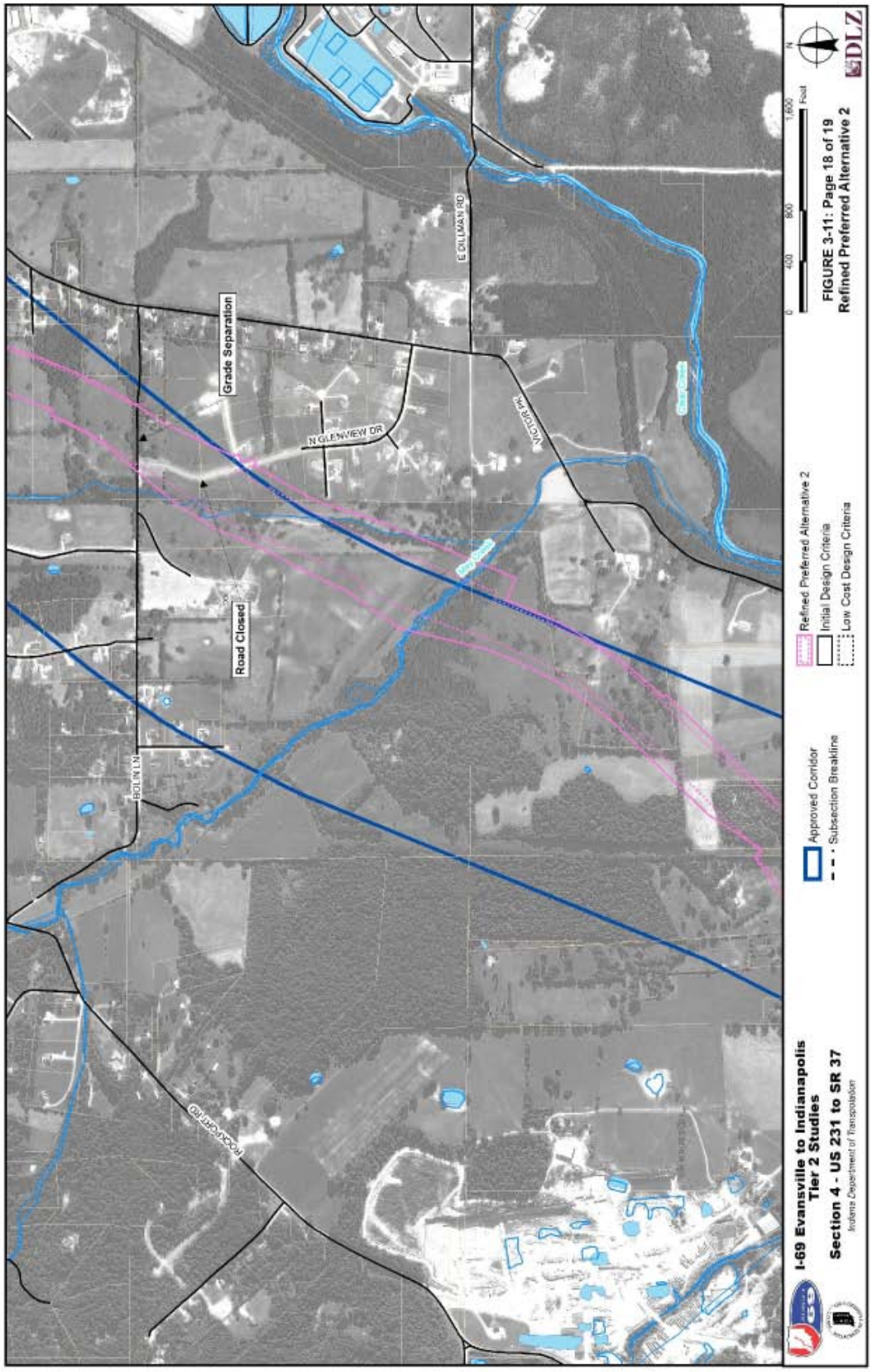

GRAVES RD
BREEDEN RD
CRUM RD
Monroe County
Greene County
N
0
400
800
1,600
Feet
FIGURE 3-11: Page 13 of 19
Refined Preferred Alternative 2
DLZ
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

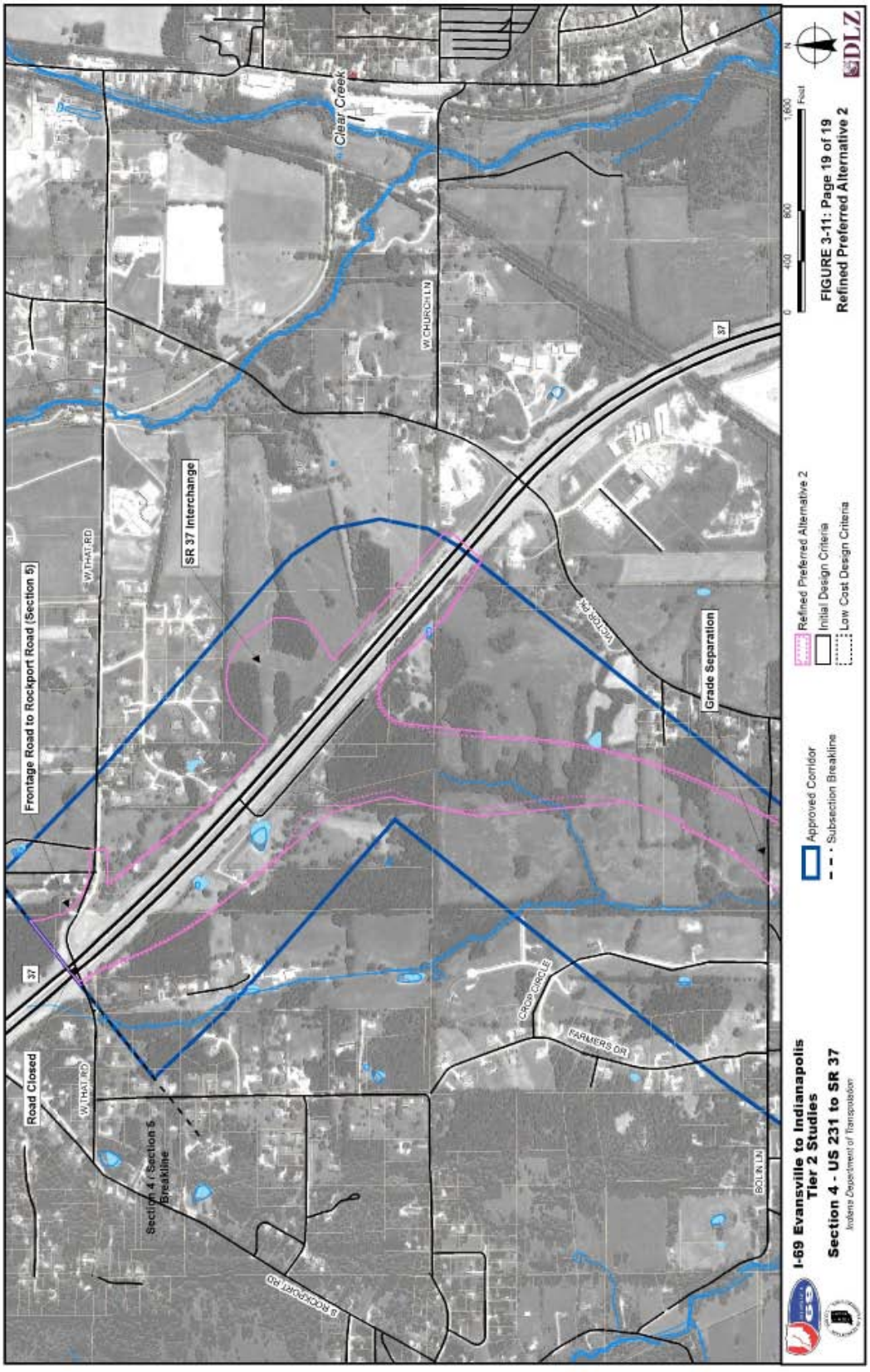

Grade Separation
BUNCH RD
TOM PHILLIPS RD
Subsection Breakline F-G
BRESDEN RD
Indian Creek
Grade Separation
Monroe County
Greene County
TIMBER TRACE
CR 1300E
GREEN MEADOWS
WOODVIEW HILLS
CR 375N
CR 1350E
CR 350N
SR
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 14 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

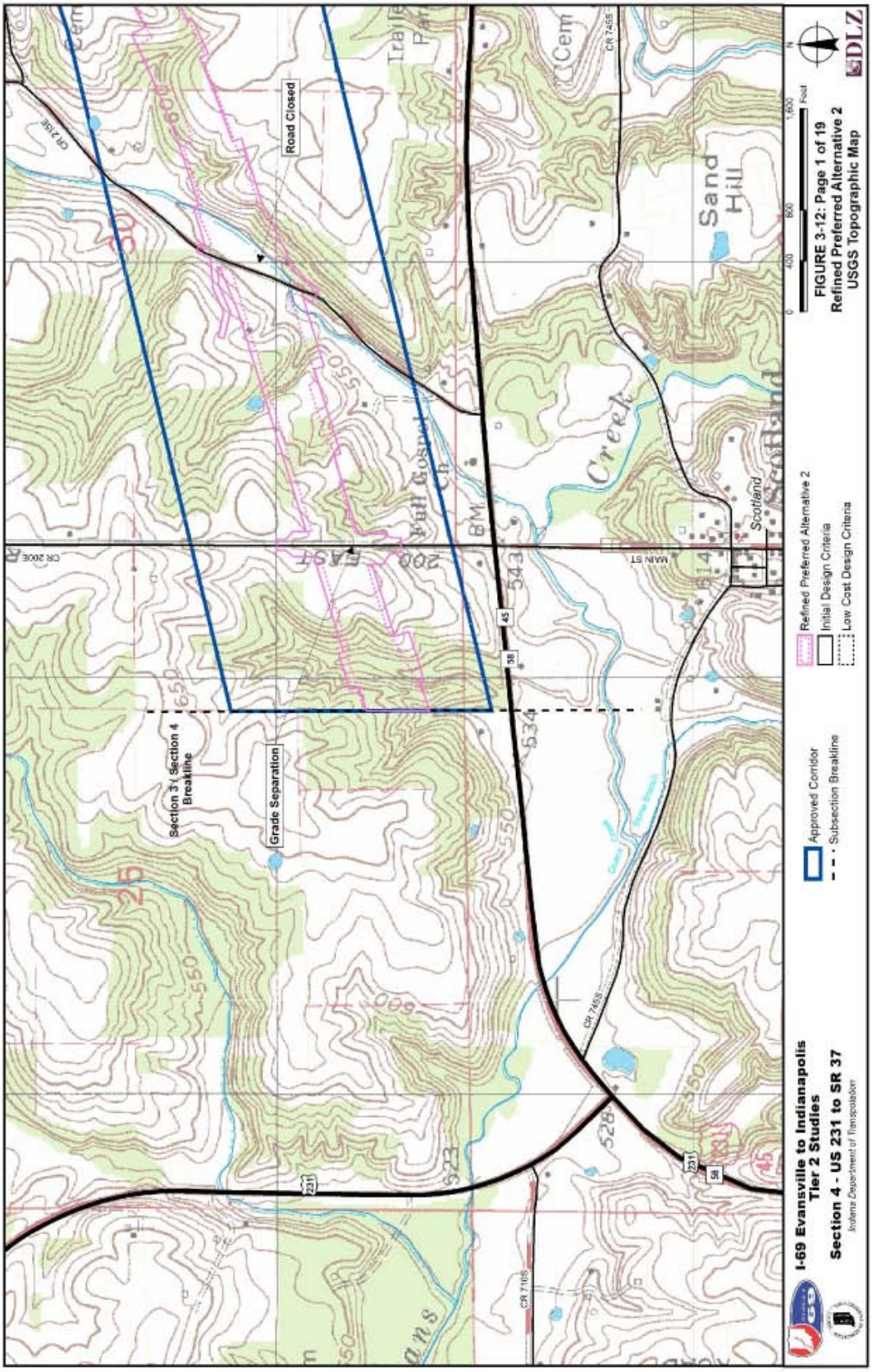

KOONTZ RD
HARMONY RD
EVANS RD
Grade Separation
MT ZION RD
HARMONY RD
EVANS LN
Grade Separation
EVANS RD
BURCH RD
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 15 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Grade Separation
LODGE RD
LODGE RD
ROCKPORT RD
Subsection 1
Breakline G-H
ROCKPORT RD
WEST EVANS LN
Grade Separation
Road Closed
KOONTZ RD
DUVALL RD
HARMONY RD
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
0
400
800
1,600
Feet
N
DLZ
FIGURE 3-11: Page 16 of 19
Refined Preferred Alternative 2


MAMIE EADS RD
Grade Separation
FLUCKEWELL RD
TRAMWAY RD
ROCKPORT RD
DUVALL RD
LODGE RD
Grade Separation
Subsection Breakline G-H
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-11: Page 17 of 19
Refined Preferred Alternative 2
DLZ


Grade Separation
Road Closed
N GLENVIEW DR
E GILMAN RD
N COLTS RUN
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
FIGURE 3-11: Page 18 of 19
Refined Preferred Alternative 2
DLZ


Clear Creek
W CHURCH LN
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
W THAT RD
Grade Separation
Road Closed
Section 4 / Section 5 Breakline
S ROCKPORT RD
CROSSROAD LN
FARMERS DR
BOLIN LN
37
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
0
400
800
1,600
Feet
N
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
FIGURE 3-11: Page 19 of 19
Refined Preferred Alternative 2


Road Closed
Grade Separation
Section 3 / Section 4 Breakline
Sand Hill
Scotland
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 1 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ

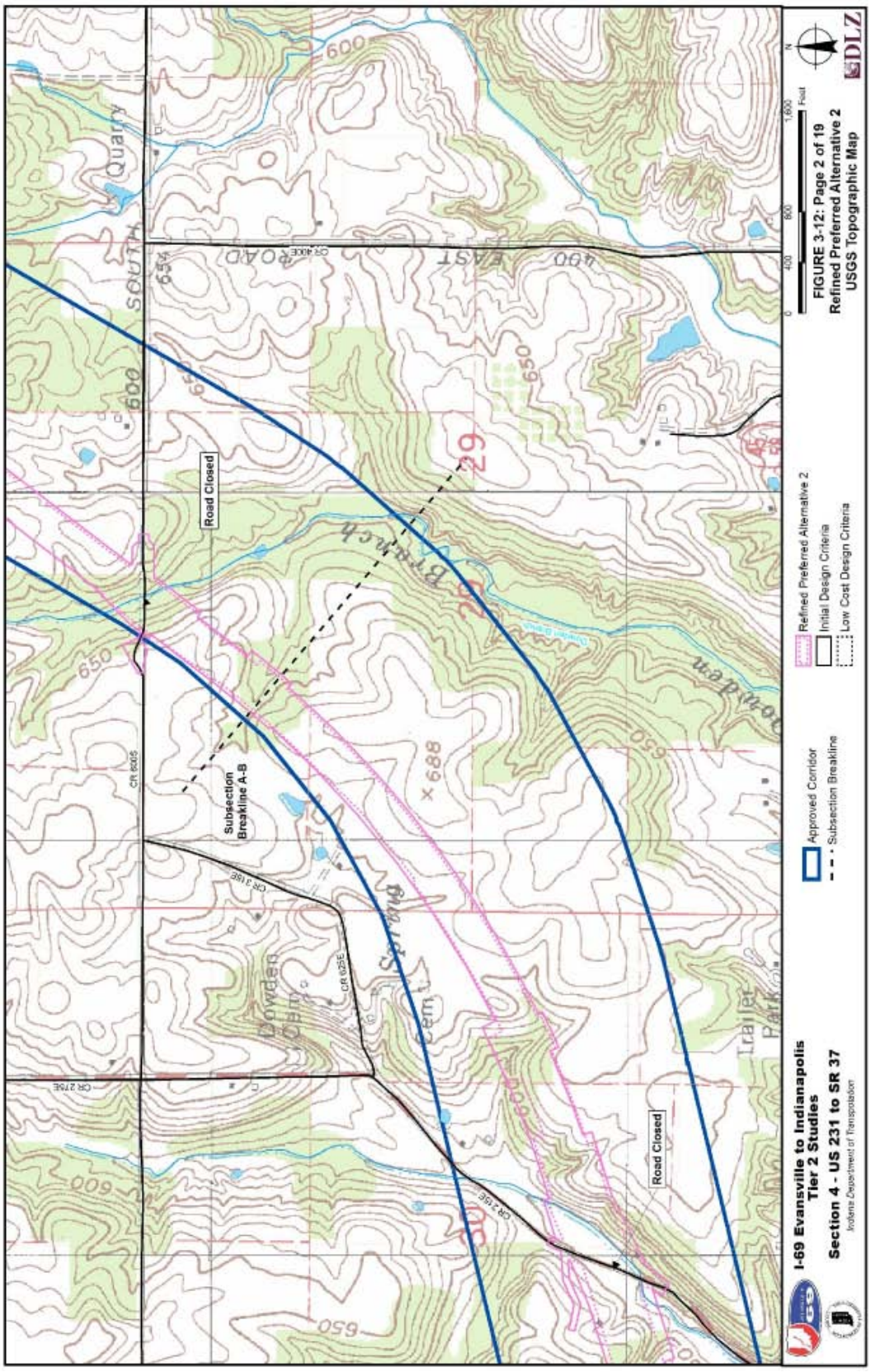
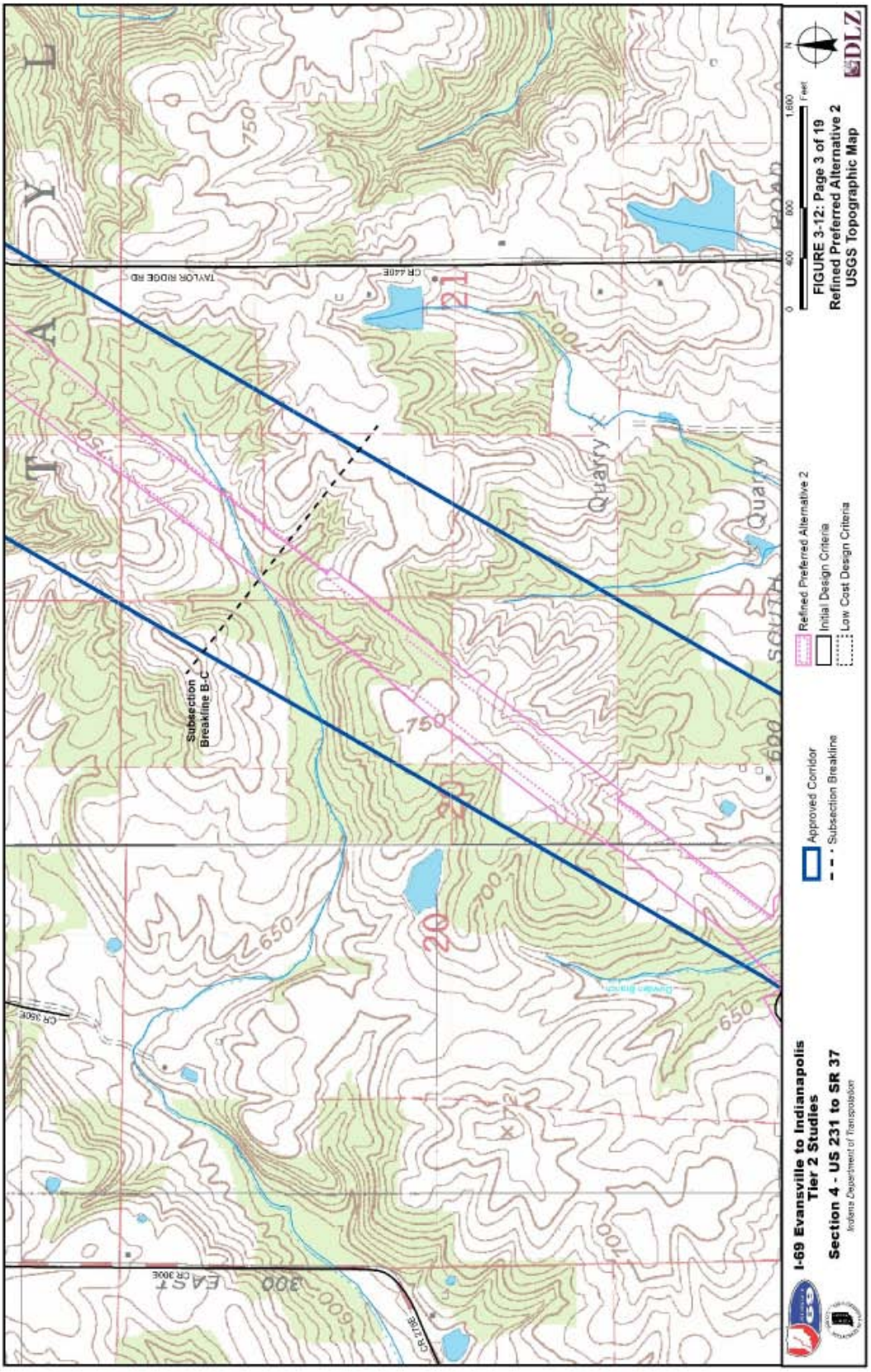
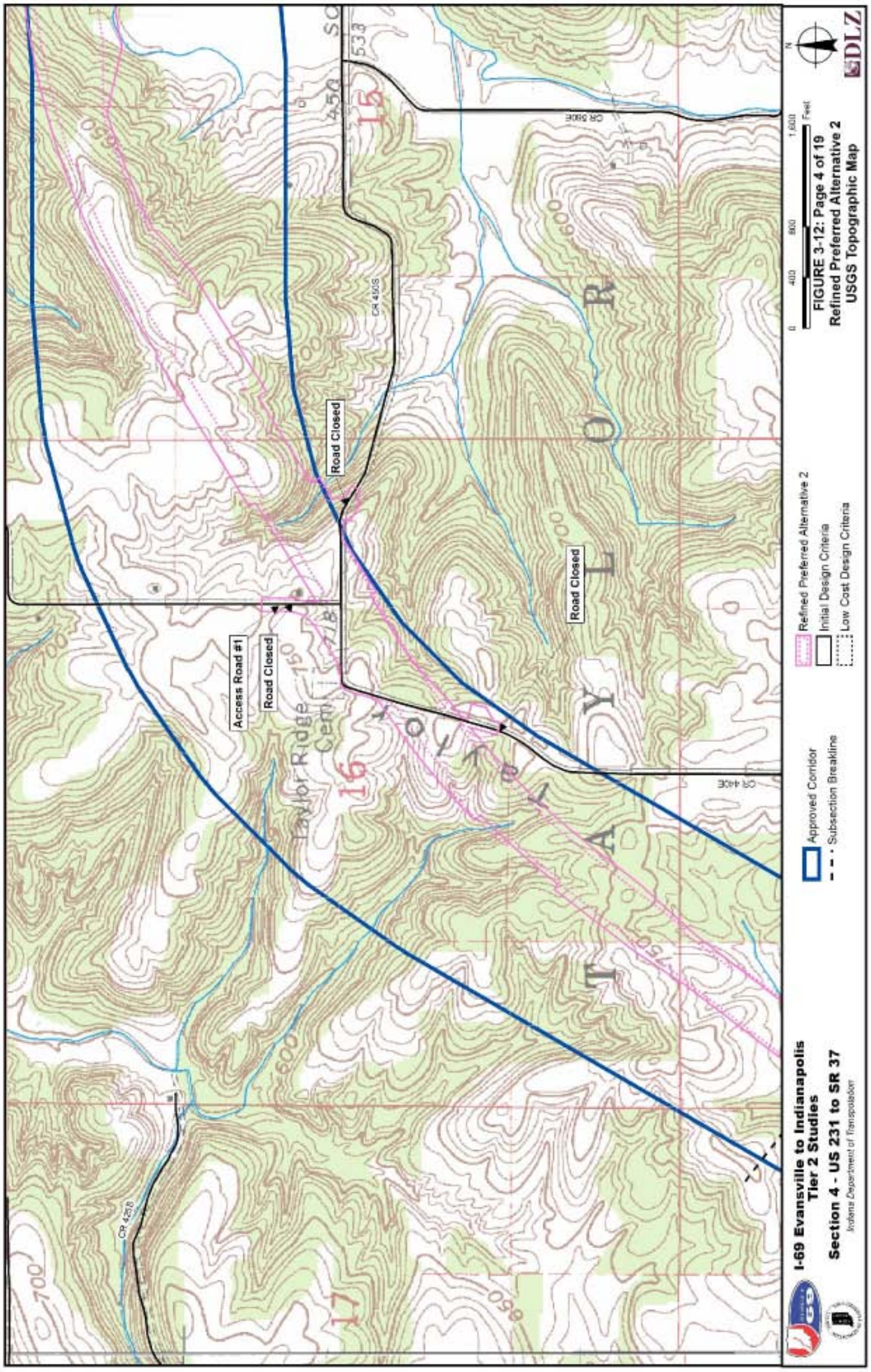


FIGURE 3-12: Page 2 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
Subsection Breakline A-B
Road Closed
Road Closed
Quarry
Trailer Park
Cem.
Branch
South
EAST
ROAD
600
650
688


I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
FIGURE 3-12: Page 3 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ
Subsection Breakline B-C
TAYLOR RIDGE RD
CR 440E
CR 300E
CR 310E
Quarry
SOUTH
EAST
750
700
650
600
300


Road Closed
Road Closed
Road Closed
Access Road #1
Taylor Ridge Cemetery
CR 450S
CR 440E
CR 420S
CR 428
TAYLOR TWP
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 4 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ

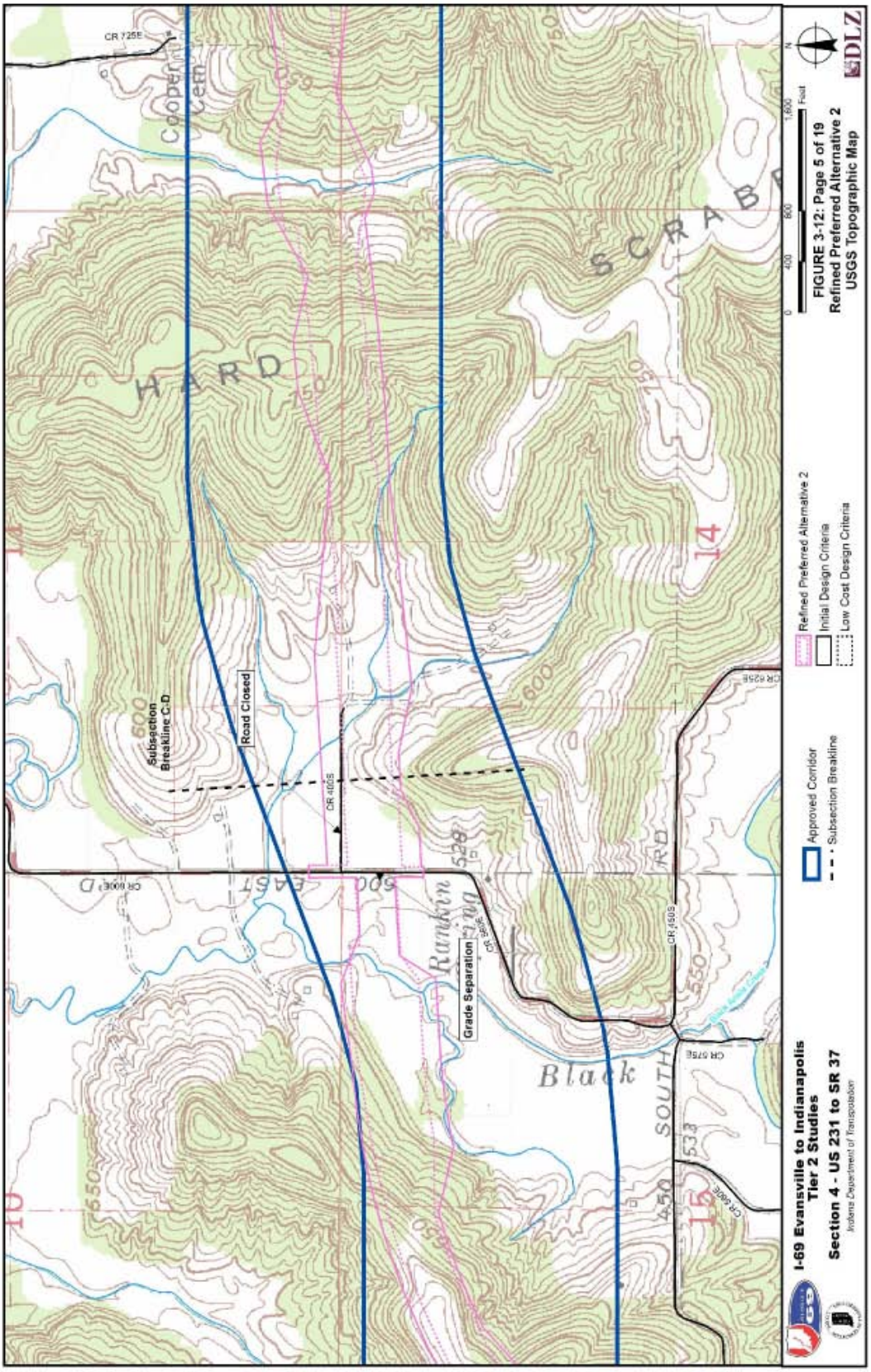

CR 725E
Cooper Cem
HARD
SCRAB
Road Closed
Subsection Breakline C-D
CR 400S
CR 600E
EAST
Rankin
Grade Separation
CR 450S
CR 575E
Black
SOUTH
RD
CR 625E
CR 650E
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
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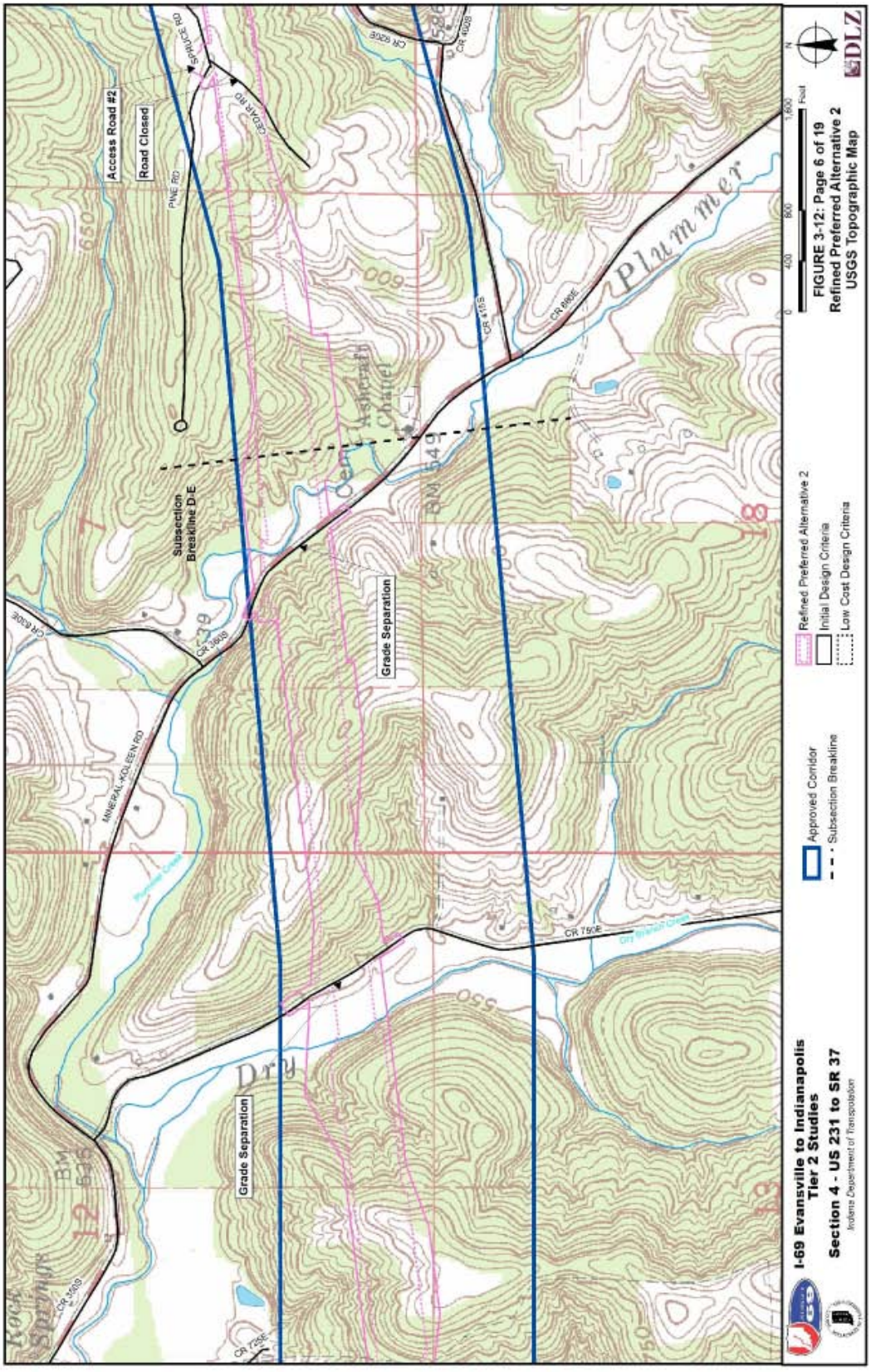
FIGURE 3-12: Page 5 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ


Access Road #2
Road Closed
Subsection Breakline D-E
Grade Separation
Grade Separation
Plummer
Dry
Rock Springs
CR 750E
CR 800E
MINERAL-KOLEEN RD
PINE RD
CEDAR RD
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 6 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ

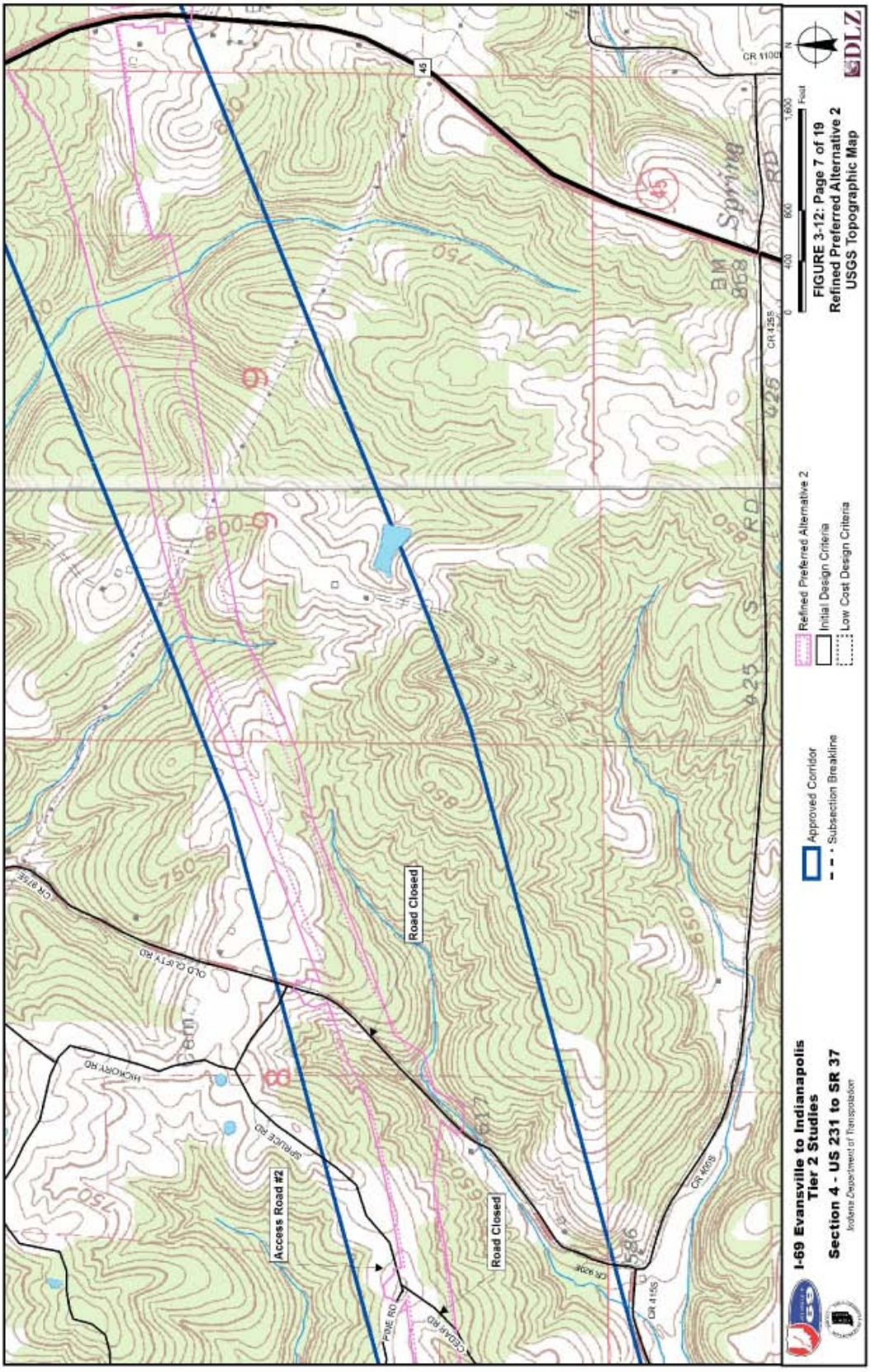
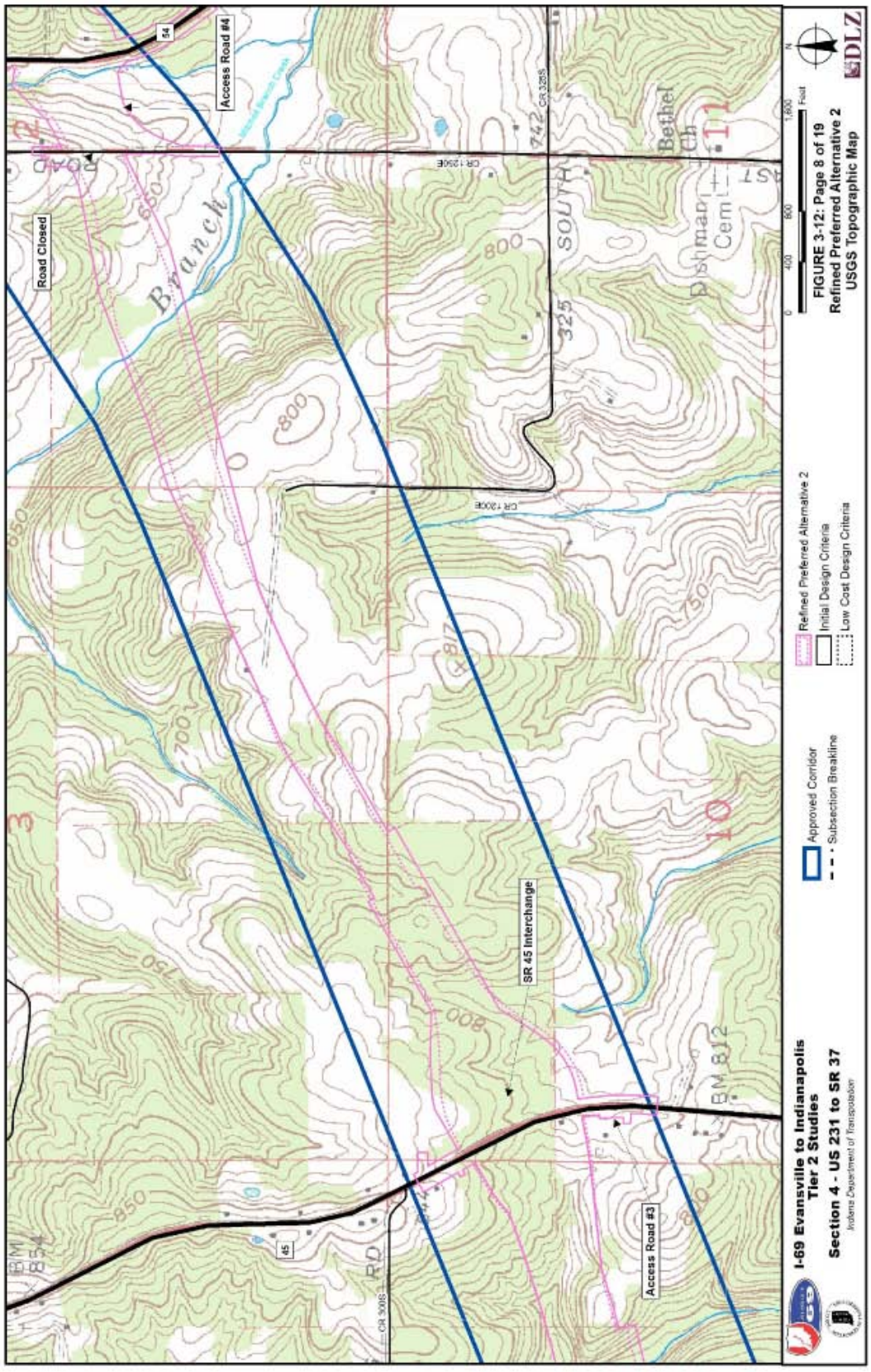


FIGURE 3-12: Page 7 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Road Closed
Access Road #2
Road Closed
Spring RD
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
PINE RD
CEDAR RD
CR 400S
CR 425E
CR 450E
CR 415S
CR 1100S
CR 425S
45


Access Road #4
Road Closed
SR 45 Interchange
Access Road #3
Bethel Ch
Dishman Cemetery
SOUTH
Branch
BM 854
BM 812
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
FIGURE 3-12: Page 8 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ

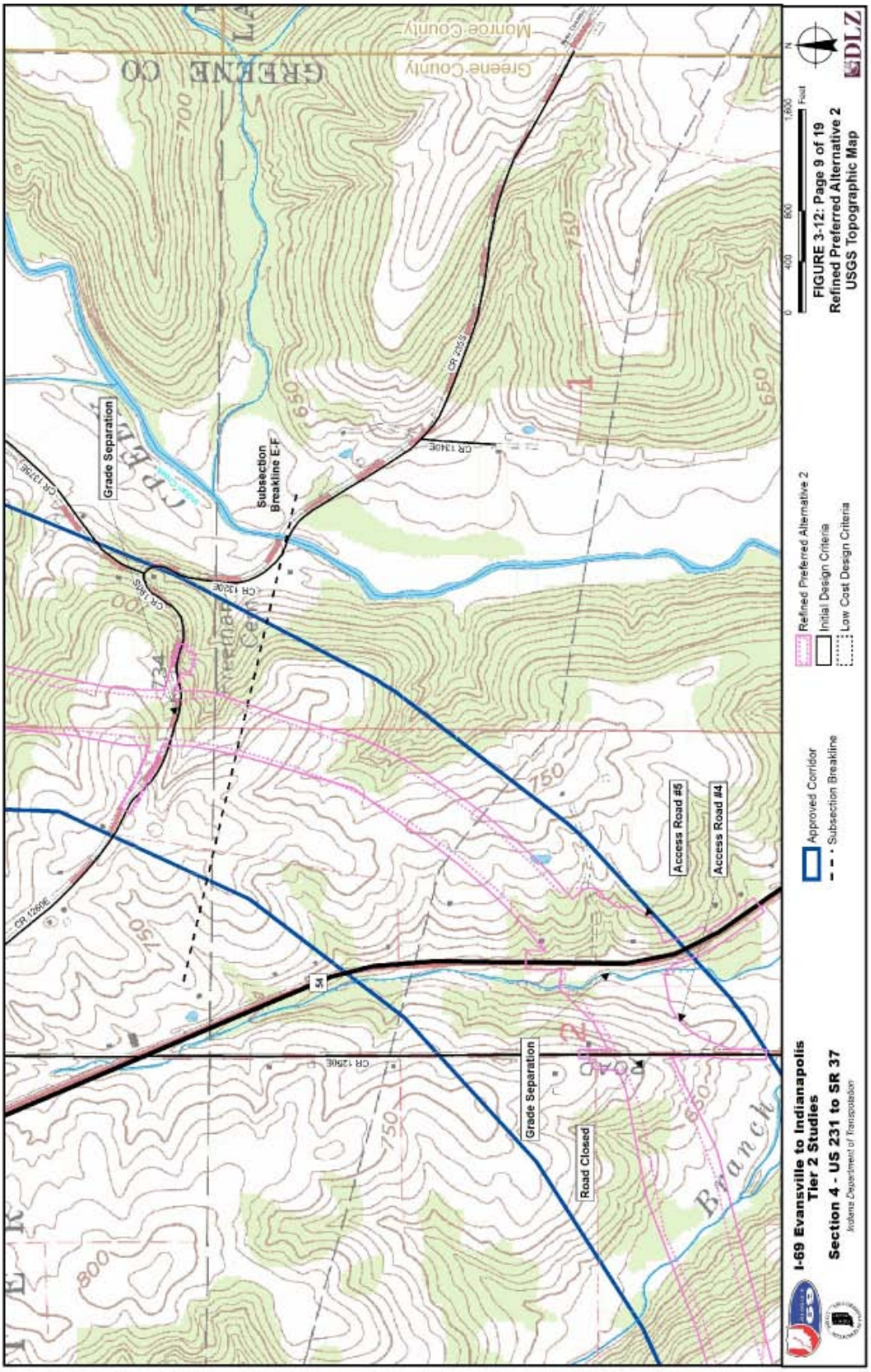

Grade Separation
Subsection Breakline E/F
Access Road #5
Access Road #4
Grade Separation
Road Closed
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
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FIGURE 3-12: Page 9 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ
Greene County
Monroe County
CR 1250E
CR 1300E
CR 1325E
CR 1350E
CR 2350S

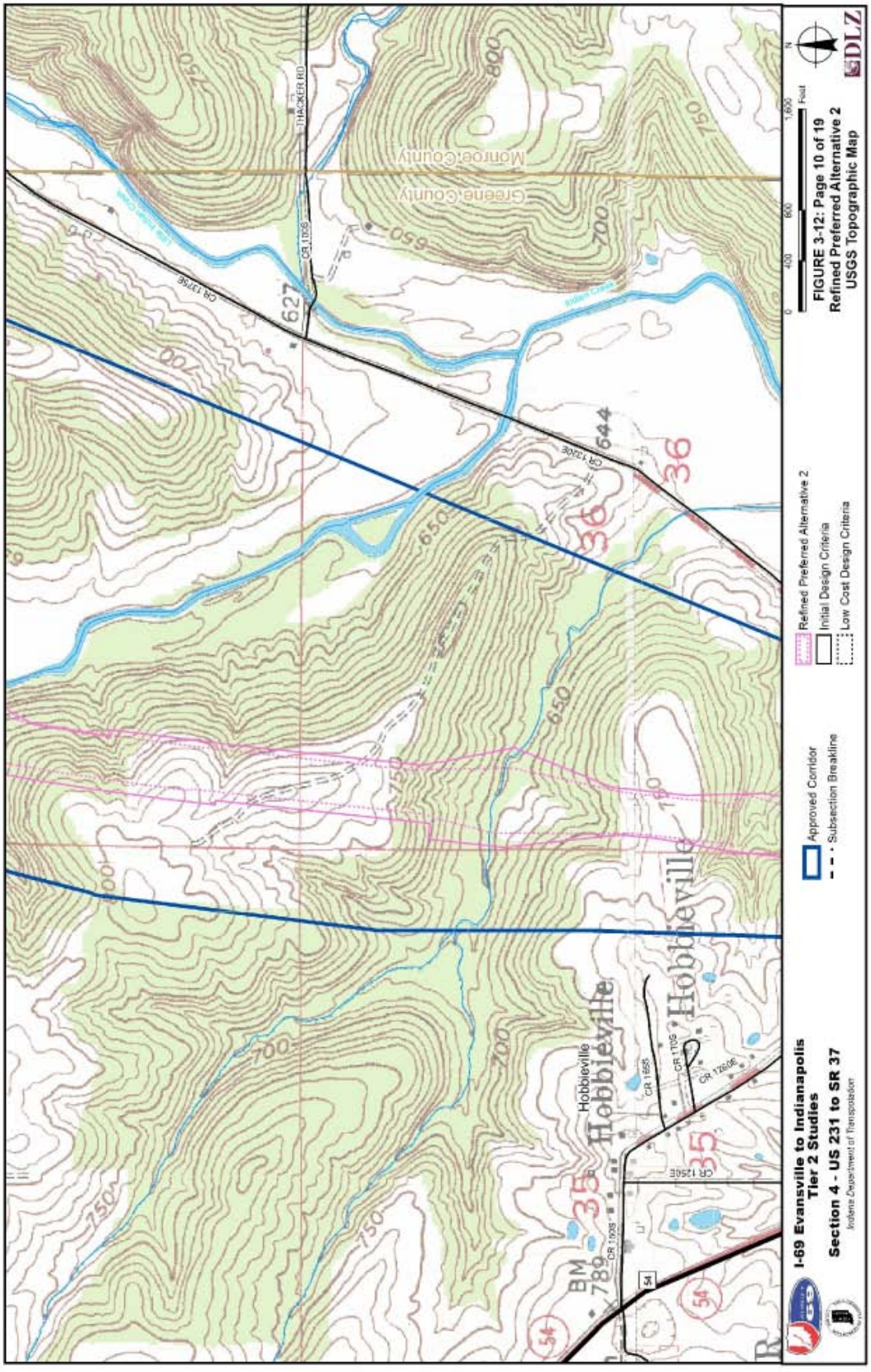
FIGURE 3-12: Page 10 of 19
Refined Preferred Alternative 2
USGS Topographic Map
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
DLZ
Hobbieville
THACKER RD
CR 1705
CR 1256E
CR 1256S
CR 1255
Monroe County
Greene County
BM 789

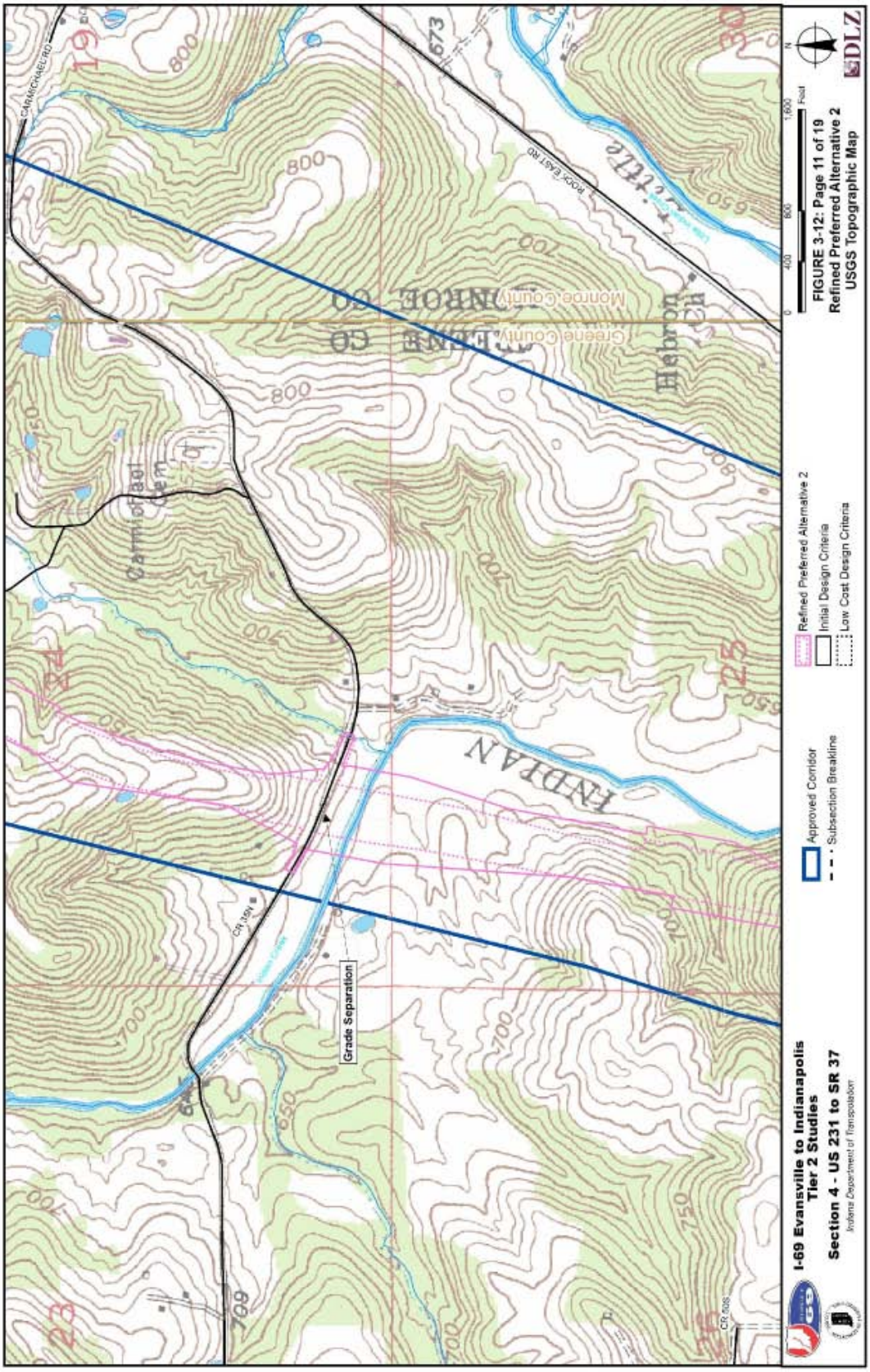
FIGURE 3-12: Page 11 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Grade Separation
INDIAN
Hebron
Greene County
Monroe County
CR 500
CR 600
CR 700
CR 800
CR 900
CR 1000
CR 1100
CR 1200
CR 1300
CR 1400
CR 1500
CR 1600
CR 1700
CR 1800
CR 1900
CR 2000
CR 2100
CR 2200
CR 2300
CR 2400
CR 2500
CR 2600
CR 2700
CR 2800
CR 2900
CR 3000
CR 3100
CR 3200
CR 3300
CR 3400
CR 3500
CR 3600
CR 3700
CR 3800
CR 3900
CR 4000
CR 4100
CR 4200
CR 4300
CR 4400
CR 4500
CR 4600
CR 4700
CR 4800
CR 4900
CR 5000
CR 5100
CR 5200
CR 5300
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CR 5500
CR 5600
CR 5700
CR 5800
CR 5900
CR 6000
CR 6100
CR 6200
CR 6300
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CR 6500
CR 6600
CR 6700
CR 6800
CR 6900
CR 7000
CR 7100
CR 7200
CR 7300
CR 7400
CR 7500
CR 7600
CR 7700
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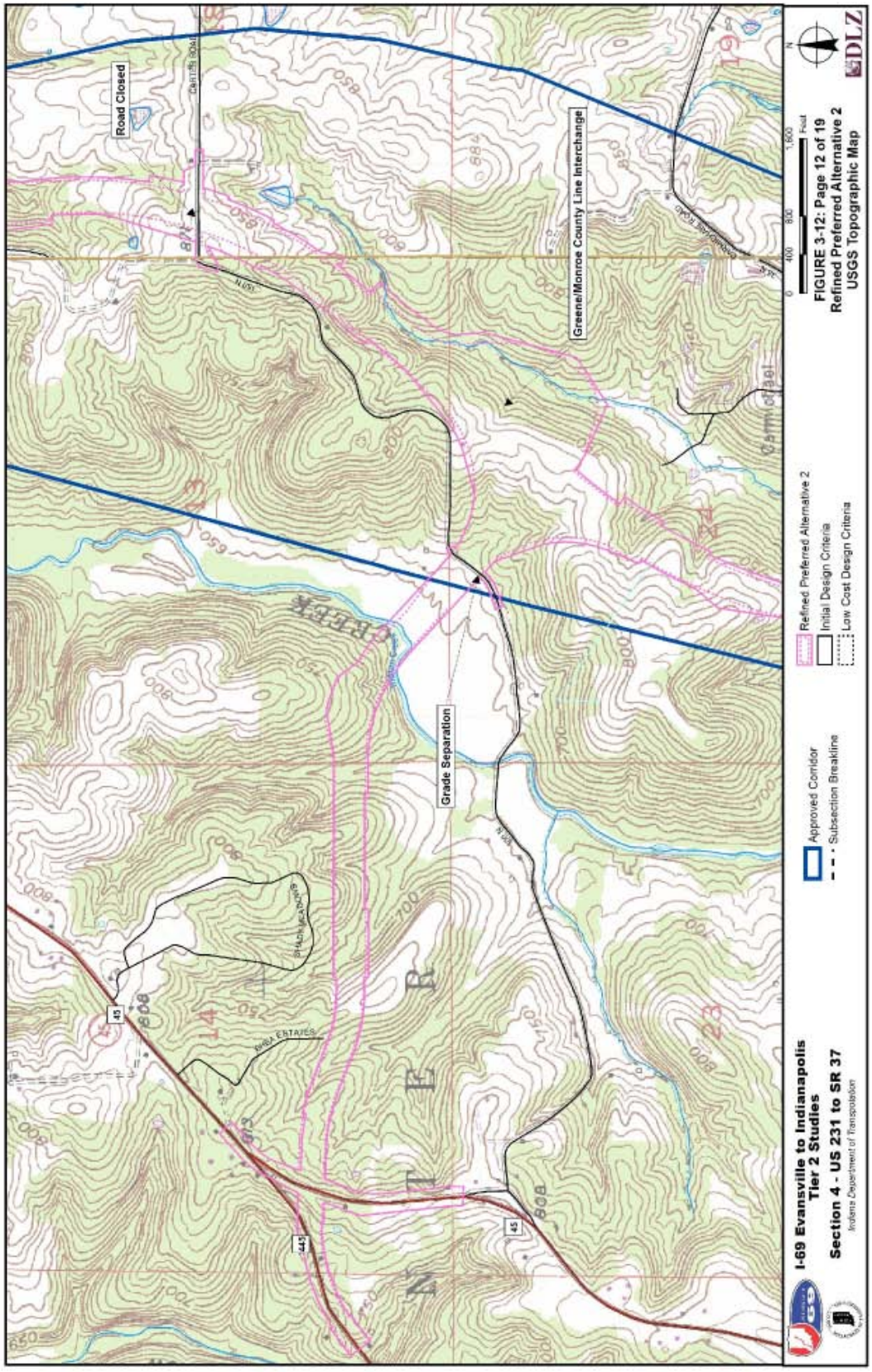
Road Closed
Greene/Monroe County Line Interchange
Grade Separation
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 12 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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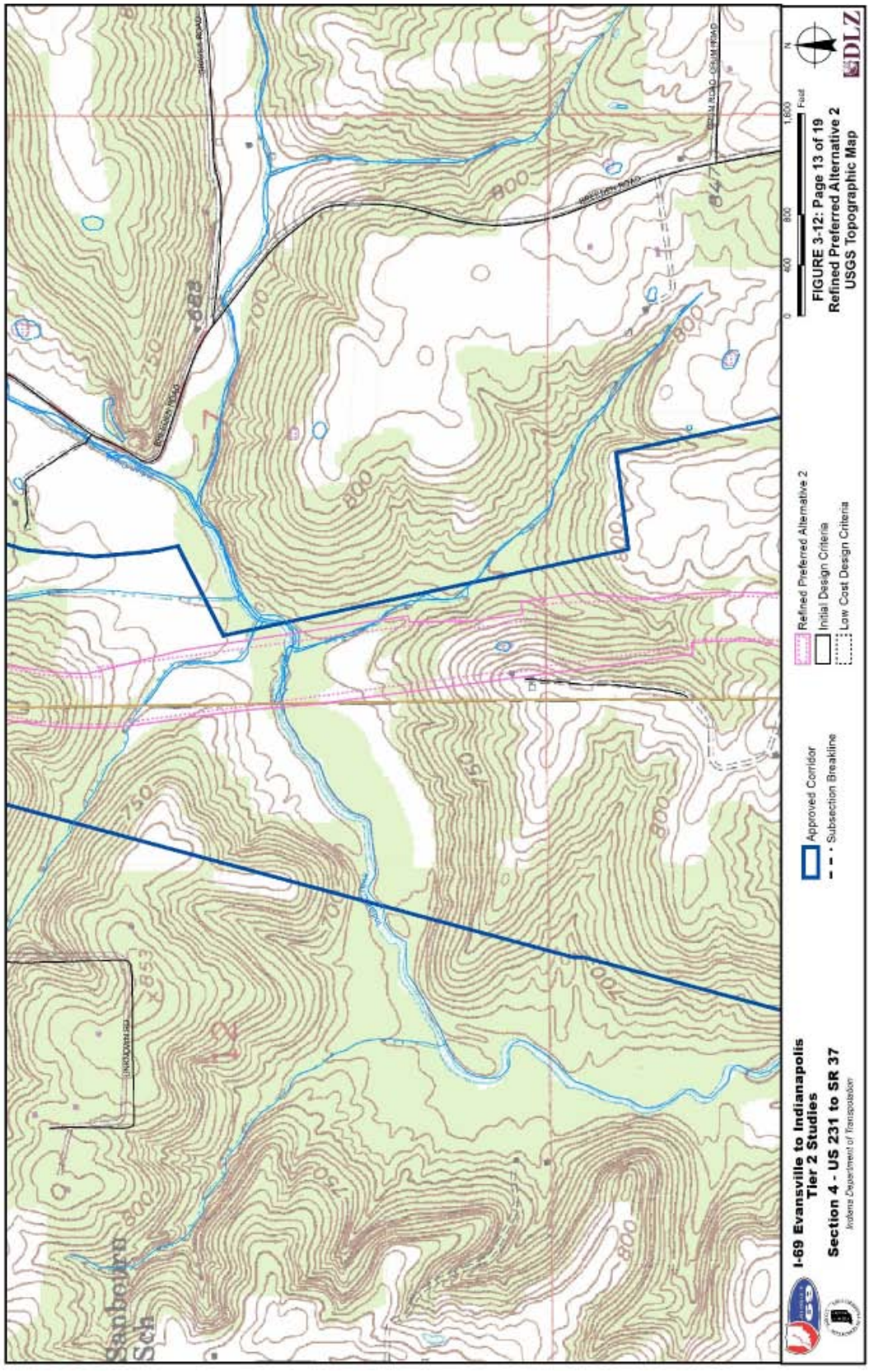
FIGURE 3-12: Page 13 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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Initial Design Criteria
Low Cost Design Criteria
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Subsection Breakline
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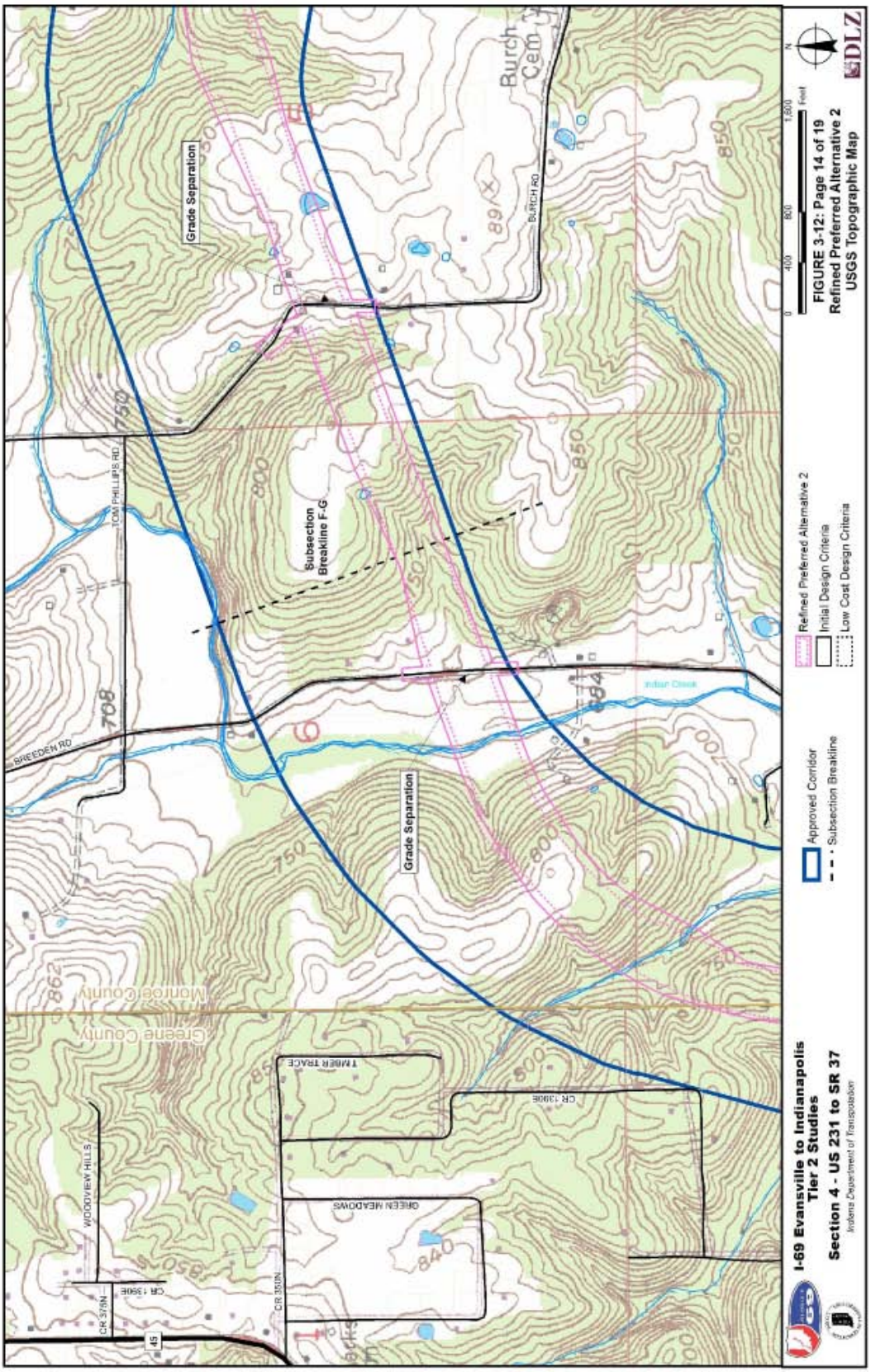
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Grade Separation
Subsection Breakline F-G
Grade Separation
BURCH RD
BREEDEN RD
TOM PHILLIPS RD
WOODVIEW HILLS
CR 350N
CR 378N
CR 1300E
TIMBER TRACE
GREEN MEADOWS
Monroe County
Greene County
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 14 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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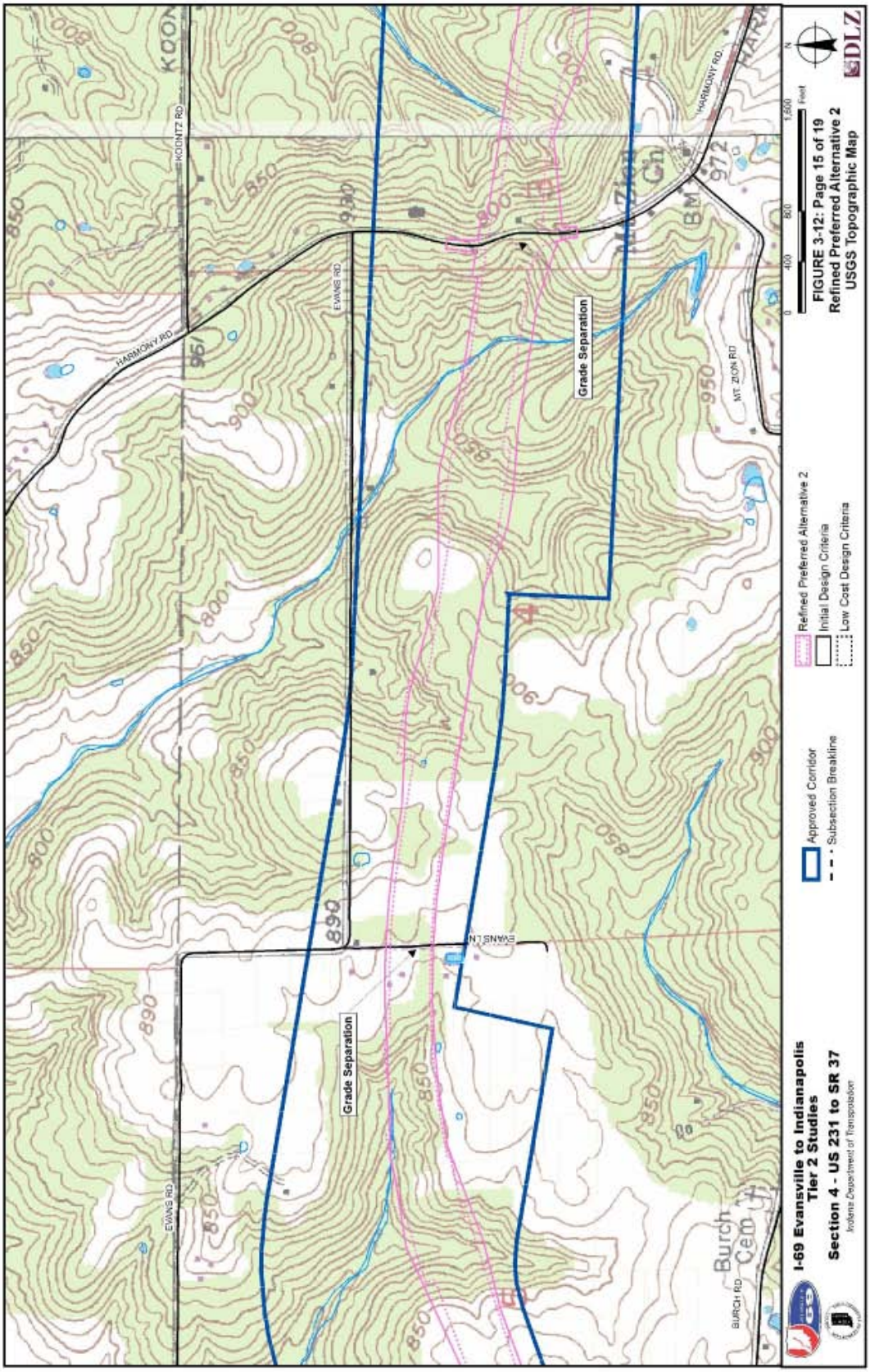
FIGURE 3-12: Page 15 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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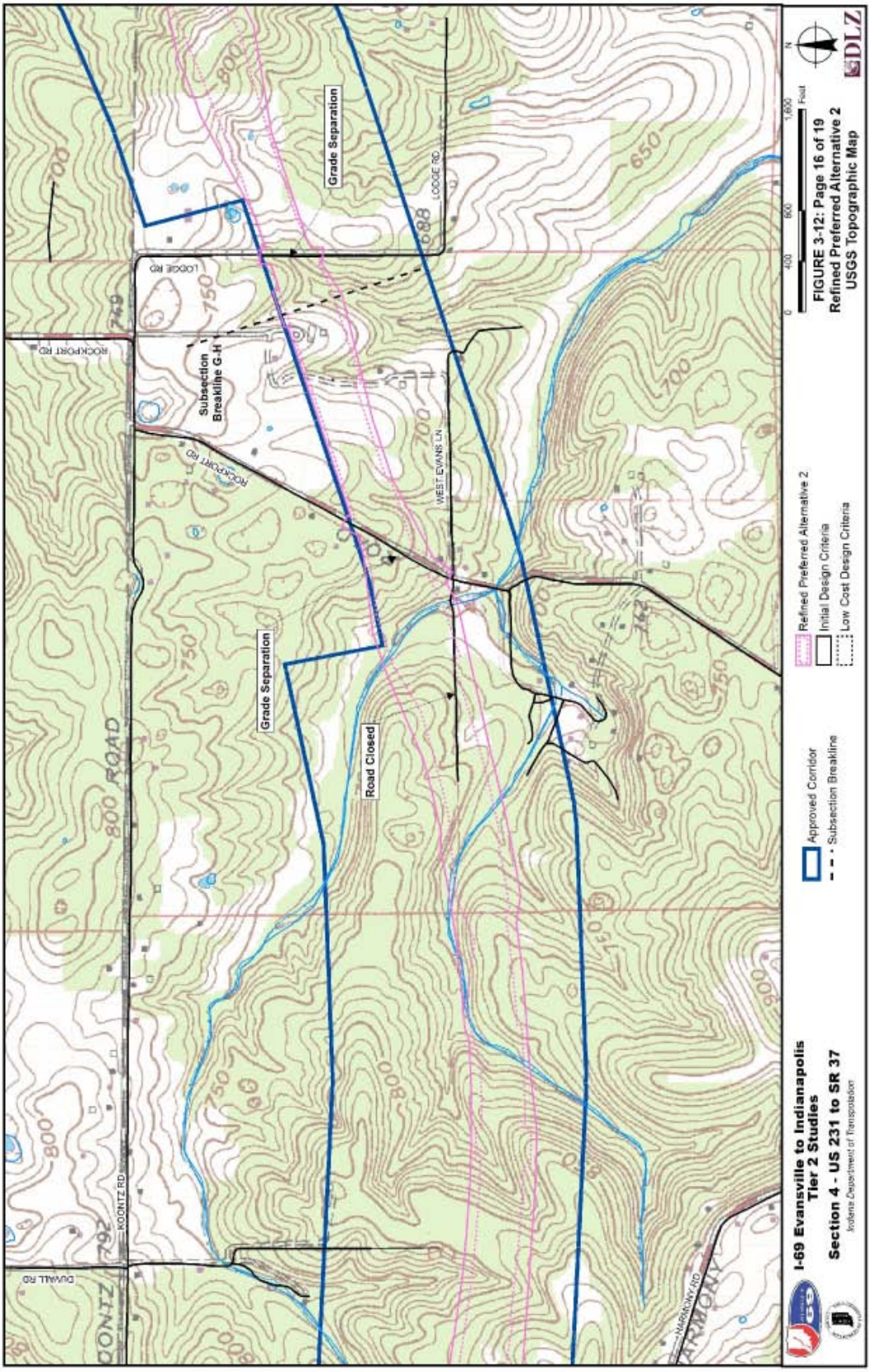
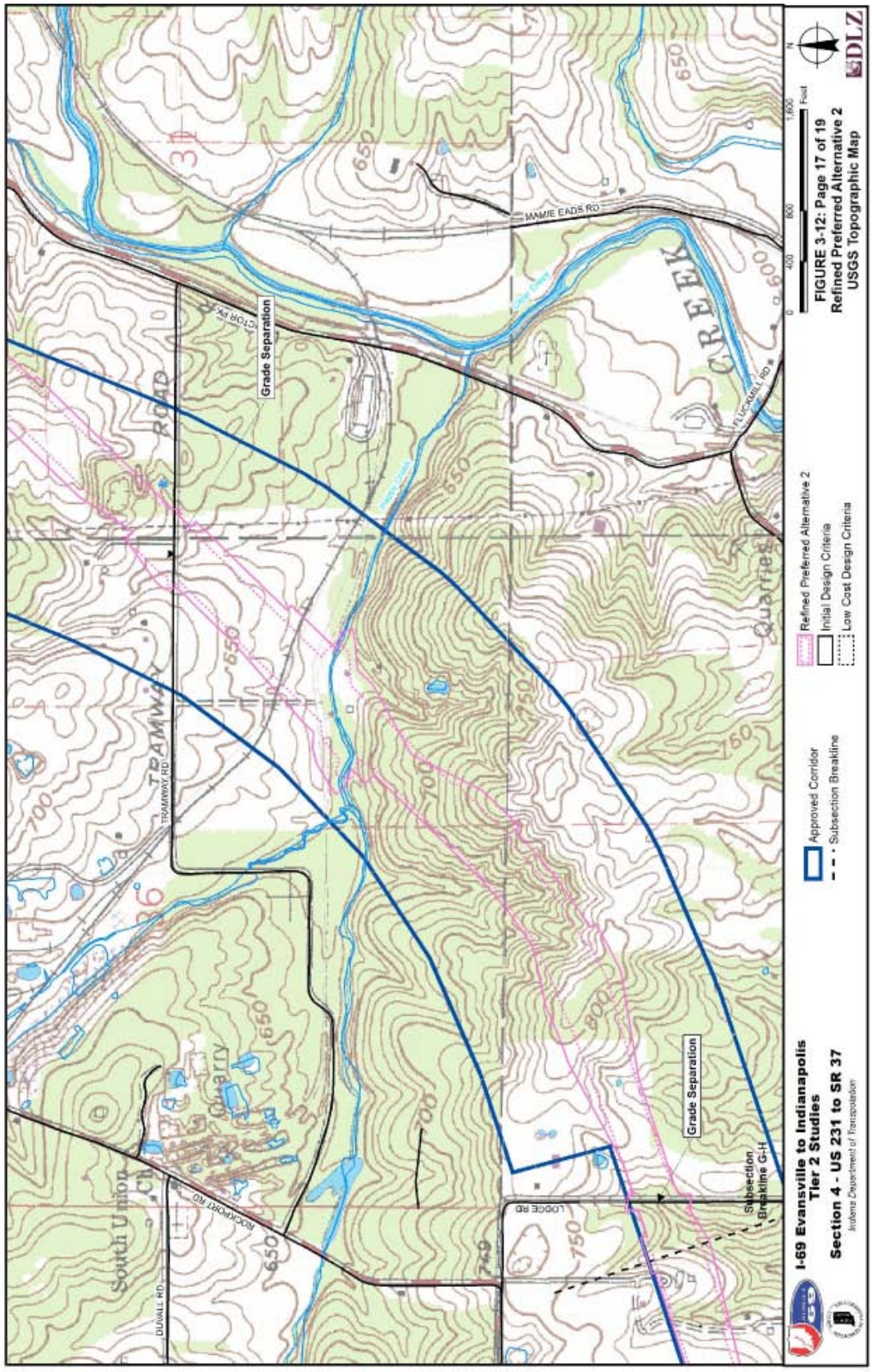
Grade Separation
Grade Separation
HARMONY RD
KOONTZ RD
EVANS RD
MT ZION RD
EVANS LN
BURCH RD
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation


Grade Separation
Subsection 1
Breakline G-H
Grade Separation
Road Closed
800 ROAD
KOONTZ
LODGE RD
ROCKPORT RD
WEST EVANS LN
DUVALL RD
HARMONY RD
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 3-12: Page 16 of 19
Refined Preferred Alternative 2
USGS Topographic Map
DLZ


MAMIE EADS RD
CREEK
TRAMWAY ROAD
TRAMWAY RD
Grade Separation
Grade Separation
LODGE RD
DUVALL RD
ROCKPORT RD
South Union Ch
Subsection Breakline G-H
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
FIGURE 3-12: Page 17 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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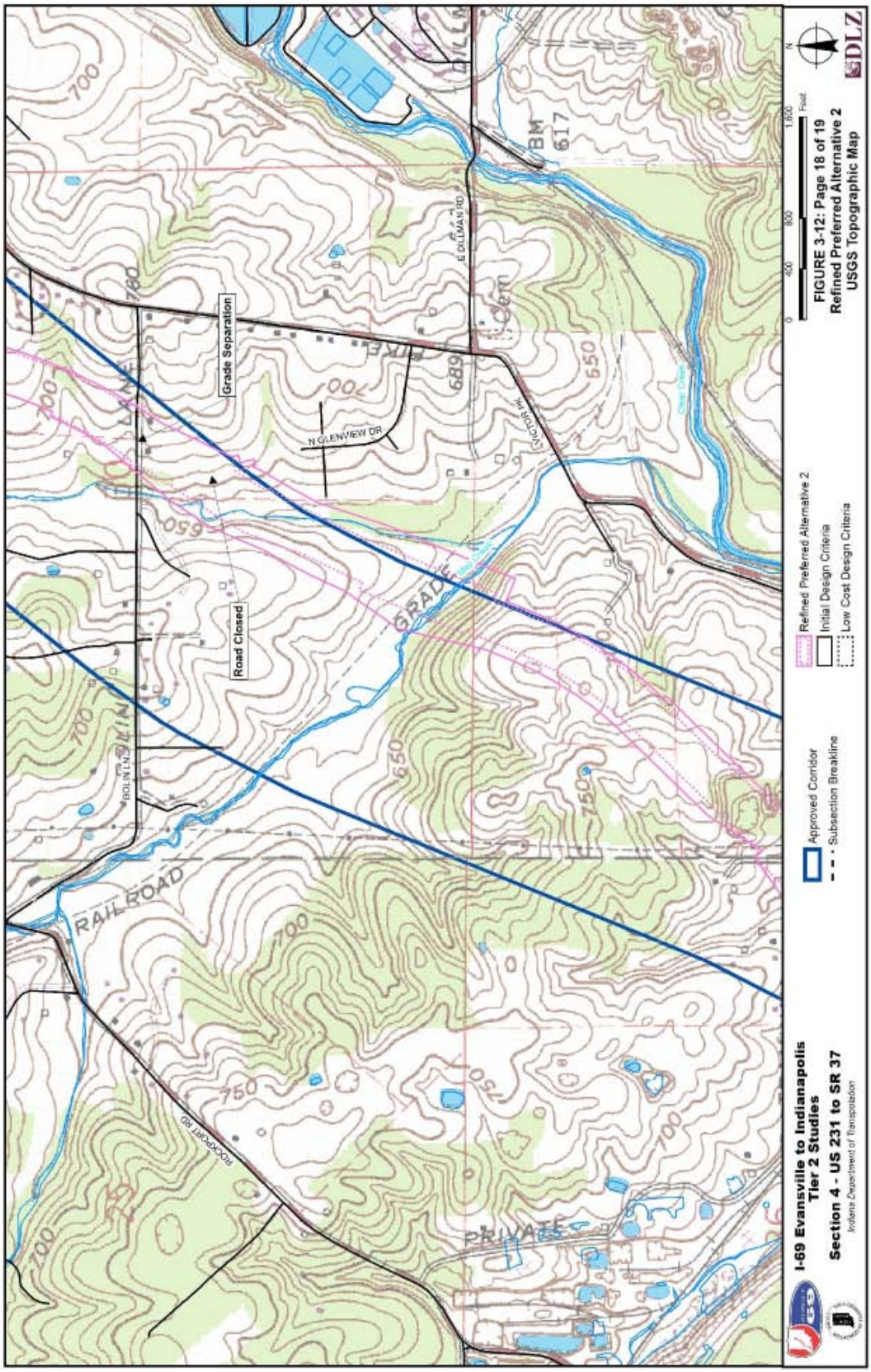
FIGURE 3-12: Page 18 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Subsection Breakline
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Grade Separation
Road Closed
N GLENVIEW DR
E DILLMAN RD
BOLIN LN
RAILROAD
PRIVATE
ROCKPORT RD
BM 617
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750
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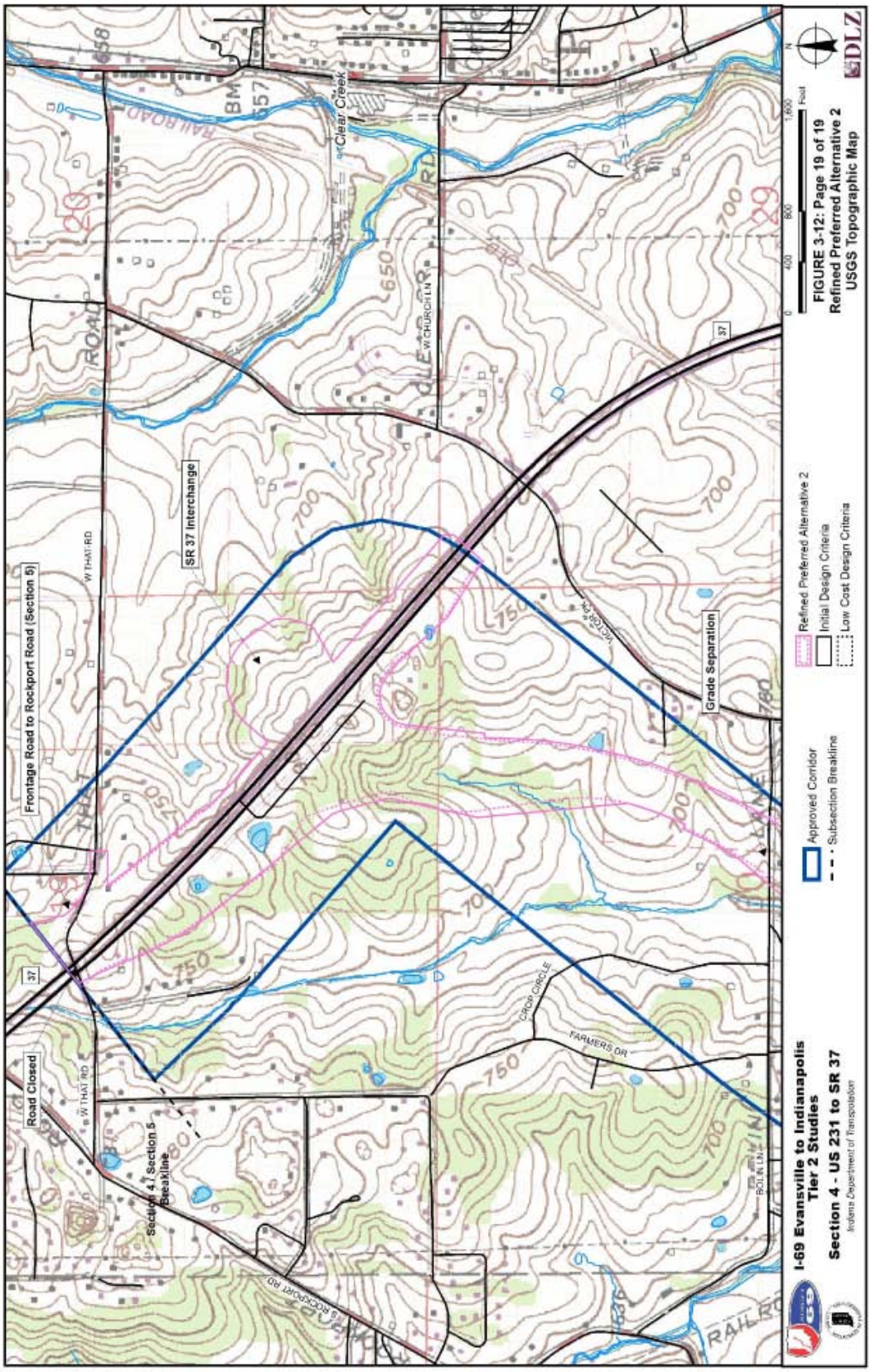
FIGURE 3-12: Page 19 of 19
Refined Preferred Alternative 2
USGS Topographic Map
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I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Refined Preferred Alternative 2
Initial Design Criteria
Low Cost Design Criteria
Approved Corridor
Subsection Breakline
SR 37 Interchange
Grade Separation
Frontage Road to Rockport Road (Section 5)
Road Closed
Section 4 / Section 5 Breakline
W THAT RD
CROP CIRCLE
FARMERS DR
Clear Creek
RAILROAD
ROCKPORT RD