Chapter 6—Comparison of Alternatives

6.1 Introduction

This chapter synthesizes the performance, cost, and impact information in Chapters 3 and 5. Section 6.2 compares the Section 4 alignment alternatives that were carried forward for detailed study in the DEIS. The discussion highlights the differences and similarities in costs and impacts on a subsection by subsection basis (subsections 4A through 4H). Section 6.3 compares the interchange options that were carried forward for detailed study in the DEIS, including the South Connector Road and North Connector Road for the Greene/Monroe County Line interchange. Section 6.4 documents the selection of the Preferred Alternative which collectively consists of the preferred end-to-end alignment and the preferred interchange option.

Alternative 2 was identified in the DEIS as the preferred alternative. No comments on the DEIS provided any reason to select a different alternative. This FEIS presents refinements to Alternative 2 that have occurred since the issuance of the DEIS. These refinements are based on comments received on the DEIS, information received from CAC members and local public officials, additional engineering and environmental studies, and decisions made by INDOT. The product of these efforts is Refined Preferred Alternative 2. The impacts associated with Refined Preferred Alternative 2 are presented in Chapter 5 and are compared herein to the impacts for Alternatives 1 through 4 as presented in the DEIS.

Additional substantive changes made to this chapter since the DEIS include the following:

- Section 6.2 – Refinements to the initial design criteria as applied to Refined Preferred Alternative 2 are identified and a summary of access related changes is provided.
- Section 6.2 – A summary list of changes to update costs and impacts for DEIS Alternatives 1, 2, 3, and 4 is presented. The noted changes are reflected in FEIS **Table 6-2** through **Table 6-9**.
- **Table 6-10** – Updated for detailed cost changes for DEIS Alternatives 1, 2, 3, and 4, by subsection.
- **Table 6-10a** – New table showing detailed costs for Refined Preferred Alternative 2, by subsection.
- **Table 6-11** - Updated for cost and impact changes for DEIS Alternatives 1, 2, 3, and 4, by subsection.
- **Table 6-11a** – New table showing costs and impacts for Refined Preferred Alternative 2, by subsection.
- Sections 6.2.1 through 6.2.8 – Revised to identify updated costs and impacts for DEIS Alternatives 1, 2, 3, and 4, by subsection, and to include costs and impacts for Refined Preferred Alternative 2, by subsection. Corresponding changes to **Table 6-2** through

Table 6-9 have also been made. Substantive impact differences between Refined Preferred Alternative 2 and DEIS Preferred Alternative 2 are identified. The revised text and tables includes updated noise impacts for the refined preferred subsection alignments that were determined per *the Indiana Department of Transportation Highway Traffic Noise Policy, 2011*.

- **Table 6-9a** – New table listing impacted streams by subsection for DEIS Alternatives 1, 2, 3, and 4 and Refined Preferred Alternative 2.

- Section 6.3.1 – Expanded discussion about beneficial traffic impacts for the interchange options as related to regional development patterns and associated environmental impacts. This includes a summary of potential effects as included in the Section 4 Tier 2 Biological Opinion.

- Section 6.3.1 – Updated to include residential displacements associated with Refined Preferred Alternative 2 for the interchange options.

- Section 6.3.1 – Local land use plans and their relationship to interchange options are listed.

- Section 6.3.2 – Additional discussion about traffic controls at the SR 45/SR 445/South Connector Road intersection.

- Section 6.4.1 – Rationale is presented for Refined Preferred Alternative 2 as being the FEIS recommended alternative for Section 4. Subsection alternatives that comprise Refined Preferred Alternative 2 are noted and graphically presented in new **Figure 6-4a** (p. 6-162).

- Section 6.4.1.1 – Updated summary of the DEIS recommendations supporting the selection of subsection alternatives and an added comparison of the FEIS refined preferred subsection alternatives to the DEIS subsection alternatives.

- 6.4.1.2 – New discussion about the deferred SR 37 interchange construction.

- Section 6.4.2 – Costs and impacts for FEIS Refined Preferred Alternative 2 are compared to the Tier 1 FEIS costs and impacts. This comparison includes an adjustment to the Tier 1 cost estimates to account for inflation so that an accurate comparison can be made between Tier 1 and Tier 2. This inflation adjustment of the Tier 1 costs inadvertently was omitted from the DEIS.

- Section 6.4.3 – New discussion about Section 4 right-of-way and construction status.

6.2 Comparison of Alignment Alternatives

The typical "comparison of alternatives" evaluates end-to-end alignment alternatives. For Section 4, this would involve comparing alternatives extending the approximately 27 miles from

just east of US 231 to SR 37. This end-to-end comparison is appropriate for evaluating alternatives for which purpose and need is an evaluation criterion.

All end-to-end alternatives in Section 4 have the same beginning and ending points and are approximately the same length. They are also based upon the same interchange option and, as such, have interchanges at the same locations (SR 45, Greene/Monroe County line, and SR 37). Because of these similarities, purpose and need performance indicators were not applicable for the analysis. Rather, a preferred end-to-end alignment alternative has been selected on the basis of costs and impacts. A separate analysis for the comparison of the interchange options, which includes the preferred interchange option used for the end-to-end alternatives and the two other interchange options that were carried forward for detailed study, is discussed in Section 6.3. Purpose and need considerations, as well as costs and impacts, are analyzed for the interchange options.

Because the preferred alignment for Section 4 was selected using only costs and impacts, it is more meaningful to compare alternatives in each individual subsection. Comparing costs and impacts on a subsection-by-subsection basis allows for the identification of a single preferred alignment alternative which minimizes overall costs and impacts.

The subsection alignment alternatives that were carried forward for detailed analysis, as identified in Section 3.4.1, are:

Subsection 4A	Alternatives **4A-2** and **Hybrid 4A-1/A-2**
Subsection 4B	Alternative **4B-1**
Subsection 4C	Alternatives **4C-1** and **4C-2**
Subsection 4D	Alternative **4D-1**
Subsection 4E	Alternative **Hybrid 4E-1/4E-2**
Subsection 4F	Alternatives **4F-1, 4F-3, 4F-4,** and **4F-5**
Subsection 4G	Alternative **4G-2**
Subsection 4H	Alternatives **4H-1, 4H-2,** and **4H-3**

As discussed in Section 3.4.2.7, the subsection alignment alternatives have been combined to form four[1] Section 4 end-to-end alternatives under the build condition that extend from the southern terminus, located just west of (Greene County) CR 200E (about 3,800 feet east of US 231), to the northern terminus interchange located at SR 37 between Victor Pike and That Road. **Table 6-1** identifies the four alternatives presented in the DEIS and the end-to-end combination of subsections of which they are composed. **Alternative 2 was identified as the preferred end-to-end alternative in the DEIS. Refined Preferred Alternative 2 is the preferred alternative**

[1] Four build alternatives were assessed in the DEIS. A total of 48 end-to-end build alternatives could be formed when using all combinations of the subsection alternatives that survived the screening of alternatives as described in Chapter 3. The four end-to-end alternatives that are assessed in Chapters 5 and 6 represent a reasonable range of possible alternatives. The Preferred Alternative was chosen by considering impacts on a subsection basis. The choice of a reasonable range of end-to-end alternatives does not prevent selection of the least impact/cost effective alternative in each subsection.

in this FEIS and is also included in this table. These five alternatives are the subject of the detailed analyses presented in Chapter 5, *Environmental Consequences*.

Table 6-1: Section 4 Alternatives for the Build Condition

Alternative	Combination	Length (Miles)
1	4A-2+4B-1+4C-1+4D-1+Hybrid 4E-1/4E-2+4F-1+4G-2+4H-1	26.67
2*	4A-2+4B-1+4C-2+4D-1+Hybrid 4E-1/4E-2+4F-3+4G-2+4H-2	26.68
3	Hybrid 4A-1/4A-2+4B-1+4C-2+4D-1+Hybrid 4E-1/4E-2+4F-4+4G-2+4H-3	26.55
4	4A-2+4B-1+4C-1+4D-1+Hybrid 4E-1/4E-2+4F-5+4G-2+4H-2	26.72
Refined Preferred Alternative 2	Refined 4A-2+ Refined 4B-1+ Refined 4C-2+ Refined 4D-1+ Refined Hybrid 4E-1/4E-2+ Refined 4F-3+ Refined 4G-2+ Refined 4H-2	26.68

* Preferred Alternative presented in the DEIS

In Section 5.1.2, typical cross sections were developed and further detailed engineering development was completed. Interchange and access treatment design details were also added along with refinements of the alignments and design profiles. These refinements and design details were developed using the initial design criteria. The initial design criteria typical cross section has two 12-foot wide lanes in each direction separated by a 60-foot wide depressed median. The median includes two 5-foot wide usable inside shoulders (4-feet paved). To the outside of each pair of travel lanes there is a minimum 35-foot wide outside clear zone[2] containing 11-foot wide usable shoulders (10-feet paved). These design elements satisfy and, in some cases, exceed Indiana Design Manual (IDM) requirements. In addition to this footprint required for the roadway, median, and shoulders, sufficient land is needed to provide for cut and fill slopes, right-of-way maintenance (maneuverability of equipment for mowing, shrub clearing, etc.), drainage, and right-of-way fencing. Safety also is a consideration; there must be sufficient distance from freeway travel lanes so that, should a tree or structure outside the right-of-way fall into the right-of-way toward the freeway, it would not cause a significant risk to motorists. Considering all of these elements, the average right-of-way width using the initial design criteria is approximately 500 feet; however, the right-of-way widths would vary from about 300 feet to over 850 feet depending upon the alignment, terrain features, and local access treatments. The typical cross sections for the initial design criteria are shown in **Figure 5.1-3** (p. 5-15).

Similar to Sections 1 through 3, further engineering analysis identified a lower cost alternative to applying the initial guidelines in every case. This analysis considered variations in design criteria in order to better estimate the possible range of construction costs. Additional low-cost design criteria were also identified in Section 4 that were not used for the Section 1, 2, or 3 projects. Many of these measures focused on minimizing the effects of the topography within Section 4. A practical design approach was adopted in Section 4, and several measures were fully examined and evaluated for their safety implications. After careful consideration of the potential cost savings and safety implications, several of the measures identified have been incorporated into the Section 4 low-cost design criteria. **Appendix GG**, *Low Cost Design*

[2] 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.

Memo, is a technical memo summarizing the additional cost savings measures that were studied in Section 4.

The low-cost design criteria under consideration for I-69 Section 4 satisfy, but do not exceed, IDM requirements and provide a mainline typical cross section similar to the initial design criteria, including a 60-foot median and 5-foot wide usable inside shoulders (4-feet paved). The most notable cross-sectional difference between the initial design criteria and low-cost design criteria is the 30-foot wide outside clear zone containing 11-foot wide usable shoulders (10-feet paved). The initial design criteria uses a minimum 35-foot wide outside clear zone. The low-cost design criteria would also consider alternative length of grade criteria, rock cut slope treatment, fill slope treatments, and different pavement materials (See **Appendix D**, *Cost Estimation Methodology*). As with the initial design criteria cross section, additional right-of-way is required beyond this footprint for cut and fill slopes, right-of-way maintenance, drainage, and right-of-way fencing. Similar to the initial design criteria, safety also is a consideration. Considering these elements, the average right-of-way width for the low-cost design criteria is approximately 380 feet; however, the right-of-way widths would vary from about 270 feet to 700 feet depending upon the alignment, terrain features, and local access treatments. The typical cross sections for the low-cost design criteria are shown in **Figure 5.1-5** (p. 5-19).

Due to the different physical characteristics of most of Section 4 (when compared with Sections 1, 2 and 3 projects), application of the initial design criteria and low-cost design criteria leads to a significant variation in the lateral footprints of alternatives. Therefore, the impact calculations provided in Chapter 5 and summarized here in Chapter 6 applied both the initial design criteria and low-cost design criteria to determine the range of impacts.

While a range of both costs and impacts are shown, it would not be correct to treat the initial design criteria and low-cost design criteria for a particular alternative as distinct alternatives for purposes of NEPA evaluation. As **Appendix GG** describes, post-NEPA geotechnical investigations and follow-up final design are required to identify whether some of the design criteria can be used in specific areas. Under the low-cost design criteria, the impacts are estimated by applying all the low-cost design elements. This provides an estimate of the minimum level of impacts possible for a particular alternative. If, during final design, it is determined that all low-cost design elements can and should be used in a portion of the project, then the impacts for that portion of the project will be at the lower end of the predicted range of impacts for that particular alternative. It is anticipated that the low-cost design elements will be suitable in some portions of the project, but not in others. Accordingly, the selection of a preferred NEPA alternative has been made by comparing the range of impacts and costs for alternatives.

Refined Preferred Alternative 2 is the product of further developments to DEIS Preferred Alternative 2. Refinements were made to reduce environmental impacts; reflect decisions made by INDOT based upon additional coordination with local public officials, public organizations and individuals; improve local access; refine the vertical road profile; make minor corrections to the project design; additional engineering and environmental analysis; and reduce project costs. These refinements were made along parts of all eight subsections.

Refinement of the vertical road profile under the initial design criteria was one of the most substantial changes for Refined Preferred Alternative 2. The typical cross section elements of the initial and low-cost design criteria for Refined Preferred Alternative 2 remained the same as those used for DEIS Alternatives 1, 2, 3, and 4 as shown in **Figure 5.1-3** (p. 5-15) and **Figure 5.1-5** (p. 5-19). Refined Preferred Alternative 2 also maintains the same horizontal alignment as DEIS Alternative 2. Portions of the proposed vertical elevation and grades of the roadway (the vertical road profile), however, have been refined for the initial design criteria condition of Refined Preferred Alternative 2. The low-cost design criteria vertical road profile remains the same as that used for DEIS Alternative 2.

The vertical road profile refinements for the initial design criteria were done to reduce, or narrow, the right-of-way requirements for the initial design criteria and thus reduce costs and environmental impacts, particularly forest impacts near bat hiberacula. This narrowing of the right-of-way and refinements for the Section 4 alignment occurred in two areas. The first area is from 0.48 miles east of SR 45 to 0.34 miles north of Hobbieville Road, which is located along Refined Hybrid 4E-1/4E-2 and the very south end of Refined 4F-3. The second area for refinement of the vertical road profile under the initial design criteria for Refined Preferred Alternative 2 occurs from 0.52 miles north of Carter Road in Refined 4F-3 to 0.18 mile west of Lodge Road in Refined 4G-2. In these two locations, the profile under the initial design criteria was revised to coincide with the low-cost vertical road profile; therefore, a maximum 20 mph truck speed reduction was utilized in calculating the maximum length of any upgrade.

The other substantial difference between DEIS Preferred Alternative 2 and FEIS Refined Preferred Alternative 2 involves local access changes and related access decisions that were made by INDOT in coordination with local public officials, public organizations, and individuals. These are summarized as follows and are presented in more detail in Sections 5.3.4.2, 5.6.3.2, and 11.2.2.10 and **Appendix Z**, *Documentation of Local Access Decisions*, of the FEIS. These changes included

- Greene CR 200E was changed from a grade separation in the DEIS to a closure in the FEIS.
- Greene CR 215E was changed from a closure in the DEIS to a grade separation in the FEIS.
- Dry Branch Road, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, will have a grade separation at I-69.
- Mineral-Koleen Road, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, will have a grade separation at I-69.
- Access Road 2, which was proposed as an intersection improvement in the DEIS, would be replaced in the FEIS by a modification of the existing cul-de-sac at the south end of Spruce Road. The new access road is referred to as Access Road 2a.
- Access Road 6 was added on the east side of SR 45 to the north of I-69 to provide access to one residential property and one undeveloped parcel.
- Burch Road, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, will have a grade separation at I-69.

- Evans Lane, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, will be closed at I-69.
- Harmony Road, which was presented in the DEIS with options to provide a grade separation of close the road at I-69, will have a grade separation at I-69.
- Bolin Lane, which was presented in the DEIS with options to provide a grade separation or close the road at I-69, will have a grade separation at I-69.
- Access Road 7 was added to maintain the current connection of Glenview Drive with Bolin Lane and the current connection of Glenview Drive to Wheaton Court.

Other refinements between DEIS Preferred Alternative 2 and FEIS Refined Preferred Alternative 2 included property acquisition changes and minor design corrections. Property acquisition changes included additional relocations and the acquisition of landlocked properties. The results of these changes are reflected in the total cost of the involved subsections but did not affect right-of-way or other impacts (except for the identified relocations). Minor design corrections were made at various locations for compliance with INDOT's Design Manual (IDM) and included such changes as slope grading and drainage. These refinements were made, where necessary, for both the initial design criteria and the low-cost design criteria. Some of these refinements did not alter construction limits and/or right-of-way but did modify the total cost for a subsection alternative. Other minor design corrections did alter construction limits and/or right-of way and thus changed total cost and/or impacts for the involved subsection alternative(s).

The following Sections 6.2.1 through 6.2.8 compare costs and impacts for each subsection alignment alternative relative to other alignment alternatives within the same corridor subsection. This comparison includes the range of costs and impacts associated with the implementation of both the initial and low-cost design criteria. **Table 6-2** through **Table 6-9** summarize costs and key environmental impacts for each alignment alternative for subsections 4A through 4H.

Where specific comparisons are made between subsection alternatives, total cost and impacts that are based upon the initial design criteria for one alternative are compared only to cost and impacts for another alternative which is also based upon the initial design criteria. Likewise, low-cost design criteria comparisons are only made to other alternatives based upon the low-cost design criteria. This type of comparison retains the range of impacts that have been established by the use of initial design criteria and low-cost design criteria.

Updates of costs and impacts for DEIS Alternatives 1, 2, 3, and 4 as presented in DEIS Table 6-2 through Table 6-9 have also been made in the FEIS. These updates included:

- Total costs were revised for all of the alternative alignments in Subsections 4F and 4H due to updated residential relocations (see below).
- Total costs were revised for all of the alternative alignments due to a recalculation of earthwork from that presented in the DEIS.

- Two stream types (intermittent and ephemeral stream classifications) within Subsection 4G and the resulting stream impacts for Alternative 4G-2 were corrected. Total stream impacts did not change.
- The methodology for determining residential relocations was modified. Residential relocation impacts were updated for all alternative alignments in Subsections 4F and 4H.
- The location of a noise receptor in Subsection 4E was adjusted in response to a public comment; noise impacts for Alternative Hybrid 4E-1/4E-2 were updated.
- The total number of impacted noise receptors in Subsections 4F and 4G were updated. The update in Subsection 4F was made for a residence, previously identified as impacted noise receptor, which will be relocated per the revised residential relocation methodology as discussed above. The update in Subsection 4G was for a revision to the methodology for calculating impacted noise receptors at the Fern Hills Club.
- One managed land property in Subsection 4H was removed from the Classified Forests and Wildlands program prior to publication of the DEIS. This change was not accounted for in the DEIS. Managed land impacts due to the unintended inclusion of this property in the DEIS have been corrected for Alternatives 4H-1, 4H-2, and 4H-3.
- The methodology for determining stream relocations was modified and impacts were updated for all alternative alignments in Subsection 4A and Subsections 4C through 4H. There are no stream relocations within Subsection 4B.

The above updates of costs and impacts for DEIS Alternatives 1, 2, 3, and 4 did not substantially affect the subsection comparisons (advantages and disadvantages). The recommendations for the preferred subsection alternatives, as presented in the DEIS, have been reviewed and no changes to those recommendations were determined to be warranted.

Table 6-10 contains cost estimates for each alignment alternative by corridor subsection. This table has been updated to reflect the cost changes for DEIS Alternatives 1, 2, 3, and 4 as noted above. **Table 6-11a** contains the cost estimates for Refined Preferred Alternative 2 by subsection.

Project cost estimates for each subsection included costs for engineering and design, right-of-way acquisition (land acquisition and relocations), and construction. Mitigation cost estimates were not a factor in the evaluation of alternatives within subsections because some mitigation measures and costs cannot be allocated by subsection. However, mitigation costs were included in the total estimated costs for the four DEIS alternatives and Refined Preferred Alternative 2 (See **Table 6-17**).

Table 6-11 gives a summary of impacts and costs for all subsections. This table has been updated to reflect the cost and impact changes for DEIS Alternatives 1, 2, 3, and 4 as noted above. Decisions regarding preferred subsection alternatives emphasized costs and avoidance/minimization of impacts. Public and resource agency input were also major factors that were considered in evaluating alternative impacts during all portions of the project. See Section 11.4.2, *Agency Coordination*, for details.

Table 6-11a gives a summary of impacts and costs for Refined Preferred Alternative 2. These impacts and cost are presented for each subsection.

6.2.1 Subsection 4A

In Subsection 4A, **Alternative 4A-2** and **Alternative Hybrid 4A-1/4A-2** were carried forward for detailed analysis in the DEIS. Alternative 4A-1 was eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4A.

The west terminus of Subsection 4A is at the Section 3-4 break line, which is approximately 1,280 feet west of CR 200E (3,800 feet east of US 231). An interchange at US 231 and the mainline of I-69 extending east from the interchange along Alternative 3E-1 to the Section 3-4 break line are included in the Section 3 Tier 2 EIS. Subsection 4A generally proceeds east/northeast from the Section 3-4 break line to the east terminus of the subsection located approximately 1,400 feet east of CR 315E and 1,200 feet south of CR 600S.

Alternative 4A-2 (map pp. 1 and 2 of **Figure 6-1**, p. 6-86, **Figure 6-2**, p. 6-105, and **Figure 6-4**, p. 6-143) begins near the center of the Subsection 4A corridor and proceeds east/northeast crossing CR 200E about 1,100 feet north of SR 45/SR 58. The alignment continues generally east/northeast and crosses CR 215E about 2,000 feet northeast of SR 45/SR 58. Approximately 2,800 feet northeast of CR 215E, the alignment merges with Alternative Hybrid 4A-1/4A-2 and turns northeast to the subsection terminus. Alternative 4A-2 has a total length of 8,855 feet (1.68 miles). Alternative 4A-2 is the Subsection 4A component of DEIS Alternatives 1, 2, and 4.

Alternative Hybrid 4A-1/4A-2 (map pp.1 and 2 of **Figure 6-3**, p. 6-124) begins in the northern portion of the Subsection 4A corridor and proceeds east. The alignment crosses CR 200E about 2,000 feet north of SR 45/SR 58 and then crosses CR 215E about 2,400 feet northeast of SR 45/SR 58. Alternative Hybrid 4A-1/4A-2merges with Alternative 4A-2 northeast of CR 215E. It has a total length of 8,646 feet (1.64 miles). Alternative Hybrid 4A-1/4A-2 is the Subsection 4A component of DEIS Alternative 3.

Alternative 4A-2 and **Alternative Hybrid 4A-1/4A-2** traverse mainly farmland (row crops and pasture) and forest (woodlots). Hasler Cemetery is located along the north edge of the corridor east of CR 215E. There are no known karst features in Subsection 4A. The alternatives are similar in the following respects:

- CR 200E grade separation over I-69. CR 215E would be closed between SR 45/SR 58 and CR 600S.
- No floodplain impacts.
- Avoid Hasler Cemetery (including a 100-foot buffer surrounding the cemetery[3]).

3 In accordance with IC 14-21-1-26.5, proposed ground disturbance within 100 feet of a burial ground requires that a cemetery development plan be prepared and that the IDNR approve the development plan prior to such disturbance.

The differences between Alternative 4A-2 and Hybrid 4A-1/4A-2 include total cost, right-of-way acquisition, and impacts upon forests, core forests, wetlands, streams, displacements, noise, managed lands, and stream relocations. A comparison of the advantages and disadvantages of each is presented below**. Table 6-2** summarizes the impacts associated with Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2.

Alternative 4A-2

Advantages:

- Core forest impacts would be less.
- No displacements would occur for Alternative 4A-2.
- Managed land impacts would be less.
- Farmland impacts would be less.

During the screening of the preliminary alternatives (See Chapter 3, *Alternatives*), it was recommended that the alignment for Alternative 4A-2 be shifted slightly north to minimize potential wetland impacts and to avoid the residence, outbuildings, and location of an unconfirmed infant burial on the Dowden Farm. The subsequent detailed development of Alternative 4A-2 included the recommended shift to the north. Potential wetland impacts, which were estimated at 0.8 to 1.9 acres during the alternatives screening, would be reduced to 0.18 to 0.45 acres. The house on the Dowden Farm would now be about 250 feet from the nearest point along the right-of-way using the initial design criteria and 330 feet or more from the right-of-way using the low-cost design criteria. Alternative 4A-2 also avoids outbuildings immediately adjacent to the north side of the house and the unconfirmed infant burial location.

Disadvantages:

- Wetland impacts would be more. Alternative Hybrid 4A-1/4A-2 would have no wetland impact.
- Right-of-way acquisition would be more.
- Stream relocation impacts would be more.

Alternative Hybrid 4A-1/4A-2

Advantages:

- Forest impacts would be less.
- No wetland impacts would occur for Alternative Hybrid 4A-1/4A-2.
- Stream impacts would be less.
- Noise impacts would be less under the initial design criteria.
- Stream relocation impacts would be less.

Alternative Hybrid 4A-1/4A-2 was added as an Alternative Carried Forward during the screening of the preliminary alternatives at the suggestion of USEPA and IDNR (See Chapter 3,

Alternatives). The intent of the alternative was to minimize potential wetland and forest impacts that were identified for Alternative 4A-2 during the alternative screening. As shown above, Alternative Hybrid 4A-1/4A-2 would have no wetland impacts and would impact about 9.5 to 11.8 acres less forest as compared to Alternative 4A-2.

Disadvantages:

- Displacements would be more. Alternative 4A-2 would have no displacements.

As described in the Tier 1 FEIS (Section 1.5, pages 1 to 13, *Scope of Environmental Analysis*), Tier 2 analyses are to "look beyond" the section termini to assure that the selection of an alternative does not impact sensitive environmental resources in the adjoining section and to facilitate coordination between Tier 2 sections. Within the Section 3-4 overlap area[4], Section 3 Alternative 3E-1 continues eastward from US 231 to the Section 3-4 break line on a tangent (straight) alignment that generally follows along the same bearing as **Section 4 Alternative 4A-2**. Alternative 3E-1 is the Selected Alternative in Section 3 as identified in the January 28, 2010 Tier 2 Record of Decision. **Alternative Hybrid4A-1/4A-2**, however, begins approximately 900 feet to the north of the Section 3 Alternative 3E-1. Because of this alignment offset, a modification of the Section 3 Alternative 3E-1 alignment would be needed to connect Section 3 with Section 4. The modification would begin along the Section 3 Alternative 3E-1 alignment about 1,000 feet east of US 231.[5] At that point, the alignment would curve to the northeast parallel to the east side of an electrical transmission line and then turn east to the connection with **Alternative Hybrid4A-1/4A-2**. **Figure 6-5** (p. 6-181) shows the two Section 3 alignments within the Section 3-4 overlap area.

Alternative 4A-2 with Section 3-4 Overlap Area

The tangent (straight) alignment along Alternative 4A-2 with the Section 3 Alternative 3E-1 provides a more desirable, safer approach at the US 231 interchange because it offers unrestricted sight lines for motorists entering and exiting the interchange. This advantage is more clearly defined in the discussion of the Section 3-4 Overlap Area disadvantages. Impact advantages along the Section 3 Alternative 3E-1 alignment within the Section 3-4 overlap area and, as applicable, combined advantages (Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) are:

[4] The Section 3-4 overlap area is located in Section 3 and is the transition area where the recommended Section 3 mainline alignment would either connect to a proposed mainline alignment in Section 4A or where the recommended Section 3 mainline alignment would need to be realigned to connect with another proposed mainline alignment in Section 4A. The Section 3-4 overlap area extends from the US 231 interchange (Section 3) on the west to the Section 3-4 break line on the east, which is located about 1,280 feet west of CR 200E.

[5] The location of the US 231 interchange is constrained by the need to avoid significant resource impacts, including stream, forest and core forest impacts. Adoption of the tight-diamond configuration for this interchange (which reduces impacts just to the north and south of the Section 3 mainline at the interchange location) results in 1,560 fewer linear feet of perennial stream impacts; 19.8 fewer acres of forest impacts; 4.1 fewer acres of wetland impacts; and 5.0 fewer acres of core forest impacts. See Section 3 FEIS, Table 6-6 (p. 6-41). Any relocation of the US 231 interchange even slightly to the north would result in increased impacts to these resources, particularly in and near Doans Creek; see also Section 3 FEIS, Figure 6-7, p. 6-120). For these reasons, as well as to provide appropriate tie-ins to the US 231 interchange ramps, any modification to the Section 3 mainline would have to begin some distance east of the US 231 interchange.

- Total cost would be less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. The combined total cost (Alternative 4A-2 plus Section 3 Alternative 3E-1) would also be less than the Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1.
- Right-of-way impacts would be less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. The combined right-of-way for Alternative 4A-2 plus Section 3 Alternative 3E-1 would also be less than Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1.
- Wetland impacts for Section 3 Alternative 3E-1 would be less than Section 3 modified Alternative 3E-1 within the overlap area.
- Farmland impacts would be less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. The combined total farmland impact for Alternative 4A-2 plus Section 3 Alternative 3E-1 would also be less than Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1.

Alternative Hybrid 4A-1/4A-2 with Section 3-4 Overlap Area

The modified Section 3 Alternative 3E-1 alignment begins about 1,000 feet east of US 231 with a curve to the northeast that takes the alignment close to and parallel to the east side of the electrical transmission line. While this alignment may meet the nominal safety requirements established by the design criteria, several engineering concerns have become apparent relative to the substantive safety (expected actual accident rates) of this alignment. The sharp reverse curvature and relatively steep grades at the freeway/ramp junction of the westbound exit ramp and eastbound entrance ramp of the US 231 interchange could lead to an increase in accidents. The reverse curvature and vertical profile of the alignments could limit the visual sightlines of drivers resulting in unsafe conditions where drivers fail to recognize, or misperceive, the curves. Other possible unsafe conditions are the possible failure of westbound drivers to recognize the interchange ramps, leading to unexpected maneuvers and the placement of an exit maneuver on a sharp, superelevated (banked), downhill curve which has the potential to lead to truck roll-overs.

The modified mainline alignment that would connect Section 3 Alternative 3E-1 with Alternative Hybrid 4A-1/4A-2 in the overlap area was designed to minimize forest impacts. However, it was constrained on the west by the electrical transmission corridor resulting in impacts to two additional electrical transmission towers. Further modification of the Alternative Hybrid 4A-1/4A-2 to avoid these utility impacts and the above safety concerns was examined. Moving, or flattening, the horizontal curvature would impact more forest by shifting it closer to Alternative 4A-2 alignment. Longer interchange ramps as well as modification of the vertical profile can provide additional sight distance to improve driver recognition of the interchange ramp configuration, but both of these measures will substantially increase earthwork costs.

Despite the safety concerns, modified Section 3 Alternative 3E-1 within the Section 3-4 overlap area has impact advantages. These advantages and, as applicable, combined advantages (Alternative Hybrid 4A-1/4A-2 plus Section 3 Alternative 3E-1 within the overlap area) are:

- Forest impacts would be less than Section 3 Alternative 3E-1 within the overlap area. The combined forest impact for Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1 would also be less than Alternative 4A-2 plus Section 3 Alternative 3E-1.
- Core forest impacts would be less than the Alternative 4A-2 within the overlap area. The combined core forest impacts for Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1 would also be less than combined Alternative 4A-2 plus Section 3 Alternative 3E-1.
- Stream impacts would be less than Alternative 3E-1 within the overlap area. The combined stream impacts for Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1 would also be less than Alternative 4A-2 and Section 3 Alternative 3E-1.

Table 6-2: Overview of Key Impacts for Subsection 4A

	Alternatives							
	4A-2			Hybrid 4A-1/4A-2			Refined 4A-2	
	Low Cost*	Initial**	Section 3-4 Overlap ***	Low Cost*	Initial**	Section 3-4 Overlap ***	Low Cost*	Initial**
Total Cost ($M)****	18.88	26.28	7.3	20.45	26.08	10.0	17.05	23.21
Right-of-Way (Ac)	76.50	88.53	44.7	72.26	79.84	54.0	75.57	89.08
Forest (Ac)	38.54	45.45	22.0	29.08	33.62	12.9	38.02	45.13
Core Forest (Ac)	3.39	3.50	3.2	3.81	4.01	0.0	3.39	3.50
Wetland Impacts (Ac)								
Emergent Wetland	0.00	0.00	0.24	0.00	0.00	0.3	0.00	0.00
Forested Wetland	0.00	0.00	0.07	0.00	0.00	0.07	0.00	0.00
Scrub/Shrub Wetland	0.18	0.45	0.00	0.00	0.00	0.00	0.18	0.45
Total Wetland Impacts	0.18	0.45	0.31	0.00	0.00	0.37	0.18	0.45
Stream Impacts (LF)								
Ephemeral	3,357	4,111	1,070.8	3,044	3,722	450.0	3,461	4,150
Intermittent	1,080	1,245	0.0	467	701	0.0	1,088	1,270
Perennial	0	0	1,513.1	0	0	1,465.3	0	0
Total Stream Impacts*****	4,437	5,356	2,583.9	3,511	4,423	1,915.3	4,549	5,420
Karst Features (#)	0	0	0	0	0	0	0	0
Displacements (#)								
Residential	0	0	0	2	2	0	0	0
Institutional	0	0	0	0	0	0	0	0
Business	0	0	0	0	0	0	0	0
Total Displacements	0	0	0	2	2	0	0	0
Noise Impacts (#)******	4	6		4	4		5	6
Managed Land (Ac)	2.24	3.20	0.0	6.30	7.82	0.0	2.23	3.18
Farmland (Ac)	30.14	34.45	17.8	31.99	35.13	36.0	29.96	34.90
Stream Relocations (LF)	1,361	1,596		524	771		1,359	1,611
Floodplain (Ac)	0.00	0.00	6.5	0.00	0.00	6.2	0.00	0.00

* Low-Cost Design Criteria
** Initial Design Criteria
*** Total cost, right of way, and all impacts are based upon the Section 3 FEIS
**** 2010 Dollars, excluding mitigation costs
****** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
***** Impacted streams are shown in **Table 6-9a** (p. 6-44)
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.
Noise, farmland, and stream relocation impacts were not determined in the Section 3-4 overlap area.

Alternative 4A-2 was the recommended preferred alternative for Subsection 4A in the DEIS because the alternative had the following primary advantages:

- Alternative 4A-2, continuing to the west into the Section 3-4 overlap area along Section 3 Alternative 3E-1, is a substantively safer alignment than Alternative Hybrid 4A-1/4A-2 continuing to the west along a Section 3 modified Alternative 3E-1 alignment. The tangent (straight) alignment of Alternative 4A-2 creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange.
- Total cost would be less using the low-cost design criteria.
- Combined total cost (Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) would be less than Alternative Hybrid 4A-1/4A-2 plus a Section 3 modified Alternative 3E-1 alignment within the overlap area.
- Right-of-way acquisition would be less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. The combined right-of-way for Alternative 4A-2 plus Section 3 Alternative 3E-1 would also be less than Alternative Hybrid 4A-1/4A-2 plus Section 3 modified Alternative 3E-1.
- Core forest impacts would be less than Alternative Hybrid 4A-1/4A-2.
- No displacements would occur for Alternative 4A-2.
- Managed land impacts would be less than Alternative Hybrid 4A-1/4A-2.
- Farmland impacts would be less than Alternative Hybrid 4A-1/4A-2 and less than the Section 3 modified Alternative 3E-1 alignment within the overlap area.

Refined Alternative 4A-2

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4A-2 has been further developed. With these refinements, Alternative 4A-2 is referred to in the FEIS as Refined Alternative 4A-2 (**Figure 6-4a**, map pp. 1 and 2, p. 6-162). Refined Alternative 4A-2 is the Subsection 4A alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4A-2 are presented in **Table 6-2**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- The proposed grade separation at CR 200E, as included in the DEIS, has been replaced by a road closure for CR 200E at the mainline alignment under Refined Alternative 4A-2. This change was made for both the initial design criteria and the low-cost design criteria. Additional discussion about this change is included in Sections 5.3.4.2, 5.6.3.2, and 11.2.2.10 and **Appendix Z** of the FEIS.

- The proposed road closure of at CR 215E at the mainline alignment, as included in the DEIS, has been replaced by a grade separation along CR 215E under Refined Alternative 4A-2. This change was made for both the initial design criteria and the low-cost design criteria. Additional discussion about this change is included in Sections 5.3.4.2, 5.6.3.2, and 11.2.2.10 and **Appendix Z** of the FEIS.

Refined Alternative 4A-2 is the recommended preferred alternative for Subsection 4A in the FEIS. Refined Alternative 4A-2 would have the same connection with the Section 3 Alternative 3E-1 alignment as described above for Alternative 4A-2. Impacts within the Section 3-4 Overlap Area for Refined Alternative 4A-2 would be the same as described for Alternative 4A-2. Refined Alternative 4A-2 has the following advantages:

- Provides improved local access by closing CR 200E and constructing a grade separation at CR 215E. This change is not included in Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2.
- The tangent (straight) alignment for Refined Alternative 4A-2 creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange. This is consistent with Alternative 4A-2.
- Combined total cost (Refined Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) would be less than combined Alternative 4A-2 and combined Alternative Hybrid 4A-1/4A-2.
- Combined right-of-way acquisition (Refined Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) under the low-cost design criteria would be less than combined Alternative 4A-2 and combined Alternative Hybrid 4A-1/4A-2.
- Total cost and managed land impacts would be less than Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2.
- Forest impacts would be less than Alternative 4A-2.
- Right-of-way acquisition, stream relocation impacts, and farmland impacts would be less than Alternative 4A-2 using the low-cost design criteria.
- Core forest, displacement, managed land, and farmland impacts would be less than Alternative Hybrid 4A-1/4A-2.

6.2.2 Subsection 4B

In Subsection 4B, **Alternative 4B-1** was advanced for detailed study and Alternative 4B-2 was eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4B.

The alignment for Alternative 4B-1 continues from the Subsection 4A-4B break line on a general northeast bearing along the west edge of the corridor. A crossing is provided for Dowden Branch which also coincides with the CR 600S crossing. Because of low traffic volumes on CR 600S and so as to avoid building a grade separation over CR 600S and another bridge for CR 600S over Dowden Branch, CR 600S would be closed. After crossing Dowden Branch, the alignment gradually shifts toward the center of the corridor and continues to the northeast ending

at a point approximately 4,100 feet north of CR 600S and 2,400 feet west of CR 440E (Taylor Ridge Road). Farmland (row crops and pasture) and forest (woodlots) dominate the land use of this subsection. No karst features are located in Subsection 4B.

Alternative 4B-1 is the Subsection 4B component of DEIS Alternatives 1, 2, 3, and 4. The alternative is 6,400 feet (1.21 miles) in length. **Table 6-3** summarizes the impacts associated with Alternative 4B-1. Alternative 4B-1 is shown on map pp. 2 and 3 of **Figure 6-1** (p. 6-86) through **Figure 6-4** (p. 6-143).

Table 6-3: Overview of Key Impacts for Subsection 4B

	Alternatives			
	4B-1		Refined 4B-1	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	12.42	24.19	12.17	24.18
Right-of-Way (Ac)	48.44	57.91	48.46	57.87
Forest (Ac)	21.26	22.53	21.26	22.48
Core Forest (Ac)	10.42	10.81	10.42	10.80
Wetland Impacts (Ac)				
Emergent Wetland	0.00	0.00	0.00	0.00
Forested Wetland	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.00
Stream Impacts (LF)				
Ephemeral	1,358	1,359	1,359	1,354
Intermittent	420	476	420	476
Perennial	0	0	0	0
Total Stream Impacts****	1,778	1,835	1,779	1,830
Karst Features (#)	0	0	0	0
Displacements (#)				
Residential	0	0	0	0
Institutional	0	0	0	0
Business	0	0	0	0
Total Displacements	0	0	0	0
Noise Impacts (#)*****	2	2	1	1
Managed Land (Ac)	2.53	2.88	2.53	2.88
Farmland (Ac)	26.02	34.21	26.03	34.21
Stream Relocations (LF)	0	0	0	0
Floodplain (Ac)	0.00	0.00	0.00	0.00

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4B-1 was the recommended Preferred Alternative for Subsection 4B in the DEIS because the alternative had the following features:

- Alternative 4B-1 has no wetland impacts. A small wetland situated along the west edge of the alignment that was recommended for avoidance during the screening of the preliminary alternatives (See Chapter 3, *Alternatives*) is not impacted by the preliminary right-of-way.

- Forest and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4B-1 (See Chapter 3, *Alternatives*).

Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forest, core forest, streams, managed land, and farmland.

Refined Alternative 4B-1

Based on additional engineering and environmental analysis, Alternative 4B-1 has been further developed. With these refinements, Alternative 4B-1 is referred to in the FEIS as Refined Alternative 4B-1 (**Figure 6-4a**, map pp. 2 and 3, pp. 6-162). Refined Alternative 4B-1 is the Subsection 4B alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4B-1 are presented in **Table 6-3**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design corrections were made at various locations for compliance with IDM. These refinements included both the initial design criteria and the low-cost design criteria.

Refined Alternative 4B-1 is the recommended preferred alternative for Subsection 4B in the FEIS. Refined Alternative 4B-1 has the following advantages:

- Total cost would be less than Alternative 4B-1. .
- Right-of-way acquisition and forest, core forest, stream, and noise impacts would be less than Alternative 4B-1 using the initial design criteria.

6.2.3 Subsection 4C

In Subsection 4C, both **Alternative 4C-1** and **Alternative 4C-2** were carried forward for detailed analysis in the DEIS. No other alternatives were considered for Subsection 4C. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4C.

The Subsection 4C corridor continues from the Subsection 4B-4C break line on a general northeast bearing toward Taylor Ridge Cemetery (near the CR 440E/CR 450S intersection). Near the cemetery, the corridor turns east across Black Ankle Creek and CR 600E. The subsection terminus is about 700 feet east of CR 600E.

Alternative 4C-1 (map pp. 3 to 5 of **Figure 6-1**, p. 6-86 and **Figure 6-**4, p. 6-143) diverges from the common alignment with Alternative 4C-2 about 800 feet northeast of the Subsection 4B-4C break line. The alignment follows the west edge of the corridor and passes to the west of Taylor Ridge Cemetery and north of the CR 475E/CR 450S intersection. The alignment utilizes a single curve to turn east along the north edge of the corridor and merges with the alignment of Alternative 4C-2 about 500 feet west of Black Ankle Creek. Alternative 4C-1 has a total length

of 14,000 feet (2.65 miles). Alternative 4C-1 is the Subsection 4C component of DEIS Alternatives 1 and 4.

Alternative 4C-2 (map pp. 3 to 5 of **Figure 6-2**, p. 6-105 and **Figure 6-**3, p. 6-124) generally trends to the east edge of the corridor. To avoid Taylor Ridge Cemetery, the alignment curves to the northeast thru the CR 475E/CR 450S intersection just east of the cemetery. After a tangent (straight) section of roadway, the alignment curves to the east where it merges with the alignment of Alternative 4C-1 and continues east across Black Ankle Creek and CR 600E to the subsection terminus. Access Road 1 (north side of the highway) would maintain access to Taylor Ridge Cemetery from CR 475E. Alternative 4C-2 has a total length of 13,302 feet (2.50 miles). Alternative 4C-2 is the Subsection 4C component of DEIS Alternatives 2 and 3.

Alternative 4C-1 and Alternative 4C-2 both traverse mainly forest and some farmland (pasture). The alternatives are similar in the following respects:

- CR 475E would be closed north of CR 450S.
- CR 400S would be closed east of CR 600E.
- A bridge/grade separation would be constructed over Black Ankle Creek/CR 600E.
- Wetland impacts could be the same using the low-cost design criteria.
- Displacements would be the same.

The differences between Alternatives 4C-1 and Alternative 4C-2 include total cost, right-of-way acquisition, and impacts upon forest, core forest, wetland (using the initial design criteria), streams, karst features, managed land, farmland, stream relocations, and floodplains. A comparison of the advantages and noteworthy disadvantages of each is presented below. **Table 6-4** summarizes impacts associated with the two alternatives.

Alternative 4C-1

Advantages:

- Noise impacts would be less.
- Farmland impacts would be less.
- Alternative 4C-1 has a more desirable geometric alignment because it would have a single curve to the east and would cross Taylor Ridge Road (CR 475E) north of the CR 450S intersection. The closing of Taylor Ridge Road at this location would not impact the current access to Koleen for residents located along Taylor Ridge Road south of CR 450S.
- The current access to Taylor Ridge Cemetery from the south and east would also be maintained.

Disadvantages:

- Up to about 5 miles or more of additional travel would be incurred for accessing Taylor Ridge Cemetery from the north. The closing of CR 475E, along with the closing of CR 600S

for Alternative 4B-1, would increase travel by about 1.5 miles to 3 miles for travel to the west and north for residences located along Taylor Ridge Road south of CR 450S.

- Up to about 1 mile of increased travel to these residences would also be incurred for emergency service vehicles and school buses.

Alternative 4C-2

Advantages:

- Total cost would be less.
- Right-of-way impacts would be less.
- Forest impacts would be less.
- Core forest impacts would be less.
- Wetland impacts would be less using the initial design criteria.
- Total stream impacts would be less.
- Karst feature impacts would be less.
- Managed land impacts would be less.
- Stream relocations would be less.
- Floodplain impacts would be less.

Disadvantages:

- Alternative 4C-2 has a less desirable geometric alignment. Two consecutive horizontal curves have deflections in the same direction. This is commonly referred to as a broken-back curve. However, a tangent (straight) alignment of over one-half mile (approximately 3,400 feet) separates these two curves, which would be sufficiently long enough to eliminate any undesirable roadway geometrics, confusion in driver expectations, or undesirable aesthetics.
- The closing of Taylor Ridge Road and CR 450S, along with the closing of CR 600S for Alternative 4B-1, would increase travel distances by about 1.5 miles to 3 miles to the west, north, and northeast (including travel to Koleen) for residents located along Taylor Ridge Road south CR 450S. Up to about 1 mile of increased travel to these residences would also be incurred for emergency service vehicles and school buses.

Taylor Ridge Cemetery would also be located at the end of a dead-end road (CR 475E). Considerable additional travel (up to 5 miles or more) would be incurred to access the cemetery from the south. Access Road 1 would require construction within the 100-foot buffer around Taylor Ridge Cemetery.[6] No construction within the cemetery boundary would be required.

[6] In accordance with IC 14-21-1-26.5, proposed ground disturbance within 100 feet of a burial ground requires that a cemetery development plan be prepared and that the IDNR approve the development plan prior to such disturbance.

Table 6-4: Overview of Key Impacts for Subsection 4C

	Alternatives					
	4C-1		4C-2		Refined 4C-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	45.37	74.33	41.33	72.71	41.43	71.78
Right-of-Way (Ac)	125.66	170.25	118.58	155.11	118.65	155.47
Forest (Ac)	73.42	98.06	71.97	92.32	72.03	92.55
Core Forest (Ac)	84.14	90.47	66.76	71.14	66.78	71.35
Wetland Impacts (Ac)						
Emergent Wetland	3.16	3.70	3.17	3.70	3.17	3.70
Forested Wetland	1.44	3.81	1.43	3.13	1.43	3.13
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00	0.00	0.00
Total Wetland Impacts	4.60	7.51	4.60	6.83	4.60	6.83
Stream Impacts (LF)						
Ephemeral	2,921	3,551	3,648	4,678	3,649	4,739
Intermittent	3,310	4,290	1,277	1,795	1,277	1,794
Perennial	1,220	1,374	1,220	1,351	1,220	1,351
Total Stream Impacts****	7,451	9,215	6,145	7,824	6,146	7,884
Karst Features (#)	3	3	1	1	1	1
Displacements (#)						
Residential	1	1	1	1	1	1
Institutional	0	0	0	0	0	0
Business	0	0	0	0	0	0
Total Displacements	1	1	1	1	1	1
Noise Impacts (#)*****	4	4	6	5	5	4
Managed Land (Ac)	25.22	41.46	5.36	7.48	5.37	7.49
Farmland (Ac)	17.79	23.99	27.47	41.14	27.47	41.26
Stream Relocations (LF)	3,419	4,381	1,920	3,049	1,920	3,048
Floodplain (Ac)	4.64	6.60	4.62	6.33	4.62	6.33

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4C-2 was the recommended Preferred Alternative for Subsection 4C in the DEIS because the alternative had the following primary advantages:

- Total cost could be less than Alternative 4C-1.
- Right-of-way acquisition would be less than Alternative 4C-1.
- Forest, core forest, stream, and karst feature impacts would be less than Alternative 4C-1.
- Wetland impacts would be less than Alternative 4C-1 under the initial design criteria and would be the same as Alternative 4C-1 under the low-cost design criteria.
- Managed land, stream relocation, and floodplain impacts would be less than Alternative 4C-1.

Refined Alternative 4C-2

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis and decisions made by INDOT, Alternative 4C-2 has been further developed. With these refinements, Alternative 4C-2 is referred to in the FEIS as Refined Alternative 4C-2 (**Figure 6-4a,** map pp. 3 to 5, p. 6-162). Refined Alternative 4C-2 is the Subsection 4C alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4C-2 are presented in **Table 6-4**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design corrections were made at various locations for compliance with IDM. These refinements included both the initial design criteria and the low-cost design criteria.

Refined Alternative 4C-2 is the recommended preferred alternative for Subsection 4C in the FEIS. Refined Alternative 4C-2 has the following advantages**:**

- Total cost would be less than Alternative 4C-1 using the low-cost design criteria.
- Right-of-way acquisition and forest, core forest, stream, karst feature, and managed land impacts would be less than Alternative 4C-1.
- Noise impacts would be less than Alternative 4C-2.
- Wetland impacts would be less than Alternative 4C-1 using the initial design criteria.
- Stream relocation impacts would be less than Alternative 4C-1 and would be less than Alternative 4C-2 using the initial design criteria.

6.2.4 Subsection 4D

In Subsection 4D, **Alternative 4D-1** was carried forward for detailed study. Alternative 4D-2 was eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4D.

Alternative 4D-1 proceeds east from the Subsection 4C-4D break line across Dry Branch Creek, CR 750E/900E (Dry Branch Road), CR 350S/CR 360S/CR 880E (Mineral-Koleen Road), and Plummer Creek. The alternative ends approximately 700 feet east of Mineral-Koleen Road. Land use is predominantly forest. Alternative 4D-1 would have grade separations/bridges over Dry Branch Creek/Dry Branch Road and Mineral-Koleen Road/Plummer Creek. Alternative 4D-1 avoids Cooper Cemetery (and the 100-foot buffer around the cemetery). The alternative is 13,000 feet (2.46 miles) in length.

This subsection has the highest construction cost per linear distance of any of the Section 4 subsections. This is due to the many ridges and valleys that are crossed by the corridor in this subsection including five elevation changes of over 200 feet. After crossing Black Ankle Creek in Subsection 4C, Alternative 4D-1 turns slightly to the north to avoid the higher peaks on the south side of the corridor. The stream crossings at Dry Branch Creek and Plummer Creek are both combined with roadway crossings with the height of the interstate above the road/stream varying from 90 feet to 130 feet.

Alternative 4D-1 is the Subsection 4D component of DEIS Alternatives 1, 2, 3, and 4. **Table 6-5** summarizes the impacts associated with Alternative 4D-1. The alternative is shown on map pp. 5 and 6 of **Figure 6-1** (p. 6-86) through **Figure 6-4** (p. 6-143).

Table 6-5: Overview of Key Impacts for Subsection 4D

	Alternatives			
	4D-1		Refined 4D-1	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	66.53	90.19	66.54	90.16
Right-of-Way (Ac)	127.24	181.44	127.80	181.44
Forest (Ac)	115.90	162.33	116.45	162.34
Core Forest (Ac)	270.25	305.31	270.31	305.33
Wetland Impacts (Ac)				
Emergent Wetland	0.05	1.41	0.05	1.41
Forested Wetland	0.17	0.33	0.17	0.33
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.22	1.74	0.22	1.74
Stream Impacts (LF)				
Ephemeral	3,189	4,945	3,189	4,946
Intermittent	2,855	3,907	2,855	3,907
Perennial	1,430	2,033	1,430	2,033
Total Stream Impacts****	7,474	10,885	7,474	10,886
Karst Features (#)	3	5	3	5
Displacements (#)				
Residential	2	2	2	2
Institutional	0	0	0	0
Business	0	0	0	0
Total Displacements	2	2	2	2
Noise Impacts (#)*****	2	2	1	1
Managed Land (Ac)	43.74	63.12	43.79	63.13
Farmland (Ac)	9.01	14.04	9.01	14.04
Stream Relocations (LF)	2,697	2,258	2,697	2,258
Floodplain (Ac)	5.88	9.80	5.88	9.80

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4D-1 was the recommended Preferred Alternative for Subsection 4D in the DEIS because the alternative had the following features:

- Forest, wetland, and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4D-1 (See Chapter 3, *Alternatives*).
- The alignment avoids the recharge area of a major spring.
- Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forests, core forests, wetlands, streams, karst features, managed lands, farmland, stream relocations, and floodplains.

Refined Alternative 4D-1

Based on additional engineering and environmental analysis, Alternative 4D-1 has been further developed. With these refinements, Alternative 4D-1 is referred to in the FEIS as Refined Alternative 4D-1 (**Figure 6-4a,** map pp. 5 and 6, p. 6-162). Refined Alternative 4D-1 is the Subsection 4D alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4D-1 are presented in **Table 6-5**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Minor design corrections were made at various locations for compliance with IDM. These refinements included both the initial design criteria and the low-cost design criteria.

Refined Alternative 4D-1 is the recommended preferred alternative for Subsection 4D in the FEIS. Refined Alternative 4D-1 has the following advantages**:**

- Total cost would be less than Alternative 4D-1 using the initial design criteria.
- Noise impacts would be less than Alternative 4D-1.

6.2.5 Subsection 4E

In Subsection 4E, **Alternative Hybrid 4E-1/4E-2** is the only alternative that was carried forward for detailed study. Alternative 4E-1, Alternative 4E-2, and Alternative 4E-3 were eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4E.

Alternative Hybrid 4E-1/4E-2 proceeds east/northeast from the Subsection 4D-4E break line and trends along the north and middle portions of the corridor before turning north/northeast to the subsection terminus located about 3,000 feet north/northeast of SR 54. Land use is predominantly forest west of SR 45 and a mix of forest, pasture, and rural residences east of SR 45. Several undeveloped lots fronting Cedar Road in the Clifty Hills Subdivision would be acquired for right-of-way or would become undevelopable due to loss of access. Ashcraft Chapel, Shoptaw Cemetery, and Ashcraft Cemetery are located near the center/south edge of the corridor. The chapel and both cemeteries (including 100-foot buffer) are located outside the preliminary right-of-way for Alternative Hybrid 4E-1/4E-2. The alternative is 26,100 feet (4.94 miles) in length.

An interchange is proposed at SR 45. The development of Alternative Hybrid 4E-1/4E-2 would require the closing of Cedar Road in Clifty Hills Subdivision, Old Clifty Road north of CR 415S, and CR 1250E on the north side of I-69. Access improvements include:

- Access Road 2 on the north side of the highway would maintain the current travel between Pine Road and Spruce Road within Clifty Hills Subdivision.
- Access Road 3 would provide access to properties located adjacent to the west side of the SR 45 interchange south of I-69 whose access would be eliminated by the full access control limits at the SR 45 interchange ramps.
- Access Road 4 on the south side of the highway would connect CR 1250E south of I-69 with SR 54.
- Grade separation at SR 54.
- Access Road 5 would provide access to properties located immediately east of SR 54 south of I-69.

Alternative Hybrid 4E-1/4E-2 follows some relatively flatter terrain on the north side of the corridor to avoid a higher ridge east of Old Clifty Road. The alignment crosses an electrical transmission line, then curves toward the center of the corridor to minimize residential relocations at the SR 45 interchange. The bridge over Mitchell Branch Creek would be over 100 feet above the creek. On a long curve to the north, the alignment will cross well above SR 54 and minimize impacts to this state highway.

Alternative Hybrid 4E-1/4E-2 is the Subsection 4E component of DEIS Alternatives 1, 2, 3, and 4. **Table 6-6** summarizes the impacts associated with Alternative Hybrid 4E-1/4E-2. The alternative is shown on map pp. 6 to 9 of **Figure 6-1** (p. 6-86) through **Figure 6-4** (p. 6-143).

Table 6-6: Overview of Key Impacts for Subsection 4E

	Alternatives			
	Hybrid 4E-1/4E-2		Refined Hybrid 4E-1/4E-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	79.90	116.79	81.80	105.83
Right-of-Way (Ac)	270.75	327.73	268.81	318.13
Forest (Ac)	187.78	227.86	187.89	224.26
Core Forest (Ac)	194.99	214.80	194.98	213.12
Wetland Impacts (Ac)				
Emergent Wetland	0.11	0.22	0.11	0.20
Forested Wetland	0.06	0.15	0.06	0.15
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.17	0.37	0.17	0.35
Stream Impacts (LF)				
Ephemeral	16,108	17,096	16,111	16,927
Intermittent	2,754	2,972	2,754	2,967
Perennial	607	927	607	735
Total Stream Impacts****	19,469	20,995	19,472	20,629
Karst Features (#)	5	5	5	5
Displacements (#)				
Residential	10	10	10	10
Institutional	0	0	0	0

Table 6-6: Overview of Key Impacts for Subsection 4E

	Alternatives			
	Hybrid 4E-1/4E-2		Refined Hybrid 4E-1/4E-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Business Total Displacements	0 10	0 10	0 10	0 10
Noise Impacts (#)*****	19	21	6	5
Managed Land (Ac)	71.19	88.43	71.29	85.59
Farmland (Ac)	44.26	57.46	44.32	53.63
Stream Relocations (LF)	5,893	7,600	5,894	6,526
Floodplain (Ac)	0.00	0.11	0.00	0.11

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative Hybrid 4E-1/4E-2 was the recommended Preferred Alternative for Subsection 4E in the DEIS because the alternative had the following features:

- Forest impacts would be less than estimated during the preliminary alternatives screening for Alternative Hybrid 4E-1/4E-2 (See Chapter 3, *Alternatives*).
- Implementation of the low-cost design criteria could reduce total cost, right-of-way acquisition, and impacts upon forests, core forests, wetlands, streams, noise, managed lands, farmland, stream relocations, and floodplains.

Refined Alternative Hybrid 4E-1/4E-2

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative Hybrid 4E-1/4E-2 has been further developed. With these refinements, Alternative Hybrid 4E-1/4E-2 is referred to in the FEIS as Refined Alternative Hybrid 4E-1/4E-2 (**Figure 6-4a,** map pp. 6 to 9, p. 6-162). Refined Alternative Hybrid 4E-1/4E-2 is the Subsection 4E alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative Hybrid 4E-1/4E-2 are presented in **Table 6-6**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from approximately 0.48 miles east of SR 45 to the Subsection 4E/Subsection 4F breakline. This refinement was made to reduce forest impacts near Indiana bat hibernaculum. It was not made for Refined Alternative Hybrid 4E-1/4E-2 under the low-cost design criteria.

- Access Road 2 at the junction of Spruce Road and Pine Road in the Clifty Hills subdivision was proposed as an intersection improvement in the DEIS. This access road was changed for Refined Alternative Hybrid 4E-1/4E-2 to a modification of the existing cul-de-sac at the south end of Spruce Road. The modified cul-de-sac, known as Access Road 2a, would be constructed slightly north of the existing cul-de-sac and would include a new connection to Pine Road. Access Road 2a is included under the initial design criteria and the low-cost design criteria for Refined Alternative Hybrid 4E-1/4E-2 and is further described in Section 5.6.3.2.
- Access Road 6 was added to Refined Alternative Hybrid 4E-1/4E-2. This access road would provide access to properties located immediately east of SR 45 north of I-69. This access road was added to Refined Preferred Alternative Hybrid 4E-1/4E-2 after completion of the DEIS (see Section 5.6.3.2). It is not part of Alternative Hybrid 4E-1/4E-2.
- Since the publication of the DEIS, ongoing public outreach lead to the identification of an additional karst feature. This feature did not exist when surveys were completed in 2004 – 2006. It has been identified and added to the impacts for both alternatives. See Section 5.21.3.10 for more details.
- Minor design corrections were made at various locations for compliance with IDM. These refinements were made for the initial design criteria and low-cost design criteria.

Refined Alternative Hybrid 4E-1/4E-2 is the recommended preferred alternative for Subsection 4E in the FEIS. Refined Alternative Hybrid 4E-1/4E-2 has the following advantages**:**

- Refinement of the vertical road profile under the initial design criteria would reduce total cost, right-of-way acquisition, and forest, core forest, wetland, stream, noise, managed land, farmland, and stream relocation impacts as compared to Alternative Hybrid 4E-1/4E-2.
- Access Road 6 would provide access to properties located immediately east of SR 45 north of I-69.
- Right-of-way acquisition and core forest impacts would be less than Alternative Hybrid 4E-1/4E-2 using the low-cost design criteria.
- Noise impacts would be less than Alternative Hybrid 4E-1/4E-2.

6.2.6 Subsection 4F

In Subsection 4F, the four alignment alternatives carried forward for detailed study in the DEIS were **Alternative 4F-1**, **Alternative 4F-3**, **Alternative 4F-4**, and **Alternative 4F-5**. Alternative 4F-2 was eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4F.

The Subsection 4F corridor proceeds generally north/northeast from the Subsection 4E-4F break line along and to the west of the Greene/Monroe County line. Near the southeast corner of the Timber Trace Subdivision (Greene County), the corridor turns east into Monroe County. The Subsection 4F corridor ends about 900 feet east of Breeden Road. The Subsection 4F corridor widens to about 5,300 feet (one mile) in the vicinity of CR 150N.

The Greene/Monroe County Line interchange, which is included with all four alternatives, is located near CR 150N. The impacts reported for each of the alternatives use the South Connector Road for access between the interchange and SR 45. The connector road includes a bridge over Indian Creek. In addition to the connector road bridge over Indian Creek, all four alignment alternatives will also have three mainline crossings of Indian Creek.

Land use in Subsection 4F is a mix of forest, farmland (pasture and row crops), and residential development including Whippoorwill Subdivision, Timber Trace Subdivision, and scattered rural residences. The Indian Creek Township fire station is located along the south side of CR 35N (Carmichael Road). Carmichael Cemetery is located in the eastern portion of the corridor along Carmichael Road. Freeman Cemetery is located along the east edge of the corridor south of Carmichael Road. Sparks Cemetery is located near the center of the corridor just north of the second crossing of Indian Creek. Adams/Breeden Cemetery is located near the east edge of the corridor where the corridor turns east into Monroe County.

The four Subsection 4F alignment alternatives are components of the four end-to-end alternatives as follows:

- Alternative 4F-1: Alternative 1
- Alternative 4F-3: Alternative 2
- Alternative 4F-4: Alternative 3
- Alternative 4F-5: Alternative 4

Alternative 4F-1 (map pp. 9 to 14 of **Figure 6-1**, p. 6-86), along with the alignment for Alternative 4F-4, diverges from the common alignment with Alternatives 4F-3 and 4F-5 in the vicinity of CR 1260E/CR 190S (Hobbieville Road) and proceeds north/northeast across Indian Creek. The alignment crosses Indian Creek about one mile south of Carmichael Road and proceeds along the valley on the east side of the creek. Turning north to avoid the Whippoorwill Subdivision, it then crosses Carmichael Road. Alternative 4F-1 diverges from the alignment with Alternative 4F-4 and merges with the alignment of Alternative 4F-5 near CR 150N. This crossover point between the four Subsection 4F alignments is also near the proposed Greene/Monroe County Line interchange. North of CR 150N, the alignment for Alternative 4F-1 (and Alternative 4F-5) proceeds on a north/northeast bearing west of CR 150N (Carter Road). It curves slightly north to avoid Sparks Cemetery and makes a second crossing of Indian Creek. At a point east of Timber Trace Subdivision, all four Subsection 4F alignments merge and turn east, avoiding Adams/Breeden Cemetery, and crossing Indian Creek (third crossing) and Breeden Road. Alternative 4F-1 has a total length of 31,351 feet (5.94 miles).

Alternative 4F-3 (map pp. 9 to 14 of **Figure 6-2**, p. 6-105), along with the alignment for Alternative 4F-5, proceeds north from Hobbieville Road along the west edge of the corridor. The alignment proceeds along higher ground west of Indian Creek before crossing the creek adjacent to the south side of Carmichael Road. Near CR 150N (and the proposed Greene/Monroe County Line interchange), the alignment diverges from the alignment with Alternative 4F-5 and merges with the alignment of Alternative 4F-4. The alignment for Alternative 4F-3 (and Alternative 4F-4) proceeds northeast on the east side of CR 150N, passing

through the area of the proposed interchange and then turns north/northwest across Carter Road and a second crossing of Indian Creek. The four Subsection 4F alignments then merge and proceed east, avoiding Adams/Breeden Cemetery, and crossing Indian Creek (third crossing) and Breeden Road into Monroe County. Alternative 4F-3 has a total length of 31,700 feet (5.94 miles).

Alternative 4F-4 (map pp. 9 to 14 of **Figure 6-3**, p. 6-124) follows the same alignment as described above for Alternative 4F-1 south of the proposed Greene/Monroe County Line interchange. North of the proposed interchange, Alternative 4F-4 follows the same alignment as described above for Alternative 4F-3. Alternative 4F-4 has a total length of 31,735 feet (6.01 miles).

Alternative 4F-5 (map pp. 9 to 14 of **Figure 6-4**, p. 6-143) follows the same alignment as described above for Alternative 4F-3 south of the proposed Greene/Monroe County Line interchange. North of the proposed interchange, Alternative 4F-5 follows the same alignment as described above for Alternative 4F-1. Alternative 4F-5 has a total length of 31,113 feet (5.89 miles).

The alignment for the South Connector Road is shown on p. 12 of **Figure 6-1** (p. 6-86) thru **Figure 6-4** (p. 6-162).

Alternative 4F-1, Alternative 4F-3, Alternative 4F-4, and Alternative 4F-5 share the following features:

- Relocation of approximately 2,200 feet of SR 445 west of SR 45 for connection to the South Connector Road.
- Reconstruction of approximately 1,000 feet of SR 45 north of the South Connector Road intersection and approximately 1,500 feet of SR 45 south of the South Connector Road intersection.
- Grade separation over Hobbieville Road.
- Bridges over Indian Creek (south crossing) and grade separations of Carmichael Road:
  - Bridge/grade separation over Indian Creek/Carmichael Road by mainline alignments of Alternative 4F-3 and Alternative 4F-5.
  - Carmichael Road grade separation over the Alternative 4F-1 mainline alignment.
  - Alternative 4F-4 mainline alignment grade separation over Carmichael Road using the initial design criteria.
  - Carmichael Road grade separation over the Alternative 4F-4 mainline alignment using the low-cost design criteria.
  - Separate bridges to the south of Carmichael Road for Alternatives 4F-1 and 4F-4 mainline alignments over Indian Creek.
- Bridges at the middle and north crossings of Indian Creek.
- Grade separation over Breeden Road.

- Avoid Freeman Cemetery, Carmichael Cemetery, and Adams/Breeden Cemetery, providing a 100-foot buffer around each cemetery.

The differences between Alternative 4F-1, Alternative 4F-3, Alternative 4F-4, and Alternative 4F-5 include total cost, right-of-way, and impacts upon forest, core forest, wetland, streams, karst features, displacements, noise, farmland, stream relocations, and floodplains. A comparison of the advantages and disadvantages of each alternative is presented below. **Table 6-7** summarizes the impacts associated with the four alternatives.

Alternative 4F-1

Advantages:

- Stream relocation impacts would be less than Alternatives 4F-3 and 4F-4, but greater than Alternative 4F-5.
- Farmland impacts would be the least of all four Subsection 4F alternatives.
- Managed land impacts would be the least of all four Subsection 4F alternatives using the initial design criteria; under the low-cost design criteria, Alternative 4F-5 is slightly lower.
- Right-of-way acquisition and stream, noise, and floodplain impacts would be less than Alternatives 4F-3 and 4F-4, however, right-of-way impacts and stream, noise, and floodplain impacts would be more than Alternative 4F-5.

The alignment avoids properties in Whippoorwill Subdivision, Sparks Cemetery, and the Indian Creek Township fire station. Carter Road would remain open at Greene/Monroe County line.

Disadvantages:

- Forest impacts would be the greatest of all four Subsection 4F Alternatives.
- Core forest impacts would be the greatest of all four Subsection 4F alternatives.
- Wetland impacts would be the greatest of all four Subsection 4F alternatives. Alternative 4F-1 would also have the most overall emergent wetland and forested wetland impacts of all four Subsection 4F alternatives.
- Karst feature impacts would be more than Alternatives 4F-3 and 4F-4. Alternative 4F-1 would have more karst feature impacts than Alternative 4F-5 using the initial design criteria but could have the same (and most) karst feature impacts as Alternative 4F-5 using the low-cost design criteria.
- Displacements would be the greatest of all four Subsection 4F alternatives. Alternative 4F-1 would also have the most overall residential displacements of all four Subsection 4F alternatives.
- Total cost would be more than Alternatives 4F-3 and 4F-5 using the initial design criteria, however, total cost could be less than Alternative 4F-4.

Alternative 4F-1 would close CR 150N at the highway right-of-way. The road closing would isolate several Greene County properties located east of the highway from other contiguous land within Greene County. Additional travel distances to access these properties (via Carter Road) would be incurred by Greene County emergency service vehicles and school busses, including

the need to travel into Monroe County. Alternative 4F-1 would also have a less desirable skewed crossing of Indian Creek (south crossing) and require substantial fill in the Indian Creek floodplain to raise Carmichael Road over the freeway.

Alternative 4F-3

Advantages:

- Total cost would be the least of all four Subsection 4F alternatives.
- Forest impacts would be the least of all four Subsection 4F alternatives.
- Core forest impacts would be the least of all four Subsection 4F alternatives.
- Wetland impacts would be the least of all four Subsection 4F alternatives. Alternative 4F-3 would also have the overall lowest forested wetland impact of all four Subsection 4F alternatives.
- Karst feature impacts would be less than Alternatives 4F-1 and 4F-5. Alternatives 4F-3 and 4F-4 have the same (and fewest) karst feature impacts.
- Displacements would be the least of all four Subsection 4F alternatives. Alternative 4F-3 would also have the fewest overall residential displacements of all four Subsection 4F alternatives.

Alternative 4F-3 avoids properties in Whippoorwill Subdivision, Sparks Cemetery, and the Indian Creek Township fire station. The alignment also maintains direct access to all Greene County properties situated along CR 150N west of the county line and would maintain access by Greene County emergency service vehicles and school busses. Alternative 4F-3 has a more desirable crossing of Indian Creek (south crossing) and Carmichael Road. This alternative combines the two crossings and minimizes grade changes and reconstruction needed for the Carmichael Road.

Disadvantages:

- Managed land impacts would the greatest of than all four Subsection 4F alternatives.
- Farmland impacts would be the greatest of all four Subsection 4F alternatives.
- Stream relocations using the initial design criteria would be the greatest of all four Subsection 4F alternatives. Stream relocations using the low-cost design criteria would be more than Alternatives 4F-1 and 4F-5, but less than Alternative 4F-4.
- Right-of-way acquisition would be more than Alternatives 4F-1 and 4F-5, but less than Alternative 4F-4.
- Stream, noise, and floodplain impacts would be more than Alternatives 4F-1 and 4F-5, however, stream, noise, and floodplain impacts would be less than Alternative 4F-4.

Alternative 4F-3 would close travel between Greene County (CR 150N) and Monroe County (Carter Road) at the county line. The proposed Greene/Monroe County Line interchange would require a slightly longer connection (about 700 feet) to SR 45 and the loop ramps east of the mainline would have higher impacts on a tributary to Indian Creek.

Alternative 4F-4

Advantages:

- Impacts less karst features than Alternatives 4F-1 and 4F-5. Alternatives 4F-3 and 4F-4 have the same (and fewest) karst feature impacts.
- Wetland impacts would be less than Alternatives 4F-1 and 4F-5, however, wetland impacts would be more than Alternative 4F-3.

The alignment avoids Sparks Cemetery. The alignment also maintains direct access to all Greene County properties situated along CR 150N west of the county line and would maintain access by Greene County emergency service vehicles and school busses. Like Alternative 4F-3, Alternative 4F-3 has a more desirable combined crossing of Indian Creek (south crossing) and Carmichael Road.

Disadvantages:

- Total cost would be more than Alternatives 4F-1 and 4F-3.
- Right-of-way acquisition would be the greatest of all four Subsection 4F alternatives.
- Stream impacts (initial design criteria and low-cost design criteria) would be the greatest of all four Subsection 4F alternatives. Alternative 4F-4 would also have the greatest ephemeral stream and intermittent stream impacts of all four Subsection 4F alternatives.
- Noise impacts would be the greatest of all four Subsection 4F alternatives.
- Floodplain impacts would be the greatest of all four Subsection 4F alternatives.
- Forest, core forest, and displacement impacts would be more than Alternatives 4F-3 and 4F-5, however, forest, core forest, and displacement impacts would be less than Alternative 4F-1.
- Managed land and farmland impacts would be more than Alternatives 4F-1and 4F-5 using the initial design criteria, however, managed land and farmland impacts would be less than Alternative 4F-3 using the initial design criteria.
- Stream relocations using the low-cost design criteria would be the greatest of all four Subsection 4F alternatives. Stream relocation impacts using the initial design criteria would be less than Alternative 4F-3 but would be more than Alternatives 4F-1 and 4F-5.

Alternative 4F-4 would close travel between Greene County (CR 150N) and Monroe County (Carter Road) at the county line. The development of the alignment would impact several properties within the Whippoorwill Subdivision, would have a less desirable skewed crossing of Indian Creek, would have a substantial fill into the Indian Creek floodplain for the Carmichael Road grade separation using the low-cost design criteria, and would displace the Indian Creek Township fire station using the initial design criteria. The proposed Greene/Monroe County Line interchange associated with this alternative would also require a slightly longer connection (about 700 feet) to SR 45 and the loop ramps east of the mainline would have higher impacts on a tributary to Indian Creek.

Alternative 4F-5

Advantages:

- Right-of-way acquisition would be the least of all four Subsection 4F alternatives.
- Stream impacts (initial design criteria and low-cost design criteria) would be the least of all four Subsection 4F alternatives. Alternative 4F-5 would also have the overall lowest intermittent stream impacts of the four Subsection 4F alternatives.
- Noise impacts would be the least of all four Subsection 4F alternatives.
- Floodplain impacts would be the least of all four Subsection 4F alternatives.
- Total cost would be less than Alternatives 4F-1 and 4F-4 using the initial design criteria, but more than Alternative 4F-3.
- Forest, core forest, and displacement impacts would be less than Alternatives 4F-1 and 4F-4, but more than Alternative 4F-3
- Managed land impacts would be less than Alternatives 4F-3 and 4F-4 using the initial design criteria. Under the low-cost criteria, managed land impacts would be less than Alternative 4F-1 and 4F-3.
- Farmland impacts would be less than Alternatives 4F-3 and 4F-5 using the initial design criteria, but more than Alternative 4F-1.
- Stream relocations using the low-cost design criteria would be the least of all four Subsection 4F alternatives. Stream relocation impacts using the initial design criteria would be more that Alternative 4F-1 but would be less than Alternatives 4F-3 and 4F-4.

Alternative 4F-5 avoids properties in Whippoorwill Subdivision and the Indian Creek Township fire station. Carter Road would remain open at Greene/Monroe County line. Like Alternative 4F-3, this alternative has a more desirable combined crossing of Indian Creek (south crossing) and Carmichael Road.

Disadvantages:

- Karst feature impacts would be more than Alternatives 4F-3 and 4F-4. Alternatives 4F-1 and 4F-5 impact the same (and most) karst features using the low-cost design criteria.
- Wetland impacts would be more than Alternatives 4F-3 and 4F-4, however, wetland impacts would be less than Alternative 4F-1.
- Farmland impacts would be more than Alternatives 4F-1 and 4F-4 using the low-cost design criteria, however, farmland impacts would be less than Alternative 4F-3.

Alternative 4F-5 would close CR 150N at the highway right-of-way. The road closing would isolate several Greene County properties located east of the highway from other contiguous land within Greene County. Additional travel distances to access these properties (via Carter Road) would be incurred by Greene County emergency service vehicles and school busses, including

the need to travel into Monroe County. The alignment would also encroach about 10 feet into the 100-foot buffer around Sparks Cemetery using the initial design criteria.[7]

Table 6-7: Overview of Key Impacts for Subsection 4F

	Alternatives									
	4F-1		4F-3		4F-4		4F-5		Refined 4F-3	
	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**
Total Cost ($M)***	123.71	182.83	123.62	168.92	124.84	188.91	125.43	181.45	124.93	169.55
Right-of-Way (Ac)	402.20	482.42	405.96	492.91	406.16	506.44	398.47	477.76	406.11	491.91
Forest (Ac)	284.76	338.35	235.10	282.03	263.03	324.75	252.87	298.27	235.05	283.22
Core Forest (Ac)	275.70	292.88	172.32	185.66	223.21	243.05	219.48	237.01	171.19	185.52
Wetland Impacts (Ac)										
Emergent Wetland	1.90	2.41	0.00	0.01	0.00	0.01	1.89	2.36	0.00	0.00
Forested Wetland	0.45	0.54	0.15	0.15	0.27	0.38	0.33	0.33	0.15	0.15
Scrub/Shrub Wetland	0.04	0.07	0.00	0.00	0.00	0.07	0.04	0.07	0.00	0.00
Total Wetland Impacts	2.39	3.02	0.15	0.16	0.27	0.46	2.26	2.76	0.15	0.15
Stream Impacts (LF)										
Ephemeral	22,243	24,453	21,161	24,508	22,274	26,006	21,326	24,091	21,147	24,395
Intermittent	3,081	3,529	6,475	7,748	7,846	8,666	1,852	2,404	6,484	7,625
Perennial	1,839	2,543	1,796	2,882	1,876	2,736	1,891	2,534	1,796	2,676
Total Stream Impacts****	27,163	30,525	29,432	35,138	31,996	37,408	25,069	29,029	29,427	34,696
Karst Features (#)	10	13	6	7	6	7	10	11	6	7
Displacements (#)										
Residential	31	31	23	23	28	29	26	26	23	23
Institutional	0	0	0	0	0	1	0	0	0	0
Business	3	3	3	3	3	3	3	3	3	3
Total Displacements	34	34	26	26	31	33	29	29	26	26
Noise Impacts (#)*****	28	29	31	32	34	36	17	19	20	21
Managed Land (Ac)	57.52	68.03	59.33	72.97	56.87	71.81	57.45	69.66	58.89	72.98
Farmland (Ac)	60.67	75.66	101.34	131.18	80.27	107.56	81.70	106.38	101.43	129.63
Stream Relocations (LF)	7,105	7,640	13,768	15,477	14,721	15,337	6,318	7,956	13,801	15,329
Floodplain (Ac)	20.49	27.22	23.09	32.75	25.73	33.43	19.06	24.61	23.09	30.65

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4F-3 was the recommended Preferred Alternative for Subsection 4F in the DEIS because the alternative had the following primary advantages:

- Total cost would be the least of all four Subsection 4F alternatives.
- Forest, core forest, wetland, and displacement impacts would be the least of all four Subsection 4F alternatives. Alternative 4F-3 would also have the lowest overall forested wetland impact and fewest overall residential displacements of all four Subsection 4F alternatives.

[7] In accordance with IC 14-21-1-26.5, proposed ground disturbance within 100 feet of a burial ground requires that a cemetery development plan be prepared and that the IDNR approve the development plan prior to such disturbance.

- Karst feature impacts (initial design criteria and low-cost design criteria) would be less than Alternatives 4F-1 and 4F-5. Alternatives 4F-3 and 4F-4 have the same impacts to karst features.
- Maintains direct access to all Greene County properties situated along CR 150N west of the county line including access by Greene County emergency service vehicles and school busses.
- Avoids properties in Whippoorwill Subdivision, Sparks Cemetery, and the Indian Creek Township fire station.

Refined Alternative 4F-3

Based on additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4F-3 has been further developed. With these refinements, Alternative 4F-3 is referred to in the FEIS as Refined Alternative 4F-3 (**Figure 6-4a,** map pp. 9 to 14, p. 6-162). Refined Alternative 4F-3 is the Subsection 4F alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4F-3 are presented in **Table 6-7**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from the Subsection 4E/Subsection 4F breakline to approximately 0.34 miles north of Hobbieville Road. This refinement was made to reduce forest impacts near Indiana bat hibernaculum. It was not made for Refined Alternative 4F-3 under the low-cost design criteria.
- Refinement of the vertical road profile under the initial design criteria from 0.52 miles north of Carter Road to the Subsection 4F/Subsection 4G breakline. This refinement was made to reduce forest impacts near Indiana bat hibernaculum. It was not made for Refined Alternative 4F-3 under the low-cost design criteria.
- Minor design corrections were made for compliance with IDM (initial design criteria and low-cost design criteria). These corrections were not included in Alternative 4F-3.

Refined Alternative 4F-3 is the recommended preferred alternative for Subsection 4F in the FEIS. Refined Alternative 4F-3 has the following advantages**:**

- Refinement of the vertical road profile under the initial design criteria would reduce right-of-way acquisition, and core forest, wetland, stream, noise, farmland, stream relocation, and floodplain impacts as compared to Alternative 4F-3.
- Forest, core forest, wetland, karst feature, displacement, and noise impacts would be less than Alternative 4F-1 and total cost would be less than Alternative 4F-1 under the initial design criteria.
- Forest, core forest, noise, and managed land impacts would be less than Alternative 4F-3 under the low-cost design criteria.

- Right-of-way acquisition and forest, core forest, wetland, stream, displacement, noise, stream relocation, and floodplain impacts would be less than Alternative 4F-4 and total cost would be less than Alternative 4F-4 under the initial design criteria.
- Total cost and forest, core forest, wetland, karst feature, and displacement impacts would be less than Alternative 4F-5.

6.2.7 Subsection 4G

In Subsection 4G, **Alternative 4G-2** is the only alternative that was carried forward for detailed study. Alternative 4G-1 was eliminated from further consideration. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4G.

Alternative 4G-2 proceeds east/northeast from the Subsection 4F-4G break line across Burch Road staying on the south side of the corridor to minimize forest impacts. A realignment of Burch Road would be needed to eliminate a sharp curve and create a more perpendicular crossing. Alternative 4G-2 then turns east across Evans Lane and Harmony Road. At Harmony Road, Alternative 4G-2 stays near a low point near the center of the corridor where the alignment crosses the highest ridge within the Section 4 corridor. The alignment then curves slightly north across Rockport Road. The slight alignment shift to the north minimizes residential displacements along West Evans Lane. Alternative 4G-2 ends about 400 feet west of Lodge Road. The alternative is 22,200 feet (4.20 miles) in length.

The Subsection 4G corridor is dominated by forest with some pasture, rural residences, and three commercial (business) properties near Rockport Road. The alternative alignment would have grade separations over Burch Road, Evans Lane, and Harmony Road. Rockport Road would have a grade separation over the I-69 mainline alignment.

Alternative 4G-2 is the Subsection 4G component of Alternatives 1, 2, 3, and 4. **Table 6-8** summarizes the impacts associated with Alternative 4G-2. The alternative is shown on map pp. 14 to 16 of **Figure 6-1** (p. 6-86) through **Figure 6-4** (p. 6-143).

Table 6-8: Overview of Key Impacts for Subsection 4G

	Alternatives			
	4G-2		Refined Preferred 4G-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	56.83	100.69	58.02	69.86
Right-of-Way (Ac)	192.44	259.05	191.90	248.20
Forest (Ac)	141.76	189.10	141.80	184.41
Core Forest (Ac)	155.48	179.34	155.49	173.87
Wetland Impacts (Ac)				
Emergent Wetland	0.00	0.00	0.00	0.00
Forested Wetland	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.00
Stream Impacts (LF)				
Ephemeral	11,581	14,472	11,581	13,866

Table 6-8: Overview of Key Impacts for Subsection 4G

	Alternatives			
	4G-2		Refined Preferred 4G-2	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Intermittent	4,269	5,891	4,271	5,630
Perennial	0	0	0	0
Total Stream Impacts****	15,850	20,363	15,852	19,496
Karst Features (#)	16	19	16	20
Displacements (#)				
Residential	17	21	26	29
Institutional	0	0	0	0
Business	1	2	1	1
Total Displacements	18	23	27	30
Noise Impacts (#)*****	36	25	24	23
Managed Land (Ac)	0.00	0.00	0.00	0.00
Farmland (Ac)	22.78	31.62	22.77	29.73
Stream Relocations (LF)	4,624	6,654	4,626	6,631
Floodplain (Ac)	0.00	0.00	0.00	0.00

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4G-2 was the recommended Preferred Alternative for Subsection 4G in the DEIS because the alternative had the following features:

- Avoids a cave in which state-endangered cave biota have been found.
- Forest and stream impacts would be less than estimated during the preliminary alternatives screening for Alternative 4G-2 (See Chapter 3, *Alternatives*).
- Implementation of the low-cost design criteria would reduce total cost, right of way impacts, and impacts to forests, core forests, streams, karst features, displacements, farmland and stream relocations.

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4G-2 has been further developed. With these refinements, Alternative 4G-2 is referred to in the FEIS as Refined Alternative 4G-2 (**Figure 6-4a,** map pp. 9 to 14, p. 6-162). Refined Alternative 4G-2 is the Subsection 4G alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4G-2 are presented in **Table 6-8**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Refinement of the vertical road profile under the initial design criteria from the Subsection 4F/Subsection 4G breakline to the Subsection 4G/Subsection 4H breakline. This refinement was made to reduce forest impacts near Indiana bat hibernaculum. It was not made for Refined Alternative 4G-2 under the low-cost design criteria.
- A grade separation at Evans Lane was proposed in the DEIS. Based upon comments received from local governments, public organizations, and public individuals and additional review of environmental impact, traffic, engineering and cost factors, it was decided that Evans Lane would be closed at I-69.
- Minor design corrections were made for compliance with IDM using the low-cost design criteria. These corrections were not included in Alternative 4G-2.

Refined Alternative 4G-2 is the recommended preferred alternative for Subsection 4G in the FEIS. Refined Alternative 4G-2 has the following advantages**:**

- Refinement of the vertical road profile under the initial design criteria would reduce total cost, right-of-way acquisition, and forest, stream, noise, farmland, and stream relocation impacts as compared to Alternative 4G-2.
- Right-of-way acquisition, noise impacts, and farmland impacts would be less than Alternative 4G-2 using the low-cost design criteria.

6.2.8 Subsection 4H

In Subsection 4H, the three alignment alternatives carried forward for detailed study in the DEIS were **Alternative 4H-1**, **Alternative 4H-2**, and **Alternative 4H-3**. No other alternatives were considered for Subsection 4H. Chapter 3, *Alternatives*, provides a discussion of the development, evaluation, and screening of the preliminary alignment alternatives for Subsection 4H.

The Subsection 4H corridor continues northeast from the Subsection 4G-4H break line across Lodge Road and then turns north/northeast to SR 37. An interchange is proposed at SR 37. After crossing Lodge Road, the alternative alignments traverse a ridge located south of Happy Creek and negotiate an elevation difference of about 200 feet between the ridge top and creek valley. After crossing May Creek, the terrain generally rises and the alignments curve north to existing SR 37. The merge with SR 37 is located just north of an existing rock cut along SR 37. Land use is a mix of forest, pasture, two small abandoned limestone quarries, and developed land uses consisting of five residential subdivisions, scattered rural residences, and one industrial business site (3D Stone, Inc.).

The three Subsection 4H alignment alternatives are components of the alternatives under the build condition as follows:

- Alternative 4H-1: Alternative 1
- Alternative 4H-2: Alternative 2 and Alternative 4
- Alternative 4F-3: Alternative 3

Alternative 4H-1 (map pp. 16 to 19 of **Figure 6-1**, p. 6-86) and Alternative 4H-2 diverge from the alignment for Alternative 4H-3 about 1,000 feet northeast of Lodge Road. The common alignment for Alternative 4H-1 and Alternative 4H-2 follow adjacent to the west side of the Subsection 4H corridor. Alternative 4H-1 diverges from Alternative 4H-2 just south of Happy Creek and continues on a north/northeast bearing along the west edge of the corridor across Happy Creek and Tramway Road. It then shifts toward the center of the corridor where it crosses May Creek and Bolin Lane. North of Bolin Lane the alignment turns north to SR 37. Alternative 4H-1 would sever the connection of Crop Circle Drive (Farmers Field Acres Subdivision) to Bolin Lane. Alternative 4H-1 has a total length of 18,946 feet (3.59 miles).

Alternative 4H-2 (map pp. 16 to 19 of **Figure 6-2**, p. 6-105 and **Figure 6-4**, p. 6-143) follows the same alignment as Alternative 4H-1 to a point just south of Happy Creek. At that point, the alignment proceeds northeast across Happy Creek and Tramway Road to the east edge of the Section 4H corridor. About 1,300 feet north of Tramway Road the alignment merges with Alternative 4H-3. The common alignment for Alternative 4H-2 and Alternative 4H-3 continue along the east side of the corridor across Bolin Lane and then turn north to SR 37. Alternative 4H-2 has a total length of 19,500 feet (3.69 miles).

Alternative 4H-3 (map pp. 16 to 19 of **Figure 6-3**, p. 6-124) diverges from the common alignment for Alternative 4H-1 and Alternative 4H-2 about 1,000 feet northeast of Lodge Road and continues along the east edge of the Subsection 4H corridor across Happy Creek and Tramway Road. The alignment then merges with the alignment of Alternative 4H-2 and includes Access Road 7 in the Rolling Glen Estates subdivision, as described above. Alternative 4H-3 has a total length of 19,970 feet (3.78 miles).

Alternative 4H-1, **Alternative 4H-2**, and **Alternative 4H-3** share the following features:

- Grade separation over Lodge Road.
- Grade separation over Tramway Road.
- Grade separation over Bolin Lane.
- Bridge over Happy Creek.
- Bridge over May Creek.
- That Road would be closed on both sides of the mainline alignment. A frontage road would connect That Road on the east side of the mainline alignment with Rockport Road. The frontage road would be developed by Section 5.
- No wetland impacts except for 0.03 acres along Alternatives 4H-2 and 4H-3 using the initial design criteria.
- Total displacements only differ by 2 using the initial design criteria and up to 3 using the low-cost design criteria.

The alternatives differ in the following ways: total cost, right-of-way, and impacts upon forest, core forest, streams, karst features, noise, managed land, stream relocations, and floodplains. A comparison of the advantages and disadvantages of each alternative is presented below. **Table 6-9** summarizes the impacts associated with the three alternatives.

Alternatives 4H-1

Advantages:

- North Glenview Drive (Rolling Glen Estates Subdivision) would remain open south of Bolin Lane.
- Total cost would be less than Alternative 4H-3.
- No floodplain impacts would occur along Alternative 4H-1.
- Overall perennial stream impacts would be less than Alternatives 4H-2.

Alternative 4H-1 avoids the abandoned quarries south of Happy Creek and north of Tramway Road. The alignment also avoids properties in Rolling Glen Estates Subdivision and 3D Stone, Inc., along Victor Pike.

Disadvantages:

- Total cost would be more than Alternative 4H-2.
- Crop Circle Drive (Farmers Field Acres Subdivision) would be closed north of Bolin Lane.
- Right-of-way impacts would be more than Alternatives 4H-2 and 4H-3.
- Forest impacts would be more than Alternatives 4H-2 and 4H-3.
- Stream impacts would be more than Alternatives 4H-2 and 4H-3. Also, ephemeral stream impacts are more than Alternatives 4H-2 and 4H-3.
- Karst feature impacts would be more than Alternatives 4H-2 and 4H-3.
- Noise impacts would be more than Alternatives 4H-2 and 4H-3 using the initial design criteria.
- Managed land impacts would be more than Alternatives 4H-2 and 4H-3.
- Stream relocations would be more than Alternatives 4H-2 and 4H-3.

Alternative 4H-1 would impact several undeveloped properties within Farmers Field Acres Subdivision. Although the centerline crossing of Happy Creek is perpendicular to the stream, some stream relocation may be required to accommodate the fill slopes of the new roadway. Alternative 4H-1 would overpass Tramway Road with less than the minimum vertical clearance so additional reconstruction would be needed to lower this local road.

Alternative 4H-2

Advantages:

- Total cost is less than Alternatives 4H-1 and 4H-3.
- Crop Circle Drive (Farmers Field Acres Subdivision) would remain open north of Bolin Lane.
- Forest impacts would be less than Alternatives 4H-1 and 4H-3.
- Core forest impacts would be less than Alternatives 4H-1 and 4H-3.

- Karst feature impacts would be less than Alternative 4H-1. Alternative 4H-2 would have more impacts to karst features than Alternative 4H-3 using the initial design criteria, however, Alternatives 4H-2 and 4H-3 have the same (and fewest) number of karst features impacts using the low-cost design criteria.
- Stream relocations would be less than Alternatives 4H-1 and 4H-3.
- Managed land impacts would be less than Alternatives 4H-1. This is an additional advantage that was not presented in the DEIS. This advantage is the result of the removal of one property from the Classified Forests and Wildlands program (see Sections 5.22.3 and 5.22.5).

Alternative 4H-2 avoids the abandoned quarry south of Happy Creek, properties within Farmers Field Acres Subdivision, and 3D Stone, Inc., along Victor Pike. Although this alignment would have a more skewed crossing of Tramway Road, it minimizes grade changes and reconstruction along this local road.

Disadvantages:

- Without the addition of an access road, Rolling Glen Estates subdivision would not be connected to Bolin Lane.
- Farmland impacts would be more than Alternatives 4H-1 and 4H-3.
- More perennial stream impacts than Alternatives 4H-1 and 4H-3.

Alternative 4H-2 would impact the abandoned quarry north of Tramway Road. The alignment also would impact several undeveloped lots in the Rolling Glen Estates Subdivision. Alternative 4H-2 would cross Happy Creek at more of a skew than the other alternatives and would require a driveway relocation on Tramway Road to maintain access to a residence on the north side.

Alternative 4H-3

Advantages:

- Crop Circle Drive (Farmers Field Acres Subdivision) would remain open north of Bolin Lane.
- Right-of-way acquisition would be less than Alternatives 4H-1 and 4H-2 using the initial design criteria.
- Stream impacts would be less than Alternatives 4H-1 and 4H-2. Also, ephemeral stream and perennial stream impacts are less than Alternatives 4H-1 and 4H-2.
- Karst feature impacts would be less than Alternative 4H-1 and less than Alternative 4H-2 using the initial design criteria. Impacts to karst features could be less than Alternative 4H-1 using the low-cost design criteria. Alternatives 4H-2 and 4H-3 have the same (and fewest) number of karst features impacts using the low-cost design criteria.
- Noise impacts would be less than Alternatives 4H-1 and 4H-2.
- Managed land impacts would be less than Alternatives 4H-1. This advantage was changed from the advantage presented in the DEIS due to the removal of one property from the Classified Forests and Wildlands program (see Sections 5.22.3 and 5.22.5).

- Farmland impacts would be less than Alternatives 4H-1 and 4H-2.

Alternative 4H-3 avoids the abandoned quarry north of Tramway Road and properties within Farmers Field Acres Subdivision. This alternative has more desirable, perpendicular crossings at Happy Creek and Tramway Road.

Disadvantages:

- Without the addition of an access road, Rolling Glen Estates subdivision would not be connected to Bolin Lane.
- Total cost would be more than Alternatives 4H-1 and 4H-2.
- Forest impacts would be more than Alternative 4H-2.
- Displaces one industrial business (3D Stone, Inc.).

Alternative 4H-3 would impact the abandoned quarry south of Happy Creek and several undeveloped lots in the Rolling Glen Estates Subdivision. It would also displace 3D Stone, Inc. located along Victor Pike. Although the alignment would cross perpendicular to Tramway Road, additional cut would be needed to lower the road below the mainline elevation.

Table 6-9: Overview of Key Impacts for Subsection 4H

	Alternatives							
	4H-1		4H-2		4H-3		Refined Preferred 4H-2	
	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**
Total Cost ($M)***	75.35	111.01	74.63	108.28	79.57	112.00	73.94	108.42
Right-of-Way (Ac)	224.84	268.18	217.18	267.16	218.25	263.88	218.20	267.29
Forest (Ac)	72.71	89.55	61.51	76.73	69.79	85.63	61.43	76.74
Core Forest (Ac)	25.19	27.39	22.03	23.74	32.59	35.09	22.03	23.74
Wetland Impacts (Ac)								
Emergent Wetland	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Forested Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.03
Stream Impacts (LF)								
Ephemeral	8,030	9,616	5,910	6,828	5,497	6,136	5,882	6,829
Intermittent	727	1,045	994	1,366	994	1,390	994	1,366
Perennial	1,088	1,890	1,621	2,211	896	1,439	1,621	2,211
Total Stream Impacts****	9,845	12,551	8,525	10,405	7,387	8,965	8,497	10,406
Karst Features (#)	71	77	57	70	57	66	57	70
Displacements (#)								
Residential	12	12	9	10	9	10	9	10
Institutional	0	0	0	0	0	0	0	0
Business	0	0	0	0	1	1	0	0
Total Displacements	12	12	9	10	10	11	9	10
Noise Impacts (#)*****	55	81	63	72	53	70	28	27
Managed Land (Ac)	25.27	27.24	19.71	21.40	19.83	21.38	19.72	21.40
Farmland (Ac)	89.02	111.06	94.99	123.93	85.90	107.98	95.04	123.96
Stream Relocations (LF)	3,239	3,940	564	1,922	949	2,281	564	1,922
Floodplain (Ac)	0.00	0.00	2.67	4.08	2.22	4.26	2.67	4.08

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs

Table 6-9: Overview of Key Impacts for Subsection 4H

	Alternatives							
	4H-1		4H-2		4H-3		Refined Preferred 4H-2	
	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**	Low Cost*	Initial**

**** Impacted streams are shown in **Table 6-9a** (p. 6-44)
***** Noise impacts for the refined alternative were determined per the *Indiana Department of Transportation Traffic Noise Policy, 2011*
$M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Alternative 4H-1 would have more right-of-way acquisition and would have more forest, stream, karst feature, noise, and managed land impacts as compared to Alternatives 4H-2 and 4H-3. As such, the selection of a Preferred Alternative was made by comparing Alternatives 4H-2 and 4H-3.

Alternative 4H-2 was the recommended Preferred Alternative for Subsection 4H in the DEIS because the alternative had the following primary advantages as compared to Alternative 4H-3:

- Total cost would be less than Alternative 4H-3.
- Forest impacts would be less than Alternative 4H-3.
- Core forest impacts would be less than Alternative 4H-3.
- Alternative 4H-2 would have more impacts to karst features than Alternative 4H-3 using the initial design criteria, however, Alternatives 4H-2 and 4H-3 have the same (and fewest) number of karst features impacts using the low-cost design criteria.
- Total displacements would be less than Alternative 4H-3 and Alternative 4H-2 would not displace 3D Stone, Inc. located along Victor Pike.
- Stream relocation impacts would be less than Alternative 4H-3.

Refined Alternative 4H-2

Based on comments received on the DEIS from the public, resource agencies, CAC members and local public officials, additional engineering and environmental analysis, and decisions made by INDOT, Alternative 4H-2 has been further developed. With these refinements, Alternative 4H-2 is referred to in the FEIS as Refined Alternative 4H-2 (**Figure 6-4a,** map pp. 17 to 19, p. 6-161). Refined Alternative 4H-2 is the Subsection 4H alternative included in Refined Preferred Alternative 2.

Cost and impacts of Refined Alternative 4H-2 are presented in **Table 6-9**. Chapter 5, *Environmental Consequences*, provides the impacts reflecting the grade separation, access road, and road closure recommendations as shown in Section 6.4.1.

The following describes refinements and how those refinements changed the costs and impacts reported in the DEIS:

- Access Road 7 was added to Refined Alternative 4H-2. This access road relocates and extends Glenview Drive to Bolin Lane and maintains a second access into Rolling Glen

Estates subdivision. Access Road 7 was not included in DEIS Alternatives 4H-1, 4H-2 or 4H-3.

- Minor design corrections were made for compliance with IDM using the low-cost design criteria. These corrections were not included in DEIS Alternatives 4H-1, 4H-2 or 4H-3.

Refined Alternative 4H-2 is the recommended preferred alternative for Subsection 4H in the FEIS. Refined Alternative 4H-2 has the following advantages**:**

- Total cost and forest impacts are less than Alternatives 4H-1 and 4H-3 and less than Alternative 4H-2 using the low-cost design criteria.
- Noise impacts are less than Alternatives 4H-1, 4H-2, and 4H-3.
- Right-of-way acquisition and core forest, stream, karst feature, managed land, and stream relocation impacts are less than Alternative 4H-1 and noise impacts are less than Alternative 4H-1 using the initial design criteria.
- Forest impacts are less than Alternative 4H-2 using the low-cost criteria.
- Core forest and stream relocation impacts are less than Alternative 4H-3 and managed land impacts are less than Alternative 4H-3 using the initial design criteria.

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Table 6-9a: Stream Impacts by Subsection Alternatives

Subsection	Alternative	Design Criteria	Impacted Ephemeral Streams (By Stream Inventory Number)	Impacted Intermittent Streams (By Stream Inventory Number)	Impacted Perennial Streams (By Stream Inventory Number)
4A	4A-2	Low-Cost	s4-001; s4-002; s4-005; s4-006; s4-010; s4-013; s4-014; s4-015; s4-020	s4-009	
		Initial	s4-001; s4-002; s4-005; s4-006; s4-007; s4-008; s4-010; s4-013; s4-014; s4-015; s4-020	s4-009	
	Hybrid 4A-1/4A-2	Low-Cost	s4-003; s4-004; s4-010; s4-013; s4-014; s4-015; s4-016; s4-020	s4-009	
		Initial	s4-003; s4-004; s4-010; s4-013; s4-014; s4-015; s4-016; s4-020	s4-009	
	Refined Preferred 4A-2	Low-Cost	s4-001; s4-002; s4-005; s4-006; s4-010; s4-013; s4-014; s4-015; s4-020	s4-009	
		Initial	s4-001; s4-002; s4-005; s4-006; s4-007; s4-008; s4-010; s4-013; s4-014; s4-015; s4-020	s4-009	
4B	4B-1	Low-Cost	s4-020; s4-032; s4-033; s4-034	s4-023	
		Initial	s4-020; s4-032; s4-033; s4-034	s4-023	
	Refined Preferred 4B-1	Low-Cost	s4-020; s4-032; s4-033; s4-034	s4-023	
		Initial	s4-020; s4-032; s4-033; s4-034	s4-023	
4C	4C-1	Low-Cost	s4-036; s4-037; s4-049pt2; s4-055; s4-056; s4-059; s4-071	s4-031; s4-050; s4-058; s4-069	s4-076
		Initial	s4-036; s4-037; s4-040; s4-049pt2; s4-055; s4-056; s4-059; s4-071; s4-077	s4-031; s4-050; s4-058; s4-069; s4-080	s4-076
	4C-2	Low-Cost	s4-036; s4-037; s4-040; s4-049pt1; s4-051; s4-053; s4-054; s4-061; s4-062; s4-063; s4-065	s4-031; s4-064	s4-076
		Initial	s4-036; s4-037; s4-040; s4-041; s4-049pt1; s4-051; s4-053; s4-054; s4-055; s4-060; s4-061; s4-062; s4-063; s4-065; s4-077	s4-031; s4-064; s4-080	s4-076
	Refined Preferred 4C-2	Low-Cost	s4-036; s4-037; s4-040; s4-049pt1; s4-051; s4-053; s4-054; s4-061; s4-062; s4-063; s4-065	s4-031; s4-064	s4-076
		Initial	s4-036; s4-037; s4-040; s4-041; s4-049pt1; s4-051; s4-053; s4-054; s4-055; s4-060; s4-061; s4-062; s4-063; s4-065; s4-077	s4-031; s4-064; s4-080	s4-076
4D	4D-1	Low-Cost	s4-092; s4-093; s4-095; s4-096; s4-099; s4-100; s4-102; s4-393; s4-395	s4-082; s4-088; s4-090; s4-394	s4-101; s4-108
		Initial	s4-092; s4-093; s4-095; s4-096; s4-099; s4-100; s4-102; s4-103; s4-109; s4-393; s4-395	s4-082; s4-088; s4-090; s4-394	s4-101; s4-108
	Refined Preferred 4D-1	Low-Cost	s4-092; s4-093; s4-095; s4-096; s4-099; s4-100; s4-102; s4-393; s4-395	s4-082; s4-088; s4-090; s4-394	s4-101; s4-108
		Initial	s4-092; s4-093; s4-095; s4-096; s4-099; s4-100; s4-102; s4-103; s4-109; s4-393; s4-395	s4-082; s4-088; s4-090; s4-394	s4-101; s4-108
4E	Hybrid 4E-1/4E-2	Low-Cost	s4-111; s4-112; s4-114; s4-115; s4-116; s4-117; s4-118; s4-121; s4-122; s4-125; s4-127; s4-128; s4-129; s4-130; s4-131; s4-134; s4-137; s4-138; s4-139; s4-140; s4-141; s4-142; s4-143; s4-144; s4-147; s4-150; s4-151; s4-154; s4-155; s4-159; s4-160; s4-164; s4-165pt1; s4-165pt2; s4-166; s4-171; s4-172; s4-173; s4-397; s4-398; s4-399; s4-400	s4-113; s4-126; s4-133; s4-162; s4-401	s4-156
		Initial	s4-111; s4-112; s4-114; s4-115; s4-116; s4-117; s4-118; s4-121; s4-122; s4-125; s4-127; s4-128; s4-129; s4-130; s4-131; s4-134; s4-137; s4-138; s4-139; s4-140; s4-141; s4-142; s4-143; s4-144; s4-147; s4-150; s4-151; s4-154; s4-155; s4-159; s4-160; s4-161; s4-164; s4-165pt1; s4-165pt2; s4-166; s4-171; s4-172; s4-173; s4-396; s4-397; s4-398; s4-399; s4-400	s4-113; s4-126; s4-133; s4-162; s4-401	s4-156
	Refined Preferred Hybrid 4E-1/4E-2	Low-Cost	s4-111; s4-112; s4-114; s4-115; s4-116; s4-117; s4-118; s4-121; s4-122; s4-125; s4-127; s4-128; s4-129; s4-130; s4-131; s4-134; s4-137; s4-138; s4-139; s4-140; s4-141; s4-142; s4-143; s4-144; s4-147; s4-150; s4-151; s4-154; s4-155; s4-159; s4-160; s4-164; s4-165pt1; s4-165pt2; s4-166; s4-171; s4-172; s4-173; s4-397; s4-398; s4-399; s4-400	s4-113; s4-126; s4-133; s4-162; s4-401	s4-156
		Initial	s4-111; s4-112; s4-114; s4-115; s4-116; s4-117; s4-118; s4-121; s4-122; s4-125; s4-127; s4-128; s4-129; s4-130; s4-131; s4-134; s4-137; s4-138; s4-139; s4-140; s4-141; s4-142; s4-143; s4-144; s4-147; s4-150; s4-151; s4-154; s4-155; s4-159; s4-160; s4-161; s4-164; s4-165pt1; s4-165pt2; s4-166; s4-171; s4-172; s4-173; s4-396; s4-397; s4-398; s4-399; s4-400	s4-113; s4-126; s4-133; s4-162; s4-401	s4-156
4F	4F-1	Low-Cost	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-190pt1; s4-195; s4-197; s4-202; s4-203; s4-204; s4-205; s4-210; s4-211; s4-212pt2; s4-213; s4-217; s4-218; s4-219; s4-220; s4-228; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-243; s4-246; s4-247; s4-248; s4-249; s4-250; s4-251; s4-252; s4-258; s4-260; s4-261; s4-264; s4-265; s4-266; s4-267; s4-279; s4-280; s4-284; s4-287; s4-288; s4-296; s4-297; s4-389; s4-391	s4-186pt2; s4-208pt1; s4-283pt2; s4-403	s4-189pt2; s4-245; s4-282pt1; s4-292
		Initial	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-190pt1; s4-195; s4-197; s4-202; s4-203; s4-204; s4-205; s4-210; s4-211; s4-212pt2; s4-213; s4-217; s4-218; s4-219; s4-220; s4-228; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-243; s4-246; s4-247; s4-248; s4-249; s4-250; s4-251; s4-252; s4-258; s4-260; s4-261; s4-264; s4-265; s4-266; s4-267; s4-279; s4-280; s4-284; s4-287; s4-288; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt2; s4-208pt1; s4-283pt2; s4-403	s4-189pt2; s4-245; s4-282pt1; s4-292
	4F-3	Low-Cost	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-217; s4-219; s4-225; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt2; s4-292
		Initial	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-217; s4-219; s4-225; s4-226; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt2; s4-292

Table 6-9a: Stream Impacts by Subsection Alternatives

Subsection	Alternative	Design Criteria	Impacted Ephemeral Streams (By Stream Inventory Number)	Impacted Intermittent Streams (By Stream Inventory Number)	Impacted Perennial Streams (By Stream Inventory Number)
	4F-4	Low-Cost	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-190pt1; s4-195; s4-197; s4-202; s4-203; s4-204; s4-205; s4-210; s4-211; s4-212pt2; s4-213; s4-217; s4-218; s4-219; s4-220; s4-225; s4-226; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt2; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-403	s4-189pt2; s4-245; s4-282pt2; s4-292
		Initial	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-190pt1; s4-195; s4-197; s4-202; s4-203; s4-204; s4-205; s4-210; s4-211; s4-212pt2; s4-213; s4-217; s4-218; s4-219; s4-220; s4-225; s4-226; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt2; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-403	s4-189pt2; s4-245; s4-282pt2; s4-292
	4F-5	Low-Cost	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-212pt1; s4-217; s4-219; s4-228; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-243; s4-244; s4-246; s4-247; s4-248; s4-249; s4-250; s4-251; s4-252; s4-258; s4-260; s4-261; s4-264; s4-265; s4-266; s4-267; s4-279; s4-280; s4-284; s4-287; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-283pt2; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt1; s4-292
		Initial	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-212pt1; s4-217; s4-219; s4-228; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-243; s4-246; s4-247; s4-248; s4-249; s4-250; s4-251; s4-252; s4-258; s4-260; s4-261; s4-264; s4-265; s4-266; s4-267; s4-279; s4-280; s4-284; s4-287; s4-288; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-283pt2; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt1; s4-292
	Refined Preferred 4F-3	Low-Cost	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-217; s4-219; s4-225; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt2; s4-292
		Initial	s4-174; s4-175; s4-176; s4-177; s4-178; s4-179; s4-180; s4-181; s4-182; s4-183; s4-188; s4-190pt2; s4-192; s4-193; s4-198; s4-199; s4-200; s4-201; s4-217; s4-219; s4-225; s4-226; s4-228; s4-229; s4-230; s4-235; s4-236; s4-237; s4-238; s4-239; s4-240; s4-241; s4-242; s4-246; s4-248; s4-249; s4-250; s4-251; s4-252; s4-268; s4-270; s4-273; s4-274; s4-275pt1; s4-276; s4-277; s4-278; s4-287; s4-290; s4-291; s4-296; s4-297; s4-389; s4-391	s4-186pt1; s4-208pt1; s4-208pt2; s4-208pt3; s4-275pt2; s4-283pt1; s4-285; s4-402; s4-403	s4-189pt1; s4-245; s4-282pt2; s4-292
4G	4G-2	Low-Cost	s4-296; s4-298; s4-299; s4-300; s4-301; s4-302; s4-303; s4-304; s4-305; s4-306; s4-307; s4-310; s4-312; s4-313; s4-314; s4-317; s4-318; s4-319; s4-320; s4-321; s4-323; s4-324; s4-325; s4-327; s4-328; s4-330; s4-331; s4-332; s4-334; s4-335; s4-338; s4-349; s4-350; s4-351; s4-352; s4-354; s4-405; s4-408	s4-316; s4-329; s4-342; s4-343; s4-348; s4-406; s4-407	
		Initial	s4-296; s4-298; s4-299; s4-300; s4-301; s4-302; s4-303; s4-304; s4-305; s4-306; s4-307; s4-310; s4-312; s4-313; s4-314; s4-317; s4-318; s4-319; s4-320; s4-321; s4-322; s4-323; s4-324; s4-325; s4-327; s4-328; s4-330; s4-331; s4-332; s4-334; s4-335; s4-338; s4-340; s4-346; s4-349; s4-350; s4-351; s4-352; s4-354; s4-404; s4-405; s4-408	s4-316; s4-329; s4-342; s4-343; s4-348; s4-406; s4-407	
	Refined Preferred 4G-2	Low-Cost	s4-296; s4-298; s4-299; s4-300; s4-301; s4-302; s4-303; s4-304; s4-305; s4-306; s4-307; s4-310; s4-312; s4-313; s4-314; s4-317; s4-318; s4-319; s4-320; s4-321; s4-323; s4-324; s4-325; s4-327; s4-328; s4-330; s4-331; s4-332; s4-334; s4-335; s4-338; s4-349; s4-350; s4-351; s4-352; s4-354; s4-405; s4-408	s4-316; s4-329; s4-342; s4-343; s4-348; s4-406; s4-407	
		Initial	s4-296; s4-298; s4-299; s4-300; s4-301; s4-302; s4-303; s4-304; s4-305; s4-306; s4-307; s4-310; s4-312; s4-313; s4-314; s4-317; s4-318; s4-319; s4-320; s4-321; s4-323; s4-324; s4-325; s4-327; s4-328; s4-330; s4-331; s4-332; s4-334; s4-335; s4-338; s4-346; s4-349; s4-350; s4-351; s4-352; s4-354; s4-405; s4-408	s4-316; s4-329; s4-342; s4-343; s4-348; s4-406; s4-407	
4H	4H-1	Low-Cost	s4-353; s4-355; s4-359; s4-360; s4-361; s4-367pt3; s4-368; s4-370; s4-373; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt2	s4-365; s4-372pt1
		Initial	s4-353; s4-355; s4-359; s4-360; s4-361; s4-367pt3; s4-368; s4-370; s4-373; s4-375; s4-376; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-408	s4-374pt2	s4-365; s4-372pt1
	4H-2	Low-Cost	s4-353; s4-355; s4-360; s4-361; s4-364; s4-367pt2; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-365; s4-372pt2
		Initial	s4-353; s4-355; s4-360; s4-361; s4-364; s4-367pt2; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-365; s4-372pt2
	4H-3	Low-Cost	s4-353; s4-355; s4-363; s4-367pt1; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-366; s4-372pt2
		Initial	s4-353; s4-355; s4-363; s4-367pt1; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-366; s4-372pt2
	Refined Preferred 4H-2	Low-Cost	s4-353; s4-355; s4-360; s4-361; s4-364; s4-367pt2; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-365; s4-372pt2
		Initial	s4-353; s4-355; s4-360; s4-361; s4-364; s4-367pt2; s4-375; s4-377; s4-378; s4-379; s4-380; s4-381; s4-383; s4-385; s4-386; s4-408	s4-374pt1	s4-365; s4-372pt2

Table 6-10: Cost Estimates* for Alternatives in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Estimated Costs (Rounded)	Subsection A		Subsection B	Subsection C		Subsection D	Subsection E	Subsection F				Subsection G	Subsection H		
	4A-2	Hybrid 4A-1/ 4A-2	4B-1	4C-1	4C-2	4D-1	Hybrid 4E-1/ 4E-2	4F-1	4F-3	4F-4	4F-5	4G-2	4H-1	4H-2	4H-3
Construction															
Initial Design Criteria	$22,358,000	$21,737,000	$21,348,000	$65,353,000	$63,768,000	$77,784,000	$95,079,000	$150,704,000	$140,826,000	$157,010,000	$150,921,000	$84,267,000	$92,468,000	$90,797,000	$90,101,000
Low-Cost Design Criteria	$15,656,000	$16,636,000	$10,791,000	$39,367,000	$35,625,000	$56,487,000	$61,904,000	$97,471,000	$100,129,000	$99,837,000	$100,503,000	$45,458,000	$60,613,000	$61,027,000	$61,402,000
Design/Engineering															
Initial Design Criteria	$912,000	$940,000	$967,000	$2,958,000	$2,884,000	$3,806,000	$4,219,000	$6,710,000	$6,552,000	$7,182,000	$6,751,000	$3,565,000	$4,213,000	$4,275,000	$4,204,000
Low-Cost Design Criteria	$699,000	$734,000.	$515,000	$1,953,000	$1,802,000	$2,920,000	$2,885,000	$4,612,000	$4,831,000	$4,802,000	$4,811,000	$2,111,000	$2,840,000	$2,928,000	$2,926,000
Administration															
Initial Design Criteria	$1,597,000	$1,553,000	$1,525,000	$4,668,000	$4,555,000	$5,556,000	$6,791,000	$10,765,000	$10,059,000	$11,215,000	$10,780,000	$6,019,000	$6,605,000	$6,486,000	$6,436,000
Low-Cost Design Criteria	$1,146,000	$1,217,000	$790,000	$2,880,000	$2,607,000	$4,133,000	$4,530,000	$7,132,000	$7,327,000	$7,305,000	$7,354,000	$3,326,000	$4,435,000	$4,465,000	$4,493,000
Right-of-Way															
Initial Design Criteria	$1,100,000	$1,592,000	$350,000	$1,091,000	$1,047,000	$2,739,000	$4,635,000	$11,135,000	$7,909,000	$10,141,000	$9,255,000	$6,319,000	$5,201,000	$4,478,000	$9,006,000
Low-Cost Design Criteria	$1,070,000	$1,600,000	$327,000	$912,000	$839,000	$2,681,000	$4,514,000	$10,984,000	$7,750,000	$9,534,000	$9,013,000	$5,414,000	$4,933,000	$3,972,000	$8,496,000
Utility Relocation															
Initial Design Criteria	$312,000	$261,000	$0	$258,000	$458,000	$309,000	$6,064,000	$3,511,000	$3,578,000	$3,359,000	$3,747,000	$519,000	$2,524,000	$2,241,000	$2,253,000
Low-Cost Design Criteria	$312,000	$261,000	$0	$258,000	$458,000	$309,000	$6,064,000	$3,511,000	$3,578,000	$3,359,000	$3,747,000	$519,000	$2,524,000	$2,241,000	$2,253,000
Total Cost															
Initial Design Criteria	$26,279,000	$26,083,000	$24,190,000	$74,328,000	$72,712,000	$90,194,000	$116,788,000	$182,825,000	$168,924,000	$188,907,000	$181,454,000	$100,689,000	$111,011,000	$108,277,000	$112,000,000
Low-Cost Design Criteria	$18,883,000	$20,448,000	$12,423,000	$45,370,000	$41,331,000	$66,530,000	$79,897,000	$123,710,000	$123,615,000	$124,837,000	$125,428,000	$56,828,000	$75,345,000	$74,633,000	$79,570,000

* Cost estimates include access roads and grade separations. Subsection cost estimates do not include mitigation costs.

Table 6-10a: Cost Estimates* for Refined Preferred Alternative 2 in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Estimated Costs (Rounded)	Subsection A	Subsection B	Subsection C	Subsection D	Subsection E	Subsection F	Subsection G	Subsection H
	4A-2	4B-1	4C-2	4D-1	Hybrid 4E-1/4E-2	4F-3	4G-2	4H-2
Construction								
Initial Design Criteria	$19,527,000	$21,335,000	$62,820,000	$77,751,000	$85,288,000	$141,417,000	$55,500,000	$90,930,000
Low-Cost Design Criteria	$14,042,000	$10,566,000	$35,604,000	$56,498,000	$63,616,000	$101,289,000	$45,303,000	$60,394,000
Design/Engineering								
Initial Design Criteria	$873,000	$966,000	$2,839,000	$3,805,000	$3,778,000	$6,521,000	$2,467,000	$4,288,000
Low-Cost Design Criteria	$595,000	$507,000	$1,800,000	$2,922,000	$2,987,000	$4,885,000	$2,099,000	$2,913,000
Administration								
Initial Design Criteria	$1,395,000	$1,524,000	$4,487,000	$5,554,000	$6,092,000	$10,101,000	$3,964,000	$6,495,000
Low-Cost Design Criteria	$1,027,000	$773,000	$2,605,000	$4,134,000	$4,655,000	$7,411,000	$3,315,000	$4,419,000
Right-of-Way								
Initial Design Criteria	$1,105,000	$350,000	$1,175,000	$2,739,000	$4,612,000	$7,928,000	$7,412,000	$4,467,000
Low-Cost Design Criteria	$1,070,000	$327,000	$963,000	$2,681,000	$4,481,000	$7,766,000	$6,782,000	$3,972,000
Utility Relocation								
Initial Design Criteria	$312,000	$0	$458,000	$309,000	$6,064,000	$3,578,000	$519,000	$2,241,000
Low-Cost Design Criteria	$312,000	$0	$458,000	$309,000	$6,064,000	$3,578,000	$519,000	$2,241,000
Total Cost								
Initial Design Criteria	$23,212,000	$24,175,000	$71,779,000	$90,158,000	$105,834,000	$169,545,000	$69,862,000	$108,421,000
Low-Cost Design Criteria	$17,046,000	$12,173,000	$41,430,000	$66,544,000	$81,803,000	$124,929,000	$58,018,000	$73,939,000

* Cost estimates include access roads and grade separations. Subsection cost estimates do not include mitigation costs.

Table 6-11: Summary of Key Impacts for Alternatives in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Subsections	4A				4B		4C				4D		4E		4F								4G		4H					
Alignment Alternatives	4A-2		Hybrid 4A-1/4A-2		4B-1		4C-1		4C-2		4D-1		Hybrid 4E-1/ 4E-2		4F-1		4F-3		4F-4		4F-5		4G-2		4H-1		4H-2		4H-3	
Impacts/Design Criteria	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial
Total Cost ($M)*	18.88	26.28	20.45	26.08	12.42	24.19	45.37	74.33	41.33	72.71	66.53	90.19	79.90	116.79	123.71	182.83	123.62	168.92	124.84	188.91	125.43	181.45	56.83	100.69	75.35	111.01	74.63	108.28	79.57	112.00
Right-of-Way (Ac)	76.50	88.53	72.26	79.84	48.44	57.91	125.66	170.25	118.58	155.11	127.24	181.44	270.75	327.73	402.20	482.42	405.96	492.91	406.16	506.44	398.47	477.76	192.44	259.05	224.84	268.18	217.18	267.16	218.25	263.88
Forest (Ac)	38.54	45.45	29.08	33.62	21.26	22.53	73.42	98.06	71.97	92.32	115.90	162.33	187.78	227.86	284.76	338.35	235.10	282.03	263.03	324.75	252.87	298.27	141.76	189.10	72.71	89.55	61.51	76.73	69.79	85.63
Core Forest (Ac)	3.39	3.50	3.81	4.01	10.42	10.81	84.14	90.47	66.76	71.14	270.25	305.31	194.99	214.80	275.70	292.88	172.32	185.66	223.21	243.05	219.48	237.01	155.48	179.34	25.19	27.39	22.03	23.74	32.59	35.09
Total Wetland (Ac)																														
Emergent Wetland	0.00	0.00	0.00	0.00	0.00	0.00	3.16	3.70	3.17	3.70	0.05	1.41	0.11	0.22	1.90	2.41	0.00	0.01	0.00	0.01	1.89	2.36	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Forested Wetland	0.00	0.00	0.00	0.00	0.00	0.00	1.44	3.81	1.43	3.13	0.17	0.33	0.06	0.15	0.45	0.54	0.15	0.15	0.27	0.38	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrub/Shrub Wetland	0.18	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.00	0.00	0.00	0.07	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Wetland Impacts	0.18	0.45	0.00	0.00	0.00	0.00	4.60	7.51	4.60	6.83	0.22	1.74	0.17	0.37	2.39	3.02	0.15	0.16	0.27	0.46	2.26	2.76	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
Total Streams (LF)																														
Ephemeral	3,357	4,111	3,044	3,722	1,358	1,359	2,921	3,551	3,648	4,678	3,189	4,945	16,108	17,096	22,243	24,453	21,161	24,508	22,274	26,006	21,326	24,091	11,581	14,472	8,030	9,616	5,910	6,828	5,497	6,136
Intermittent	1,080	1,245	467	701	420	476	3,310	4,290	1,277	1,795	2,855	3,907	2,754	2,972	3,081	3,529	6,475	7,748	7,846	8,666	1,852	2,404	4,269	5,891	727	1,045	994	1,366	994	1,390
Perennial	0	0	0	0	0	0	1,220	1,374	1,220	1,351	1,430	2,033	607	927	1,839	2,543	1,796	2,882	1,876	2,736	1,891	2,534	0	0	1,088	1,890	1,621	2,211	896	1,439
Total Stream Impacts	4,437	5,356	3,511	4,423	1,778	1,835	7,451	9,215	6,145	7,824	7,474	10,885	19,469	20,995	27,163	30,525	29,432	35,138	31,996	37,408	25,069	29,029	15,850	20,363	9,845	12,551	8,525	10,405	7,387	8,965
Karst Features (#)	0	0	0	0	0	0	3	3	1	1	3	5	5	5	10	13	6	7	6	7	10	11	16	19	71	77	57	70	57	66
Displacements (#)																														
Residential	0	0	2	2	0	0	1	1	1	1	2	2	10	10	31	31	23	23	28	29	26	26	17	21	12	12	9	10	9	10
Institutional	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Business	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	1	2	0	0	0	0	1	1
Total Displacements	0	0	2	2	0	0	1	1	1	1	2	2	10	10	34	34	26	26	31	33	29	29	18	23	12	12	9	10	10	11
Noise Impacts (#)	4	6	4	4	2	2	4	4	6	5	2	2	19	21	28	29	31	32	34	36	17	19	36	25	55	81	63	72	53	70
Managed Land (Ac)	2.24	3.20	6.30	7.82	2.53	2.88	25.22	41.46	5.36	7.48	43.74	63.12	71.19	88.43	57.52	68.03	59.33	72.97	56.87	71.81	57.45	69.66	0.00	0.00	25.27	27.24	19.71	21.40	19.83	21.38
Farmland (Ac)	30.14	34.45	31.99	35.13	26.02	34.21	17.79	23.99	27.47	41.14	9.01	14.04	44.26	57.46	60.67	75.66	101.34	131.18	80.27	107.56	81.70	106.38	22.78	31.62	89.02	111.06	94.99	123.93	85.90	107.98
Stream Relocations (LF)	1,361	1,596	524	771	0	0	3,419	4,381	1,920	3,049	2,697	2,258	5,893	7,600	7,105	7,640	13,768	15,477	14,721	15,337	6,318	7,956	4,624	6,654	3,239	3,940	564	1,922	949	2,281
Floodplain (Ac)	0.00	0.00	0.00	0.00	0.00	0.00	4.64	6.60	4.62	6.33	5.88	9.80	0.00	0.11	20.49	27.22	23.09	32.75	25.73	33.43	19.06	24.61	0.00	0.00	0.00	0.00	2.67	4.08	2.22	4.26

* 2010 Dollars, excluding mitigation costs, $M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Green shading denotes components of the Preferred Alternative – Alternative 2

Table 6-11a: Summary of Key Impacts for Refined Preferred Alternative 2 in Subsections 4A, 4B, 4C, 4D, 4E, 4F, 4G and 4H

Subsections	4A		4B		4C		4D		4E		4F		4G		4H		Refined Preferred Alternative 2	
Alignment Alternatives	Refined Preferred 4A-2		Refined Preferred 4B-1		Refined Preferred 4C-2		Refined Preferred 4D-1		Refined Preferred Hybrid 4E-1/ 4E-2		Refined Preferred 4F-3		Refined Preferred 4G-2		Refined Preferred 4H-2			
Impacts/Design Criteria	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial	Low-Cost	Initial
Total Cost ($M)*	17.05	23.21	12.17	24.18	41.43	71.78	66.54	90.16	81.80	105.83	124.93	169.55	58.02	69.86	73.94	108.42	475.88	662.99
Right-of-Way (Ac)	75.57	89.08	48.46	57.87	118.65	155.47	127.80	181.44	268.81	318.13	406.11	491.91	191.90	248.20	218.20	267.29	1,455.5	1,809.39
Forest (Ac)	38.02	45.13	21.26	22.48	72.03	92.55	116.45	162.34	187.89	224.26	235.05	283.22	141.80	184.41	61.43	76.74	873.93	1,091.13
Core Forest (Ac)	3.39	3.50	10.42	10.80	66.78	71.35	270.31	305.33	194.98	213.12	171.19	185.52	155.49	173.87	22.03	23.74	894.59	987.23
Total Wetland (Ac)																	0	0
Emergent Wetland	0.00	0.00	0.00	0.00	3.17	3.70	0.05	1.41	0.11	0.20	0.00	0.00	0.00	0.00	0.00	0.03	3.33	5.34
Forested Wetland	0.00	0.00	0.00	0.00	1.43	3.13	0.17	0.33	0.06	0.15	0.15	0.15	0.00	0.00	0.00	0.00	1.81	3.76
Scrub/Shrub Wetland	0.18	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.45
Total Wetland Impacts	0.18	0.45	0.00	0.00	4.60	6.83	0.22	1.74	0.17	0.35	0.15	0.15	0.00	0.00	0.00	0.03	5.32	9.55
Total Streams (LF)																		
Ephemera	3,461	4,150	1,359	1,354	3,649	4,739	3,189	4,946	16,111	16,927	21,147	24,395	11,581	13,866	5,882	6,829	66,379	77,206
Intermittent	1,088	1,270	420	476	1,277	1,794	2,855	3,907	2,754	2,967	6,484	7,625	4,271	5,630	994	1,366	20,143	25,035
Perennia	0	0	0	0	1,220	1,351	1,430	2,033	607	735	1,796	2,676	0	0	1,621	2,211	6,674	9,006
Total Stream Impacts	4,549	5,420	1,779	1,830	6,146	7,884	7,474	10,886	19,472	20,629	29,427	34,696	15,852	19,496	8,497	10,406	93,196	111,247
Karst Features (#)	0	0	0	0	1	1	3	5	5	5	6	7	16	20	57	70	88	108
Displacements (#)																		
Residentia	0	0	0	0	1	1	2	2	10	10	23	23	26	29	9	10	71	75
Institutiona	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business	0	0	0	0	0	0	0	0	0	0	3	3	1	1	0	0	4	4
Total Displacements	0	0	0	0	1	1	2	2	10	10	26	26	27	30	9	10	75	79
Noise Impacts (#)	5	6	1	1	5	4	1	1	6	5	20	21	24	23	28	27	90	88
Managed Land (Ac)	2.23	3.18	2.53	2.88	5.37	7.49	43.79	63.13	71.29	85.59	58.89	72.98	0.00	0.00	19.72	21.40	203.82	256.65
Farmland (Ac)	29.96	34.90	26.03	34.21	27.47	41.26	9.01	14.04	44.32	53.63	101.43	129.63	22.77	29.73	95.04	123.96	356.03	461.36
Stream Relocations (LF)	1,359	1,611	0	0	1,920	3,048	2,697	2,258	5,894	6,526	13,801	15,329	4,626	6,631	564	1,922	30,861	37,325
Floodplain (Ac)	0.00	0.00	0.00	0.00	4.62	6.33	5.88	9.80	0.00	0.11	23.09	30.65	0.00	0.00	2.67	4.08	36.26	50.97

* 2010 Dollars, excluding mitigation costs, $M = million dollars, Ac = acres, LF = linear feet
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

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6.3 Comparison of Interchanges

This section further expounds upon the assessment of interchange options presented in Chapter 3, which documents the performance differences of the potential intermediate interchanges at SR 45, and the Greene/Monroe County Line on the Tier 2 Purpose and Need goals. Section 6.3.1 compares the interchange options that were carried forward for detailed study and Section 6.3.2 compares the South Connector Road and North Connector Road design options for the Greene/Monroe County Line interchange.

In Chapter 5 (Section 5.1.2), typical cross sections were developed and further detailed engineering development was completed for the Alternatives Carried Forward. Part of the detailed engineering development included preliminary design of the potential interchanges at SR 45, Greene/Monroe County line, and SR 37. Following is a brief description of each potential interchange, further interchange details and traffic analysis can be found in Section 5.6.

The SR 45 interchange was identified as a potential interchange in the Tier 1 study and is projected to serve between 2,800 and 3,400 vehicles per day in the year 2030. The preferred configuration in the DEIS and the FEIS is a rural diamond interchange, with reduced ramp spacing of 800 feet.

The Greene County/Monroe County Line interchange was added to the project in response to numerous comments received from local government officials, emergency responders, businesses, and the public in support of an access point to I-69 in Eastern Greene County. The preferred interchange in both the DEIS and the FEIS is a three-leg rural trumpet configuration. The northbound and southbound ramps for this interchange merge to form a new approximate 1 mile, 2-lane roadway that connects with SR 45. This interchange is projected to serve between 5,400 and 6,700 vehicles per day in the year 2030.

A SR 37 interchange is projected to serve between 27,800 and 28,100 vehicles per day in the year 2030. It is considered a necessary linkage to the state highway system. SR 37, north of the intersection with the Section 4 mainline alignment, is the approved alignment for I-69 in Section 5 as it proceeds north toward Bloomington, Martinsville, and Indianapolis. South of the interchange, SR 37 is a 4-lane divided rural arterial that provides access to southern Monroe County, the City of Bedford, Lawrence County, and points further south. As such, the SR 37 interchange is considered an essential system linkage and has been included in all Section 4 end-to-end alternatives. In both the DEIS and the FEIS, the recommended SR 37 interchange configuration includes a loop ramp in the northeast quadrant for northbound SR 37 to southbound I-69 traffic movements. The loop ramp was selected in order to maintain the present at-grade intersection access between SR 37 and Victor Pike immediately south of the Section 4 corridor and to minimize impacts to the Stipp-Bender Farmstead historic property. The interchange configuration also includes a 2-lane directional ramp for southbound traffic movements that will continue southbound along SR 37.

These interchange configurations are included in FEIS Refined Preferred Alternative 2. There were no substantive changes in the Section 4 interchange configurations as compared to interchange configurations included in the DEIS with Alternative 2.

6.3.1 Interchange Options

As described in Section 3.4.2, preliminary interchange locations were evaluated using performance measures analyses, compliance with interchange spacing policies, predicted interchange use, potential environmental impacts, and input from environmental resource agencies and the public. As a result of this evaluation, the following three interchange options were recommended to be carried forward for detailed study. US 231, located near the western terminus of Section 4, is included in the Section 3 study and is the selected interchange location as identified in the January 28, 2010, Tier 2 Section 3 Record of Decision. The US 231 interchange is included in the traffic analysis of all of the Section 4 interchange options. Also, all three interchange options include an interchange at SR 37.

- **Interchange Option 1** includes two intermediate interchanges: SR 45 and the Greene/Monroe County Line. Because this option includes interchanges at both intermediate locations, this interchange option effectively represents a combination of Interchange Options 2 and 4. Interchange Option 1 was included in all four end-to-end DEIS alternatives and Refined Preferred Alternative 2 in order to identify the most substantial impacts for the Section 4 Alternatives.
- **Interchange Option 2** includes one intermediate interchange at the Greene/Monroe County Line.
- **Interchange Option 4** includes one intermediate interchange at SR 45.

Transportation Performance Measures

As shown in Section 3.3 of Chapter 3, *Alternatives*, all of the Section 4 interchange options provide significant benefits on performance measures addressing the Tier 2 Purpose and Need goals (See **Table 3-8** through **Table 3-10e**). They are similar in that they all provide essentially equal benefits for accessibility-related measures and crash frequency safety measures. All of the interchange options will also provide substantial benefits on performance measures related to congestion.

Interchange Option 1 would provide the greatest congestion relief and reduction in crash frequency in the five-county Study Area. Compared to the no-build scenario, this option would reduce total congested (LOS D, E and F) vehicle miles traveled (VMT) in the five-county Study Area by about 12.6% (-182,200 VMT) and total congested (LOS D. E and F) vehicle hours traveled (VHT) by about 12.8% (-3,600 VHT). This option would also provide the highest annual reduction in crashes at 53.50 fewer crashes per 100 million vehicle miles traveled.

Interchange Option 2 is not as effective as Interchange Option 1 in providing congestion relief and reduced crash rates, but is more effective than Interchange Option 4. Compared to the no-build scenario, this option would reduce total congested vehicle miles traveled in the five-county Study Area by about 11.9% (-171,200 VMT) and total congested vehicle hours traveled by about 12.0% (-3,400 VHT). The annual reduction in crashes would be similar with 52.43 fewer crashes per 100 million vehicle miles traveled.

Interchange Option 4 is the least effective in improving safety and providing congestion relief. A reduction in total congested vehicle miles traveled compared to the no-build scenario would be less than Interchange Options 1 and 2 at about 8.8% (-127,200 VMT). Further, the total congested vehicle hours traveled would be reduced by only about 9.1% (-2,500 VHT) and the annual reduction in crashes at 51.88 less crashes per 100 million vehicle miles traveled is less than the other options.

Overall, the Greene/Monroe County Line interchange would have the greatest benefits for congestion relief and crash frequency reduction in the five-county Study Area whether as a single intermediate interchange (Interchange Option 2) or combined with the SR 45 interchange (Interchange Option 1).

Traffic

Total predicted 2030 daily traffic volumes for the three interchange options are shown in **Table 6-12**. The interchange volumes are based upon the total entering and exiting traffic on all interchange ramps, the I-69 mainline segment volumes are the total northbound and southbound daily traffic volumes.

Table 6-12: Total Interchange and Mainline Volumes

Interchange Locations	Interchange Options (vehicles per day)		
	1	2	4
SR 45	2,700	--	3,400
Greene County / Monroe County Line	5,400	6,700	--
SR 37	28,100	28,100	27,800
Total Interchange Volumes	*36,200*	*34,800*	*31,200*
I-69 Mainline Segments			
US 231 to SR 45	23,500	22,800	23,700
SR 45 to Greene/Monroe County Line	23,700		24,500
Greene/Monroe County Line to SR 37	29,600	28,600	

The highest predicted total interchange volumes as well as the highest mainline volumes north (east) of the Greene/Monroe County line would occur under Option 1. This option would have over 36,000 vehicles per day (VPD) entering and exiting the interchanges along Section 4 and about 29,500 VPD using I-69. The lowest predicted volumes would occur under Option 4 with just over 31,000 vehicles per day using the interchanges, which is about 14% less traffic compared to Interchange Option 1. The mainline traffic volumes would be around 24,500 VPD, which is 17% less vehicles using the interstate. Interchange Option 2 would have a higher usage than Interchange Option 4 but the Greene/Monroe County Line interchange alone would serve 4% less vehicles than both interchanges combined and have 3% to 4% less mainline vehicles.

The greatest benefit provided by the Section 4 intermediate interchanges on local Purpose and Need performance measures for congestion relief and crash reduction would occur along SR 45 between US 231 and SR 37. While minor traffic volume changes are forecasted in the Section 4

Study Area for SR 54 and SR 37, there would be no change in level of service on these two highways by the proposed interstate. **Table 6-13** shows the predicted 2030 traffic volumes and level of services for SR 45 between US 231 in Greene County and SR 37 on the southwest side of Bloomington.

The Greene/Monroe County Line interchange (Interchange Options 1 and 2) provides the greatest benefit to SR 45 between the SR 445 intersection near Cincinnati in Greene County and Curry Pike/South Leonard Springs in Monroe County. Along this segment of SR 45, the predicted 2030 no-build Level of Service (LOS) is LOS E. Because traffic would be diverted from SR 45 to I-69, SR 45 traffic operations would improve significantly under the build scenario. In Greene County, about 6,600 to 7,500 vehicles per day are predicted to divert to the new highway in 2030 with travel conditions improving to LOS B. As shown in **Table 6-13**, reductions are also predicted on SR 45 in Monroe County with level-of-service improvements on the following segments:

- Breeden Road to Harmony Road/Garrison Chapel Road with an improvement from LOS E to LOS C with an over 50% reduction in traffic volumes.
- Harmony Road/Garrison Chapel Road to Leonard Springs Road with an improvement from LOS E to LOS D and an over 40% reduction in traffic volumes.
- Leonard Springs Road to Curry Pike where the level of service improves from LOS E to LOS A with a 25% to 33% reduction in traffic volumes.

Interchange Option 4 would also reduce traffic volumes on the SR 45 between the SR 445 intersection and Curry Pike, however, the reductions are not as great and less benefit is predicted when compared to Interchange Options 1 and 2. The level-of-service on SR 45 would improve slightly from a LOS E to LOS D on the segment north of SR 445 but no improvement is forecasted for SR 45 between the Greene/Monroe County line and Leonard Springs Road. However, the SR 45 interchange, included with Interchange Options 1 and 4, would have beneficial traffic impacts on SR 45/SR 58 between US 231 and SR 445. Both of these options would reduce traffic volumes on SR 45/SR 58 by 300 to 400 VPD (9%-12%). Traffic volumes on SR 45 between SR 54 and SR 445 would be reduced 28% to 39% (860 to 1,550 VPD) compared to Interchange Option 2 (no SR 45 interchange).

Table 6-13: SR 45 Traffic Volumes and LOS per Interchange Option

Roadway Section	No-Build		Option 1*		Option 2**		Option 4	
	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
SR 45/58 E of CR 200E	4,901	D	3,599	B	4,023	B	3,603	B
SR 45/58 E of CR 900E	4,620	C	3,288	B	3,612	B	3,290	B
SR 45 N of SR 58	3,246	B	1,914	B	2,097	B	1,917	B
SR 45 S of SR 54	4,396	C	3,327	B	3,526	B	2,871	B
SR 45 S of SR 445	4,704	C	3,113	B	3,978	C	2,431	B
SR 45 N of SR 445/South Connector Road	10,555	E	3,107	B	3,913	B	7,917	D
Greene-Monroe County Line								
SR 45 W of Breeden Rd	12,524	E	5,194	C	6,014	C	9,860	E
SR 45 NE of Harmony Rd/Garrison Chapel Rd	16,025	E	8,602	D	9,424	E	13,269	E
SR 45 NE of W Leonard Springs Rd	14,913	E	10,037	A	10,848	A	14,124	A
SR 45 SW of Curry Pike/ S Leonard Springs Rd	17,770	E	12,537	A	13,262	A	16,118	A
SR 45 SW of SR 37	26,461	A	24,861	A	25,213	B	27,301	B

* Option 1 uses the South Connector Road
** Option 2 uses the North Connector Road
Sources: I-69 Corridor Travel Demand Model for year 2030 traffic

Another beneficial traffic impact from the construction of I-69 would occur in the environmentally sensitive Garrison Chapel Valley area in Monroe County north of SR 45. In the 2002 and 2004 Long Range Plan (LRP) updates, INDOT showed SR 45 as being upgraded from a 2-lane to a 4-lane road between Leonard Springs Road and Garrison Chapel Road. This upgrade was programmed as a 2014 project. The improvement along SR 45 would provide increased accessibility to the Garrison Chapel Valley area and could encourage development in an area that has sensitive bat habitat. This improvement project along SR 45 has since been "demoted" and no funding has been identified for the improvements. One of the reasons the status of this proposed project was changed is that the building of I-69 is expected to relieve congestion along SR 45. While, overall regional development patterns are not significantly affected by whether an individual transportation project (such as increasing capacity along SR 45) occurs, where such development occurs within the region can and is affected by individual transportation projects. In this case, it is anticipated that this would serve to not encourage regional development in the Garrison Chapel Valley, as would be the case were increased capacity provided.

As shown in **Table 6-13**, all three interchange options would reduce traffic along SR 45, especially Interchange Option 1 which would provide the greatest benefit to the Garrison Chapel Valley area with a traffic volume reduction of about 46% (7,400 VPD) compared to the no-build scenario. Interchange Option 2 is the second best option for reducing traffic in this area with a 41% (6,600 VPD) reduction. Interchange Option 4 provides the least benefit with only about a 17% reduction in the traffic volume on SR 45 when compared to the no-build scenario.

Overall, Interchange Option 4 provides traffic reduction benefits to the southern portion of SR 45 in Greene County between US 231 and SR 445 while Interchange Option 2 provides benefit to

the northern portion of SR 45 from SR 445 in Greene County to SR 37 on the southwest side of Bloomington, which includes the Garrison Chapel Valley area. Overall, however, Interchange Option 1 combines the advantages of both Interchange Options 2 and 4 and provides the greatest traffic and level of service reductions along the entire portion of SR 45 in the Section 4 Study Area.

Environmental Impacts

The key impacts for the interchange options are shown in **Table 6-14**. All impacts shown are directly related to the construction of the ramps and access roads outside of the mainline roadway footprint. All of the interchange options are similar in that they would not impact any historic properties, archaeological sites, wetlands, cemeteries, or karst features.

Table 6-14: Overview of Key Impacts for Interchange Options

Impacts	Interchange Options					
	Option 1 (SR 45 & County Line)		Option 2 (County Line)		Option 4 (SR 45)	
	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	35.50	52.58	29.29	43.41	6.21	9.17
Right-of-Way (Ac)	148.82	154.31	123.66	131.34	25.16	22.97
Forest (Ac)	111.62	116.02	91.26	97.19	20.36	18.83
Core Forest (Ac)	69.66	69.50	63.82	63.32	5.84	6.18
Total Wetland Impacts (Ac)	0.00	0.00	0.00	0.00	0.00	0.00
Total Stream Impacts (LF)	11,425	12,126	9,706	10,548	1,719	1,578
Karst Features (#)	0	0	0	0	0	0
Total Displacements (#)	14	14	13	13	1	1

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs
$M = million dollars, Ac = acres, LF = linear feet
The Greene/Monroe County Line interchange uses the South Connector Road.
All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

As shown in **Table 6-14**, Interchange Option 4, has the smallest spatial impact requiring the least right-of-way. Interchange Option 2 would be spatially larger because it includes the South Connector Road and additional right-of-way on SR 45 and SR 445. These areas outside of the interchange ramps themselves account for about 58% of the total interchange area reported for Interchange Option 2. The combination of the two interchanges in Interchange Option 1 would require the most right-of-way. In comparison to the entire Section 4 Refined Preferred Alternative 2 right-of-way, Interchange Option 1 represents about 8.5% to 10.2% of the total required right-of-way. Interchange Option 2 would be about 7.3% to 8.5%, and Interchange Option 4 would be about 1.3% to 1.7% of the total right-of-way required for Refined Preferred Alternative 2.

The predominant land use in the Section 4 Corridor is forest, and this holds true for the areas affected by the two intermediate interchange locations. The forest impacts for each interchange option as a percentage of the total impacts of Refined Preferred Alternative 2 are as follows:

- Interchange Option 1 – Forest: 10.6% to 12.8%, Core Forest: 7.0% to 7.8%
- Interchange Option 2 – Forest: 8.9% to 10.5%, Core Forest: 6.4% to 7.1%
- Interchange Option 4 – Forest: 1.9% to 2.2%, Core Forest: 0.6% to 0.7%%

Interchange Option 4 would have one residential displacement along SR 45 in the vicinity of the SR 45 interchange. Access Road #3 and #6 would maintain access to two properties that would otherwise loose access because their property frontage along SR 45 would be within the limited access right of way for the SR 45 interchange ramps. Interchange Option 2 would displace a total of 10 residential properties along Carter Road, SR 45, and SR 445. Additionally, three commercial properties located on SR 45 near the SR 445 junction would also be relocated for completion of the South Connector Road. Interchange Option 1 includes the relocations and access roads required of both Interchange Options 2 and 4 and would result in a total of 14 displacements: 11 residences and 3 commercial properties. This total is about 17.7% to 18.7% of the total number of displacements for Refined Preferred Alternative 2.

The total linear feet of stream impacts for the interchange options are shown in **Table 6-14**. As a comparison, the stream impacts for Interchange Option 2 make up about 9.4% to 10.4% of the total stream impacts for Refined Preferred Alternative 2 and Interchange Option 4 makes up about 1.4% to 1.8%. Combining the other two options, the stream impacts of Interchange Option 1 make up about 10.7% to 12.3% of the total Refined Preferred Alternative 2 stream impacts.

The total estimated costs for the interchange options are shown in **Table 6-14**. The SR 45 interchange (Interchange Option 4) is estimated to cost about $6,210,000 to $9,170,000. The Greene/Monroe County Line interchange (Interchange Option 2) is estimated to cost about $29,290,000 to $43,410,000. Combined, the two interchanges (Interchange Option 1) are estimated to cost $35,500,000 to $52,580,000. Interchange Options 1, 2, and 4 represent about 7.9%, 6.5% and 1.4% respectively, of the estimated total cost (excluding mitigation) of FEIS Refined Preferred Alternative 2 using the initial design criteria.

Resource Agency and Public Input

Tier 2 consultation with the U.S. Fish and Wildlife Service (USFWS) has been on-going since the issuance of the Tier 1 ROD and the beginning of Tier 2 studies. Prior to issuance of the DEIS for the Section 4 project, USFWS expressed concerns about possible indirect development impacts in karst areas.[8] The U.S. Environmental Protection Agency also expressed concerns about secondary (indirect) development associated with the proposed Greene County/Monroe County Line interchange at the April 26, 2006, meeting on Section 4's Preliminary Alternatives Evaluation and Screening. To address these concerns several factors were evaluated including: means to control induced growth, area constructability issues, and beneficial traffic impacts

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

One means of keeping roadway-induced development within established development areas is by restricting access to the roadway. Restricting access discourages strip development along new roadways. In addition to the full access control along I-69 (meaning that access to I-69 would be allowed only at interchanges), the Greene/Monroe County Line interchange connector road would also be fully access controlled. The only access to the interchange would be from SR 45 (or SR 445 with the South Connector Road option). Furthermore, the road approaches along SR 45 and SR 445, with access to the interstate, would also have some level of access control. This design would help to control the location of development and improve traffic flow and safety in the vicinity of the interchange.

Another means of guiding the location and type of development is through land use planning. The following plans were developed as a result of the I-69 Planning Grant Program. Section 7.2, *Major Mitigation Initiatives*, describes the program in greater detail and **Appendix T**, *I-69 Planning Grant Program Update*, gives the outcomes and current status of these projects.. These plans identify sensitive environmental areas and recommend further measures, including zoning ordinances, to protect karst features, water quality, ecosystems, and natural resources.

- The Bloomfield 2009 Comprehensive Plan
- City of Bedford 2010 Comprehensive Plan
- Greene County 2009 Comprehensive Plan
- Lawrence County 2009 Strategic Plan
- Monroe County Draft 2010 Comprehensive Plan
- Monroe County 2010 SR 37 Corridor Plan

This project is also addressed in the *Greene County Comprehensive Plan* and the *Monroe County Comprehensive Plan.* The *Greene County Comprehensive Plan* identifies I-69 growth areas near the proposed interchange with SR 45, and at the Greene/Monroe County Line interchange. The comprehensive plan provides guidance for land use changes in and around the proposed highway corridor, and provides support for the continuance of desired land uses. The *Monroe County Comprehensive Plan* identifies land along and in the vicinity of SR 37 south of the I-69/SR 37 interchange for commercial and industrial development.

Given the availability of agricultural land, which is typically located on flat ridges and gradual slopes, it is reasonable to assume that, the majority of land required for induced commercial development will be converted from agricultural land. At the junction of SR 45, and both the Greene/Monroe County Line interchange South Connector Road and North Connector Road, forest is the predominant land use with steeper slopes on both the sides of SR 45. It is anticipated that land requiring extraordinary site preparation or permitting through a time-consuming and often expensive process presents an economic disadvantage and is typically less desirable to a commercial business.

As discussed above, the diversion of traffic from local roads to I-69 may also benefit some environmentally sensitive areas including the Garrison Chapel Valley. Development along SR 45 could be discouraged by the decreased traffic and accessibility expected due to the construction of I-69.

The potential for the Greene County/Monroe County Line Interchange to affect patterns of induced development were considered in the Tier 2 Biological Assessment for Section 4. It also considered the possible effects of development "leapfrogging" from Monroe County to eastern Greene County. See **Appendix JJ1**, *Redacted Section 4 Tier 2 Biological Assessment.* Appendix E in this document provides this analysis. This analysis was considered by USFWS in issuing its Section 4 Tier 2 Biological Opinion (BO). See **Appendix JJ2**, *Redacted I-69 Section 4 Tier 2 Biological Opinion*, pp. 45 – 50. The BO states (p. 46) that, "INDOT also evaluated the potential for up to half of the "no build" growth anticipated in southeastern Monroe County to "leap" to Greene County if the County Line interchange is built due to lower land costs and travel-time savings. Based on a combination of these worst-case scenarios, INDOT has determined only an additional 18 acres of forest is expected to be impacted (0.1% of the total forest area in these TAZs). Please refer to Appendix E of the Tier 2 BA for a full discussion of the indirect land use analysis."

During the Section 4 Tier 2 public involvement process, numerous comments were received from local government officials, emergency responders, businesses, and the general public, in support of an access point to I-69 in Eastern Greene County. The Greene County/Monroe County interchange was added to the project in response to these requests. It was also added to relieve congestion on SR 45 in Monroe County and provide improved access between Bloomington and Bloomfield/Eastern Greene County. Furthermore, it improves the ability of emergency responders to respond to incidents on I-69 and in Eastern Greene County and Western Monroe County.

Purpose and Need

As demonstrated above by the transportation performance measures and traffic, all of the interchange options address the Section 4 Tier 2 Purpose and Need goals of:

- Improved personal accessibility for area residents,
- Reduction of existing and forecasted traffic congestion,
- Reduction in the frequency of crashes along with a reduction of crashes on local roads, and
- Support local economic development initiatives.

Individually the two intermediate interchange locations, SR 45 and Greene/Monroe County Line, were both designed to address these goals, but each makes it own unique contribution.

The SR 45 interchange was identified in the Tier 1 study to provide regional access for southeast Greene County and Crane NSWC. It is projected to serve about 2,700 vehicles per day in the year 2030 when coupled with the Greene/Monroe County Line interchange (Interchange Option 1). It provides a direct I-69 connection to the North Gate of Crane NSWC, located approximately 4 miles south of the interchange at the SR 45/SR 58 intersection. The improved access provided by the SR 45 interchange, to Southeast Greene County and the congestion relief provided by it all strongly support the Section 4 local purpose and need goals.

The Greene/Monroe County Line interchange has considerable local government and public support and it demonstrates the greatest congestion relief and improved safety. It was added to the project to relieve congestion on SR 45 in Monroe County and provide improved access for commuters between Bloomington and Bloomfield/Eastern Greene County. The Greene/Monroe County Line interchange has double the overall interchange demand volume of SR 45 with a projected traffic volume of 5,400 vehicles per day in the year 2030 when coupled with the SR 45 interchange (Interchange Option 1). It provides increased accessibility to Eastern Greene County and Bloomfield area residences where the SR 45 interchange does not perform as well. It also provides accessibility for emergencies along I-69 and in Eastern Greene County and Western Monroe County.

The combination of both intermediate interchanges best meets the Section 4 Purpose and Need goals of increased accessibility and reduced travel time to regional destinations, especially to Crane NSWC, Eastern Greene County and Western Monroe County. It also performs best in relieving congestion on SR 45 throughout the Section 4 Study Area

Recommendation

Interchange Option 1 was the recommended preferred combination of intermediate interchanges in the DEIS because it had the following primary purpose and need advantages:

- It would provide the greatest congestion relief and highest crash rate reduction in the five-county Study Area especially along SR 45.
- It has the greatest traffic volume usage.
- The SR 45 interchange would provide regional access for southeast Greene County and a direct I-69 connection to Crane NSWC. It also provides congestion relief on SR 45 between US 231 and SR 54.
- The Greene/Monroe County Line interchange has nearly double the overall interchange demand volume of SR 45 and would provide increased accessibility to Eastern Greene County and Bloomfield area residences. It has considerable local government and public support and provides accessibility for emergencies along I-69 and in Eastern Greene County and Western Monroe County and reduced traffic volumes and congestion relief on SR 45 from SR 445 into Bloomington.

The preferred alternative in the FEIS is **Interchange Option 1.** There are no substantive differences in the interchange options as part of Refined Preferred Alternative 2 as compared to DEIS Alternative 2.

6.3.2 Greene/Monroe County Line Interchange Connector Road

The DEIS and FEIS recommended Greene/Monroe County Line interchange is a three-leg rural trumpet configuration. The entrance and exit ramps for this interchange merge to form a new approximate 1 mile, 2-lane connector road that intersects SR 45. Two alternative corridors were studied in the DEIS for the connector road between the interchange and SR 45. The North Connector Road and South Connector Road design options are shown in **Figure 6-6** (p. 6-182).

The **South Connector Road** option provides a direct connection with SR 445 at SR 45. A new four-leg intersection would be created by shifting approximately 2,200 feet of SR 445 to the south and aligning it with the new South Connector Road from the east. Reconstruction and realignment of SR 45 would also be required to facilitate the new intersection. This reconstruction would extend approximately 1,000 feet north and 1,500 feet south of the proposed South Connector Road intersection. The existing SR 45 and SR 445 intersection has an unorthodox configuration with the legs forming a 'Y,' as SR 445 approaches from the west and SR 45 from the northeast and southwest. There are no turn lanes and a traffic signal has been installed since this intersection can be confusing to motorists as to who has the right-of-way and which movements constitute a turn and which are through. The rolling and curving alignments of the highways and lack of drive access control also have negative impacts on safety. The proposed South Connector Road intersection would have an at-grade intersection with SR 45/SR 445.

The proposed at-grade intersection was analyzed with both a two-way stop controlled configuration, with free-flowing movement along SR 445 and the connector road and the SR 45 approaches stop controlled, and a four-way stop controlled configuration. The two-way stop controlled configuration adequately addresses the needs of this intersection from a traffic standpoint; however, there are safety considerations that should also be examined. This will be the first traffic control a driver will come upon after exiting from the freeway. Providing a four-way stop would give the driver a clear indication that they are leaving a high-speed, access controlled facility, for the lower speed facilities of Greene County. Both the two and four-way stop conditions would provide an acceptable level of service for the proposed new intersection. The traffic control at this intersection will be more thoroughly analyzed during the design phase of the project and determined at that time.

The **North Connector Road** option proposes an alternative to the South Connector Road option because of initial concerns with constructability and increased impacts to the existing highway system and environment. The proposed North Connector Road intersection would "Tee" into SR 45 approximately 3,500 feet (0.67 mile) north of the current SR 45/SR 445 intersection. The proposed North Connector Road intersection would have an at-grade intersection with SR 45. East-west movements along SR 45 would be uncontrolled while the interchange access road would be controlled by a stop sign.

Environmental Impacts

Impacts associated with both the North and South Connector Road option of the Greene/Monroe County Line interchange are included in **Table 6-15**. These design options are the same in that they do not impact any historic properties, archaeological sites, wetlands, cemeteries, or caves and major springs. A comparison of the advantages and noteworthy disadvantages of each is presented below.

Table 6-15: Overview of Key Impacts for the Greene/Monroe County Line Interchange Connector Road Options

Impacts	Greene/Monroe County Line Connector Roads			
	North Connector Road		South Connector Road	
	Low-Cost*	Initial**	Low-Cost*	Initial**
Total Cost ($M)***	28.76	43.03	29.29	43.41
Right-of-Way (Ac)	99.35	103.56	123.66	131.34
Forest (Ac)	65.59	68.80	91.26	97.19
Core Forest (Ac)	43.74	43.38	63.82	63.32
Total Wetland Impacts (Ac)	0.00	0.00	0.00	0.00
Total Stream Impacts (LF)	9,479	9,939	9,706	10,548
Karst Features (#)	0	0	0	0
Total Displacements (#)	6	6	13	13

* Low-Cost Design Criteria, ** Initial Design Criteria, ***2010 Dollars, excluding mitigation costs

$M = million dollars, Ac = acres, LF = linear feet

All impacts are by preliminary right-of-way except wetland impacts which are by construction limits.

Total cost would be less along the North Connector Road and right-of-way acquisition and impacts would also be less. The Greene/Monroe County Line interchange with the South Connector Road would displace 10 residences and 3 businesses using either the initial design criteria or low-cost design criteria. The businesses are JM Electronics, Bloomfield State Bank, and Crossroads Collectibles/Women's Fitness Center. All three are located at the SR 45/SR 445 intersection. The Greene/Monroe County Line interchange with the North Connector Road would displace 6 residences and no businesses using either the initial design criteria or low-cost design criteria.

Traffic

Table 6-16 shows the effect of the two connector road options on the predicted 2030 traffic volumes and level of service along SR 45. Two noteworthy SR 45 traffic observations associated with the Greene/Monroe County Line interchange are:

- About 500 more vehicles per day are predicted to divert from SR 45 to I-69 with the South Connector Road as compared to the North Connector Road.
- Traffic on SR 45 between SR 445 and the point of intersection with the North Connector Road is predicted to be reduced by only about 2,000 vehicles per day and operate at LOS-D. In comparison, traffic on this segment of SR 45 with the South Connector Road is predicted to be reduced by about 7,500 vehicles per day and operate at LOS-B.

Table 6-16: SR 45 Traffic Volumes and LOS – North Connector vs. South Connector						
Roadway Section	No-Build		North Connector		South Connector	
	ADT	LOS	ADT	LOS	ADT	LOS
SR 45 N of SR 445/I-69 South Connector Road	10,555	E	8,601	D	3,107	B
SR 45 N of I-69 North Connector Road	10,555	E	3,626	B	3,107	B
SR 45 W of Breeden Rd	12,524	E	5708	C	5,194	C
SR 45 NE of Harmony Rd/Garrison Chapel Rd	16,025	E	9,123	E	8,602	D
SR 45 NE of W Leonard Springs Rd	14,913	E	10,556	A	10,037	A
SR 45 SW of Curry Pike/ S Leonard Springs Rd	17,770	E	13,021	A	12,537	A
SR 45 SW of SR 37	26,461	A	25,130	B	24,861	A
Both Scenarios also include a SR 45 Interchange. Sources: I-69 Corridor Travel Demand Model for year 2030 traffic						

One of the advantages of the Greene/Monroe County Line interchange, as discussed in Section 6.3.1, is its ability to provide increased accessibility to Eastern Greene County and Bloomfield. SR 54 and SR 445 is the major route between this area and the Bloomington urban area. The South Connector Road design option would provide a more desirable and safer direct connection at the point that this traffic normally joins with the SR 45 traffic stream. The unconventional signalized "Y" intersection that exists at the intersection of SR 45 and SR 445 would be replaced by a conventional four-leg intersection where the highest volume traffic movement would be the through movement along SR 445 and the South Connector Road, exceeding traffic volumes on SR 45. The South Connector Road also would have a 0.5 mile shorter travel distance to the Greene/Monroe County Line interchange from the SR 445 and SR 45 junction as compared to the North Connector Road.

The location of the North Connector Road would leave an approximate 3,500 feet (0.67 mile) segment of SR 45, immediately north of the SR 445 intersection, at a congested LOS D. The current unconventional "Y" intersection at SR 45/SR 445 would remain and traffic from the Bloomfield and the Eastern Greene County area would have to continue north along SR 45 prior to accessing the Greene/Monroe County Line interchange via the North Connector Road. The added distance travel distance from the SR 45 and SR 445 junction to the interchange would be approximately two miles, 0.5 mile longer than the South Connector Road. The uncontrolled access and higher traffic volumes on this segment of SR 45 (between SR 445 and the North Connector Road) may also stimulate some undesirable indirect development in this environmentally-sensitive area.

Recommendation

The **South Connector Road** option was the recommended Greene/Monroe County Line interchange configuration in the DEIS because the alternative has the following advantages as compared to North Connector Road option:

- Demonstrates the best transportation performance with greater than 500 VPD traffic reductions on SR 45 from SR 445 to SR 37 compared to the North Connector.

- Provides a direct connection for travel between Eastern Greene County/Bloomfield and the Bloomington urbanized area at the point this traffic joins with SR 45.
- Replaces an unconventional, potentially confusing intersection with a safer conventional four-leg intersection.

While the South Connector Road is approximately 1,000 feet longer than the North Connector Road Option and subsequently has more impacts, it also demonstrates overall superior transportation performance and better meets the Section 4 local purpose and need goals of: increased personal accessibility for area residents, reduced existing and forecasted traffic congestion, and improved traffic safety.

The preferred Greene/Monroe County Line interchange configuration in the FEIS is the **South Connector Road** option**.** There are no substantive differences in the South Connector Road as part of Refined Preferred Alternative 2 as compared to DEIS Alternative 2.

6.4 Selection of Preferred Alternative

6.4.1 Rationale for Selection of Preferred Alternative

Alternative 2 was recommended as the Preferred Alternative for Section 4 in the DEIS. **Refined Preferred Alternative 2** is recommended as the Preferred Alternative for Section 4 in the FEIS.

Alterative 2 is comprised of subsection alignments 4A-2, 4B-1, 4C-2, 4D-1, Hybrid 4E-1/4E-2, 4F-3, 4G-2, and 4H-2. Alternative 2 would have interchanges at SR 45, Greene/Monroe County Line (with the South Connector Road), and SR 37. Section 6.2 describes the advantages and disadvantages, and summarizes the reasons for the recommended alignment alternative in each of the eight subsections that comprise the end-to-end alignment for Alternative 2. Section 6.3 describes the transportation performance measures, environmental impacts, and costs, and summarizes the reasons for the recommended interchanges for Alternative 2.

Refined Preferred Alterative 2 is comprised of subsection alignments Refined 4A-2, Refined 4B-1, Refined 4C-2, Refined 4D-1, Refined Hybrid 4E-1/4E-2, Refined 4F-3, Refined 4G-2, and Refined 4H-2. Refined Preferred Alternative 2 would have interchanges at SR 45, Greene/Monroe County Line (with the South Connector Road), and SR 37. Section 6.2 identifies substantive differences, on a subsection-by-subsection basis, between Refined Preferred Alternative 2 and Alternative 2. Section 6.3 describes the transportation performance measures, environmental impacts, and costs, and summarizes the reasons for the recommended interchanges for Alternative 2.

Table 6-17 tabulates in detail the potential impacts and estimated cost ranges associated with Refined Preferred Alternative 2 in comparison with the four alternatives presented in the DEIS. **Figure 6-4a** (p. 6-162) shows the alignment of Refined Preferred Alternative 2 within the Section 4 corridor. Alternative 1 is shown in **Figure 6-1** (p. 6-86), Alternative 2 is shown in **Figure 6-2** (p. 6-105), Alternative 3 is shown in **Figure 6-3** (p. 6-124, and Alternative 4 is shown in **Figure 6-4** (p. 6-143). Refined Preferred Alternative 2 and all four Alternatives

presented in the DEIS include interchanges at SR 45, Greene/Monroe County Line (with the South Connector Road), and SR 37.

The recommendation for Alternative 2 in the DEIS followed a period of public and regulatory agency comments on the preliminary subsection alignment alternatives and the preliminary interchange options and an evaluation and screening analysis of the alternatives to meet Purpose and Need (See Chapter 3, *Alternatives*, and Chapter 11, *Comments, Coordination, and Public Involvement*). Alternatives Carried Forward were identified and four alternatives representing end-to-end build conditions for the mainline alignment with interchanges at SR 45, Greene/Monroe County Line, and SR 37 were established for detailed study. The four alternatives presented in the DEIS were evaluated for potential impacts on the natural and human environment (See Chapter 5, *Environmental Consequences*), and costs (Section 6.2). As shown in Chapter 3, *Alternatives*, the alternatives all provide significant benefits in satisfying the local Purpose and Need goals and differences in performance of the alignment alternatives were negligible. Therefore, the preferred alignment alternative in each subsection was selected primarily based upon impacts and cost. As discussed in Section 6.3, interchange recommendations were based primarily on the ability of the interchanges to meet Purpose and Need including increased accessibility, reduced travel time for regional destinations, congestion relief, and safety benefits.

Following the issuance of the DEIS there was a formal comment period, during which time a public hearing was held (See Chapter 11*, Comments, Coordination, and Public Involvement)*. During this process, certain environmental impacts specifically directed to the alignments and interchanges for the DEIS alternatives were identified. Substantive public comments and impact concerns included noise impacts, local access, and neighborhood/socio-economic concerns along with the evaluation of purpose and need as related to the proposed interchanges and varied comments about the Greene County/Monroe County Line interchange. In response to these comments, the highway traffic noise analysis and noise abatement analysis were updated; a decision was made to include a grade separation at CR 215E in Greene County; it was decided that Evans Lane would be closed; and decisions were made to maintain local road connectivity by including grade separations at Dry Branch Creek Road, Mineral-Koleen Road, Burch Road, Harmony Road, and Bolin Lane for the Refined Preferred Alternative 2. These and other local concerns about neighborhood impacts, particularly for the Rolling Glen Estates subdivision, effects upon school bus routes and bicycle lanes, and emergency response services as well as regulatory agency comments were considered in the selection of the subsection alternatives that together form Refined Preferred Alternative 2.

6.4.1.1 Preferred Alignment for Refined Preferred Alternative 2

Subsection 4A

In the DEIS, **Alternative 4A-2** was selected because it is a substantively safer alignment in the Section 3-4 overlap area. The tangent alignment along the selected Section 3 Alternative 3E-1 alignment continuing east to the Alternative 4A-2 alignment creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange as compared to a modified Section 3 Alternative 3E-1 alignment that would connect with the Hybrid 4A-1/4A-2 alignment.

Total cost would be less than Alternative Hybrid 4A-1/4A-2 using the low-cost design criteria and the combined total cost (Alternative 4A-2 plus Section 3 Alternative 3E-1 within the overlap area) would be less than Alternative Hybrid 4A-1/4A-2 plus a Section 3 modified Alternative 3E-1 alignment within the overlap area. Right-of-way acquisition would also be less than Alternative Hybrid 4A-1/4A-2 and less than the Section 3 modified Alternative 3E-1 alignment within the overlap area. Core forest impacts would be less than Alternative Hybrid 4A-1/4A-2. No displacements would occur for Alternative 4A-2. Other advantages that support the recommendation for Alternative 4A-2 include less managed land impacts than Alternative Hybrid 4A-1/4A-2. Farmland impacts would also be less than Alternative Hybrid 4A-1/4A-2 and less than the Section 3 modified Alternative 3E-1 alignment within the overlap area.

Refined Alternative 4A-2 is the recommended alternative for Subsection 4A. Refinements that were made to DEIS preferred Alternative 4A-2 involved two changes to local access. Under Refined Alternative 4A-2, CR 200E would be closed and a grade separation would be built along CR 215E. A grade separation at CR 200E and closing CR 215E were proposed in the DEIS for preferred Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2. INDOT's decision regarding these two local access changes was made after extensive coordination with local public officials, public organizations, and individuals. The refined local access changes would be made under both the initial design criteria and the low-cost design criteria for Refined Alternative 4A-2. In addition to the benefits of improved local access, Refined Alternative 4A-2 would also have a lower total cost and less managed land impacts than DEIS preferred Alternative 4A-2 and Alternative Hybrid 4A-1/4A-2. Forest impacts would be less than DEIS preferred Alternative 4A-2. Right-of-way acquisition, stream relocation impacts, and farmland impacts would be less than DEIS preferred Alternative 4A-2 under the low-cost design criteria. Core forest, displacement, managed land, and farmland impacts would be less than Alternative Hybrid 4A-1/4A-2. With regards to other comparisons with DEIS preferred Alternative 4A-2, Refined Alternative 4A-2 would have the same core forest, wetland, displacement, and floodplain impacts and the same farmland and stream relocation impacts under the low-cost design criteria.

With regards to roadway geometric considerations, the tangent (straight) alignment for Refined Alternative 4A-2 creates a more desirable and safer approach for motorists entering and exiting the US 231 interchange. This is consistent with DEIS preferred Alternative 4A-2. For combined impacts, which includes the Subsection 4A alignment plus Section 3 Alternative 3E-1 within the overlap area, the combined total cost for Refined Alternative 4A-2 would be less than the combined total cost for DEIS preferred Alternative 4A-2 and the combined total cost for Alternative Hybrid 4A-1/4A-2. Combined right-of-way acquisition for Refined Alternative 4A-2 under the low-cost design criteria would also be less than the combined right-of-way acquisition for DEIS preferred Alternative 4A-2 and the combined right-of-way acquisition for Alternative Hybrid 4A-1/4A-2.

Subsection 4B

Alternative 4B-1 was selected in the screening of alternatives (see Chapter 3, *Alternatives*). Alternative 4B-1 was the only Subsection 4B alternative that was carried forward and is included in each of the four alternatives. CR 600S would be closed. Alternative 4B-1 has no wetland

impacts, and forest and stream impacts would be less than estimated during the preliminary alternatives screening.

Refined Alternative 4B-1 is the recommended alternative for Subsection 4B. The only refinements that were made to DEIS preferred Alternative 4B-1 involved minor design modifications. These design modifications were made at various locations along the alignment for both the initial design criteria and the low-cost design criteria. As a result of these design modifications, Refined Alternative 4B-1 would have a lower total cost, less right-of-way acquisition and less forest, core forest, stream, and noise impacts as compared to DEIS preferred Alternative 4B-1. All other impacts for Refined Alternative 4B-1 are the same as DEIS preferred Alternative 4B-1.

Subsection 4C

In the DEIS, **Alternative 4C-2** was selected because the total cost, right-of-way acquisition, forest, core forest, stream, and karst feature impacts would be less than Alternative 4C-1. Wetland impacts would be less using the initial design criteria and would be the same as Alternative 4C-1 using the low-cost design criteria. Other advantages that support the recommendation for Alternative 4C-2 include less managed land, stream relocation, and floodplain impacts.

Refined Alternative 4C-2 is the recommended alternative for Subsection 4C. The only refinements that were made to DEIS preferred Alternative 4C-2 involved minor design modifications. These design modifications were made at various locations along the alignment for both the initial design criteria and the low-cost design criteria. As a result of these design modifications, Refined Alternative 4C-2 would have a lower total cost as compared to Alternative 4C-1 and a lower total cost as compared to DEIS preferred Alternative 4C-2 under the low-cost design criteria. Right-of-way acquisition and forest, core forest, stream, karst feature, and managed land impacts would be less than Alternative 4C-1. Noise impacts would be less than Alternative 4C-2. Wetland and farmland impacts would be less than Alternative 4C-1 using the initial design criteria. Stream relocation impacts would be less than Alternative 4C-1 and would be less than DEIS preferred Alternative 4C-2 using the initial design criteria. With regards to other comparisons with DEIS preferred Alternative 4C-2, Refined Alternative 4C-2 would have the same wetland, karst feature, displacement and floodplain impacts and the same farmland impacts under the low-cost criteria.

Subsection 4D

Alternative 4D-1 was selected in the screening of alternatives (see Chapter 3, *Alternatives*). Alternative 4D-1 was the only Subsection 4D alternative that was carried forward and is included in each of the four Alternatives. Alternative 4D-1 avoids the recharge area of a major spring. Forest, wetland, and stream impacts would be less than estimated during the preliminary alternatives screening. Grade separations/bridges over Dry Branch Creek/Dry Branch Road and over Mineral-Koleen Road/Plummer Creek are proposed. Two options that would shorten either or both bridges/grade separations and terminate the roads at I-69 were proposed for consideration.

Refined Alternative 4D-1 is the recommended alternative for Subsection 4D. The only refinements that were made to DEIS preferred Alternative 4D-1 involved minor design modifications. These design modifications were made at various locations along the alignment for both the initial design criteria and the low-cost design criteria. Grade separations/bridges over Dry Branch Creek/Dry Branch Road and over Mineral-Koleen Road/Plummer Creek are included in Refined Alternative 4D-1. As a result of these design modifications, Refined Alternative 4D-1 would have a lower total cost as compared to DEIS Alternative 4D-1 under the initial design criteria. Noise impacts would be less than Alternative 4D-1. With regards to other comparisons with DEIS Alternative 4D-1, Refined Alternative 4D-1 would have the same wetland, karst feature, displacement, farmland, stream relocation and floodplain impacts, the same right-of-way acquisition under the initial design criteria, and the same stream impacts under the low-cost design criteria.

Subsection 4E

Alternative Hybrid 4E-1/4E-2 was selected in the screening of alternatives (see Chapter 3, *Alternatives*). Alternative Hybrid 4E-1/4E-2 was the only Subsection 4E alternative that was carried forward and is included in each of the four alternatives. Forest impacts would be less than estimated during the preliminary alternatives screening. The development of Alternative Hybrid 4E-1/4E-2 includes an interchange at SR 45 and a grade separation at SR 54. Cedar Road, Old Clifty Road, and CR 1250E (on the north side of I-69) would be closed. Access Road 2 would maintain the current travel between Pine Road and Spruce Road within Clifty Hills subdivision. Access Road 3 would provide access to properties located adjacent to the west side of the SR 45 interchange south of I-69. Access Road 4 would connect CR 1250E south of I-69 with SR 54. Access Road 5 would provide access to properties located immediately east of SR 54 south of I-69.

Refined Alternative Hybrid 4E-1/4E-2 is the recommended alternative for Subsection 4E. The most substantial change to DEIS preferred Alternative Hybrid 4E-1/4E-2 was refinement of the vertical road profile under the initial design criteria from approximately 0.48 miles east of SR 45 to the Subsection 4E/Subsection 4F breakline. Other changes to DEIS preferred Alternative Hybrid 4E-1/4E-2 involved modifications of Access Road 2 at the junction of Spruce Road and Pine Road in the Clifty Hills subdivision (now referred to as Access Road 2a), the addition of Access Road 6 along SR 45 in the northeast quadrant of the SR 45 interchange, and minor design modifications at various locations. The local access refinements and minor design modifications were made for both the initial design criteria and the low-cost design criteria. As a result of the refined vertical road profile, two access road changes, and design modifications, Refined Alternative Hybrid 4E-1/4E-2 would have a lower total cost, less right-of-way acquisition, and less forest, core forest, wetland, stream, noise, managed land, farmland, and stream relocation impacts as compared to DEIS preferred Alternative Hybrid 4E-1/4E-2. Right-of-way acquisition and core forest impacts would be less than DEIS preferred Alternative Hybrid 4E-1/4E-2 using the low-cost design criteria. Noise impacts would be less than Alternative Hybrid 4E-1/4E-2. With regards to other comparisons with DEIS preferred Alternative Hybrid 4E-1/4E-2, Refined Alternative Hybrid 4E-1/4E-2 would have the same karst feature, displacement and floodplain impacts and the same wetland impacts under the low-cost design criteria.

Subsection 4F

In the DEIS, **Alternative 4F-**3 was selected because total cost would be the least of all four Subsection 4F Alternatives. Forest, core forest, wetland, and displacement impacts also would be the least of all four Subsection 4FAlternatives. Karst feature impacts would be less than Alternatives 4F-1 and 4F-5 (Alternatives 4F-3 and 4F-4 have the same impacts to karst features). Other advantages that support the recommendation for Alternative 4F-3 include maintaining direct access to all Greene County properties situated along CR 150N west of the county line including access by Greene County emergency service vehicles and school busses and avoiding properties in Whippoorwill Subdivision, Sparks Cemetery, and the Indian Creek Township fire station.

Refined Alternative 4F-3 is the recommended alternative for Subsection 4F. The most substantial change to DEIS preferred Alternative 4F-3 was refinement of the vertical road profile under the initial design criteria. This refinement was made at two locations along DEIS preferred Alternative 4F-3. These are between the Subsection 4E/Subsection 4F breakline and a point approximately 0.34 miles north of Hobbieville Road and between a point approximately 0.52 miles north of Carter Road and the Subsection 4F/Subsection 4G breakline. Minor design modifications were also made at various locations. These minor design modifications were made for both the initial design criteria and the low-cost design criteria. As a result of the two refinements to the vertical road profile and the design modifications, Refined Alternative 4F-3 would have less right-of-way acquisition and less core forest, wetland, stream, noise, farmland, stream relocation, and floodplain impacts as compared to DEIS preferred Alternative 4F-3. Forest, core forest, noise, and managed land impacts would also be less than DEIS preferred Alternative 4F-3 under the low-cost design criteria. Forest, core forest, wetland, karst feature, displacement, and noise impacts would be less than Alternative 4F-1 and total cost would be less than Alternative 4F-1 under the initial design criteria. Right-of-way acquisition and forest, core forest, wetland, stream, displacement, noise, stream relocation, and floodplain impacts would be less than Alternative 4F-4 and total cost would be less than Alternative 4F-4 under the initial design criteria. Total cost and forest, core forest, wetland, karst feature, and displacement impacts would be less than Alternative 4F-5. With regards to other comparisons with DEIS preferred Alternative 4F-3, Refined Alternative 4F-3 would have the same karst feature, and displacement impacts and the same wetland and floodplain impacts under the low-cost design criteria.

Subsection 4G

Alternative 4G-2 was selected in the screening of alternatives (see Chapter 3, *Alternatives*). Alternative 4G-2 was the only Subsection 4G alternative that was carried forward and is included in each of the four end-to-end alternatives. The alignment impacts fewer karst features and avoids a cave in which state endangered cave biota have been found as compared to discarded Alternative 4G-1. Forest and stream impacts would be less than estimated during the preliminary alternatives screening. Grade separations are proposed at Burch Road, Evans Lane, Harmony Road, and Rockport Road. No local roads would be closed, however, three options that would eliminate any or all of the grade separations at Burch Road, Evans Lane and Harmony Road and terminate the roads at I-69 were was considered in the DEIS.

Refined Alternative 4G-2 is the recommended alternative for Subsection 4G. The most substantial change to DEIS preferred Alternative 4G-2 was refinement of the vertical road profile under the initial design criteria. This refinement was made along the entire length of Alternative 4G-2. Refined Alternative 4G-2 also includes closing Evans Lane. Under DEIS preferred Alternative 4G-2, a grade separation was proposed at Evans Lane. INDOT's decision to close Evans Lane was made in consideration of input from area residents, local public officials, public organizations and additional engineering analysis. Refined Preferred Alternative 4G-2 would include grade separations at Burch Road and Harmony Road. Minor design modifications were also made under the low-cost design criteria at various locations along the alignment. Refinement of the vertical road profile, the closing of Evans Lane, and the minor design modifications would result in a lower total cost, less right-of-way acquisition, and less forest, stream, noise, farmland, and stream relocation impacts as compared to DEIS preferred Alternative 4G-2. Right-of-way acquisition, and farmland impacts would be less than DEIS preferred Alternative 4G-2 using the low-cost design criteria. With regards to other comparisons with DEIS Alternative 4G-2, Refined Alternative 4G-2 would have the same wetland, managed land and floodplain impacts and the same karst feature impacts under the low-cost design criteria.

Subsection 4H

In the DEIS, **Alternative 4H-2** was selected because total cost and impacts to forest and core forest would be less than Alternative 4H-3. Alternative 4H-2 would have more impacts to karst features than Alternative 4H-3 using the initial design criteria, however, Alternatives 4H-2 and 4H-3 have the same (and fewest) number of karst features impacts using the low-cost design criteria. Total displacements would be less than Alternative 4H-3 and Alternative 4H-2 would not displace 3D Stone, Inc. Alternative 4H-1 was not considered because it would have more right-of-way acquisition and more forest, stream, karst feature, noise, and managed land impacts as compared to Alternatives 4H-2 and 4H-3. No local roads would be closed, however, an option that would eliminate the grade separation at Bolin Lane and terminate the road at I-69 was considered in the DEIS.

Refined Alternative 4H-2 is the recommended alternative for Subsection 4H. Refinements that were made to DEIS preferred Alternative 4H-2 involved the addition of Access Road 7 (both for the initial design criteria and low-cost design criteria) and minor design modifications (low-cost design criteria) at various locations along the DEIS preferred Alternative 4H-2 alignment. Access Road 7 was added to Refined Alternative 4H-2 following coordination with local public officials, public organizations, and individuals and additional engineering analysis. This access road connects Glenview Drive to Bolin Lane and maintains the connection between Glenview Drive and Wheaton Court. In addition to the benefits of the local access improvements, which includes maintaining a second access point for the Rolling Glen Estates subdivision via Glenview Drive, these refinements would also result in a lower total cost and less forest impacts than Alternative 4H-1 and Alternative 4H-3 and less than DEIS preferred Alternative 4H-2 under the low-cost design criteria. Noise impacts are less than Alternatives 4H-1, 4H-2, and 4H-3. Right-of-way acquisition and core forest, stream, karst feature, managed land, and stream relocation impacts are less than Alternative 4H-1 and noise impacts are less than Alternative 4H-1 using the initial design criteria. Forest and stream impacts are less than DEIS preferred

Alternative 4H-2 using the low-cost criteria. Core forest and stream relocation impacts are less than Alternative 4H-3 and managed land impacts are less than Alternative 4H-3 using the initial design criteria. With regards to other comparisons with DEIS preferred Alternative 4H-2, Refined Alternative 4H-2 would have the same core forest, wetland, karst feature, displacement, stream relocation and floodplain impacts and the same managed land impacts under the initial design criteria.

6.4.1.2 Preferred Interchanges for Refined Preferred Alternative 2

Interchange Option #1 is the recommended preferred combination of intermediate interchanges for alignment Refined Preferred Alternative 2. This option includes interchanges at SR 45, the Greene/Monroe County Line with a South Connector Road access to SR 45, and SR 37. The potential impacts and estimated cost ranges tabulated in **Table 6-17** include this combination of interchanges. **Figure 6-2** (p. 6-105) also shows the preferred configuration of these interchanges with alignment **Refined Preferred Alternative 2**.

Interchange Option 1 is the recommended preferred combination of intermediate interchanges because it would provide the greatest congestion relief and reduction in crashes in the five-county Study Area especially along SR 45. It also has the greatest traffic volume usage. Individually the two intermediate interchange locations, SR 45 and Greene/Monroe County Line, were both designed to address the Section 4 Tier 2 Purpose and Need goals, but each makes it own unique contribution. The SR 45 interchange would provide regional access for southeast Greene County, direct access to Crane NSWC, and congestion relief on SR 45 between US 231 and SR 54. The Greene/Monroe County line interchange has considerable local government and public support, provides accessibility for emergencies along I-69, and reduces traffic volumes and congestion on SR 45 from SR 445 into Bloomington.

The **South Connector Road** option is recommended as part of the Greene/Monroe County Line interchange because it demonstrates overall superior transportation performance and better meets the Section 4 local purpose and need goals of increased personal accessibility for area residents, reduced existing and forecasted traffic congestion, and improved traffic safety. It provides a shorter, direct connection for travel between Eastern Greene County/Bloomfield and the Bloomington urbanized area at the point this traffic joins with SR 45. It also increases transportation system safety because it replaces an unconventional "Y" intersection at SR 45/445 with a conventional 4-legged intersection.

The SR 37 interchange is considered a necessary linkage to the state highway system and is included all alternatives.

This combination of intermediate interchanges best meets the Section 4 Purpose and Need goals of increased accessibility and reduced travel time to regional destinations, especially to Crane NSWC, Eastern Greene County and Western Monroe County. It also performs best in relieving congestion and improving safety on SR 45 throughout the Section 4 Study Area.

Deferred SR 37 Interchange Construction

Due to the tiered approach of the six sections of the I-69 Tier 2 studies and the staging of construction along the 142-mile I-69 improvement, it is planned that the new freeway in Sections 1, 2, 3, and 4 will be complete and open to traffic before Sections 5 and 6 are constructed. The construction of the full interchange at SR 37 is anticipated to be deferred until construction of the southern portion of the Section 5. In the interim between the completion of Section 4 and the completion of Section 5, a temporary signalized "T" intersection would be constructed between I-69 and SR 37 at Section 4's northern terminus; see **Appendix PP**, *Interim SR 37 Interchange Design* for specifics. This proposed interim design would result in deferred construction cost savings ranging from $19 to $20 million. INDOT intends to purchase the right-of-way for the full build out of the SR 37 interchange regardless of whether the interchange construction is deferred, and this savings reflects these right-of-way purchases.

The signalized intersection for the Interim SR 37 connection would serve as an indicator to drivers on the Interstate that they are leaving the access controlled interstate for a lower speed, non-access controlled facility. In addition, an Interim SR 37 intersection would require minimal disruption of traffic during its initial construction while also helping to facilitate future maintenance of traffic for the construction of the full interchange.

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Table 6-17: Comparative Impacts Summary - Section 4 Alternatives

DEIS Section	Potential Impacts	Section 4 Alternatives									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
		Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
	Length (miles)	26.67	26.67	26.68	26.68	26.55	26.55	26.72	26.72	26.68	26.68
	Estimated costs ($M) in 2010 dollars including design, construction, ROW, relocation, utilities, mitigation	$535.11	$796.01	$530.26	$777.76	$537.99	$801.27	$536.12	$791.91	$532.01	$732.69
5.2 Social Impacts	**Relocations / displacements:**										
	Residential	73	77	62	67	69	75	65	70	71	75
	Institutional	0	0	0	0	0	1	0	0	0	0
	Business	4	5	4	5	5	6	4	5	4	4
	Acres of ROW to be acquired: Total	1,468.07	1,835.51	1,457.09	1,829.84	1,454.12	1,831.40	1,456.68	1,829.83	1,455.50	1,809.39
5.3 Land Use and Community Impacts	Agricultural	299.69	382.49	356.01	468.03	327.70	429.14	326.69	426.08	356.03	461.36
	Developed	146.51	162.34	134.97	149.56	140.58	161.92	143.63	155.61	134.01	146.46
	Mines/Quarries	0.00	0.00	0.96	0.96	0.00	0.00	0.96	0.96	0.96	0.96
	Upland habitat (includes non-wetland forest, herbaceous cover, and scrub/shrub areas)	1,019.22	1,281.32	963.18	1,201.91	983.13	1,230.96	983.11	1,236.92	962.29	1,191.66
	Open water (lakes, ponds, PUBs)	1.98	2.73	1.53	2.40	1.61	2.31	2.04	2.96	1.45	2.14
	Streams	15.46	19.48	15.79	19.80	15.09	18.64	15.33	19.12	15.80	19.42
	Wetlands: (Emergent / forested / scrub/shrub)	9.65	15.58	7.14	12.25	7.00	12.08	9.46	15.28	7.15	12.25
	Agricultural Land, Indirect Impacts (acres):	106	106	106	106	106	106	106	106	106	106
	Forest Land, Indirect Impacts (acres):	54	54	54	54	54	54	54	54	54	54
	Local road access impacts:										
	Roads closed	12	12	15	15	15	15	13	13	13	13
	Overpass, interchange, relocate	20	20	21	21	21	21	20	20	21	21
	Proposed access roads – relocating of existing ***	2	2	2	2	2	2	2	2	3	3
	Proposed access roads to landlocked parcels ***	2	2	3	3	3	3	2	2	4	4
5.4 Farmland	**Farmland impacts:**										
	Total farmland acres to be acquired for ROW	299.69	382.49	356.01	468.03	327.70	429.14	326.69	426.08	356.03	461.36
	Cropland acres to be acquired	199.63	254.57	239.08	313.42	214.22	278.86	220.77	286.83	239.28	309.96
	Agricultural land indirect impacts	106	106	106	106	106	106	106	106	106	106
	Number of uneconomic remnants	10	9	13	12	16	15	9	8	13	12
	Number of parcels landlocked	13	13	18	16	16	15	15	13	18	16
	NRCS-CPA-106 form results:										
	Prime/unique farmland acres in ROW:										
	Greene County	250.9	335.4	238.1	309.5	251.8	309.7	250.4	322.1	n/a	n/a
	Monroe County	169.4	208.3	208.5	238.5	182.4	226.5	128.4	166.6	n/a	n/a
	Statewide + local important farmland acres in ROW	0	0	0	0	0	0	0	0	n/a	n/a
	Total points: relative value of farmland to be converted + Corridor assessment:										
	Greene County	110	111	117	118	119	119	117	117	n/a	n/a
	Monroe County	135	135	135	134	130	130	135	134	n/a	n/a
	Estimated crop production loss—total Greene + Monroe Counties:	$81,468	$103,783	$97,132	$127,374	$86,709	$112,906	$90,454	$117,346	$97,215	$126,015
5.5 Economic Impacts	**Economic impacts:**										
	Estimated loss in tax base	$381,749	$405,276	$320,986	$347,618	$405,361	$437,567	$342,206	$369,282	$342,302	$365,089
	Estimated crop production loss (i.e., farm income)	$81,468	$103,783	$97,132	$127,374	$86,709	$112,906	$90,454	$117,346	$97,215	$126,015
	Induced growth projected—year 2030, total Daviess & Greene Counties:										
	Housing units	476	476	476	476	476	476	476	476	476	476
	Jobs	771	771	771	771	771	771	771	771	771	771

Table 6-17: Comparative Impacts Summary - Section 4 Alternatives

DEIS Section	Potential Impacts	Section 4 Alternatives									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
		Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
5.6 Traffic	**Access**										
	Proposed interchanges	SR 45, Greene/Monroe County Line, and SR 37		SR 45, Greene/Monroe County Line, and SR 37		SR 45, Greene/Monroe County Line, and SR 37		SR 45, Greene/Monroe County Line, and SR 37		SR 45, Greene/Monroe County Line, and SR 37	
	Proposed Grade Separations	17		18		18		17		18	
	Proposed Road Closures	12		15		15		13		13	
	Proposed access roads relocating of existing: number & total length, in feet ***	2/2,550		2/2,550		2/2,550		2/2,550		3/2,500	
	Proposed access roads to landlocked parcels: number & total length, in feet ***	2/900		3/1,900		3/1,900		2/900		4/2,050	
	Traffic volumes on state & local roads—percent variance from No Build										
	SR 45/58 E of CR 200E	-26.60%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-26.60%	
	SR 45/58 E of CR 900E	-28.80%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-28 80%	
	SR 45 N of SR 58	-41.00%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-41 00%	
	SR 45 S of I-69	-21.90%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-21 90%	
	SR 45 N of I-69	-32.10%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-32.10%	
	SR 54 N of SR 58	-7.00%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-7.00%	
	SR 54 S of Hobbieville Rd	-4.90%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-4.90%	
	SR 54 S of SR 45/SR 54 South Junction	-0.40%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-0.40%	
	SR 54/45	-22.10%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-22.10%	
	SR 54 W of SR 445	-0.40%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-0.40%	
	SR 445 W of SR 45	-0.40%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-0.40%	
	SR 45 S of SR 445	-33.80%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-33 80%	
	SR 45 N of SR 445	-70.60%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-70.60%	
	SR 45 W of Breeden Rd	-58.50%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-58 50%	
	SR 45 NE of Harmony Rd/Garrison Chapel Rd	-46.30%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-46 30%	
	SR 45 NE of W Leonard Springs Rd	-28.40%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-28.40%	
	SR 45 SW of Curry Pike/ S Leonard Springs Rd	-29.50%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-29 50%	
	SR 45 SW of SR 37	-5.90%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-5.90%	
	SR 37 S of Victor Pike	-0.10%		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		-0.10%	
5.7 Visual	**View from / of I-69:**										
	View from the road	Views will be limited due to terrain and/or dense vegetation. Some panoramic views will occur.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
	View of the road	Views from adjacent residences will be limited in many areas due to excava ion for the roadway construction. The roadway will be visible in the area north of Tramway Road.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.8 Environmental Justice	**Impact on minority/low-income populations**	*See Alternative 2*		No disproportionately high or adverse effect on minority or low-income populations.		*See Alternative 2*		*See Alternative 2*		*See Alternative 2*	
5.9 Air Quality	**Air quality standard exceedances predicted (based on current SIP budget)**	0	0	0	0	0	0	0	0	0	0

Table 6-17: Comparative Impacts Summary - Section 4 Alternatives

DEIS Section	Potential Impacts	Section 4 Alternatives									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
		Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
5.10 Noise	**Total Number of Impacted Noise Receptors**	150	170	163	165	156	165	147	151	90	88
	Impacted Receptors that Approach or Exceed NAC	0	1	0	0	0	0	0	0	0	0
	Impacted Receptors that Approach or Exceed NAC and have a Substantial Increase	8	11	9	13	9	11	8	12	6	6
	Impacted Receptors with a Substantial Increase	142	158	154	152	147	154	139	139	84	82
	Impacted Receptors with Substan ial Increases from 15 dBA to 20 dBA	103	118	97	91	93	86	85	78	51	50
	Impacted Receptors with Substan ial Increases from 20 dBA to 25 dBA	38	39	52	59	49	64	48	58	32	33
	Impacted Receptors with Substan ial Increases from 25 dBA and Greater	9	12	14	15	14	15	14	15	7	5
5.11 Wild & Scenic Rivers	**Wild & Scenic Rivers impacts**	None in Study Area		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.12 Construction	**Construction impacts**	Temporary dust, noise, traffic delays, karst, and water quality impacts.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.13 Historic Resources	**National Register of Historic Places eligible or listed resources**	No Adverse Effect		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.14 Archaeological Resources	**National Register of Historic Places eligible or listed resources**	‡Adverse Effect on Below Ground Resources		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.15 Mineral Resources	**Mineral resources potentially in ROW:**										
	Potentially Marketable Limestone (Acres)	286	359	278	357	279	354	278	357	279	349
	Abandoned Limestone Quarries	0	0	1	1	0	0	1	1	1	1
	Active Limestone Quarries	0	0	0	0	0	0	0	0	0	0
	Active Oil/Gas Wells (number of wells)	0	0	0	0	0	0	0	0	0	0
	Abandoned/Dry Oil/Gas Wells (number of wells)	1	1	1	1	1	1	1	1	1	1
5.16 Hazardous Waste	**HAZMAT sites potentially in ROW:**	5	5	5	5	6	6	5	5	5	5
	Sec-4 HM-3 (gas station, underground storage tanks (UST's))	Potential	Poten ial	Potential	Poten ial	Poten ial	Poten ial	Potential	Potential	Potential	Potential
	Sec-4 HM-5 (lumber yard/mill)	Potential	Poten ial	Potential	Poten ial	Poten ial	Poten ial	Potential	Potential	Potential	Potential
	Sec-4 HM-6 (open dump/auto graveyard)	Potential	Poten ial	Potential	Poten ial	Poten ial	Poten ial	Potential	Potential	Potential	Potential
	Sec-4 HM-7 (3-D Stone, Inc.)	No-Impact	No-Impact	No-Impact	No-Impact	Poten ial	Poten ial	No-Impact	No-Impact	No-Impact	No-Impact
	Dry Well (located near CR 600 S, Greene County)	Potential	Poten ial	Potential	Poten ial	Poten ial	Poten ial	Potential	Potential	Potential	Potential

Table 6-17: Comparative Impacts Summary - Section 4 Alternatives

DEIS Section	Potential Impacts	Section 4 Alternatives									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
		Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
5.17 Threatened & Endangered Species	**Impacts to listed species:**										
	Federal-listed threatened/endangered (Corridor studied for Indiana bat, bald eagle)	Indiana bats captured near the corridor; no roosts located in the corridor. Formal Section 7 consultation on-going. No T/E species found in corridor; no impact expected.									
	State-listed threatened/ endangered/rare/special concern	Habitat for the Indiana cave springtail, Packard's groundwater amphipod, Bollman's cave millipede, Jeannel's groundwater ostracod, Ray's cave beetle, Krekeler's cave ant bee le, Ashcraft cave springtail, hilly springtail, Fountain cave springtail, Weingartner's cave flatworm, Indiana cave amphipod, eastern spadefoot, mudpuppy, eastern box turtle, barn owl, loggerhead shrike, red-shouldered hawk, sharp-shinned hawk, Henslow's sparrow, cerulean warbler, hooded warbler, evening bat, lit le brown bat, eastern pipistrelle, eastern red bat, northern myotis and the bobcat will be impacted at various locations within the corridor.								
5.18 Wildlife	**Wildlife habitat impacts (acres):**										
	Dry-Mesic Upland Forest	434.88	558.44	414.49	533.34	417.43	543.28	437.85	563.8	414.46	532.26
	Forest Fragment	9.68	12.1	10.84	13.29	11.48	14.25	8.97	11.41	10.9	12.93
	Mesic Floodplain Forest	42.82	56.75	37.78	51.43	38.95	51.01	40.09	54.11	37.92	51.45
	Mesic Upland Forest	456.31	553.21	419.74	509.82	442.26	539.86	413.1	497.8	419.74	503.66
	Mid Successional Forest	20.86	28.55	37.51	43.71	29.73	32.5	24.24	32.47	37.52	42.86
	Old Field	54.67	72.27	42.82	50.32	43.28	50.06	58.86	77.33	41.75	48.5
	Upland Habitat Subtotal	**1019.22**	**1281.32**	**963.18**	**1201.91**	**983.13**	**1230.96**	**983.11**	**1236.92**	**962.29**	**1191.66**
	Open water (ponds and lakes, including PUBs)	3.37	4.32	2.53	3.48	2.78	3.24	3.61	4.56	1.71	2.35
	Wetlands (forested/emergent & scrub/shrub) (See 5.19 for details)	7.56	13.09	5.32	9.58	5.26	9.43	7.43	12.86	5.32	9.55
	Total acres in ROW & percent of corridor total	**1030.15** 21.16%	**1298.73** 26.67%	**971.03** 19.94%	**1214.97** 24.95%	**991.17** 20.35%	**1243.63** 25.54%	**994.15** 20.42%	**1254.34** 25.76%	**969.32** 19.91%	**1203.56** 24.72%
	Streams (linear feet) (See 5.19 for details)	93,467	111,725	93,110	112,801	93,610	112,698	90,053	108,083	93,196	111,247
5.19 Water Resources	**Surface water impacts:**										
	Emergent Wetland	5.22	7.74	3.33	5.37	3.33	5.37	5.21	7.72	3.33	5.34
	Forested Wetland	2.12	4.83	1.81	3.76	1.93	3.99	2.00	4.62	1.81	3.76
	Scrub/Shrub We land	0.22	0.52	0.18	0.45	0.00	0.07	0.22	0.52	0.18	0.45
	TOTALS (Ac)	7.56	13.09	5.32	9.58	5.26	9.43	7.43	12.86	5.32	9.55
	Ephemeral	68,787	79,603	66,312	77,997	66,699	78,414	65,750	76,453	66,379	77,206
	Intermittent	18,496	23,355	20,124	25,400	20,882	25,798	17,534	22,551	20,143	25,035
	Perennial	6,184	8,767	6,674	9,404	6,029	8,486	6,769	9,079	6,674	9,006
	TOTALS (LF)	93,467	111,725	93,110	112,801	93,610	112,698	90,053	108,083	93,196	111,247
	Stream Relocations (LF)	28,338	34,069	30,827	38,556	31,328	37,950	24,876	32,367	30,861	37,325
	Floodplain (Ac)	31.01	43.73	36.26	53.07	38.45	53.93	32.25	45.20	36.26	50.97
	Ground water impacts:										
	Private wells	45	44	46	46	43	42	45	46	46	46
	Public wells	0	0	0	0	0	0	0	0	0	0
	Wellhead protec ion zones (AC)	0	0	0	0	0	0	0	0	0	0
	Sole Source Aquifers—*None in Study Area*	0	0	0	0	0	0	0	0	0	0
	Riparian impact: Acres	327.56	400.08	323.79	397.74	323.08	398.83	315.72	385.03	323.59	391.81
5.20 Forest	**Forest impacts:** total acres of impact & percent of total (4420.19 acres)	936.13 21.18%	1,173.23 26.54%	873.82 19.77%	1,098.35 24.85%	900.57 20.37%	1,138.14 25.75%	893.04 20.20%	1,120.33 25.35%	873.93 19.77%	1,091.13 24.69%
	Forest 38 wetland impacts (acres)	0.00	2.17	0.01	1.51	0.01	1.51	0.00	2.17	0.01	1.51
	Forest 40 wetland impacts (acres)	1.44	1.64	1.42	1.62	1.42	1.62	1.44	1.64	1.42	1.62
	Forest 49 wetland impacts (acres)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	Forest 53 wetland impacts (acres)	0.09	0.25	0.09	0.25	0.09	0.25	0.09	0.25	0.09	0.25
	Forest 67 wetland impacts (acres)	0.06	0.15	0.06	0.15	0.06	0.15	0.06	0.15	0.06	0.15
	Forest 82 wetland impacts (acres)	0.12	0.21	0.00	0.00	0.12	0.23	0.00	0.00	0.00	0.00
	Forest 100 wetland impacts (acres)	0.00	0.00	0.15	0.15	0.15	0.15	0.00	0.00	0.15	0.15
	Forest 101 wetland impacts (acres)	0.33	0.33	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00
	Total, All Upland Forests	934.01	1,168.40	872.01	1,094.59	898.64	1,134.15	891.04	1,115.71	872.12	1,087.37
	Core forest impacts:	1,019.85	1,124.50	895.64	994.30	957.51	1,063.55	960.18	1,064.98	894.59	987.23
5.21 Karst	**Karst features (#)**	108	122	88	107	88	103	94	113	88	108

Table 6-17: Comparative Impacts Summary - Section 4 Alternatives

DEIS Section	Potential Impacts	Section 4 Alternatives									
		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Refined Preferred Alternative 2	
		Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**	Low-Cost*	Initial**
5.22 Managed Land	**Acres In ROW**	227.71	294.36	204.10	259.48	205.82	262.92	222.08	290.15	203.82	256.65
5.23 Permits	**Permits potentially needed prior to construction**	USACE Section 404; IDEM 401, Rule 5, isolated wetland; IDNR Construction in a Floodway, USEPA Class 5 Injection Well		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.24 Cumulative Impacts	**Cumulative land use changes (acres)—Greene and Monroe Counties:** Direct conversion of agricultural land to ROW	**Calculated only for the Refined Preferred Alternative**								356	461
	Indirect conversion of agricultural land									106	106
	Total Changes from Others of agricultural land (incl. No-Build)									2,930	2,930
	Direct conversion of forest land to ROW									872	1,087
	Indirect conversion of forest land									54	54
	Total Changes from Others of forest land (incl. No-Build)									2,163	2,163
	Total Cumulative Land Use Change									**6,481**	**6,801**
5.25 Energy	**Energy impacts**	Major one-time energy resources demand during construction. Once in operation, greater fuel consumption than No-Build due to higher speed and vehicle miles traveled.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.26 Short-Term vs. Long-Term	**Short-term uses versus long-term productivity**	Temporary construction impacts; permanent loss of cropland; residential displacements.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
		Completes a link in I-69 National Corridor and enhances local & regional long-term productivity.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
5.27 Irreversible or Irretrievable Commitment of Resources	**Irreversible & irretrievable commitment of resources**	Potential Impacts include permanent commitment of dollars & resources for construction; environmental impacts from induced development. Anticipated benefits include improved accessibility & safety, time savings, greater availability of services.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
8 Sections 4 (f) & 6(f)	**Section 4(f) evaluation**	No direct or constructive use of publicly owned park, recreational area, wildlife/waterfowl refuge, or land from a historic property on or eligible National Register.		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*		*See Alternative 1*	
	Section 6(f) evaluation	No known resources funded by the Land and Water Conservation Act									

* Low-Cost Design Criteria, ** Initial Design Criteria

*** Access Roads are broken down to indicate those which are provided only to provide access to otherwise landlocked parcels, versus those which are provided to connect existing roads (which otherwise would end in a cul-de-sac) to the roadway network. In figures for Section 5.3, access roads which are provided to connect existing roads to the local roadway network also are counted under relocations in the immediately-preceding row.

±Note – Adverse Effects upon archaeological resources relate to impacts to contributing archaeological sites within two discontiguous archaeological districts

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6.4.2 Refined Preferred Alternative 2 Costs and Impacts Compared with Tier 1 Estimates

The Tier 1 FEIS presented tables that included estimates of cost and major impacts for each Tier 2 section of the proposed I-69 preferred alternative. Table 6-29 of that document presented the estimates for Section 4.

Costs and impacts in Section 4 were determined based upon identified right-of-way using two sets of design criteria for Refined Preferred Alterative 2. The initial design criteria and the low-cost design criteria establish a range of possible costs and impacts. As shown in **Table 6-18**, project costs are slightly higher than the Tier 1 FEIS estimates per the initial design criteria but are less than the Tier 1 FEIS estimates when using the low-cost design criteria. Right-of-way acquisition and forest impacts, based upon the initial design criteria, are also substantially higher than the Tier 1 FEIS estimates but are comparable to the Tier 1 FEIS estimates when using the low-cost criteria. Farmland, wetland and floodplain impacts using both the initial and low-cost design criteria are less than the Tier 1 FEIS estimates. Residential displacements and business relocations, however, are higher than the Tier 1 FEIS estimates. An explanation for these changes from Tier 1 is provided below.

Project Cost

The cost estimates for the Section 4 alternatives were calculated in Year 2009 dollars, and escalated to Year 2010 at an annual inflation rate of 3.5%. The Tier 1 estimates were in Year 2000 dollars. During the analysis conducted for updating the Tier 2 cost estimating methodology, the escalation factors used to update the Tier 1 costs in the table also were refined. These refinements analyzed INDOT-specific cost data for actual construction bids. Details of the cost analysis are presented in **Appendix D**, *Cost Estimating Methodology*. The inflation-adjusted Tier 1 cost estimates for this project were $705 to $718 million[9]. Under the low-cost design criteria, estimated Tier 2 costs for Section 4 Refined Preferred Alternative 2 are over ***$170 million less*** than Tier 1 estimates.

In addition (as noted in the footer to **Table 6-18)**, the Tier 2 cost estimates include three items (utility relocation, mitigation and construction administration) which were ***excluded*** from the Tier 1 cost estimates. These costs account for $98 to $123 million of the Tier 2 cost estimates; if these costs are excluded, the estimated Tier 2 costs for Refined Preferred Alternative 2 would be $434 to $610 million, which are significantly less than the estimated Tier 1 costs. Making an "apples-to-apples" comparison (which does not include utility relocation, mitigation and construction administration) shows that the Tier 2 costs for Refined Preferred Alternative 2 are between $108 million and $271 million ***less*** than the comparable Tier 1 estimates.

Right-of-Way

The area of land required for right-of-way in Tier 2 ranges from about 7% less to 16% higher compared to the Tier 1 FEIS. The Tier 2 estimates were based on the right-of-way limits using

[9] Project costs presented in the DEIS did not adjust the Tier 1 costs for inflation. The FEIS calculations correct this oversight.

the low-cost design criteria and the initial design criteria proposed for Refined Preferred Alternative 2 including areas for the interchanges, access roads and frontage roads. The Tier 1 right-of-way calculations did ***not*** include provision for any access roads nor did they provide for impacts associated with the Greene/Monroe County Line interchange. The Tier 1 assumptions were appropriate for comparing corridors over a broad geographic area. The Tier 1 FEIS stated with regard to the cross sections used in the Tier 1 study, "The typical cross sections will be refined during subsequent phases of project development (Tier 2 environmental studies and design)" (Appendix E*, Development of Typical Cross Sections*, p.1). The typical section considered in Tier 1 for the preferred alternative between US 231 and SR 37 was 470 feet wide. (See Tier 1 FEIS, Appendix E, discussion of Alternative 3).

Farmland

The Tier 1 FEIS estimated 670 acres of farmland impact. Refined Preferred Alternative 2 would have considerably less farmland impact. The farmland impact using the initial design criteria would be about 461 acres. Using the low-cost design criteria, farmland impacts could be about 356 acres. Overall, farmland impacts for Refined Preferred Alternative 2 would be at least 200 acres less than the Tier 1 estimate.

Forest

The Tier 1 forest data used for comparing corridors were the best available data showing forest cover within the 26-county Tier 1 study area and were suitable for comparing forest impacts for alternative corridors. It was provided by the United States Geological Survey (a subset of its National Land Cover Data set) and was derived by remote sensing photo interpretation techniques using satellite photography with a nominal 30-meter (approximately 100 foot) resolution. The nominal date for this data was 1992. The estimates for forest impacts in this Tier 2 study are based upon field surveys, which identified many smaller forested areas (such as fencerow and streamside forests) that may not have been identified in the dataset used in Tier 1.

The forest impacts estimated for Refined Preferred Alternative 2, based upon the initial design criteria, would be approximately 1,091 acres. This impact is higher than the 890 acres estimated in the Tier 1 FEIS. Implementation of the low-cost design criteria, however, could result in forest impacts as low as 874 acres, which is comparable or possibly slightly less than the Tier 1 estimate.

Wetlands

The differences between Tier 1 and Tier 2 impacts are partially the result of the procedures used to identify the impacts; i.e., Tier 1 estimates were based primarily on available published data while Tier 2 evaluations were based primarily on preliminary design and field reconnaissance combined with resource materials and updating aerial photography. Therefore, whereas Tier 1 identified wetlands using NWI mapping that contains data which are not always field-verified, Tier 2 wetlands were identified by a wetland delineation for Refined Preferred Alternative 2. The differences between Tier 1 and Tier 2 impacts can also be attributed to the approach used for the development of the Section 4 preliminary alignment alternatives. Wetlands were identified

as a key resource for impact avoidance and minimization during the initial development of the preliminary alternatives. As such, overall wetland impacts were reduced from the outset of the Section 4 project development.

Refined Preferred Alternative 2 has considerably less wetland impact than the Tier 1 FEIS estimated 20 acres of impact. The preferred alternative would have about 9.6 acres of wetland impact using the initial design criteria. Implementation of the low-cost design criteria could further reduce wetland impacts to as little as 5.3 acres.

Floodplains

Floodplain impacts for Refined Preferred Alternative 2 are much less than the Tier 1 estimate of 130 acres. Using the initial design criteria, the floodplain impact for the preferred alternative would be approximately 51 acres. The low-cost design criteria could reduce impacts to as little as approximately 36 acres. The Tier 2 studies (using FEMA floodplain mapping) provided a more precise determination of right-of-way requirements than was available during Tier 1. The preliminary design provided the opportunity to better avoid the floodplains; thus leading to a significant reduction in estimated floodplain impacts.

Residential Displacements

The 71 to 75 residential displacements for Refined Preferred Alternative 2 are substantially more than the Tier 1 FEIS estimate of 33 displacements. The increase in residential displacements can be attributed to various factors. These include:

- Differences in the alignment location and right-of-way width for Refined Preferred Alternative 2 as compared to the working alignment that was used to determine potential impacts in the Tier 1 study,
- 10 residential displacements associated with the Greene/Monroe County Line interchange that were not included in the Tier 1 study,
- The decision to close Evans Lane in Monroe County and relocate 10 residences in the Evans Lane neighborhood south of the new highway,
- New development since the completion of the Tier 1 FEIS, and
- Numerous isolated residences located within forested land cover that may not have been identified by the Tier 1 study.

Business Relocations

The Tier 1 FEIS estimated 1 business relocation. Refined Preferred Alternative 2 would have 4 relocations. All three of the additional relocations associated with the preferred alternative would occur along SR 45 for improvements associated with the South Connector Road. The Greene/Monroe County Line interchange and South Connector Road were not included in the Tier 1 study.

Table 6-18: Comparison of Tier 1 FEIS Costs and Impacts to Tier 2 FEIS Refined Preferred Alternative 2

Data and Resources	Tier 1	FEIS Refined Preferred Alternative 2	
		Low-Cost Design Criteria**	Initial Design Criteria**
Length	26.6	26.7	26.7
Project Cost ($ million)*	705 – 718	532	733
Area of New Right-of-Way (acres)	1,560	1456	1809
Farmland (acres)	670	356	461
Forest (acres)	890	874	1,091
Wetlands (acres)	20	5.3	9.6
Floodplain (acres)	130	36	51
Residential Displacements	33	71	75
Business Relocations	1	4	4

* Cost estimates are for the year 2010. Tier 1 estimates have been adjusted to account for inflation so that an accurate comparison can be made between estimated Tier 1 and Tier 2 costs. Tier 1 estimate does not include the cost for construction administration, utility relocation or mitigation. Tier 2 cost estimates include construction administration, utility relocation and mitigation.

** See Section 5.1.2 for a description of Low-Cost and Initial Design Criteria. See Figures 5.1-3 through 5.1-5 (p. 5-15) for typical sections associated with each set of design criteria.

6.4.3 I-69 Section 4 Right-of-Way and Construction Status

INDOT is currently planning for the construction of Section 4. FHWA[10] has concurred with INDOT's request to provide a refined preferred alternative for Section 4 of the I-69, Evansville to Indianapolis project. After issuance of the Record of Decision (ROD) for Section 4, construction of Section 4 is intended to be advertised for bid beginning in the second half of 2011.

Right-of-Way Acquisition

INDOT has already commenced right-of-way acquisition activities, as follows:

- Field survey has been initiated that will tie the property parcel descriptions to the project engineering survey.
- Title research has been initiated and Right-of-Way engineering has begun.

The acquisition of right-of-way is being pursued with the understanding that in no way may any acquisitions influence the decisions to be made during the National Environmental Policy Act (NEPA) process [per 23 CFR 710.501(b)(5)]. No federal-aid highway funds are being used for the early acquisition of right-of-way for highway construction prior to the issuance of the Section

[10] See FHWA letter dated November 15, 2010 in **Appendix B**.

4 Tier 2 ROD except as permitted in the Tier 1 ROD. Funding for right-of-way and preliminary design has been included by amendment in INDOT's Statewide Transportation Improvement Program (STIP) for fiscal years 2011 and 2012. FHWA has informed INDOT that these actions are at the discretion of the State, and that such actions are taken "at risk," with respect to any future claims of credit for the local portion of expenditures which may be federally-funded. [11]

Design

INDOT has already commenced preliminary design activities, as follows:

Field surveys have been initiated. Independent detailed cost estimates have been completed for the project. Preparation of the design-build and design contract documents has proceeded for projects throughout Section 4.

As part of these preliminary design activities, INDOT has identified two locations where additional modifications may be made to the Refined Preferred Alternative 2. These would involve a redesign of the ramps between I-69 and the County Line Interchange access road, as well as construction of an access road to parcels east of CR 215E which otherwise may be landlocked. If these refinements are made in final design, it may be possible to provide them within the footprint of Refined Preferred Alternative 2, as shown in this FEIS. If either of these refinements are made and require right-of-way which is not part of Refined Preferred Alternative 2, INDOT will prepare and submit a re-evaluation to FHWA.

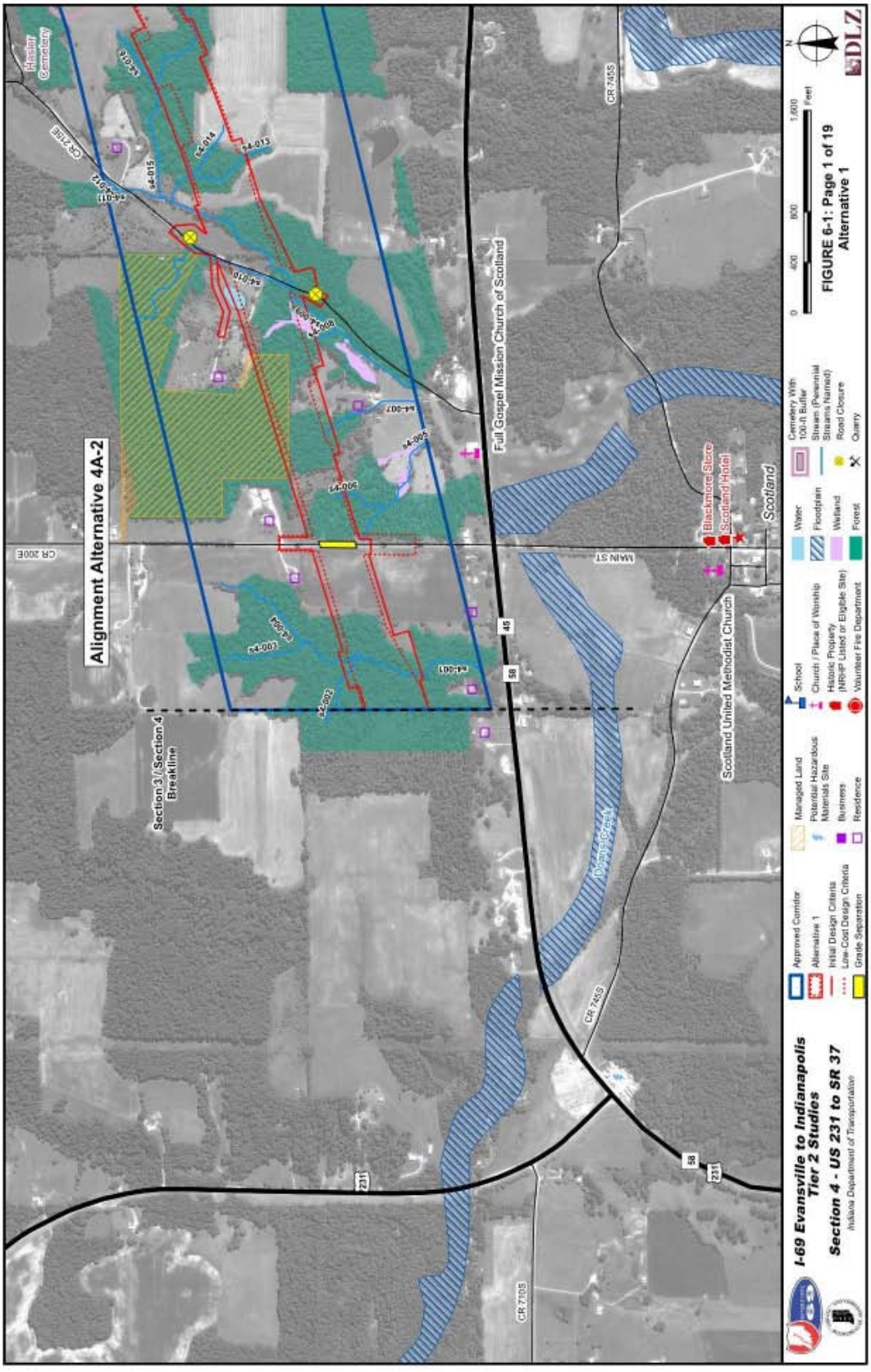
As part of the refinement of the preferred alternative, a limited amount of geotechnical evaluation work has been conducted at various locations to evaluate soil and bedrock conditions and stability considerations for highway construction. This effort has confirmed that some sub-surface karst features are located within the preferred alternative. Ten geotechnical bore holes have disclosed some limestone dissolution in the subsurface. Some of these features have been confirmed to be small solution enlarged joint fractures within limestone bedrock, while others have been identified as sandstone breakdown and limestone void combinations similar to the relict cave discovered in the right-of-way from a recent collapse east of Plummer Creek. Further information on this relict cave can be found in the Karst Report Addendum as well as Chapter 5.21. The nature of the karst features encountered as part of this preliminary geotechnical evaluation is consistent with the type of features which were anticipated (see discussion in Chapter 5.21) based on the adjacent surface expressed karst features and surrounding geology. Additional geotechnical evaluation work to be performed after a Record of Decision on the project is issued will be used to develop a final design that adequately addresses the structural and water quality concerns associated with these features as identified in the general mitigation measures identified in Chapter 5.21

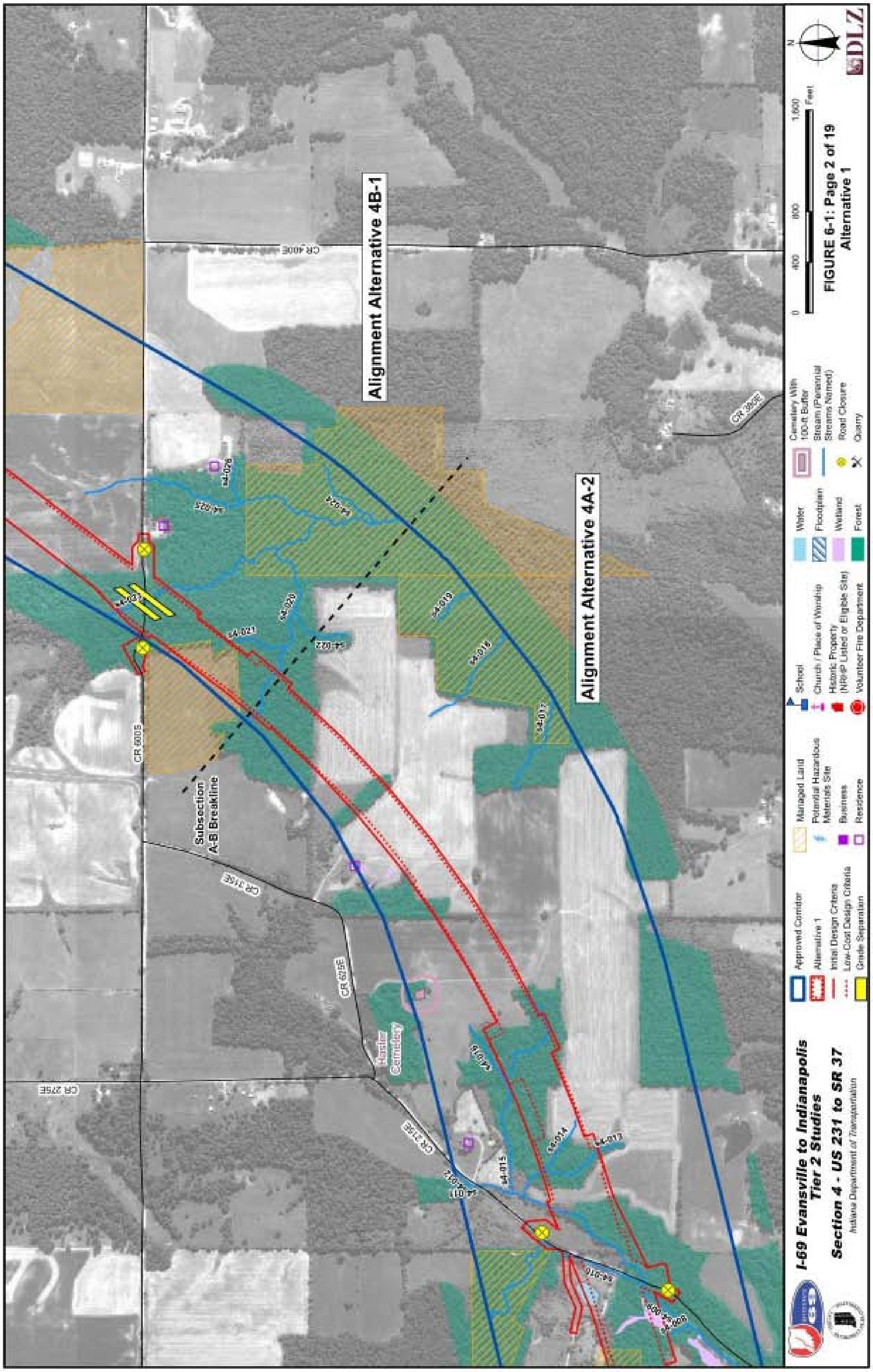
As this project proceeds into the final design phase, additional geotechnical evaluation will be conducted. As this work is completed, the design team will follow the guidelines of the Karst MOU signed by INDOT, IDNR, IDEM and USFWS on October 13, 1993 to develop appropriate final detailed mitigation measures and coordinate those designs with the MOU agencies. The

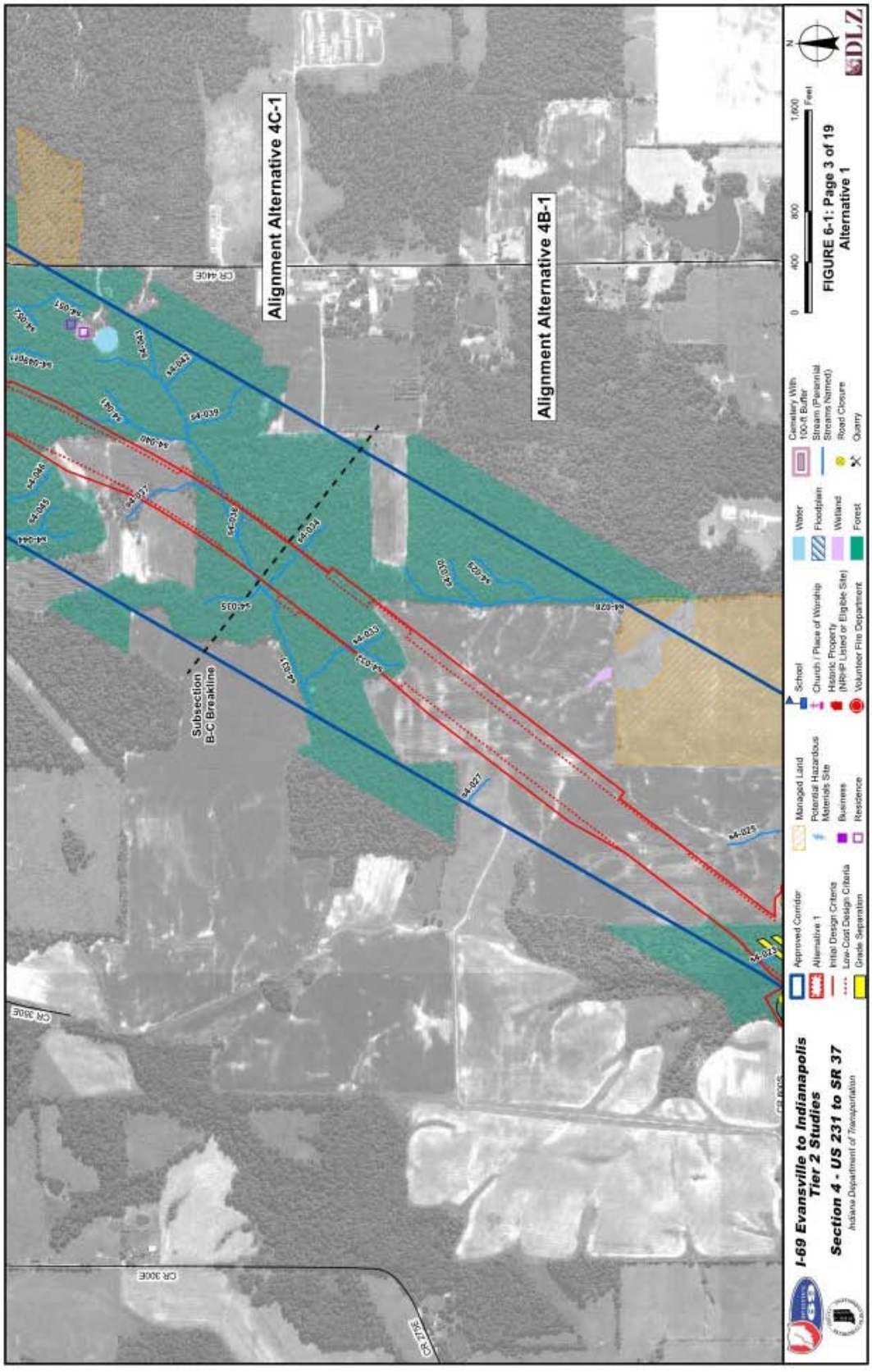
[11] See FHWA letters dated December 7, 2010 and March 14, 2011 in Appendix C.

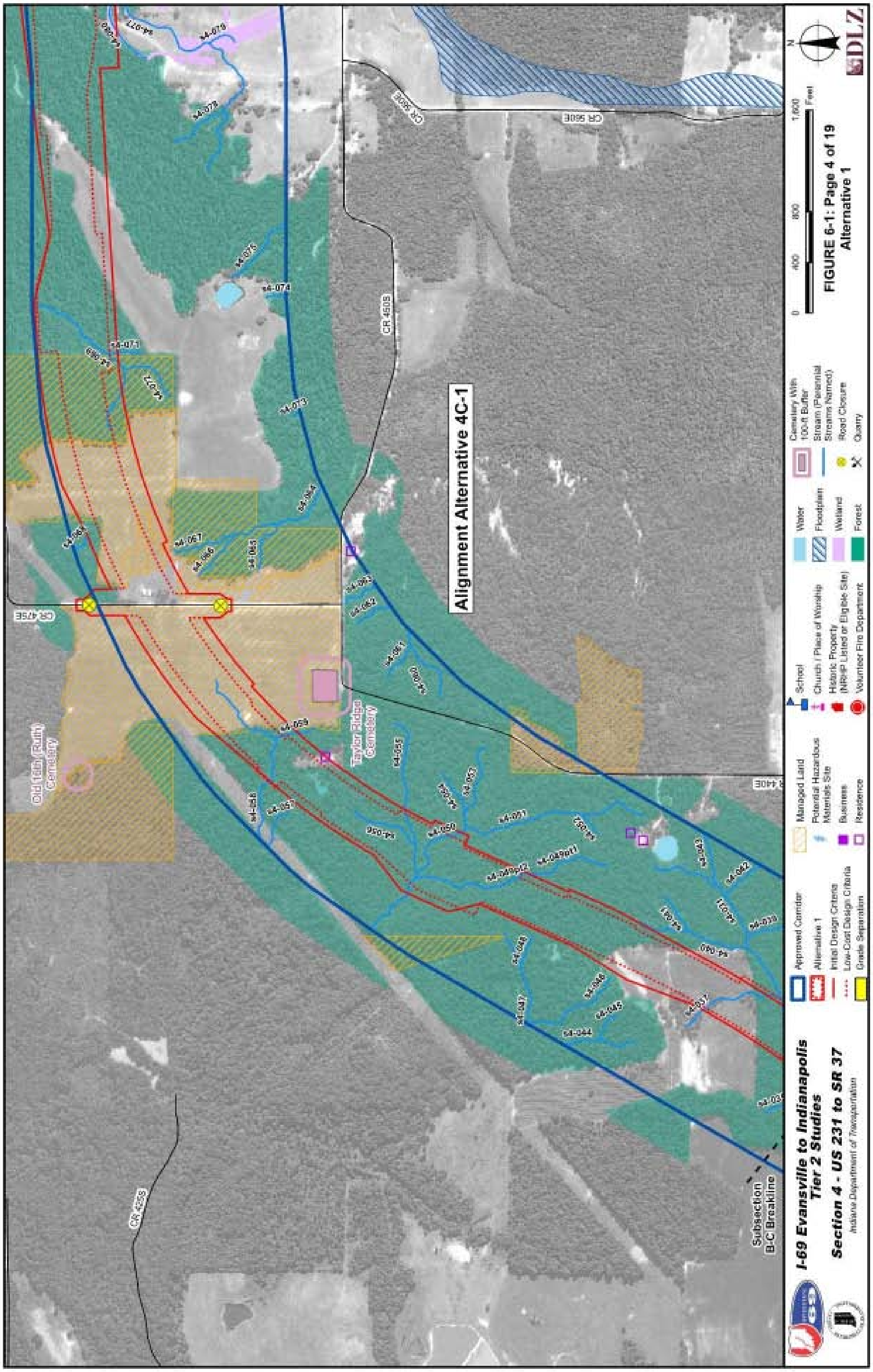
design team will complete steps 5-17 of the Karst MOU in consultation with the Karst MOU signatories once the design and construction of the roadway moves forward.

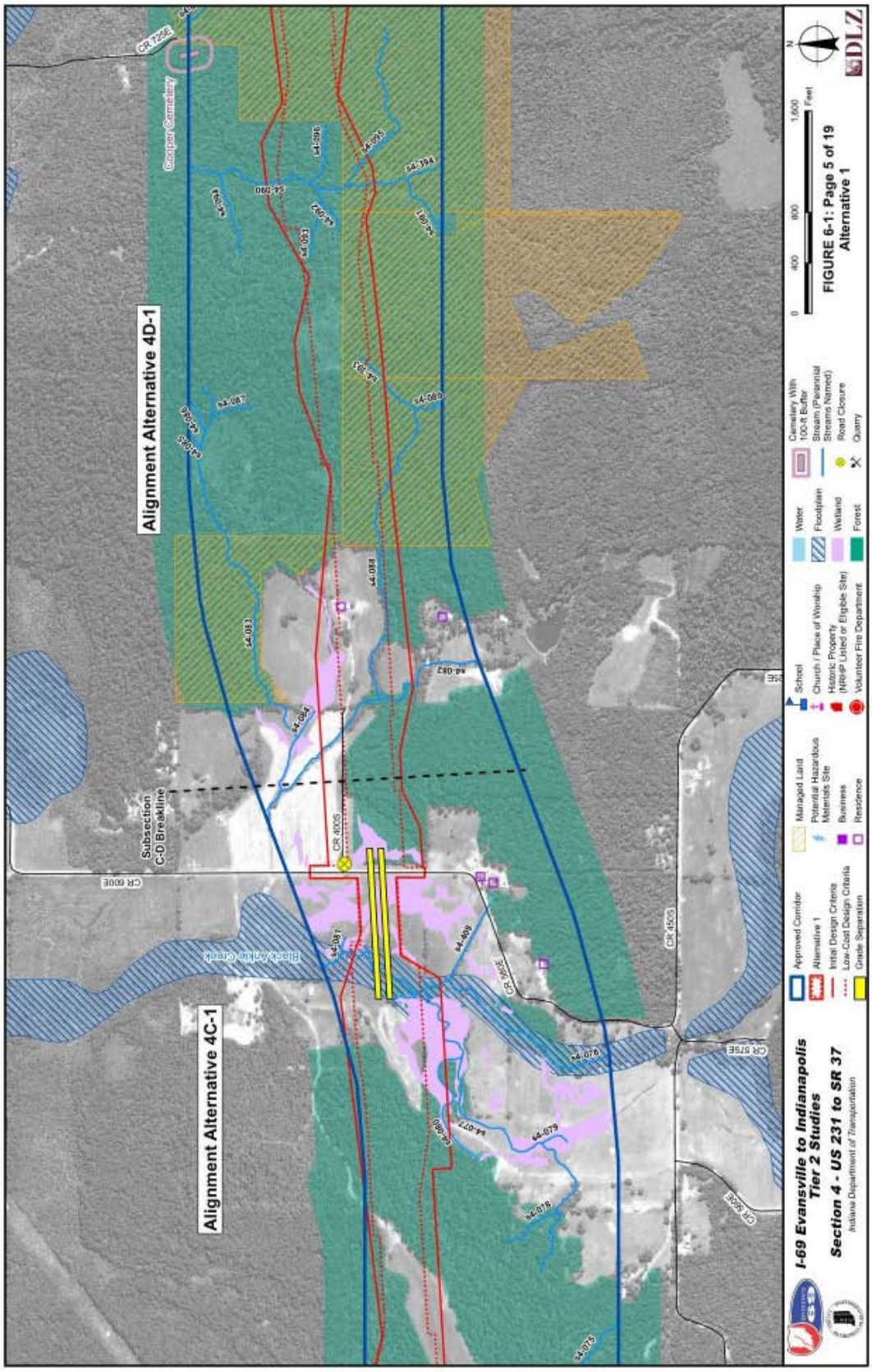
These projects are planned for letting beginning in the second half of 2011. The first of these is anticipated to be a contract for construction of portions of the project west of the SR 45 interchange.

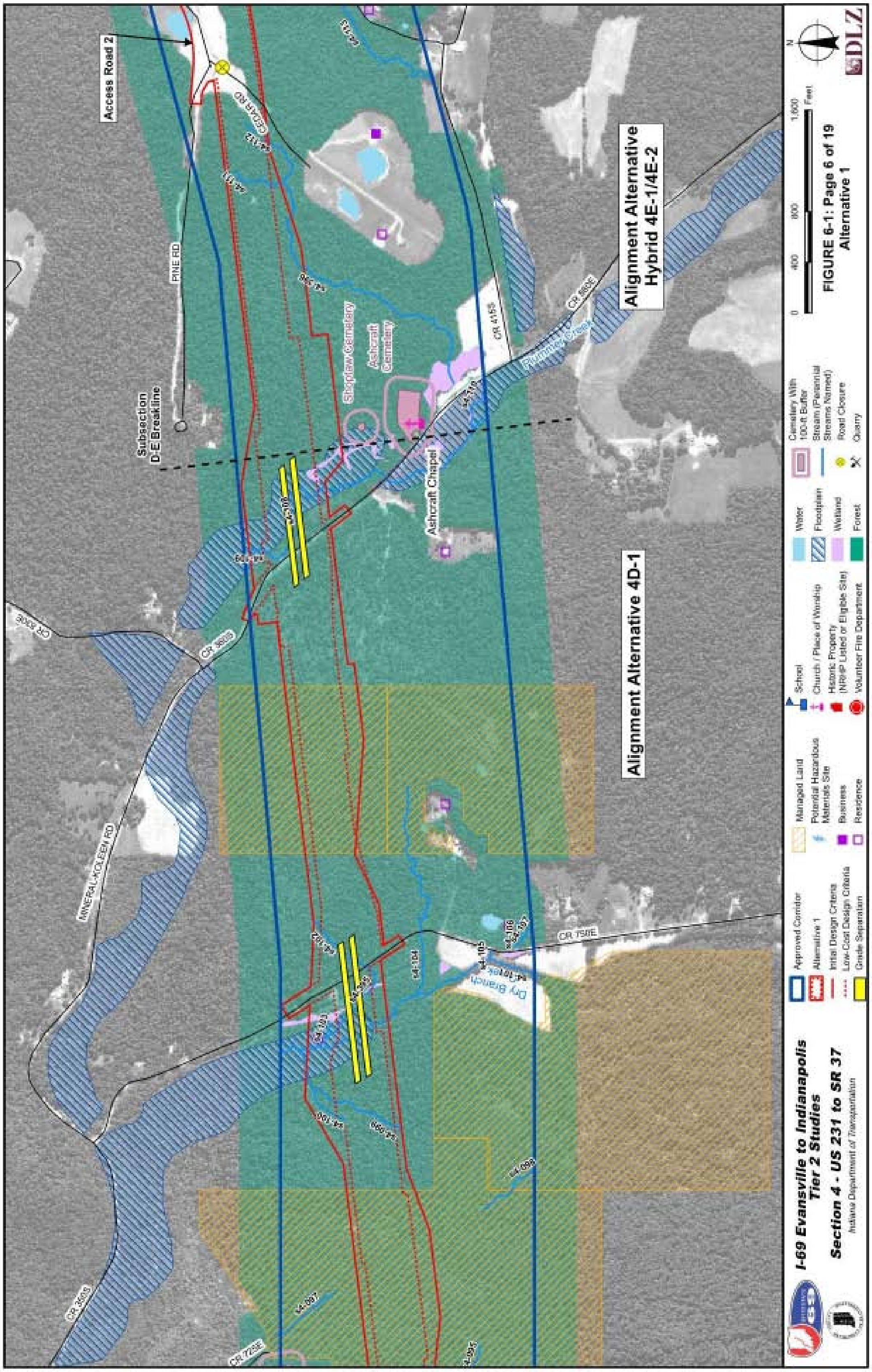

Alignment Alternative 4A-2
Section 3 / Section 4 Breakline
Full Gospel Mission Church of Scotland
Scotland
Blackmore Store
Scotland Hotel
Scotland United Methodist Church
Hesler Cemetery
CR 200E
CR 700S
CR 745S
MAIN ST
45
58
231
FIGURE 6-1: Page 1 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

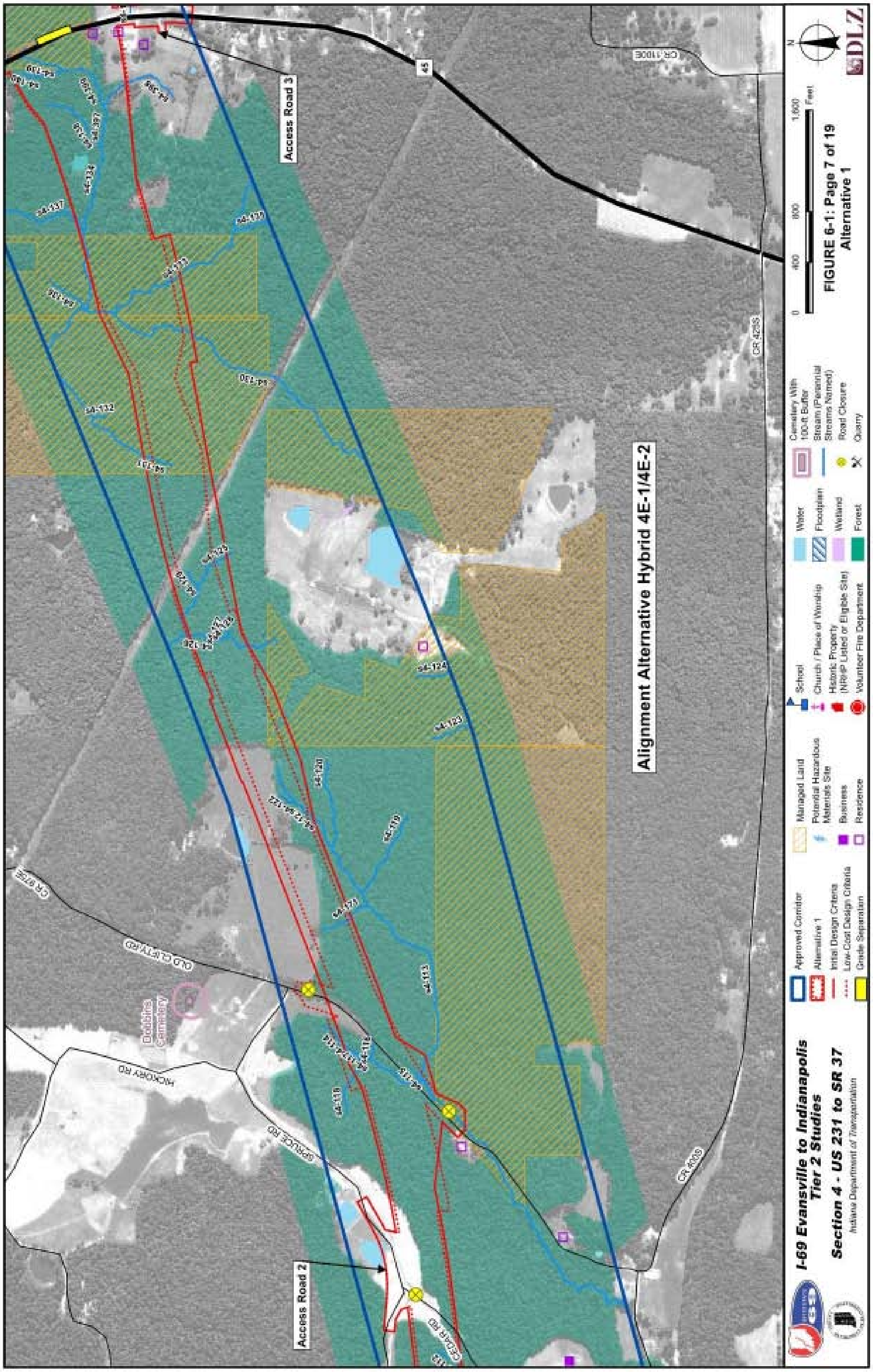

Alignment Alternative 4B-1
Alignment Alternative 4A-2
Subsection A-B Breakline
CR 400E
CR 600S
CR 315E
CR 625E
CR 275E
CR 215E
CR 380E
Hasler Cemetery
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet
FIGURE 6-1: Page 2 of 19
Alternative 1
DLZ

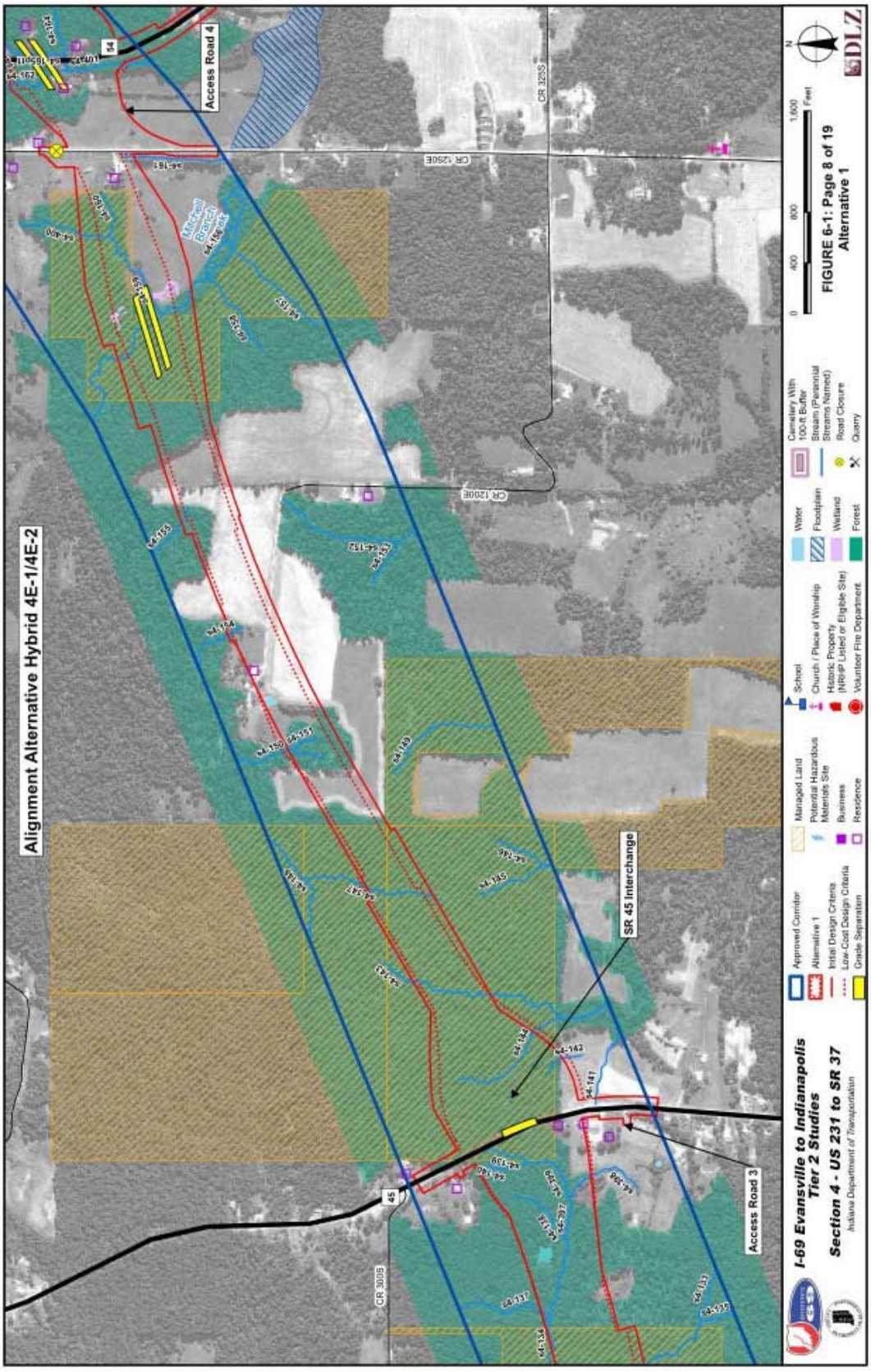

Alignment Alternative 4C-1
Alignment Alternative 4B-1
Subsection B-C Breakline
CR 440E
CR 360E
CR 300E
SR 37
FIGURE 6-1: Page 3 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Stream Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N

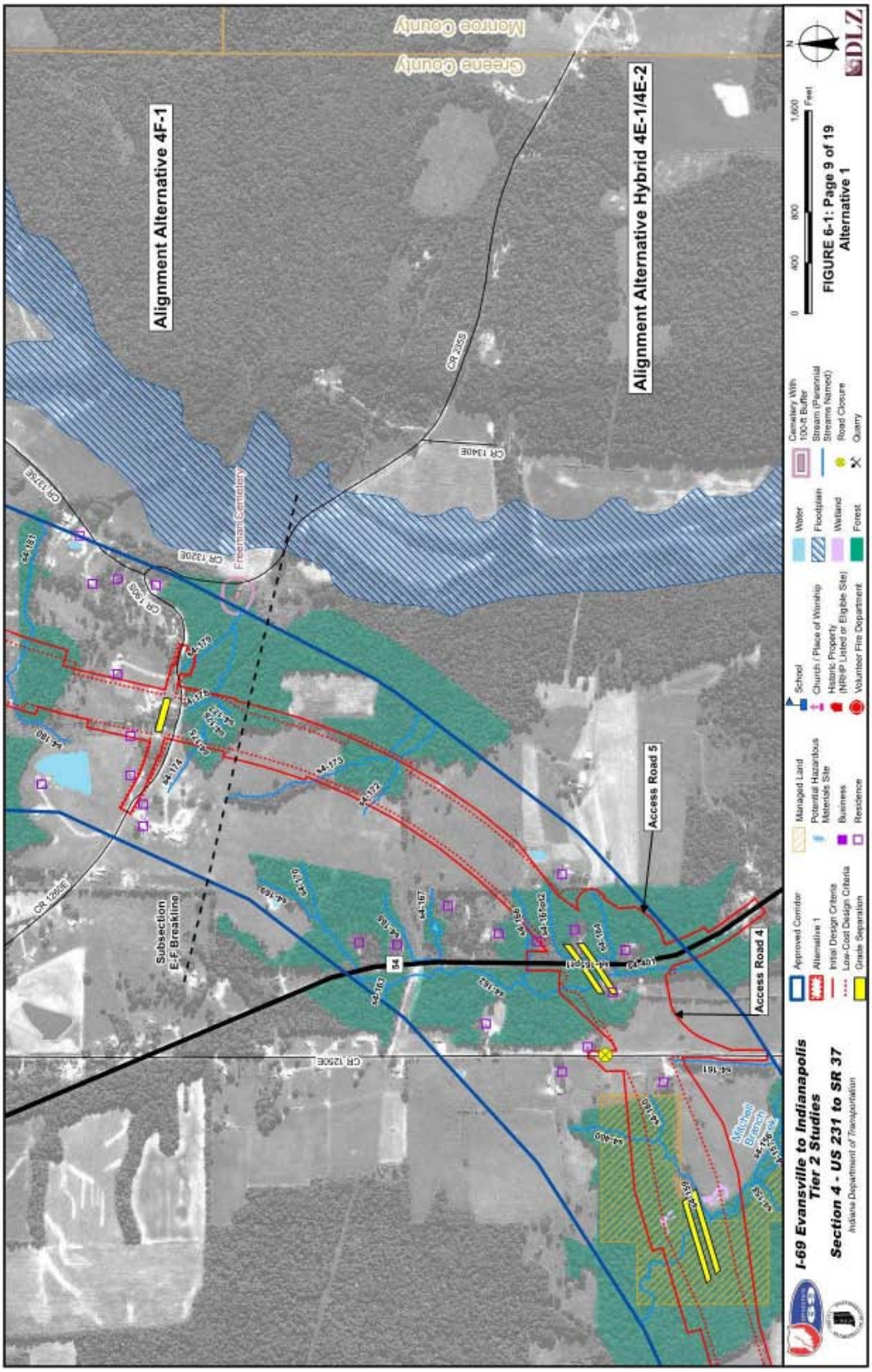

Alignment Alternative 4C-1
Taylor Ridge Cemetery
Old 16th (Ruth) Cemetery
CR 475E
CR 450S
CR 560E
CR 425S
Subsection B-C Breakline
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-1: Page 4 of 19
Alternative 1
DLZ

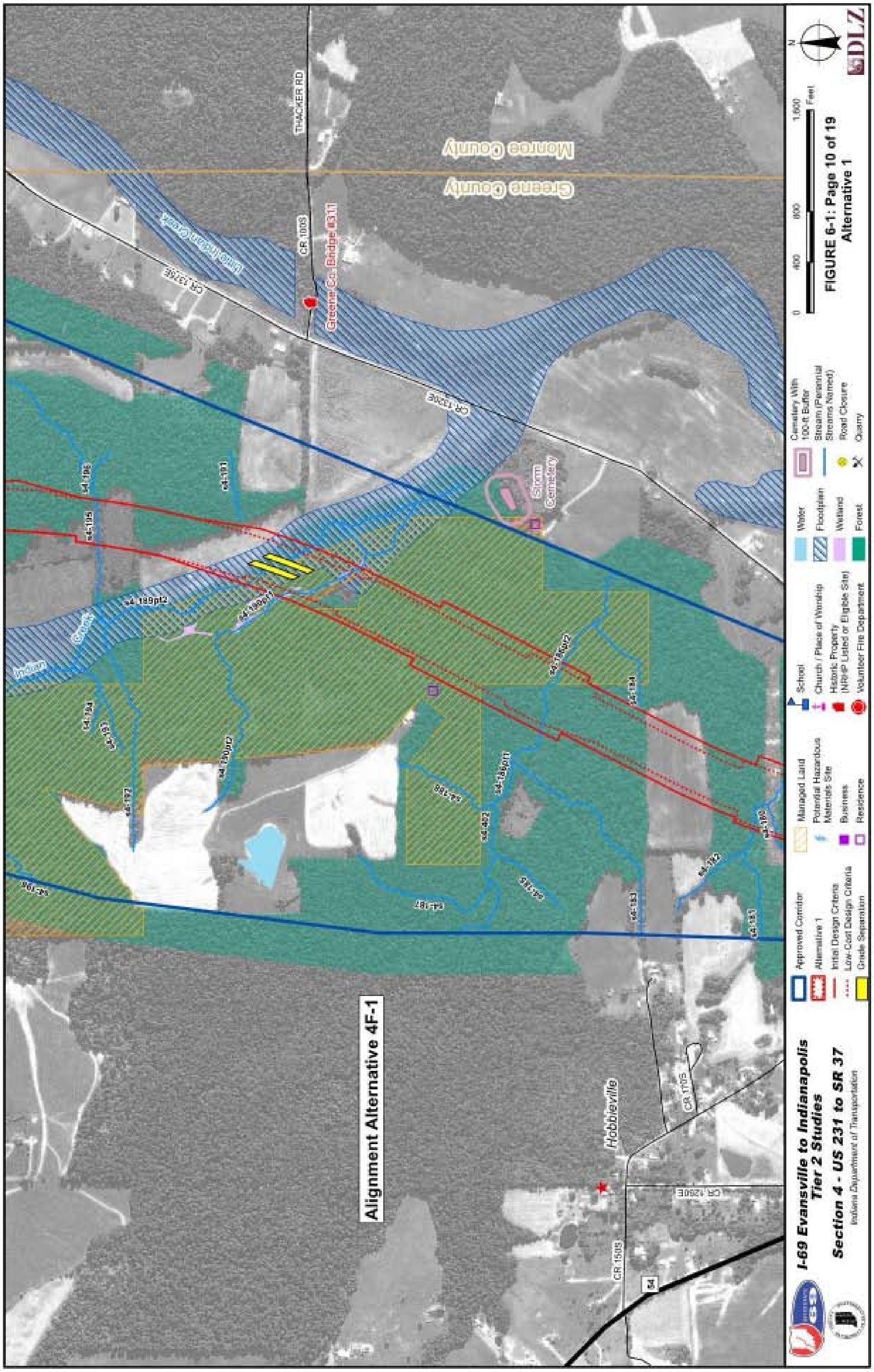

Alignment Alternative 4D-1
Alignment Alternative 4C-1
Subsection C-D Breakline
Cooper Cemetery
CR 725E
CR 600E
CR 400S
CR 575E
CR 450E
FIGURE 6-1: Page 5 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest

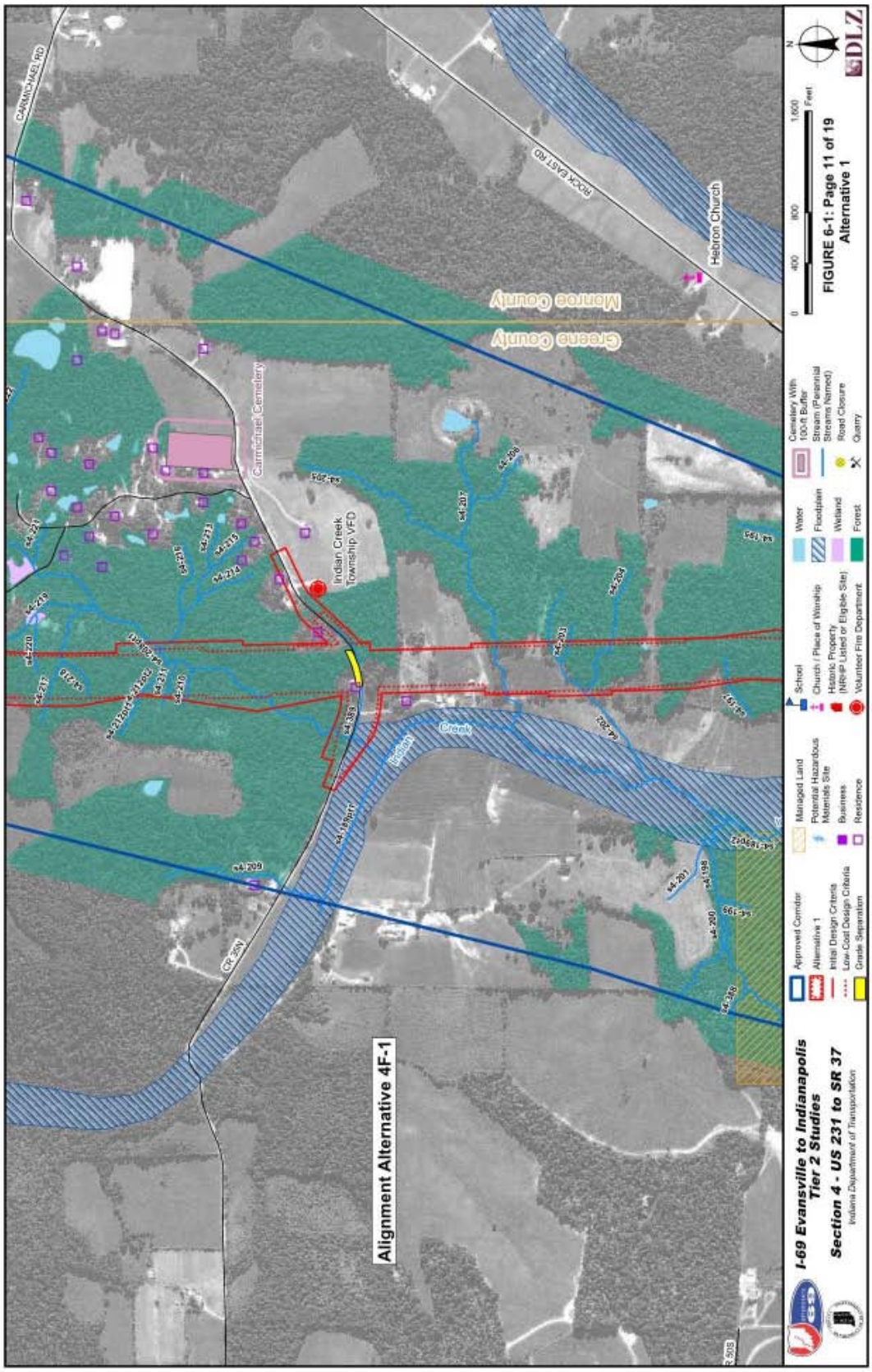

Access Road 2
Subsection D-E Breakline
Alignment Alternative Hybrid 4E-1/4E-2
Alignment Alternative 4D-1
Ashcraft Chapel
Ashcraft Cemetery
PINE RD
CEDAR RD
MINERAL-KOLEEN RD
Dry Branch
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0 400 800 1,600 Feet
FIGURE 6-1: Page 6 of 19
Alternative 1
DLZ

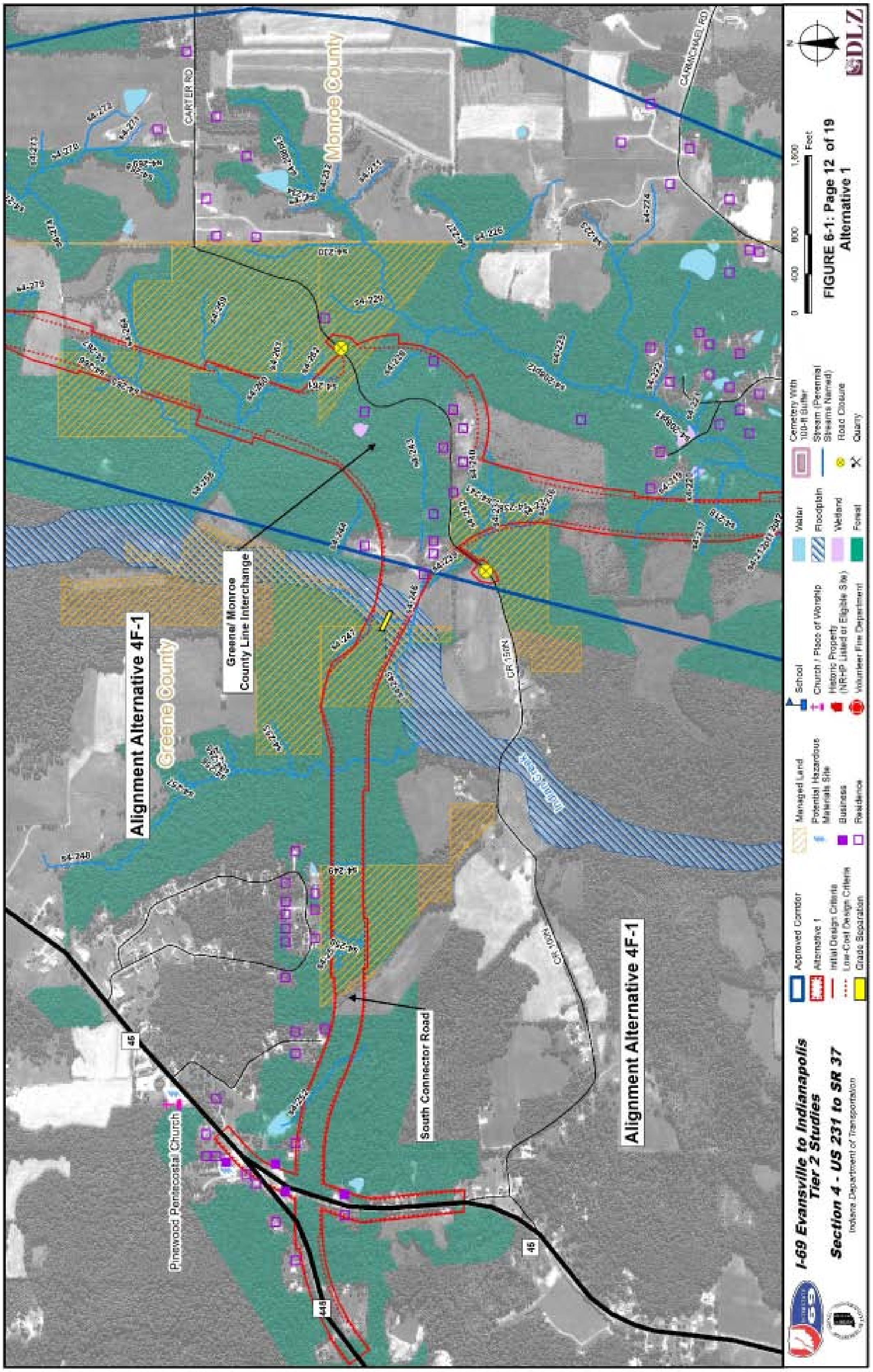

I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-1: Page 7 of 19
Alternative 1
Alignment Alternative Hybrid 4E-1/4E-2
Access Road 3
Access Road 2
Dobbins Cemetery
HICKORY RD
SPRUCE RD
CEDAR RD
OLD CLIFTY RD
CR 875E
CR 425S
CR 400S
CR 1100E
45
DLZ

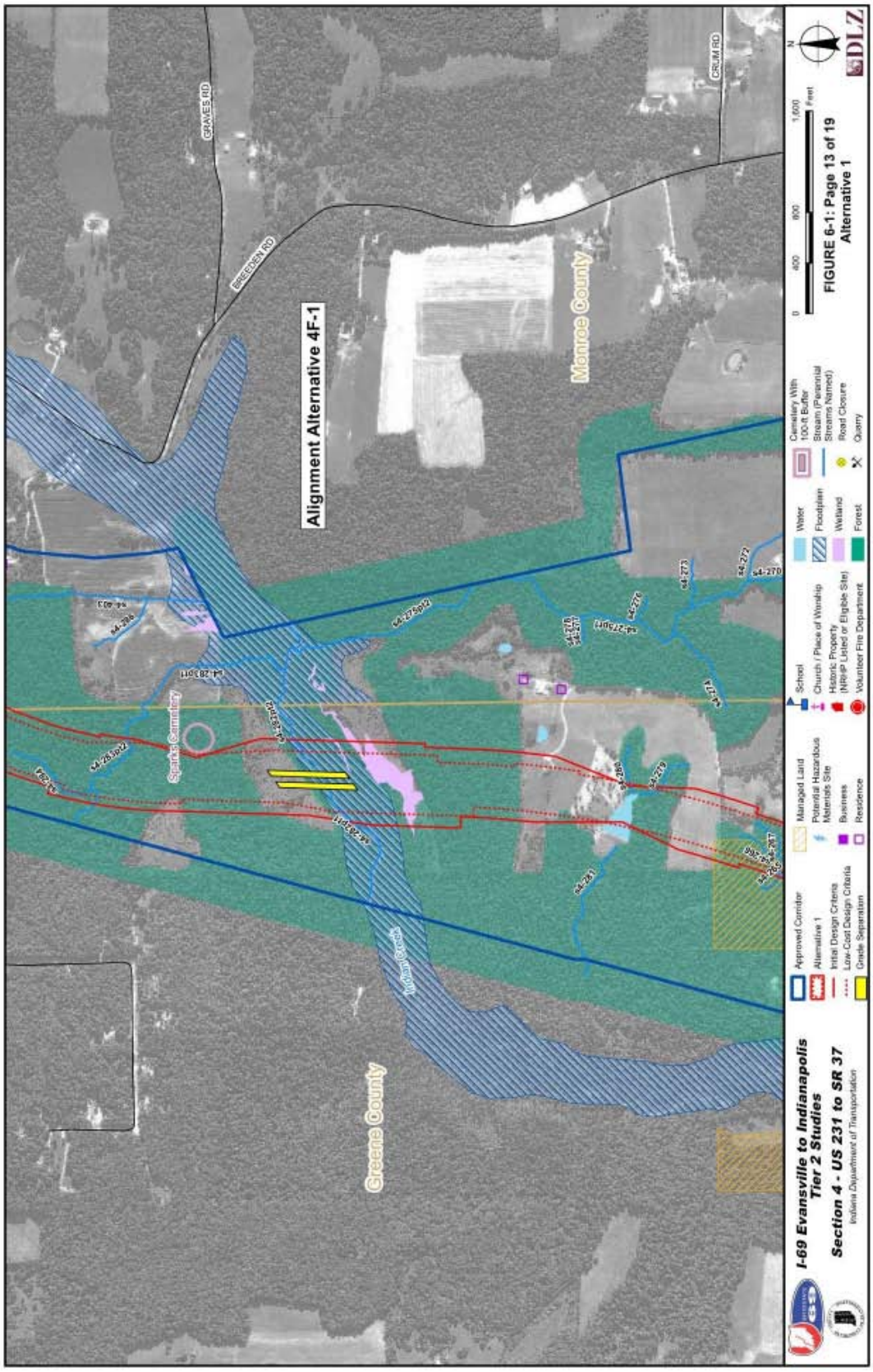

Alignment Alternative Hybrid 4E-1/4E-2
Access Road 4
Access Road 3
SR 45 Interchange
CR 325S
CR 1250E
CR 1200E
CR 300S
Marlow Branch
FIGURE 6-1: Page 8 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N

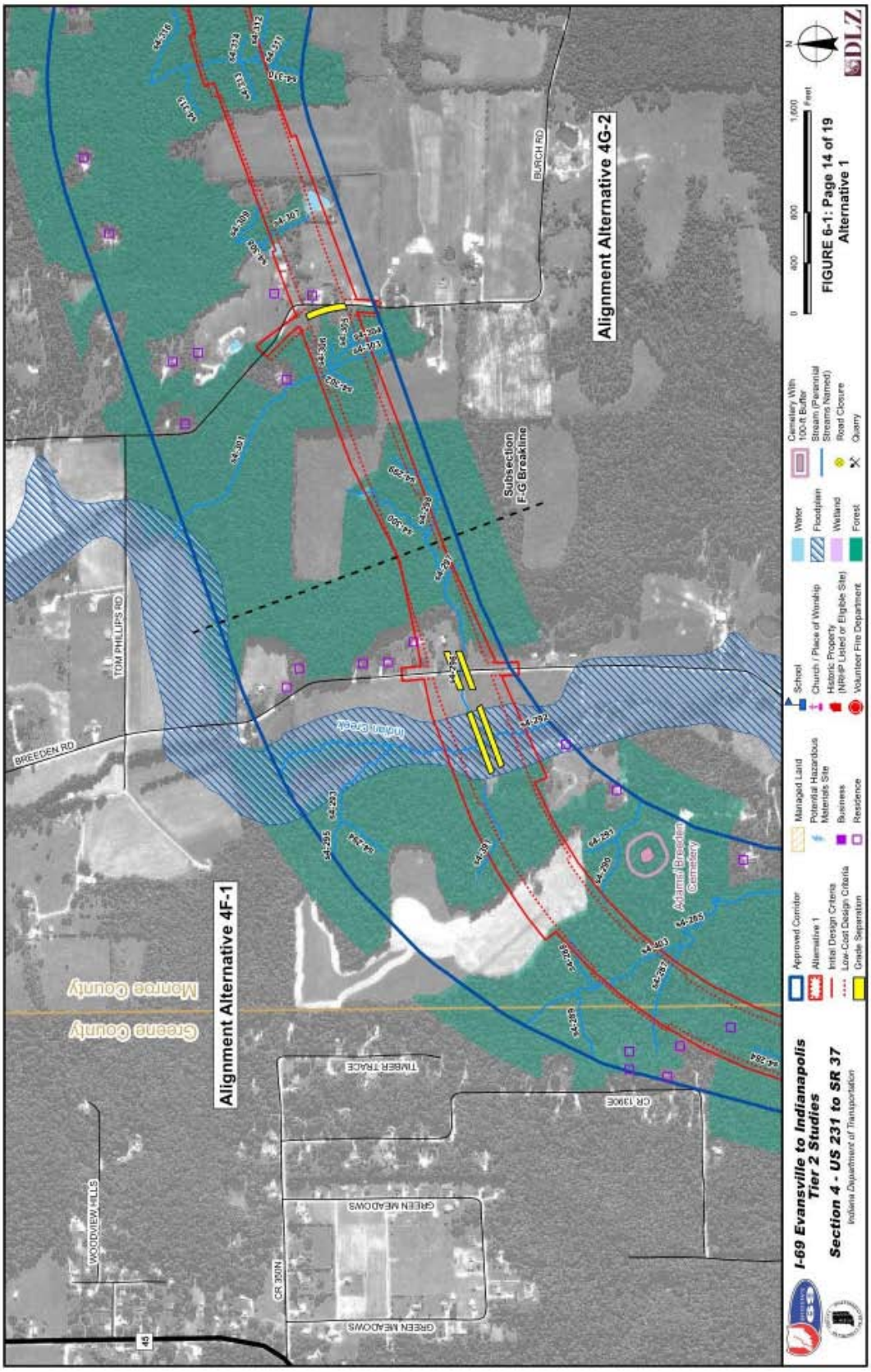

Alignment Alternative 4F-1
Alignment Alternative Hybrid 4E-1/4E-2
Monroe County
Greene County
Freeman Cemetery
Access Road 5
Access Road 4
Subsection E-F Breakline
CR 1320E
CR 1260E
CR 2055
CR 1340E
FIGURE 6-1: Page 9 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

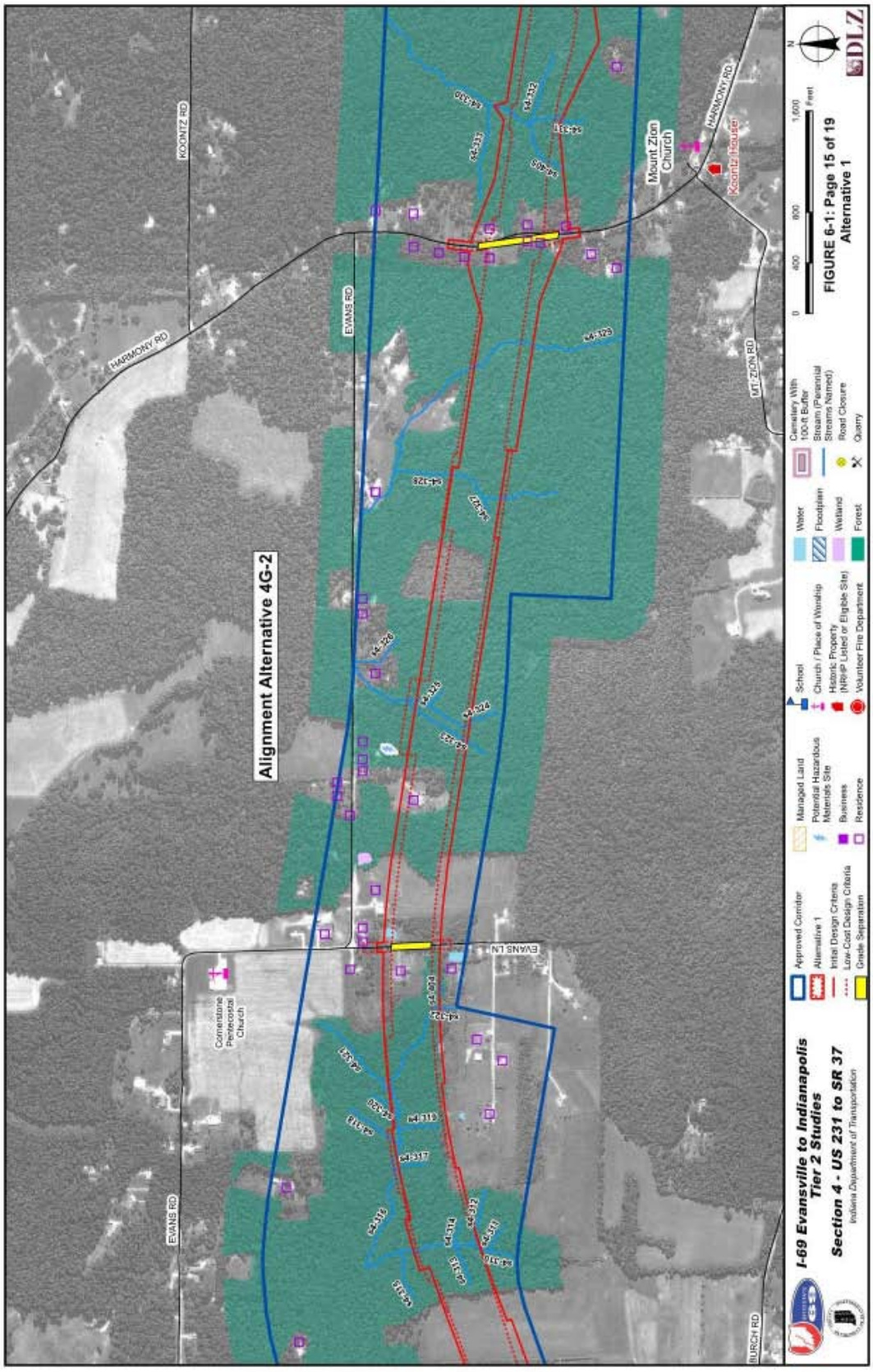

I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-1: Page 10 of 19
Alternative 1
Alignment Alternative 4F-1
Monroe County
Greene County
THACKER RD
CR 100S
Greene Co. Bridge #311
Little Indian Creek
Indian Creek
CR 1375E
CR 1320E
Storm Cemetery
Hobbieville
CR 170S
CR 150S
CR 1250E
54
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ

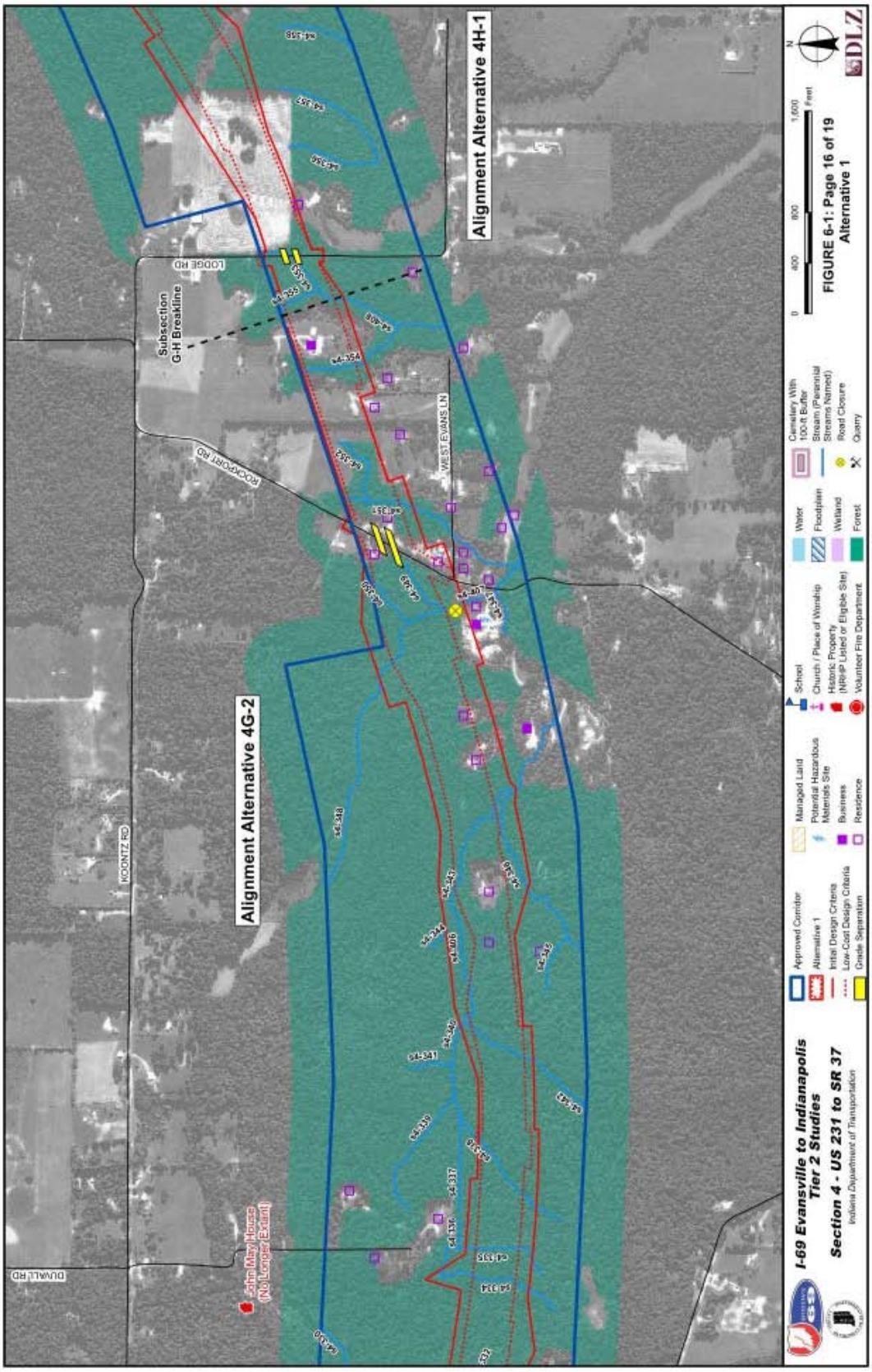

Alignment Alternative 4F-1
Greene County
Monroe County
Hebron Church
Carmichael Cemetery
Indian Creek Township VFD
Indian Creek
CARMICHAEL RD
ROCK EAST RD
CR 200N
FIGURE 6-1: Page 11 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ

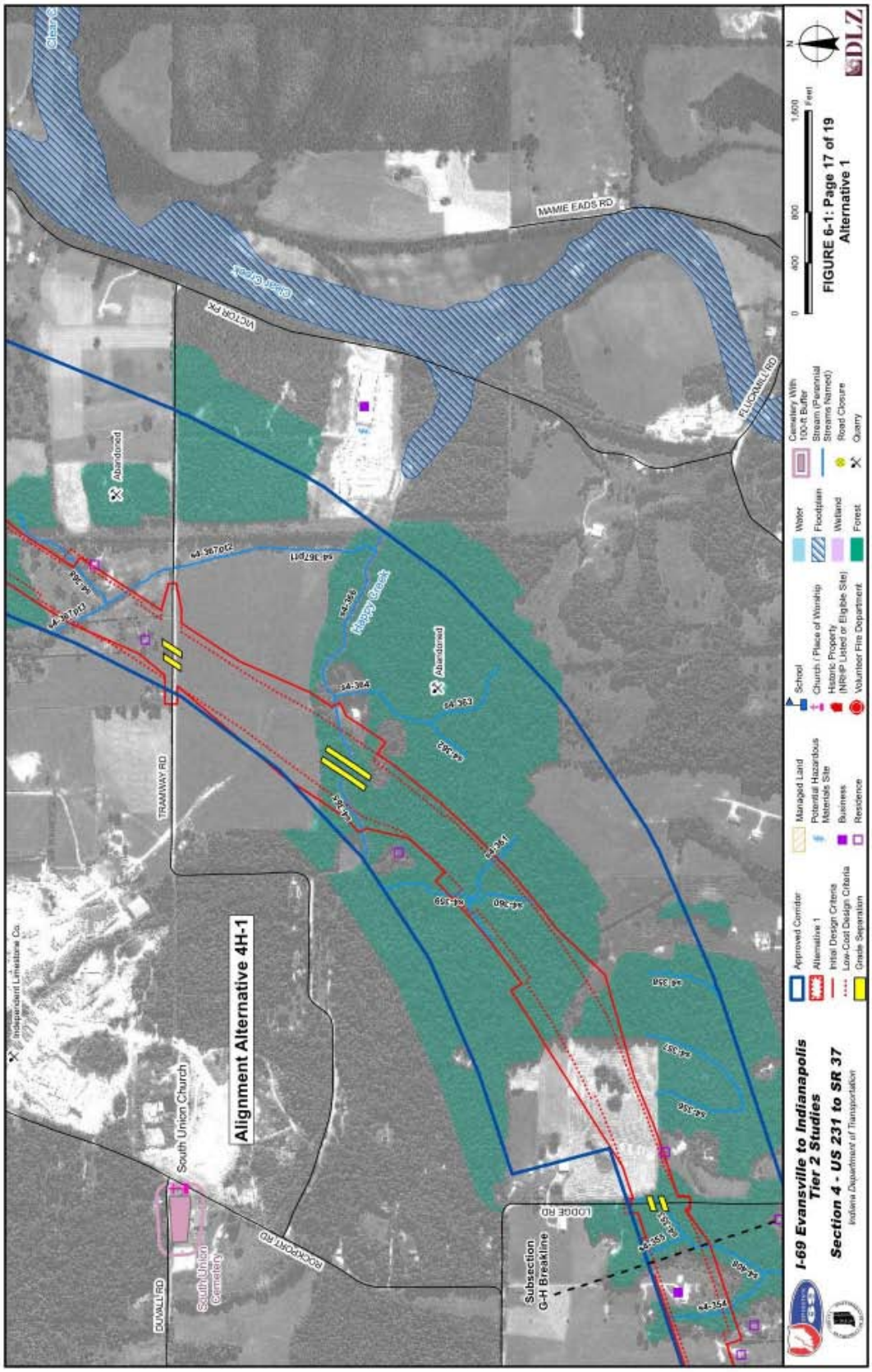

Alignment Alternative 4F-1
Greene County
Monroe County
Greene/ Monroe County Line Interchange
South Connector Road
Pinewood Pentecostal Church
Alignment Alternative 4F-1
CARTER RD
CARMICHAEL RD
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0 400 800 1,600 Feet
FIGURE 6-1: Page 12 of 19
Alternative 1
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

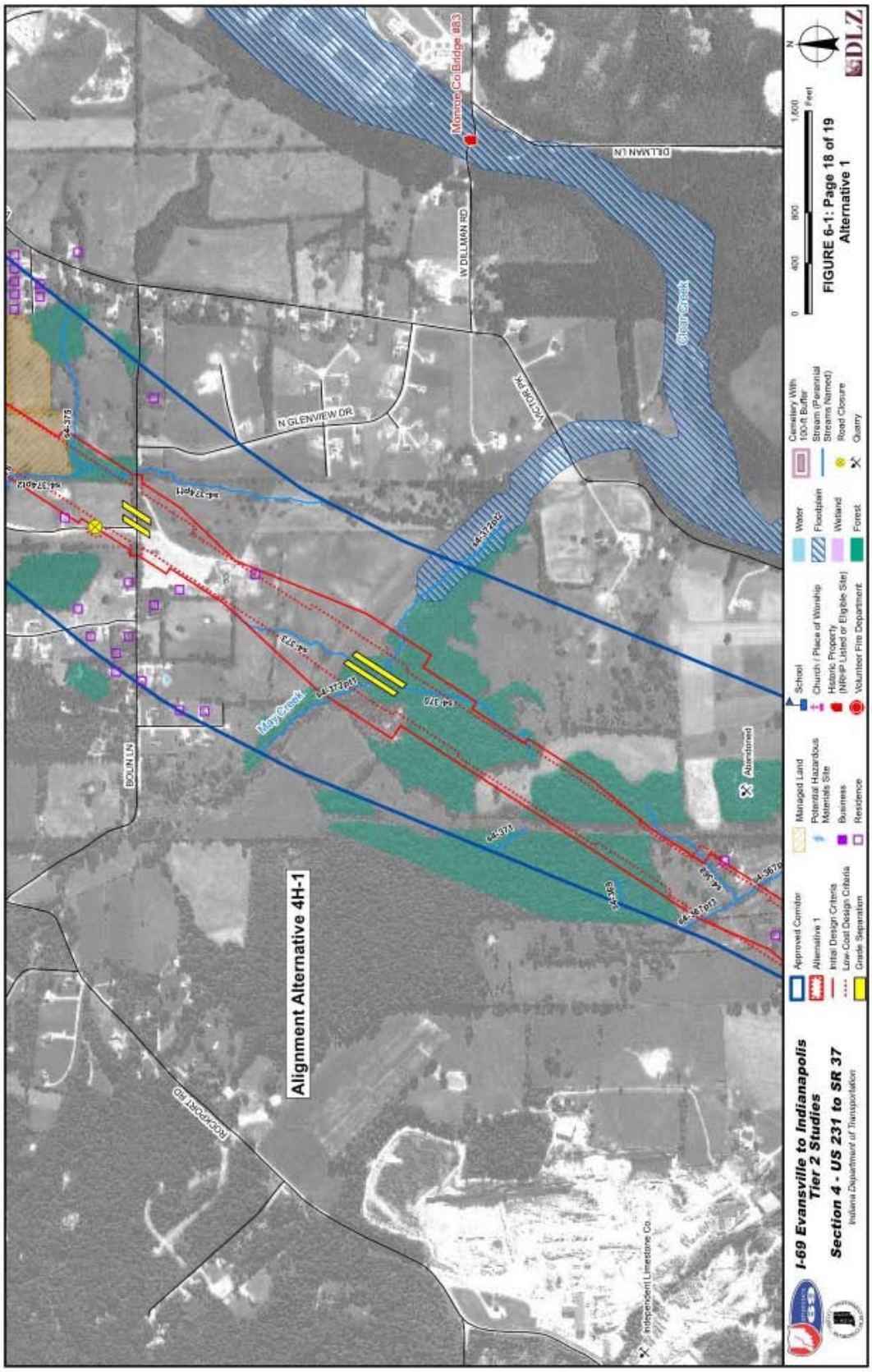

Alignment Alternative 4F-1
Monroe County
Greene County
GRAVES RD
BREEDEN RD
CRUM RD
Sparks Cemetery
Indian Creek
FIGURE 6-1: Page 13 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/IP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet

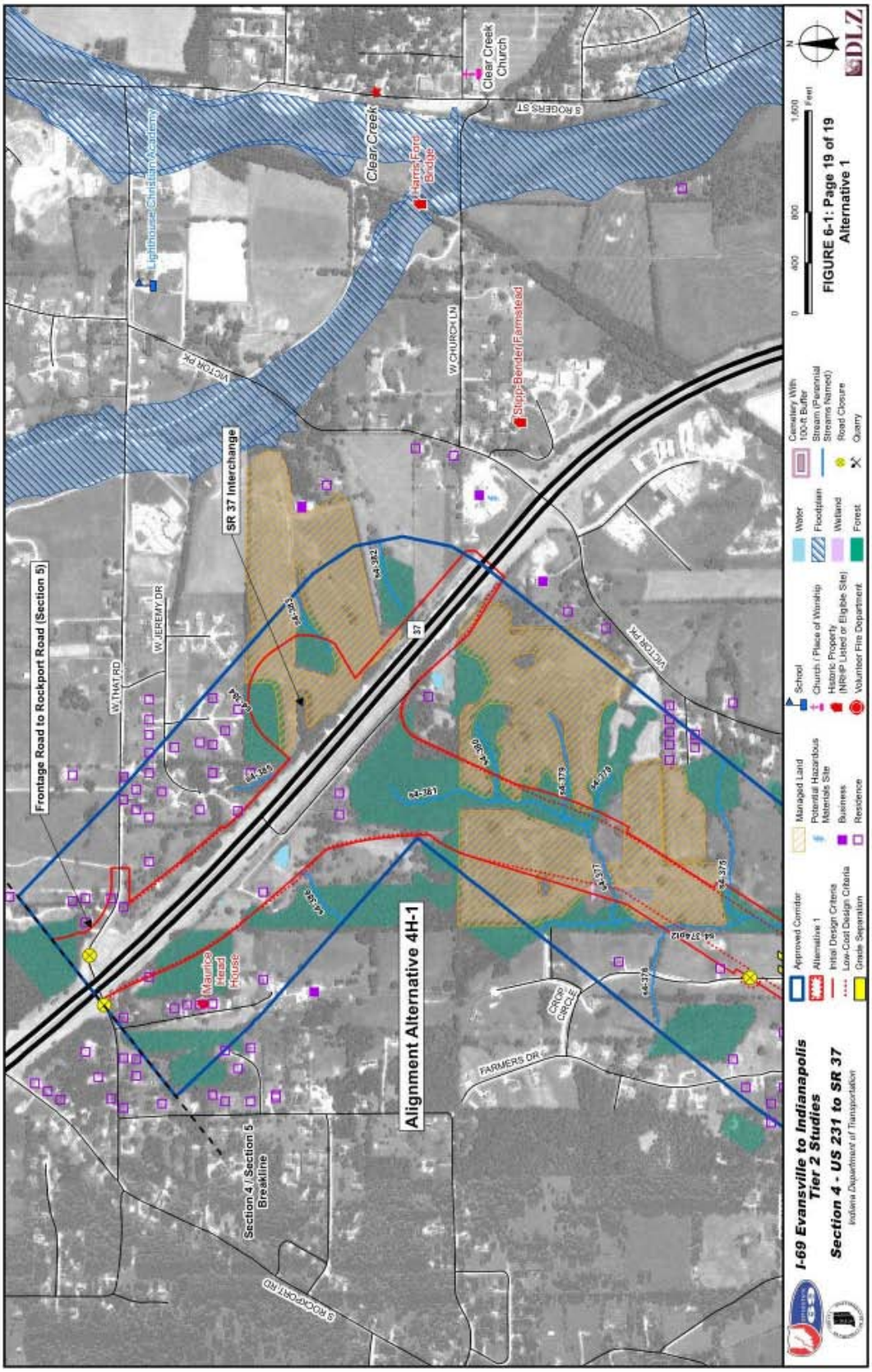

Alignment Alternative 4G-2
Alignment Alternative 4F-1
Subsection F-G Breakline
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indian Creek
Adams Chapel Cemetery
Greene County
Monroe County
TIMBER TRACE
CR 1300E
GREEN MEADOWS
WOODVIEW HILLS
CR 300N
45
FIGURE 6-1: Page 14 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N

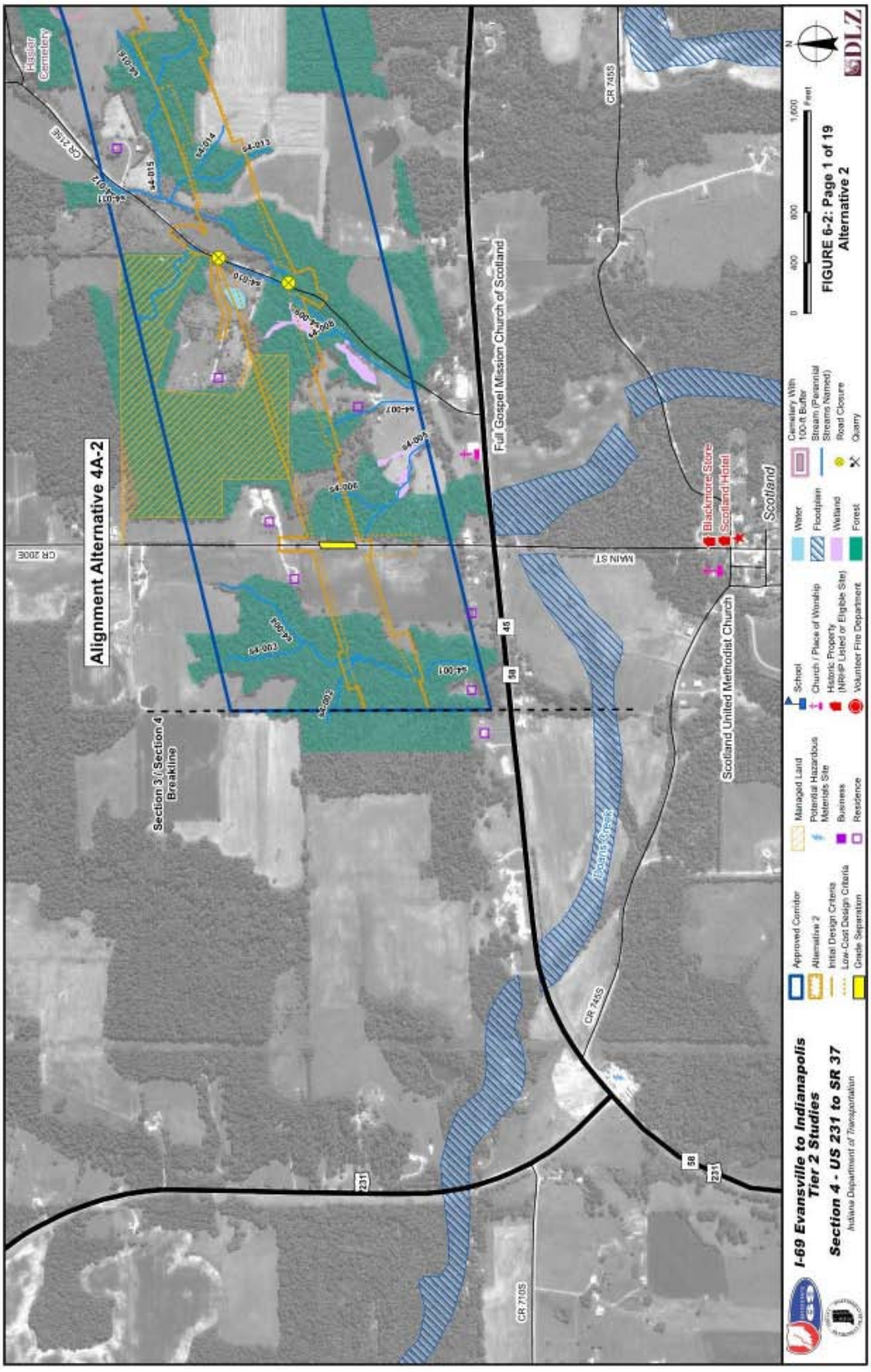

Alignment Alternative 4G-2
HARMONY RD
KOONTZ RD
EVANS RD
EVANS LN
MT. ZION RD
CHURCH RD
Mount Zion Church
Koontz House
Cornerstone Pentecostal Church
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-1: Page 15 of 19
Alternative 1
DLZ

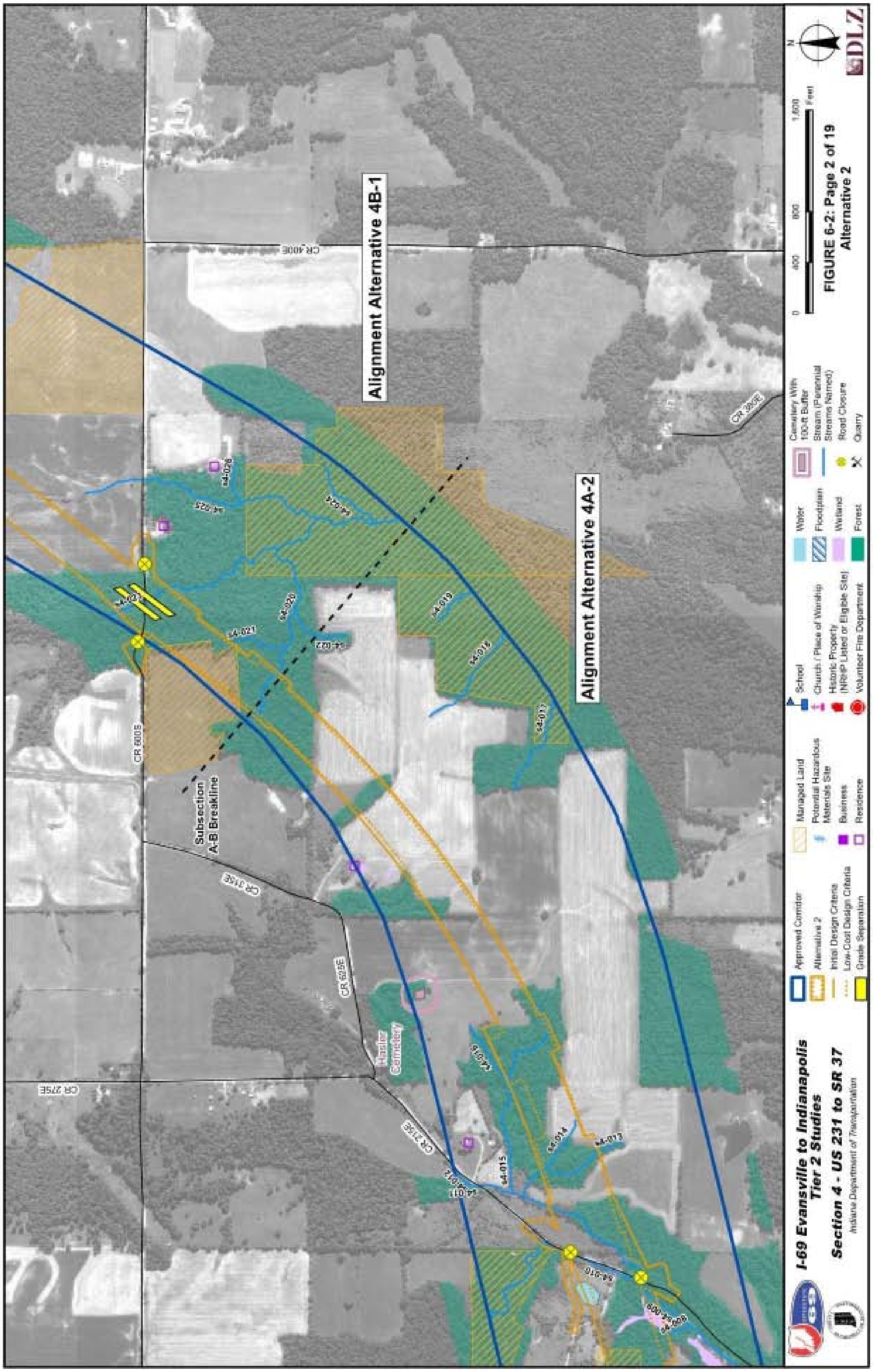

Alignment Alternative 4H-1
Alignment Alternative 4G-2
Subsection G-H Breakline
LODGE RD
ROCKPORT RD
WEST EVANS LN
KOONTZ RD
DUVALL RD
John May House (No Longer Extant)
FIGURE 6-1: Page 16 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

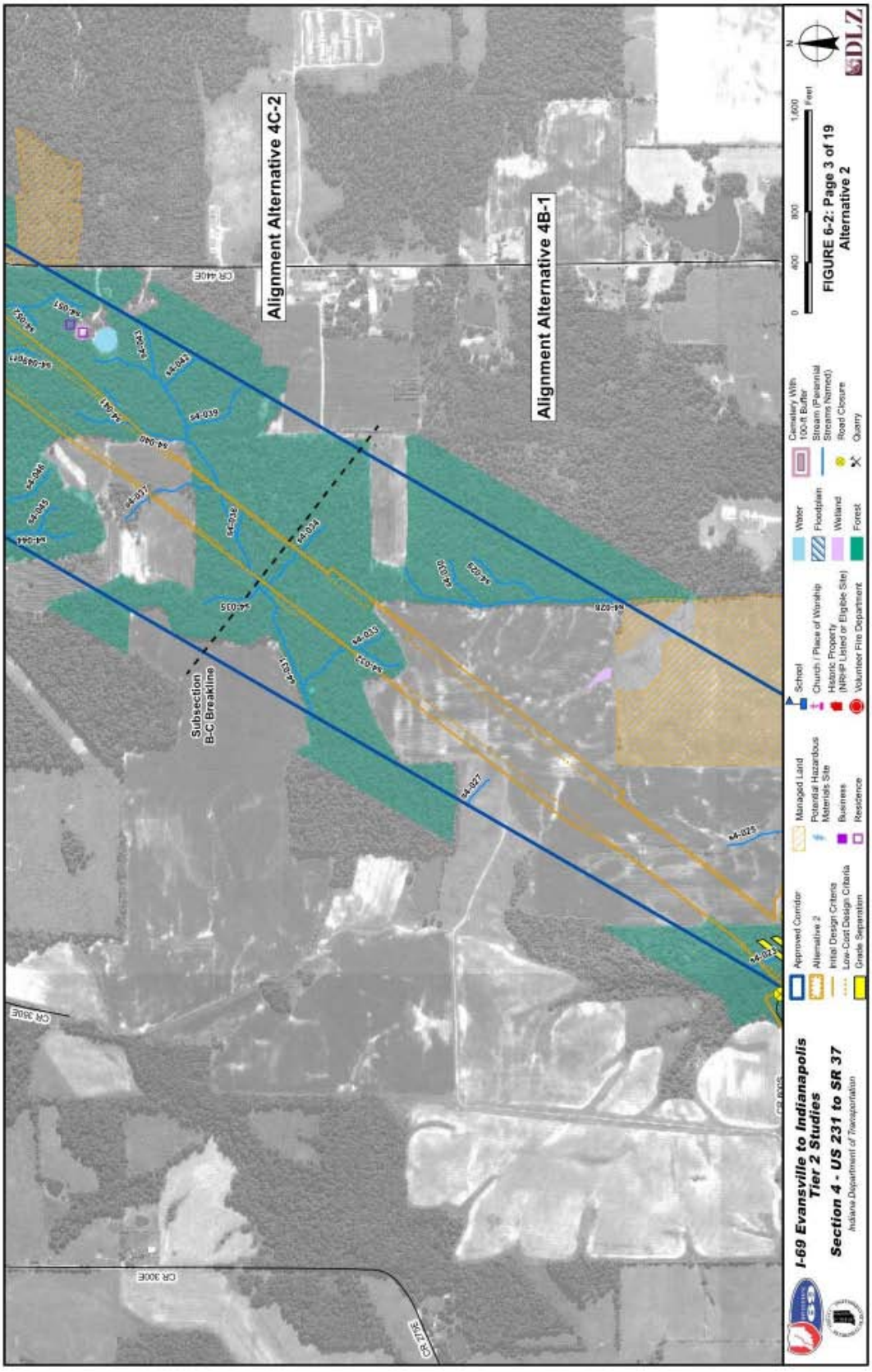

MAMIE EADS RD
Abandoned
TRAMWAY RD
Happy Creek
Alignment Alternative 4H-1
South Union Church
South Union Cemetery
DUVALL RD
ROCKPORT RD
LODGE RD
Subsection G-H Breakline
FIGURE 6-1: Page 17 of 19
Alternative 1
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

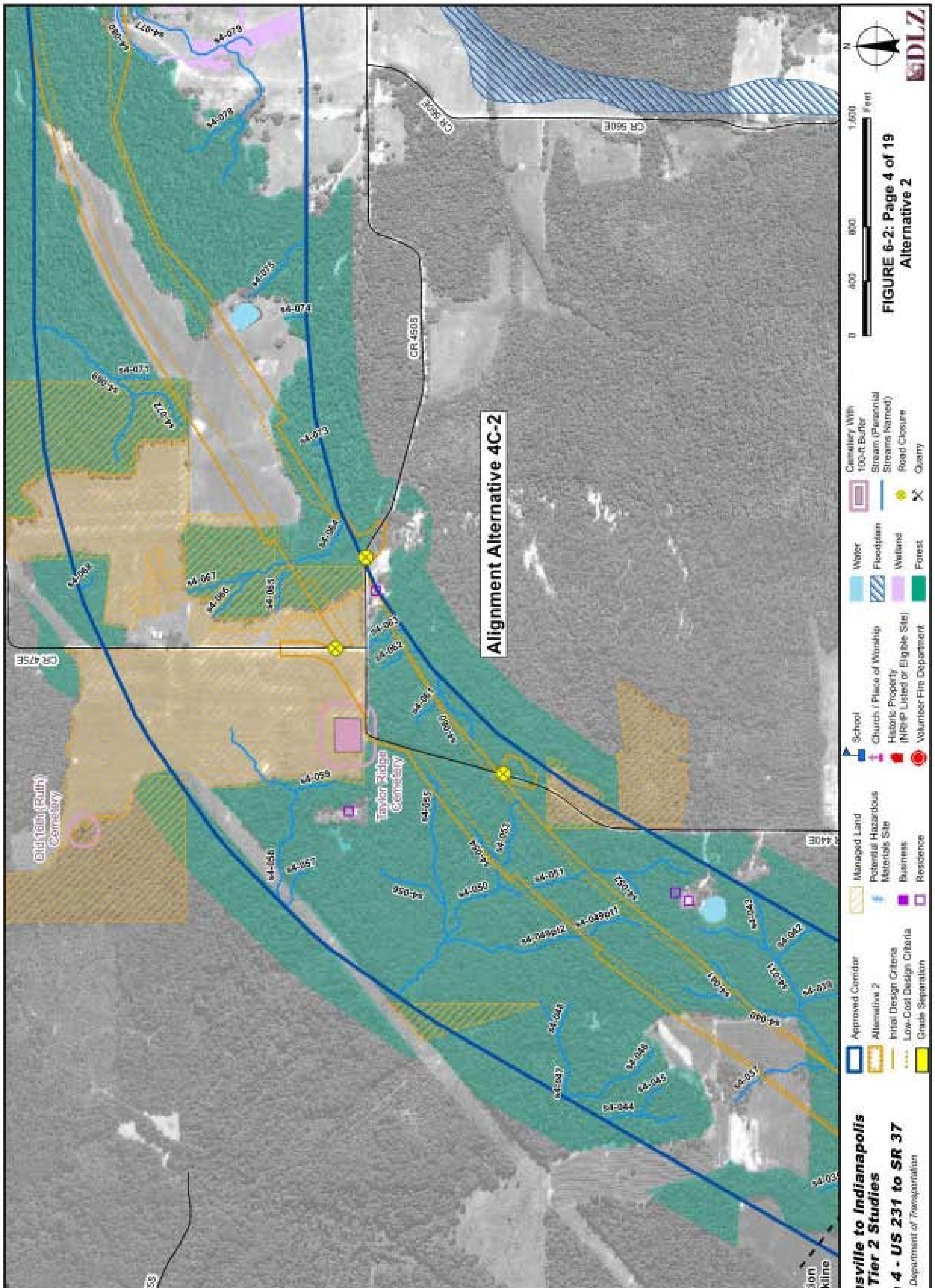

Alignment Alternative 4H-1
Monroe Co Bridge #83
DELMAN LN
W DILLMAN RD
N GLENVIEW DR
VICTOR PK
Clear Creek
May Creek
BOLIN LN
ROCKPORT RD
Abandoned
Independent Limestone Co
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery (With 100-ft Buffer
Streams (Perennial
Streams (Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-1: Page 18 of 19
Alternative 1


Alignment Alternative 4H-1
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
Clear Creek
Clear Creek Church
Harris Ford Bridge
Stipp-Bender Farmstead
Lighthouse Christian Academy
Maurice Head House
Section 4 / Section 5 Breakline
S ROGERS ST
W CHURCH LN
VICTOR PK
W JEREMY DR
W THAT RD
S ROCKPORT RD
FARMERS DR
CROP CIRCLE
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-1: Page 19 of 19
Alternative 1
DLZ
Approved Corridor
Alternative 1
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest
Feet


Alignment Alternative 4A-2
Section 3 / Section 4 Breakline
Full Gospel Mission Church of Scotland
Scotland United Methodist Church
Blackmore Store
Scotland Hotel
Scotland
Hasler Cemetery
CR 200E
MAIN ST
CR 700S
CR 745S
CR 710S
45
58
231
FIGURE 6-2: Page 1 of 19
Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


Alignment Alternative 4B-1
Alignment Alternative 4A-2
Subsection A-B Breakline
Hasler Cemetery
CR 600S
CR 400E
CR 275E
CR 215E
CR 625E
CR 380E
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100ft Buffer
Streams (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-2: Page 2 of 19
Alternative 2
DLZ


Alignment Alternative 4C-2
Alignment Alternative 4B-1
Subsection B-C Breakline
CR 440E
CR 360E
CR 300E
SR 37
FIGURE 6-2: Page 3 of 19
Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Stream Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N


Alignment Alternative 4C-2
Taylor Ridge Cemetery
Old 16th (Ruth) Cemetery
Subsection B-C Breakline
CR 450S
CR 475E
CR 425S
CR 560E
FIGURE 6-2: Page 4 of 19
Alternative 2
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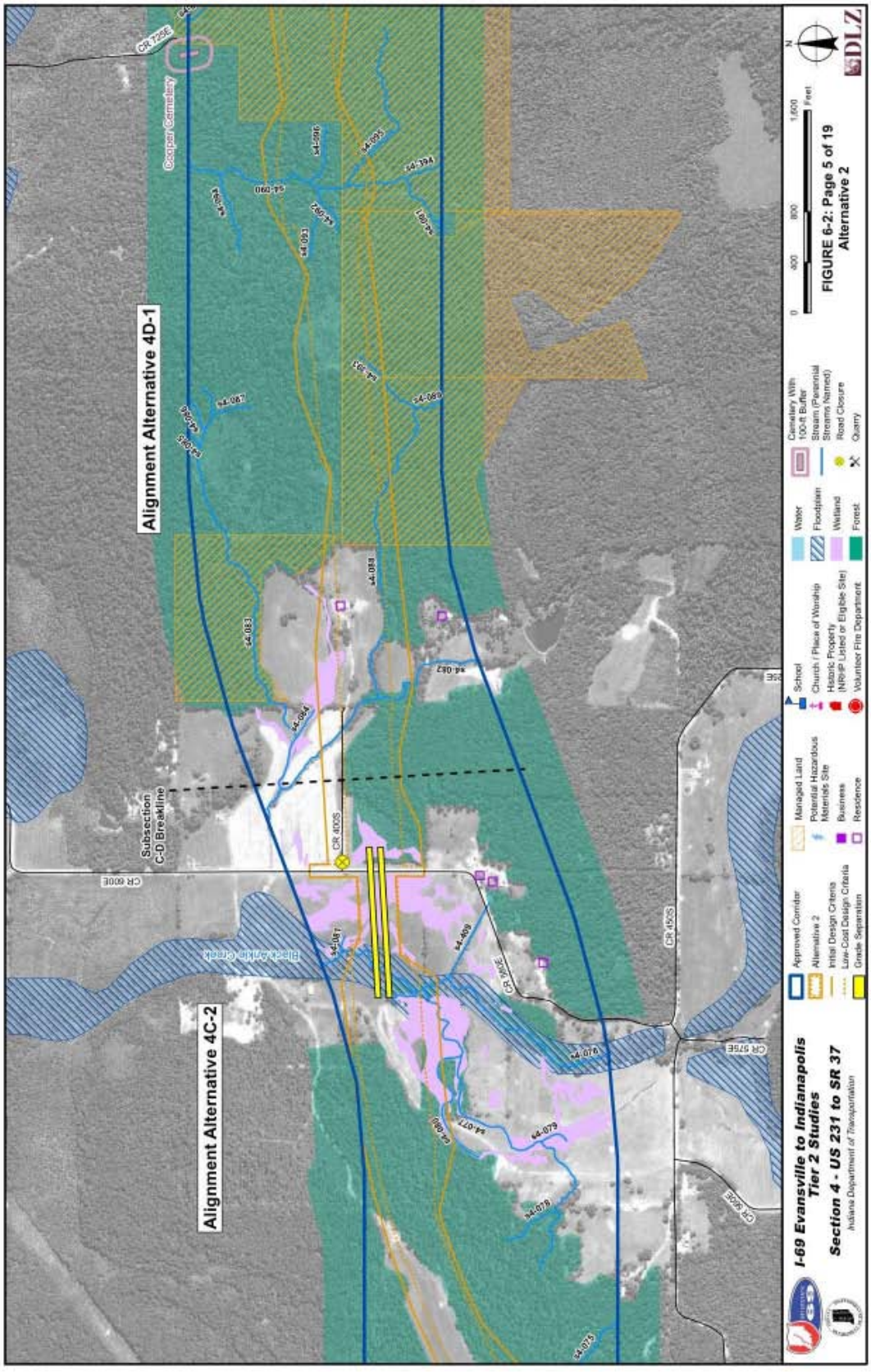
Approved Corridor
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Streams (Perennial Streams Named)
Road Closure
Quarry
DLZ


Alignment Alternative 4D-1
Alignment Alternative 4C-2
Subsection C-D Breakline
Cooper Cemetery
CR 725E
CR 600E
CR 400S
CR 450S
CR 975E
CR 925E
Black Snake Creek
FIGURE 6-2: Page 5 of 19
Alternative 2
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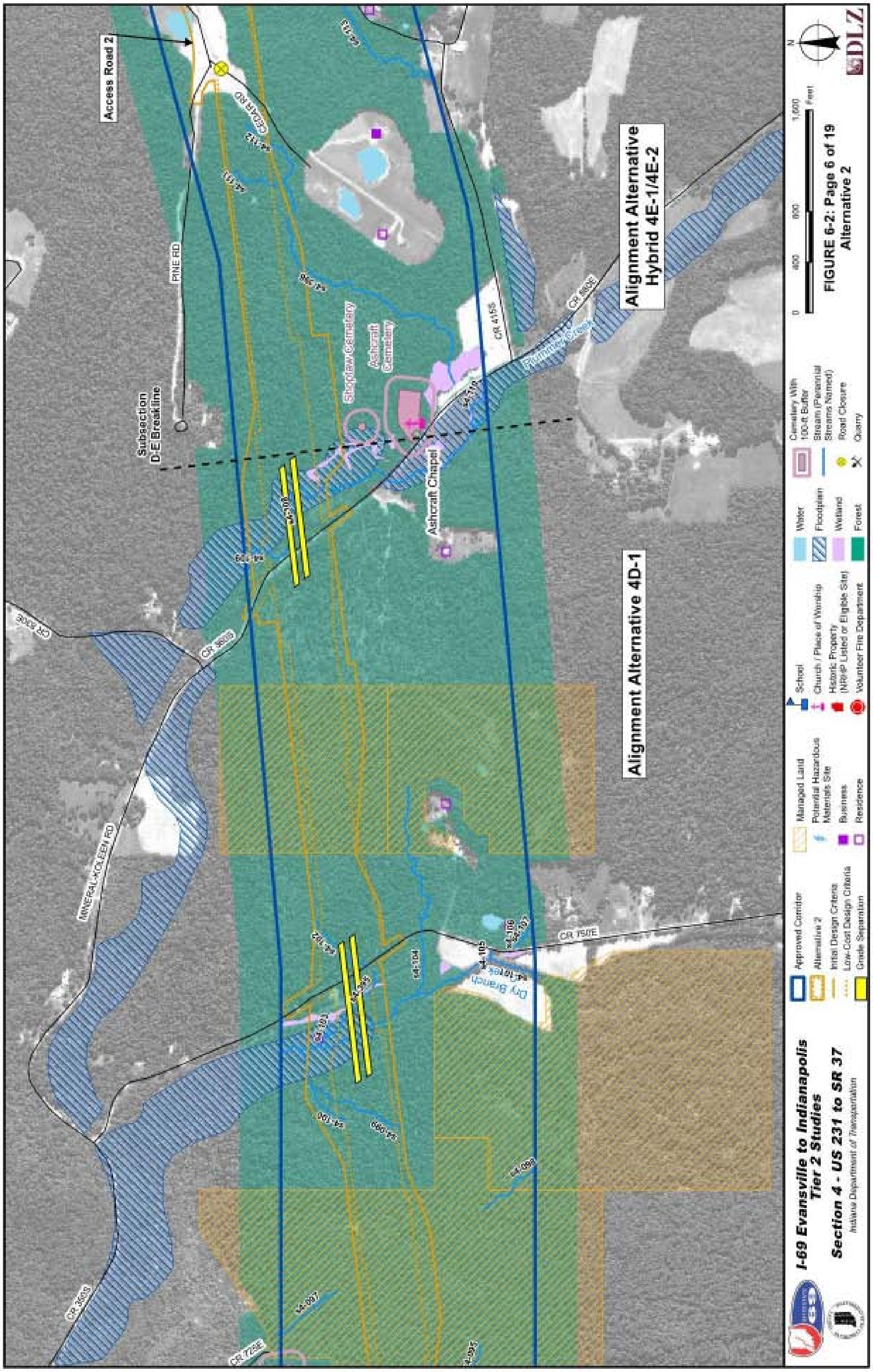
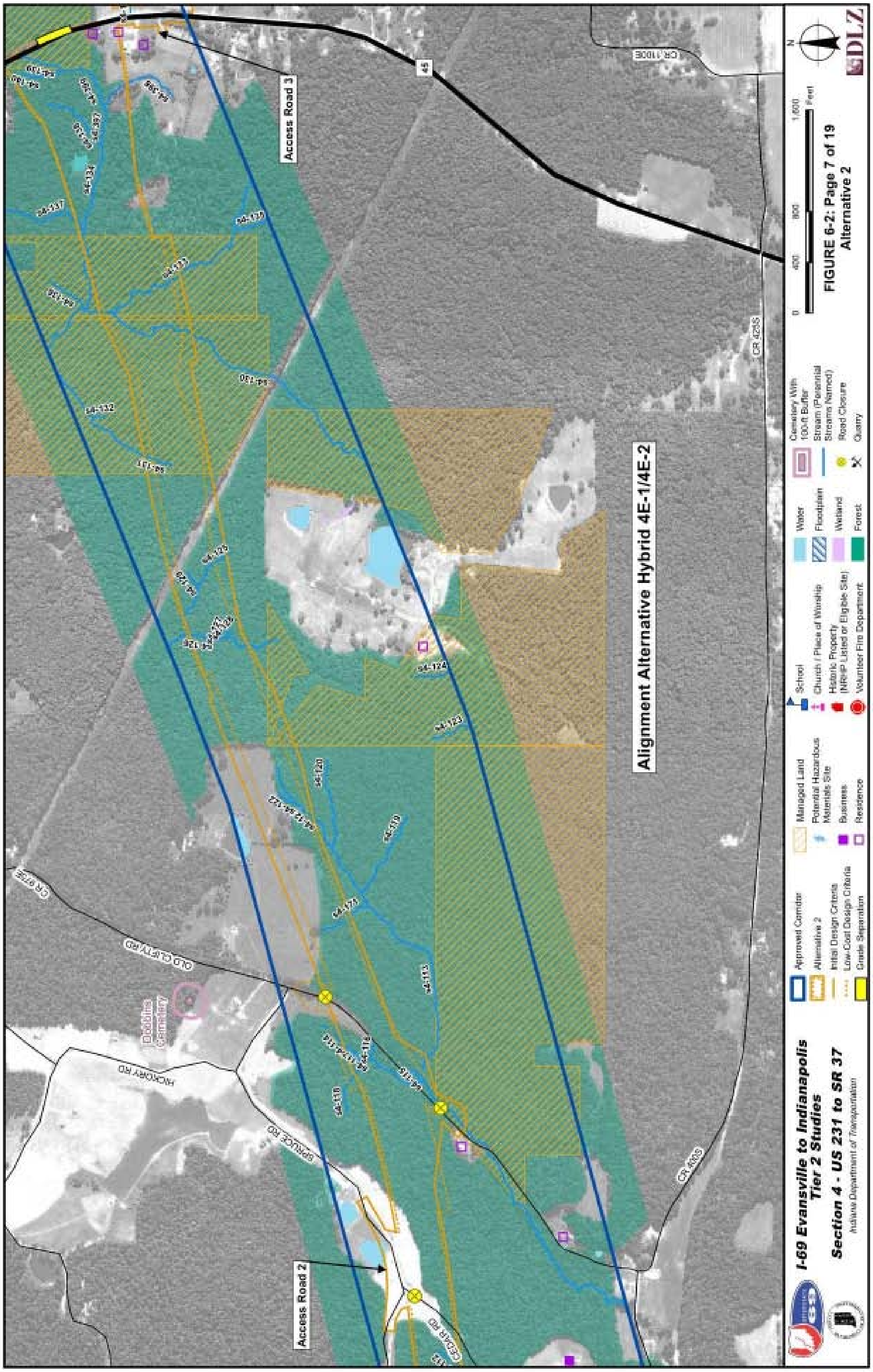
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SHL Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet


Access Road 2
Subsection D-E Breakline
Ashcraft Chapel
Alignment Alternative Hybrid 4E-1/4E-2
Alignment Alternative 4D-1
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
FIGURE 6-2: Page 6 of 19
Alternative 2


Alignment Alternative Hybrid 4E-1/4E-2
Access Road 3
Access Road 2
Dobbins Cemetery
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
CEDAR RD
FIGURE 6-2: Page 7 of 19
Alternative 2
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
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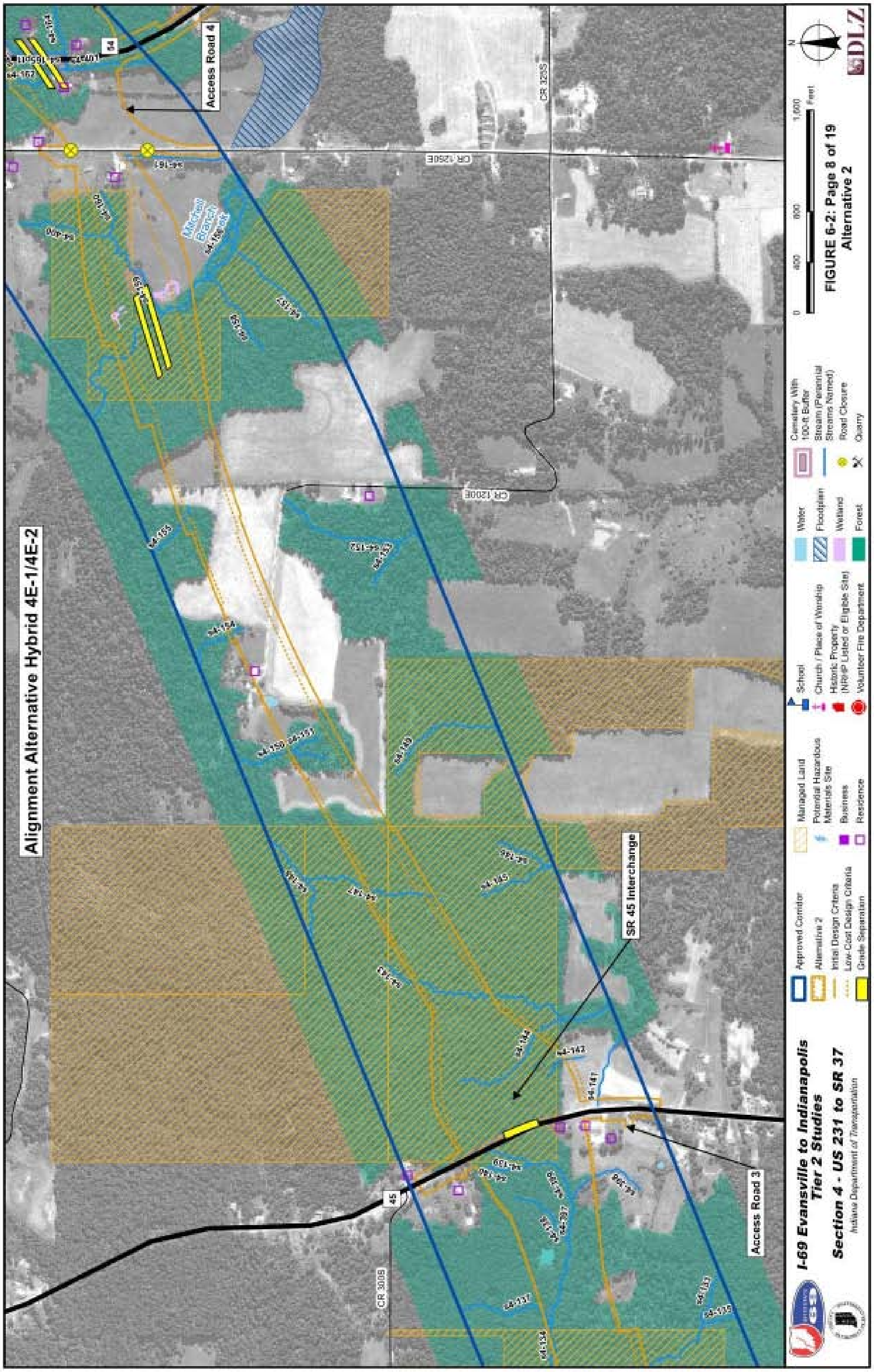
Alignment Alternative Hybrid 4E-1/4E-2
Access Road 4
SR 45 Interchange
Access Road 3
CR 1250E
CR 1200E
CR 300S
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
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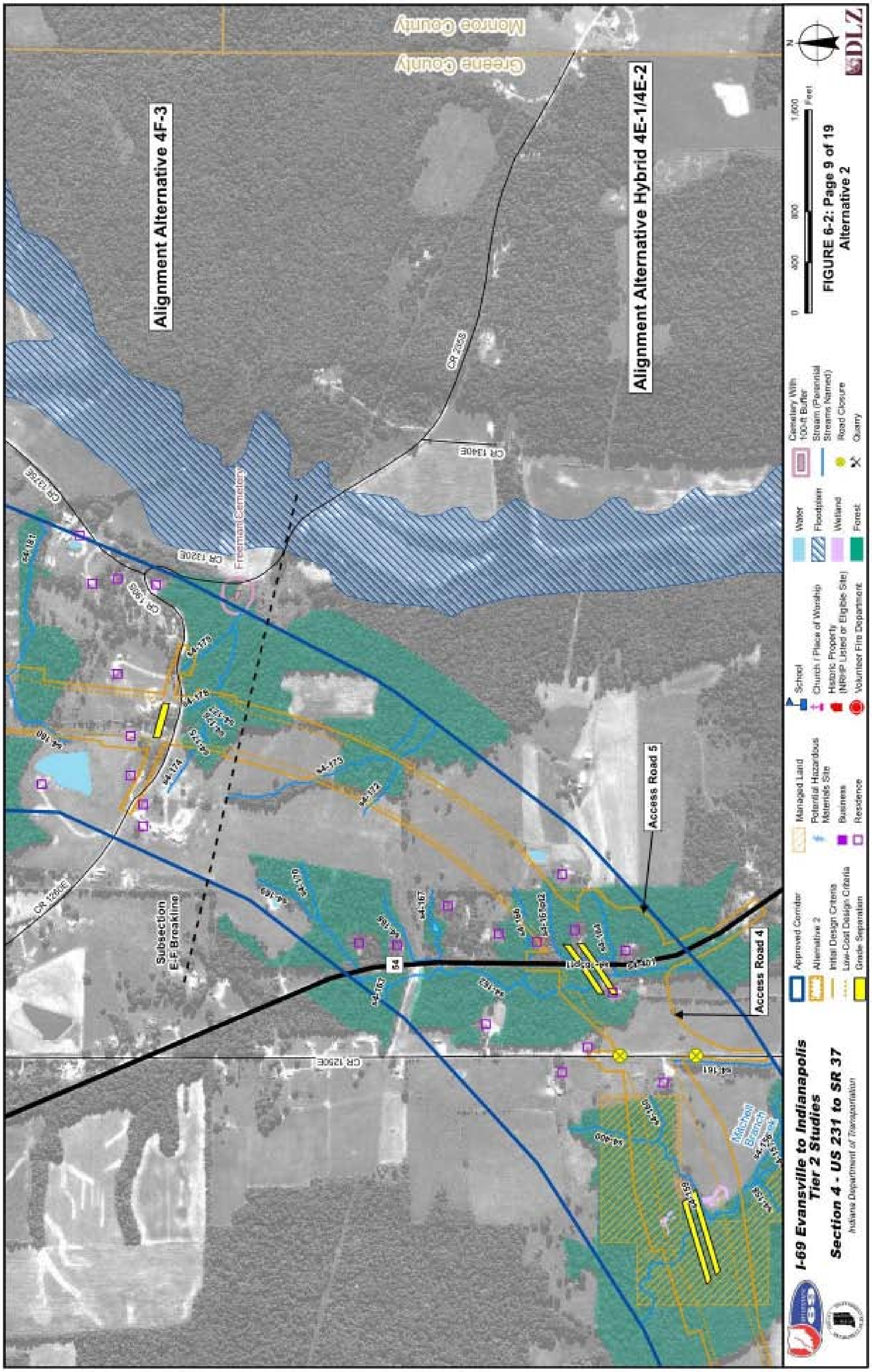
FIGURE 6-2: Page 8 of 19
Alternative 2
DLZ


Alignment Alternative 4F-3
Alignment Alternative Hybrid 4E-1/4E-2
Greene County
Monroe County
Freeman Cemetery
Access Road 5
Access Road 4
Subsection E-F Breakline
Mitchell Branch
I-69 Evansville to Indianapolis Tier 2 Studies
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Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-2: Page 9 of 19
Alternative 2
DLZ

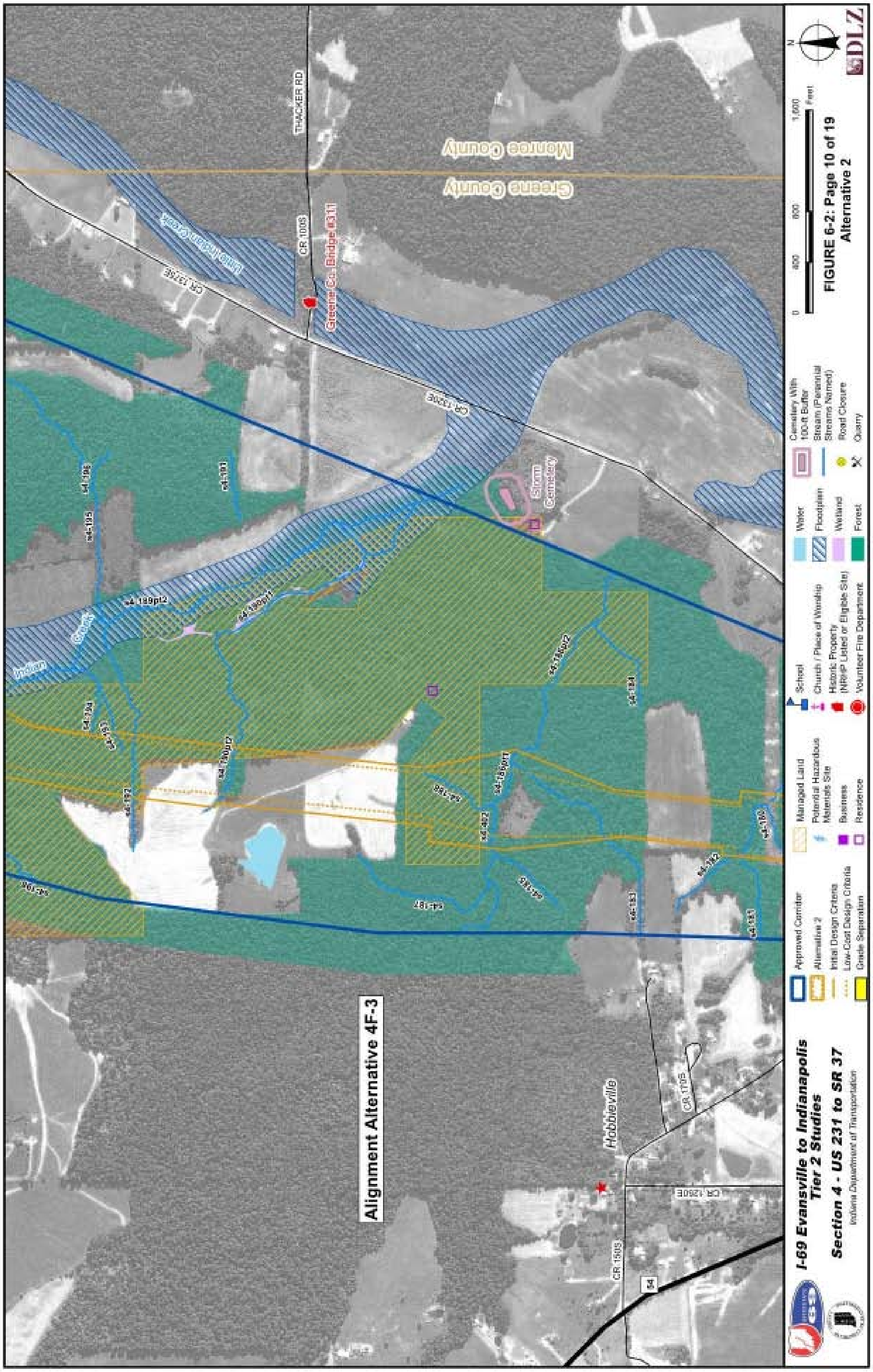
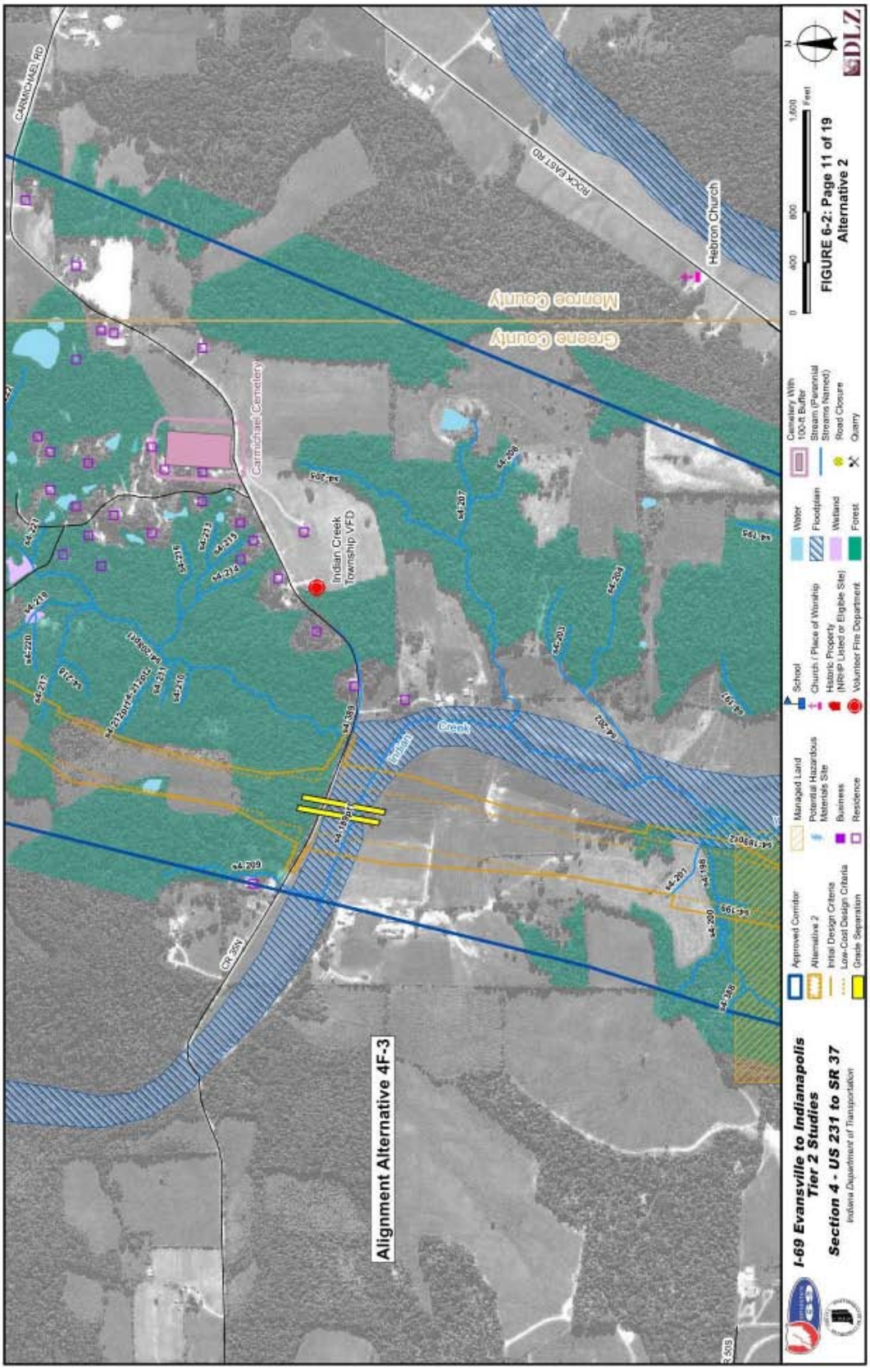


FIGURE 6-2: Page 10 of 19
Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Alignment Alternative 4F-3
Greene County
Monroe County
Greene Co. Bridge #311
Storm Cemetery
Hobbieville
THACKER RD
Indian Creek
Little Indian Creek
DLZ


Alignment Alternative 4F-3
Hebron Church
Carmichael Cemetery
Indian Creek Township VFD
Indian Creek
Greene County
Monroe County
CR 39N
FIGURE 6-2: Page 11 of 19
Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
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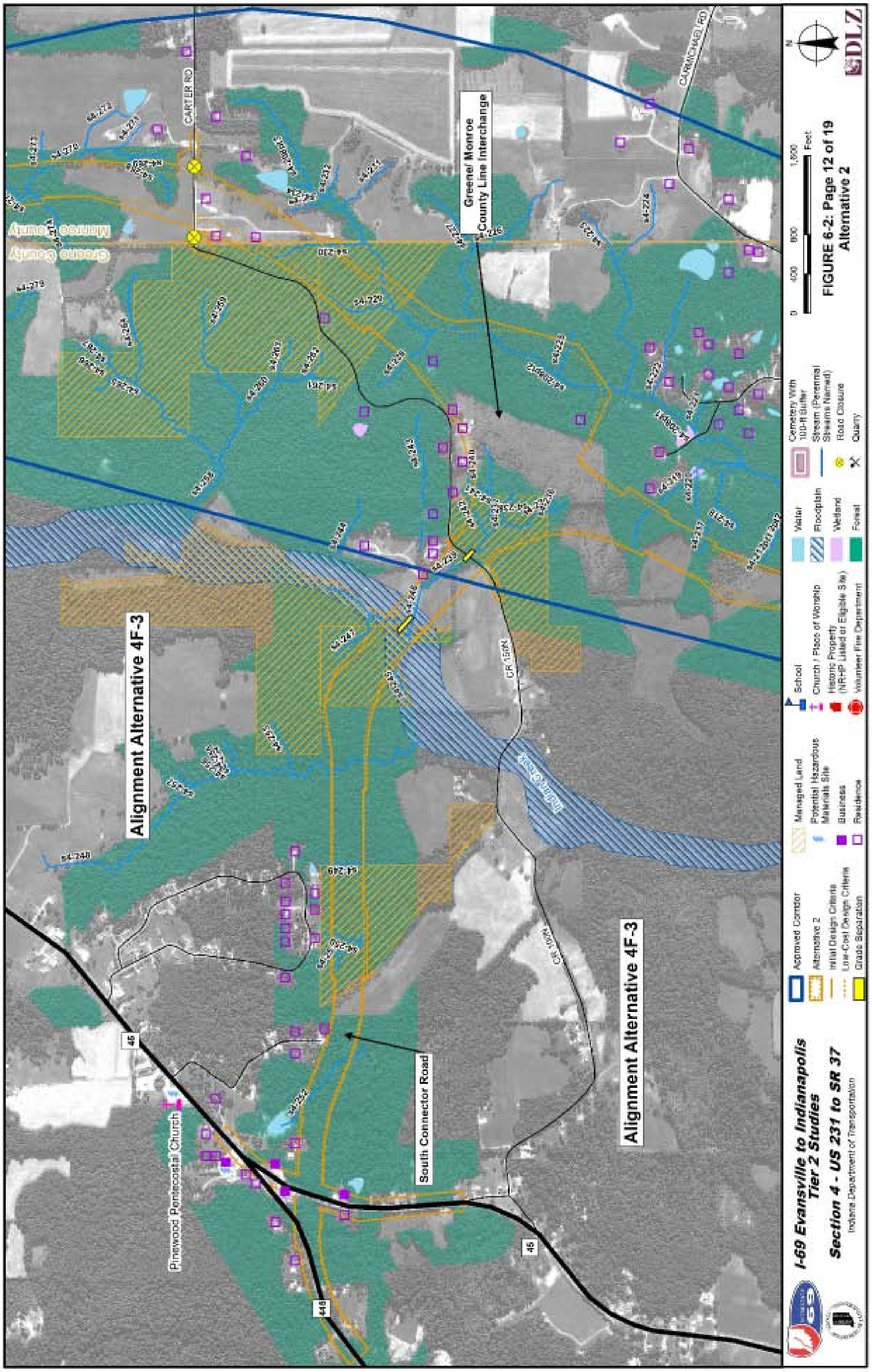
Indiana Department of Transportation
DLZ


Alignment Alternative 4F-3
Alignment Alternative 4F-3
Greene/ Monroe County Line Interchange
South Connector Road
Pinewood Pentecostal Church
Greene County
Monroe County
CARTER RD
CR 150N
CR 100N
FIGURE 6-2: Page 12 of 19
Alternative 2
I-69 Evansville to Indianapolis Tier 2 Studies
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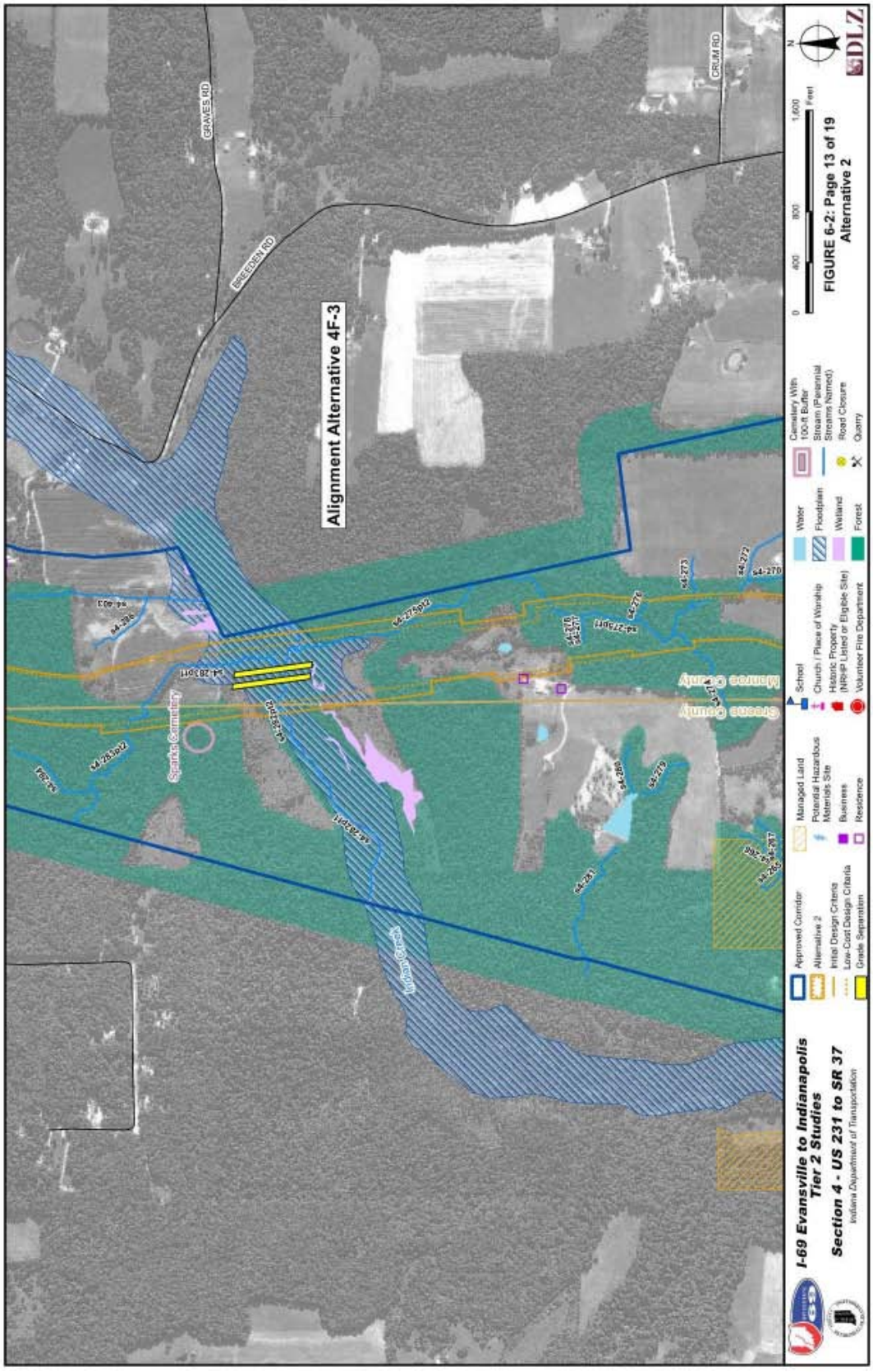
Indiana Department of Transportation
DLZ


Alignment Alternative 4F-3
GRAVES RD
BREEDEN RD
CRUM RD
Spinks Cemetery
Greene County
Monroe County
Indian Creek
FIGURE 6-2: Page 13 of 19
Alternative 2
I-69 Evansville to Indianapolis
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Indiana Department of Transportation
DLZ
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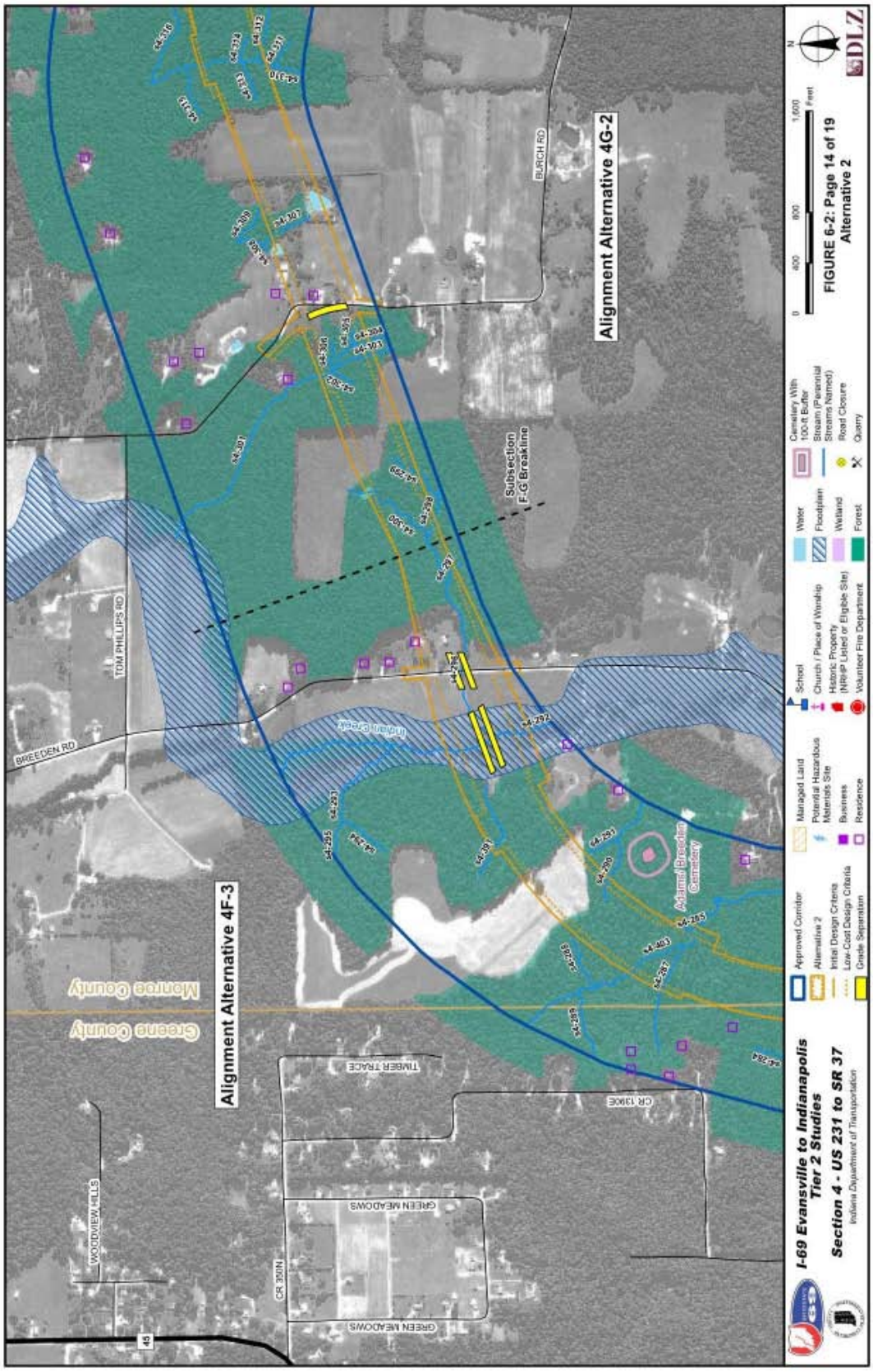
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Stream Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N


Alignment Alternative 4G-2
Alignment Alternative 4F-3
Subsection F-G Breakline
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indiana Creek
Adams Bracken Cemetery
TIMBER TRACE
GREEN MEADOWS
WOODVIEW HILLS
CR 300N
CR 1300E
45
Greene County
Monroe County
FIGURE 6-2: Page 14 of 19
Alternative 2
I-69 Evansville to Indianapolis
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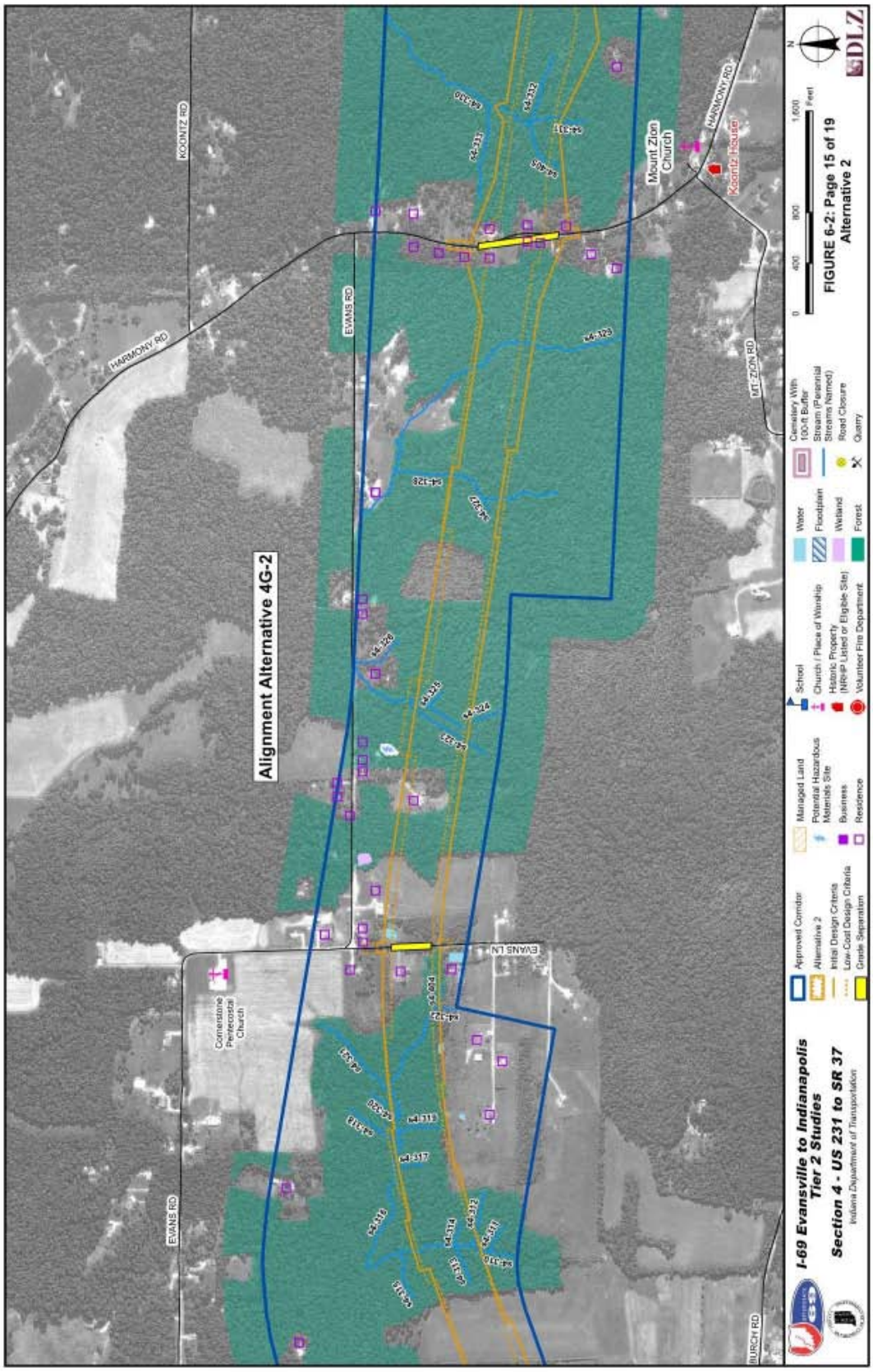
DLZ
Approved Corridor
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N


Alignment Alternative 4G-2
KOONTZ RD
HARMONY RD
EVANS RD
EVANS LN
MT ZION RD
BURCH RD
Mount Zion Church
Koontz House
Cornerstone Pentecostal Church
FIGURE 6-2: Page 15 of 19
Alternative 2
I-69 Evansville to Indianapolis
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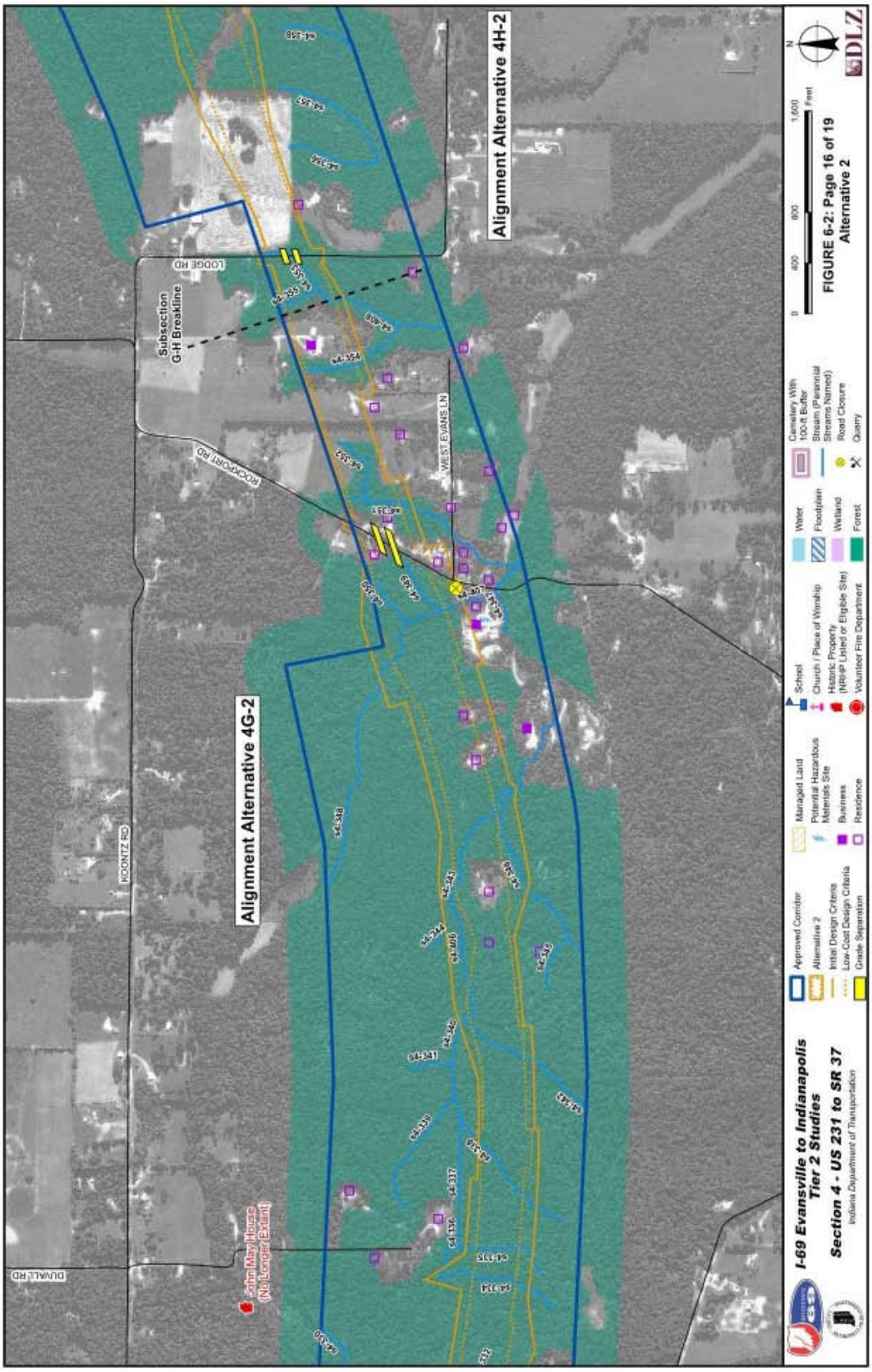
Approved Corridor
Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Cross Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet


Alignment Alternative 4H-2
Alignment Alternative 4G-2
Subsection G-H Breakline
LODGE RD
WEST EVANS LN
KOONTZ RD
DUVALL RD
John May House (No Longer Extant)
FIGURE 6-2: Page 16 of 19
Alternative 2
I-69 Evansville to Indianapolis
Tier 2 Studies
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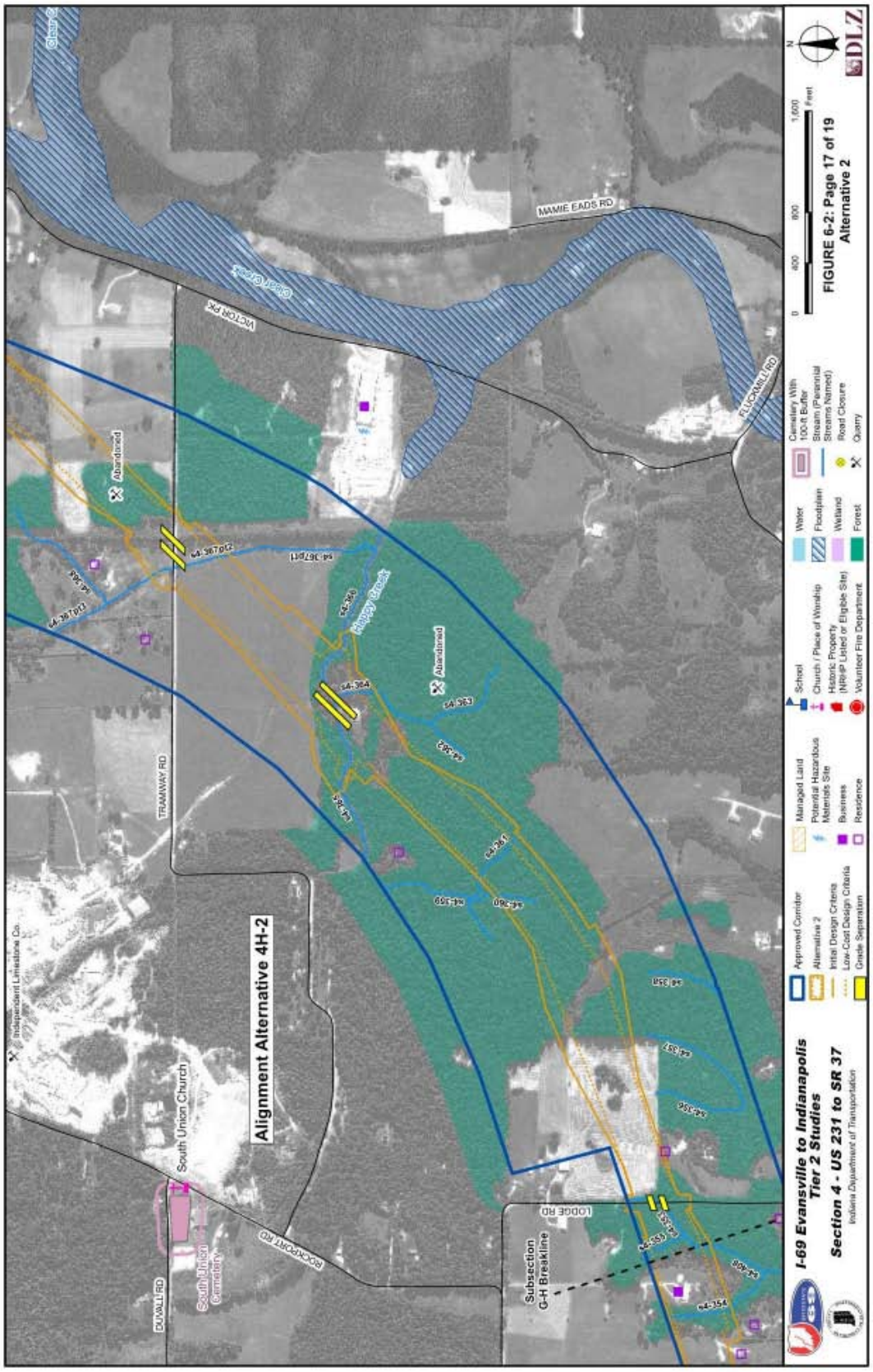
Indiana Department of Transportation
DLZ


MAMIE EADS RD
Ohio River
VICTOR PK
FLUCKAMILL RD
Abandoned
Happy Creek
TRAMWAY RD
Alignment Alternative 4H-2
South Union Church
South Union Cemetery
DUVALL RD
ROCKPORT RD
LODGE RD
Subsection G-H Breakline
Independent Limestone Co
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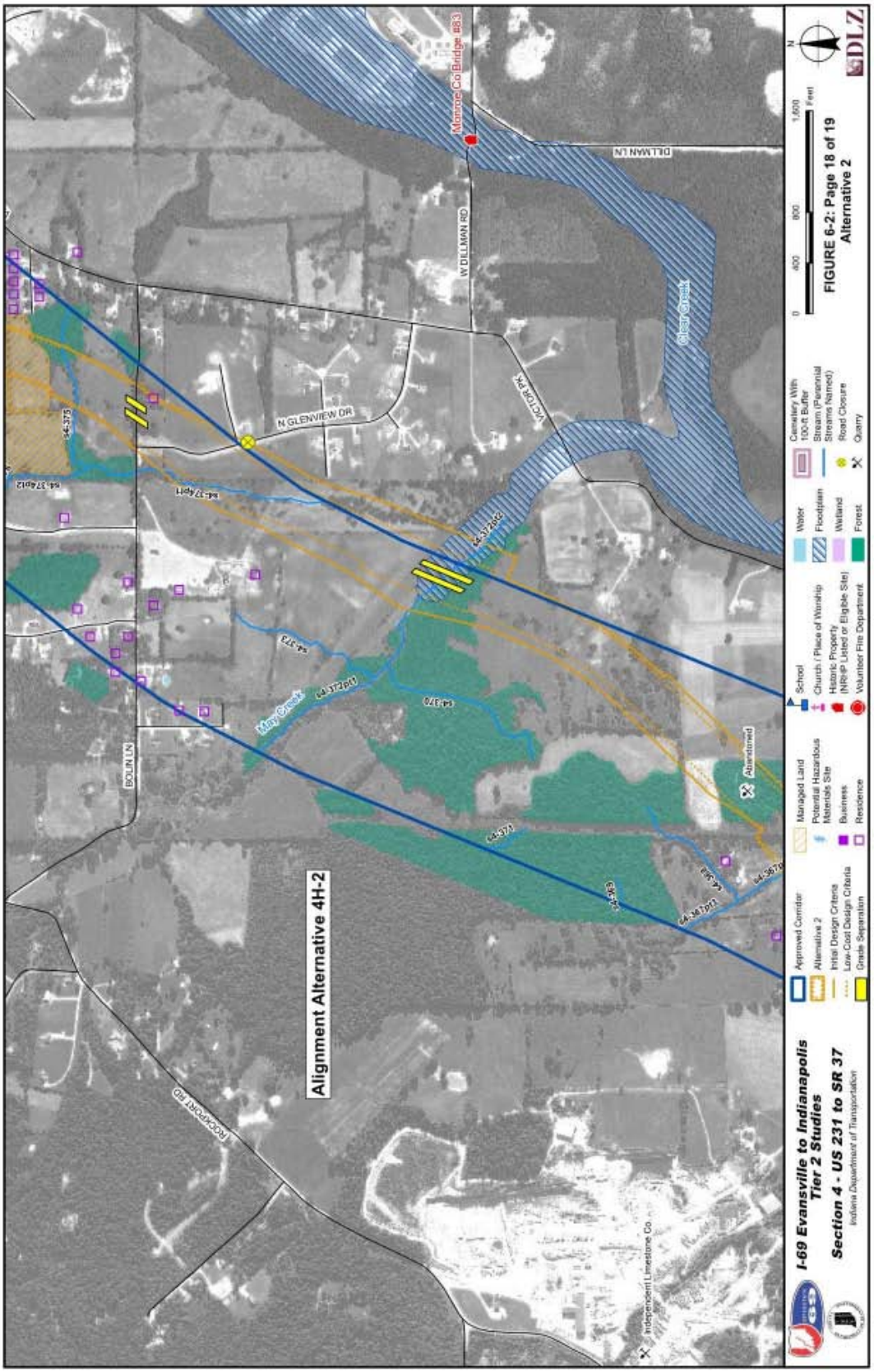
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-2: Page 17 of 19
Alternative 2


Alignment Alternative 4H-2
Monroe Co Bridge #83
W DELLMAN RD
DELMAN LN
N GLENVIEW DR
VICTOR PK
Clear Creek
Mary Creek
BOLIN LN
ROCKPORT RD
Abandoned
Independent Limestone Co
I-69 Evansville to Indianapolis Tier 2 Studies
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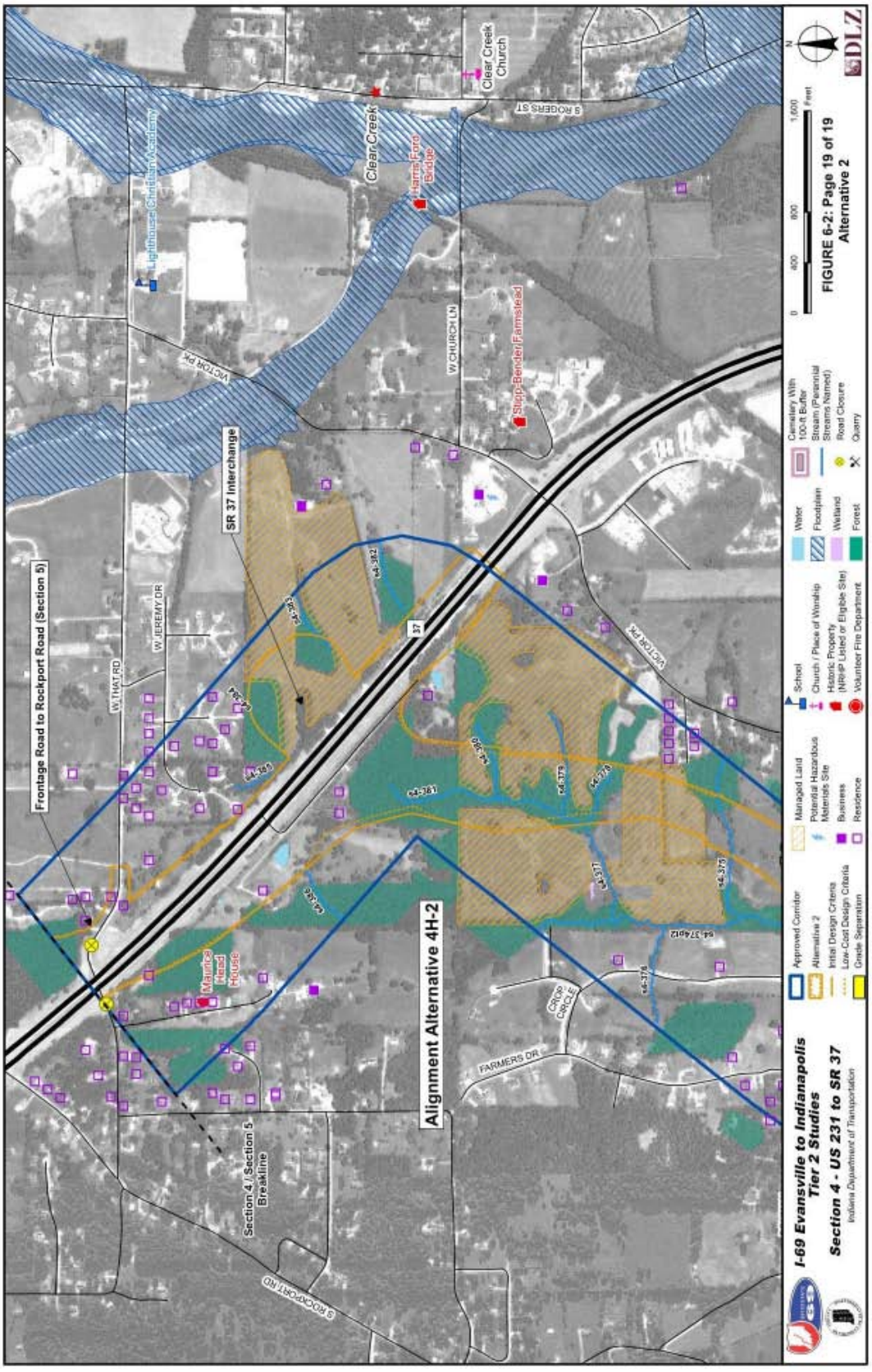
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-2: Page 18 of 19
Alternative 2
0
400
800
1,600
Feet
N
DLZ


Clear Creek Church
Clear Creek
Harris Farm Bridge
Lighthouse Christian Academy
Slupp-Bender Farmstead
W CHURCH LN
S ROGERS ST
VICTOR PK
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
W THAT RD
W JEREMY DR
37
Alignment Alternative 4H-2
Maurice Hand House
CROP CIRCLE
FARMERS DR
Section 4 / Section 5 Breakline
S ROCKPORT RD
I-69 Evansville to Indianapolis Tier 2 Studies
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Alternative 2
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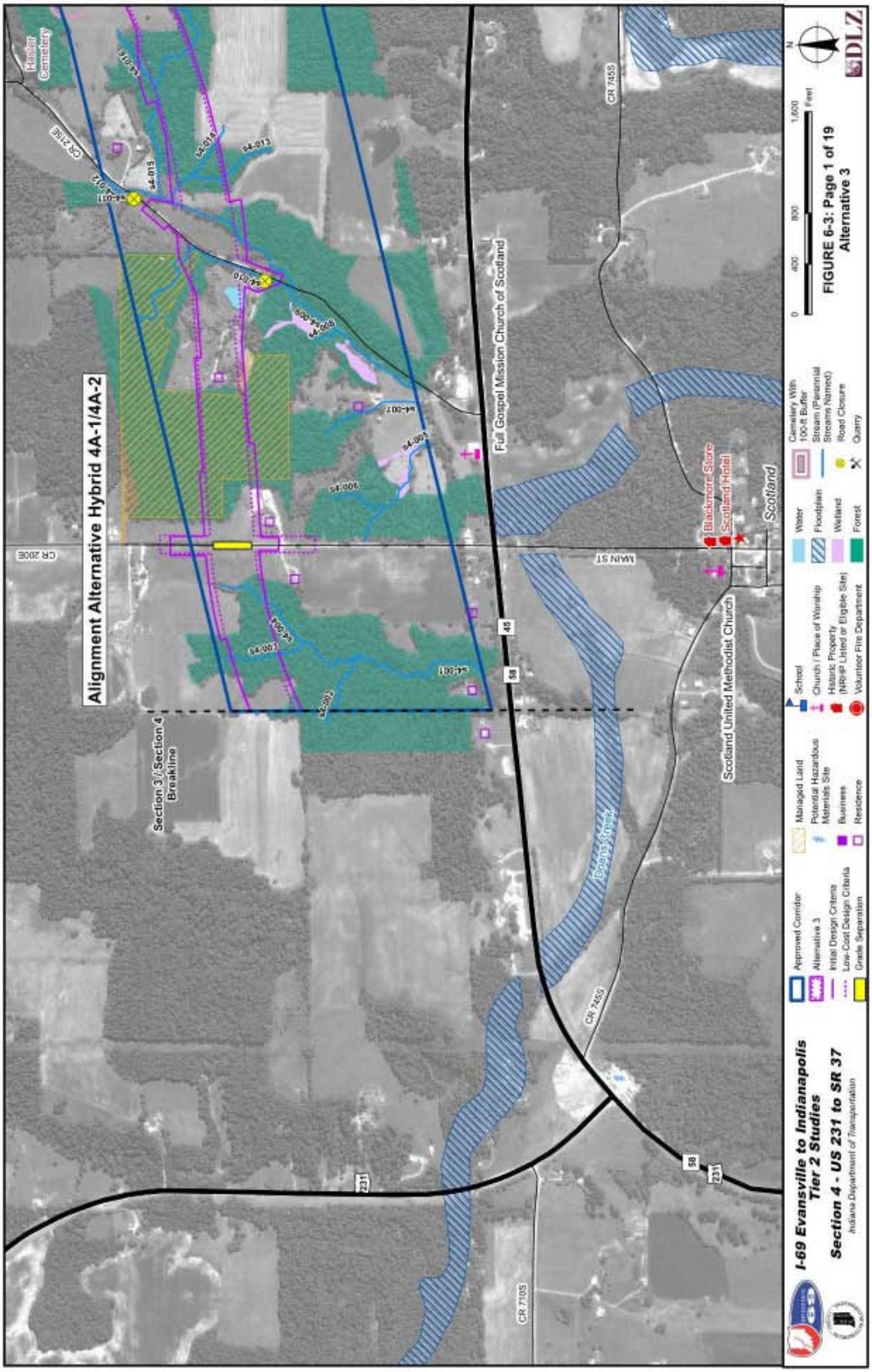
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-2: Page 19 of 19
Alternative 2
DLZ


Alignment Alternative Hybrid 4A-1/4A-2
Section 3 / Section 4 Breakline
Full Gospel Mission Church of Scotland
Scotland United Methodist Church
Blackmore Store
Scotland Hotel
Scotland
MAIN ST
CR 200E
CR 7455
CR 7485
CR 7105
Haslet Cemetery
Eagle Creek
46
58
231
FIGURE 6-3: Page 1 of 19
Alternative 3
I-69 Evansville to Indianapolis
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Section 4 - US 231 to SR 37
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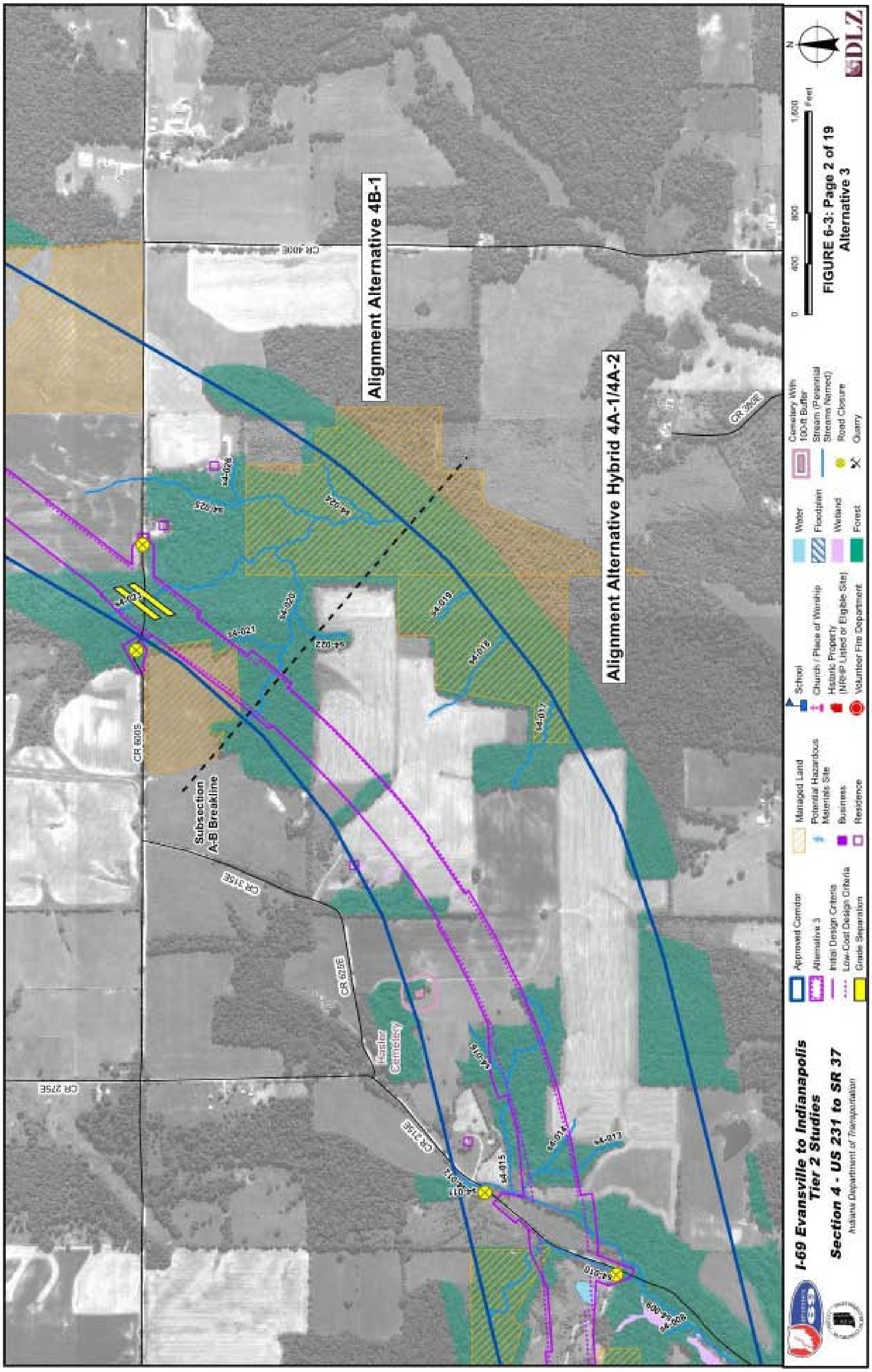
DLZ


Alignment Alternative 4B-1
Alignment Alternative Hybrid 4A-1/4A-2
Subsection A-B Breakline
Hasler Cemetery
CR 600S
CR 400E
CR 625E
CR 275E
FIGURE 6-3: Page 2 of 19
Alternative 3
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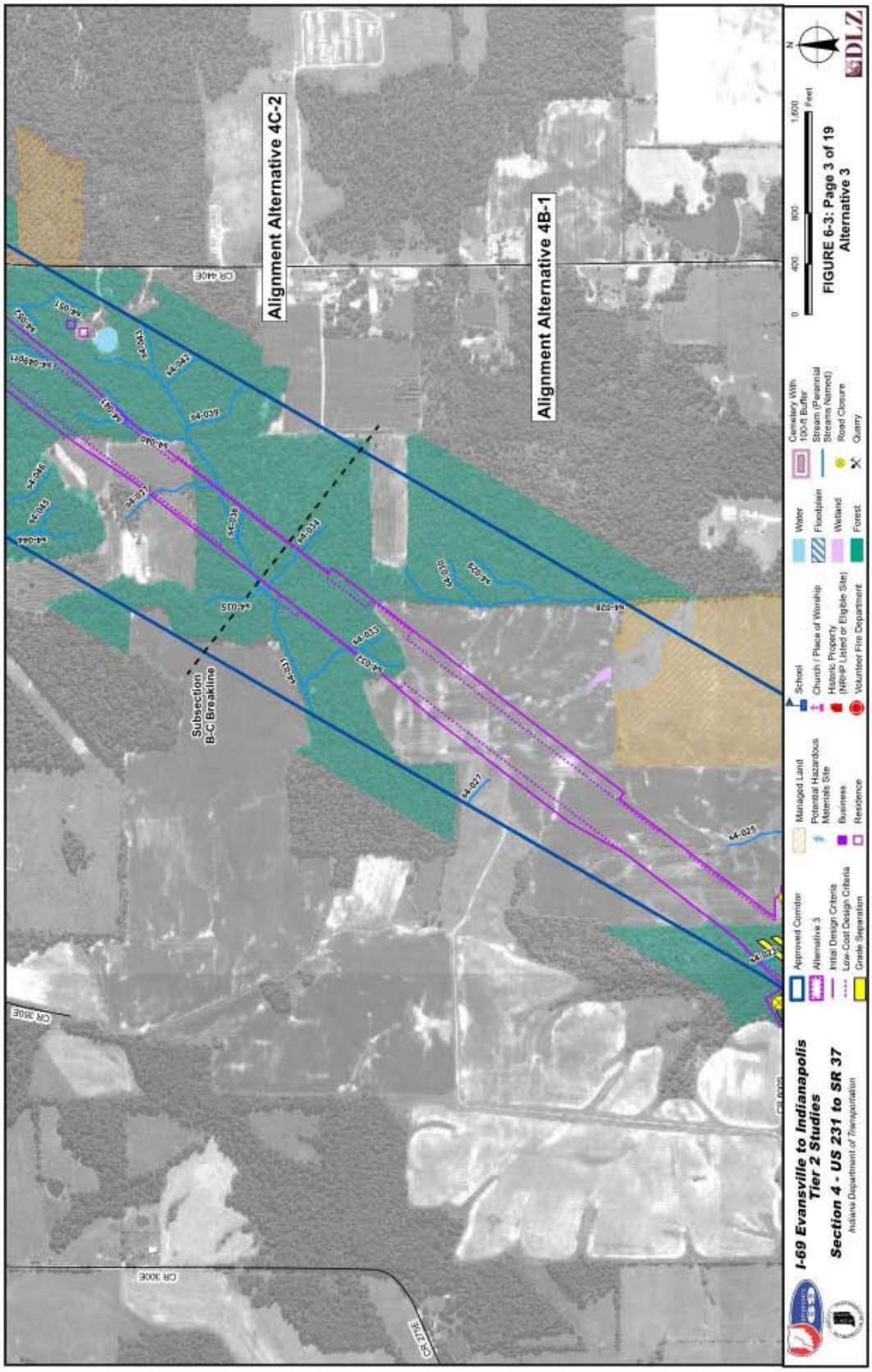
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ


Alignment Alternative 4C-2
Alignment Alternative 4B-1
Subsection B-C Breakline
CR 440E
CR 350E
CR 300E
CR 270E
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
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Alternative 3
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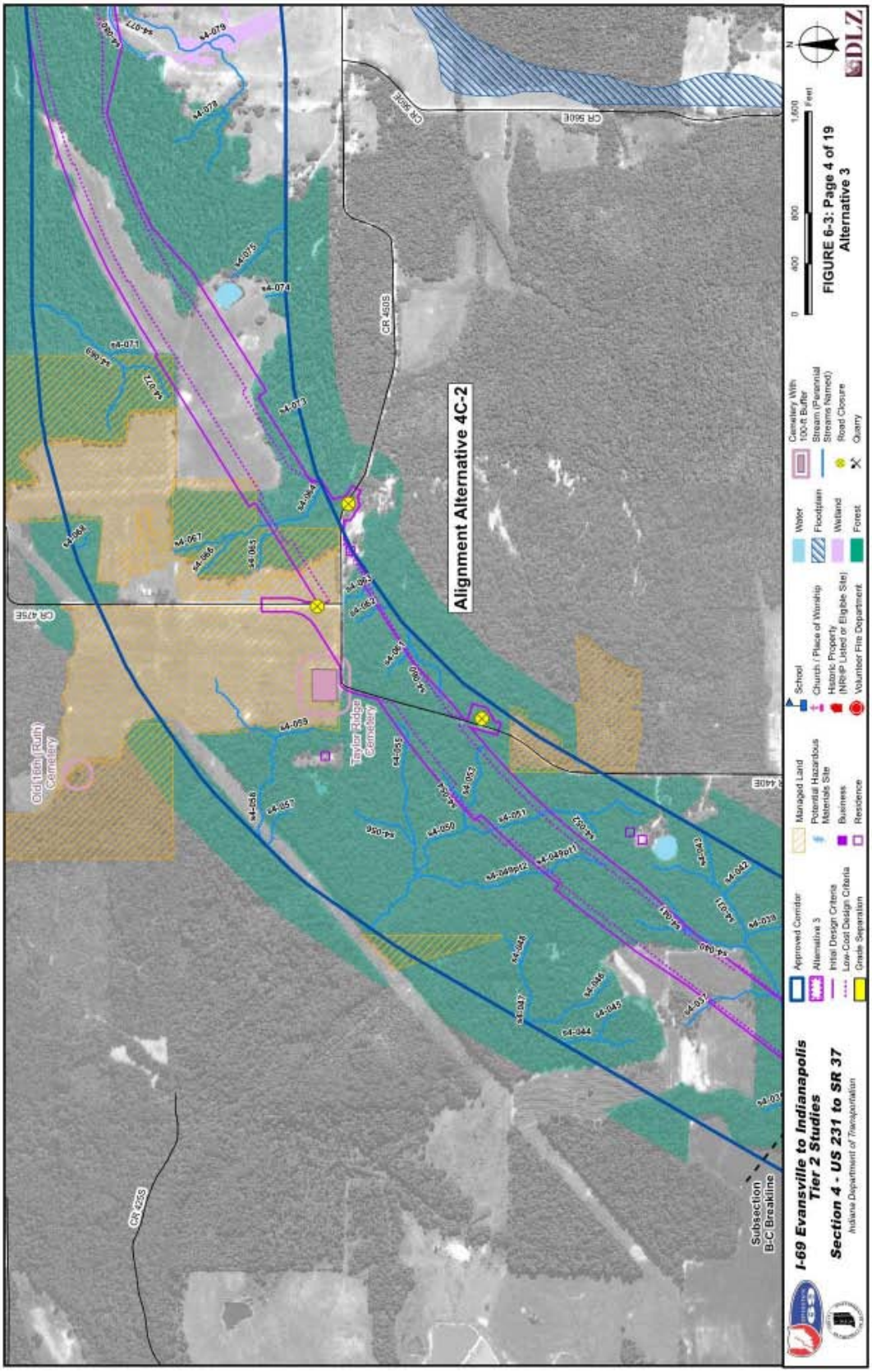
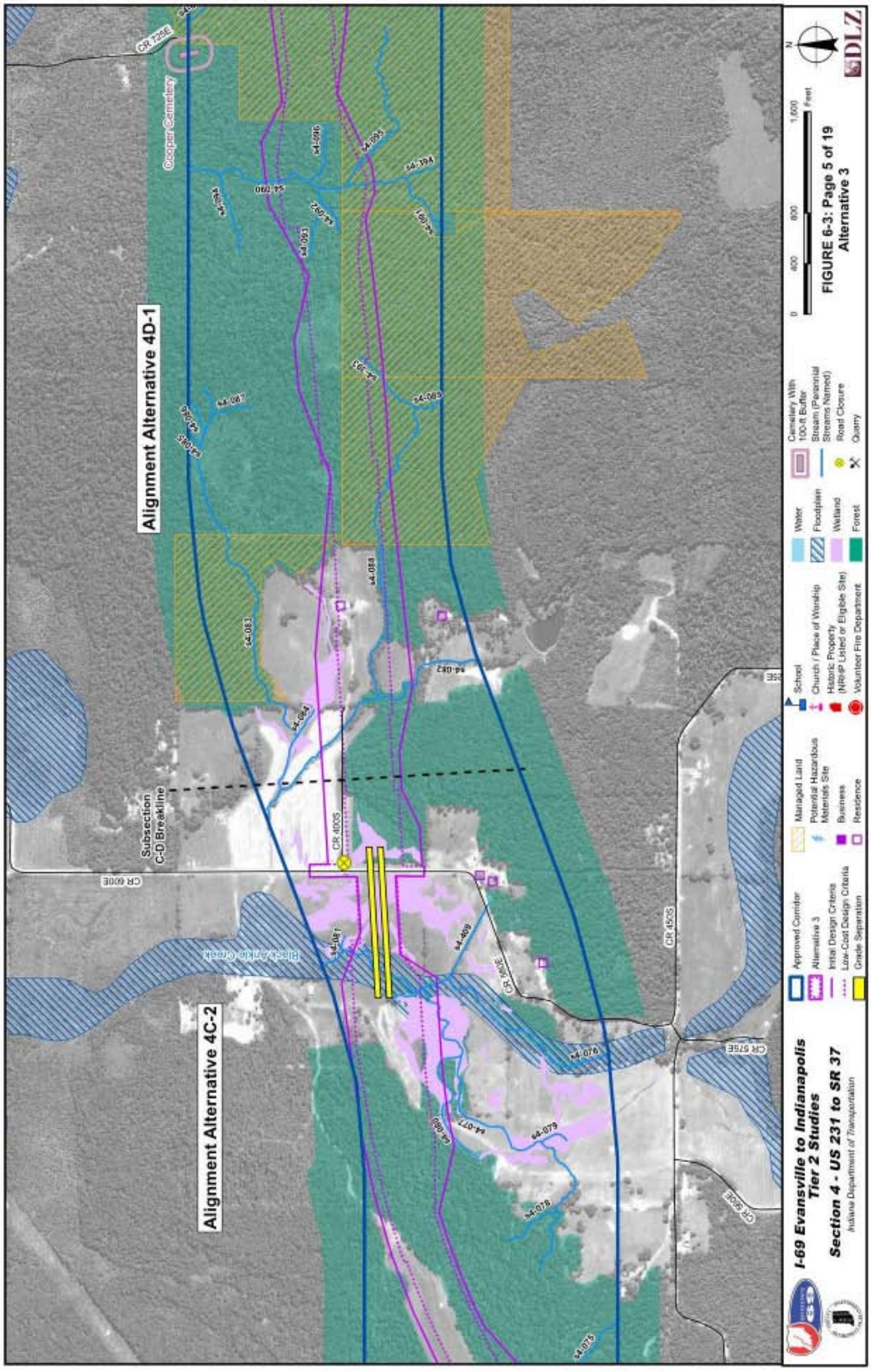
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-3: Page 3 of 19
Alternative 3


Alignment Alternative 4C-2
FIGURE 6-3: Page 4 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Subsection B-C Breakline
Old 16th Ruth Cemetery
Taylor Ridge Cemetery
CR 425S
CR 430S
CR 560E
CR 475E
DLZ


Alignment Alternative 4D-1
Alignment Alternative 4C-2
Subsection C-D Breakline
Cooper Cemetery
CR 725E
CR 600E
CR 450S
CR 675E
CR 500E
FIGURE 6-3: Page 5 of 19
Alternative 3
I-69 Evansville to Indianapolis
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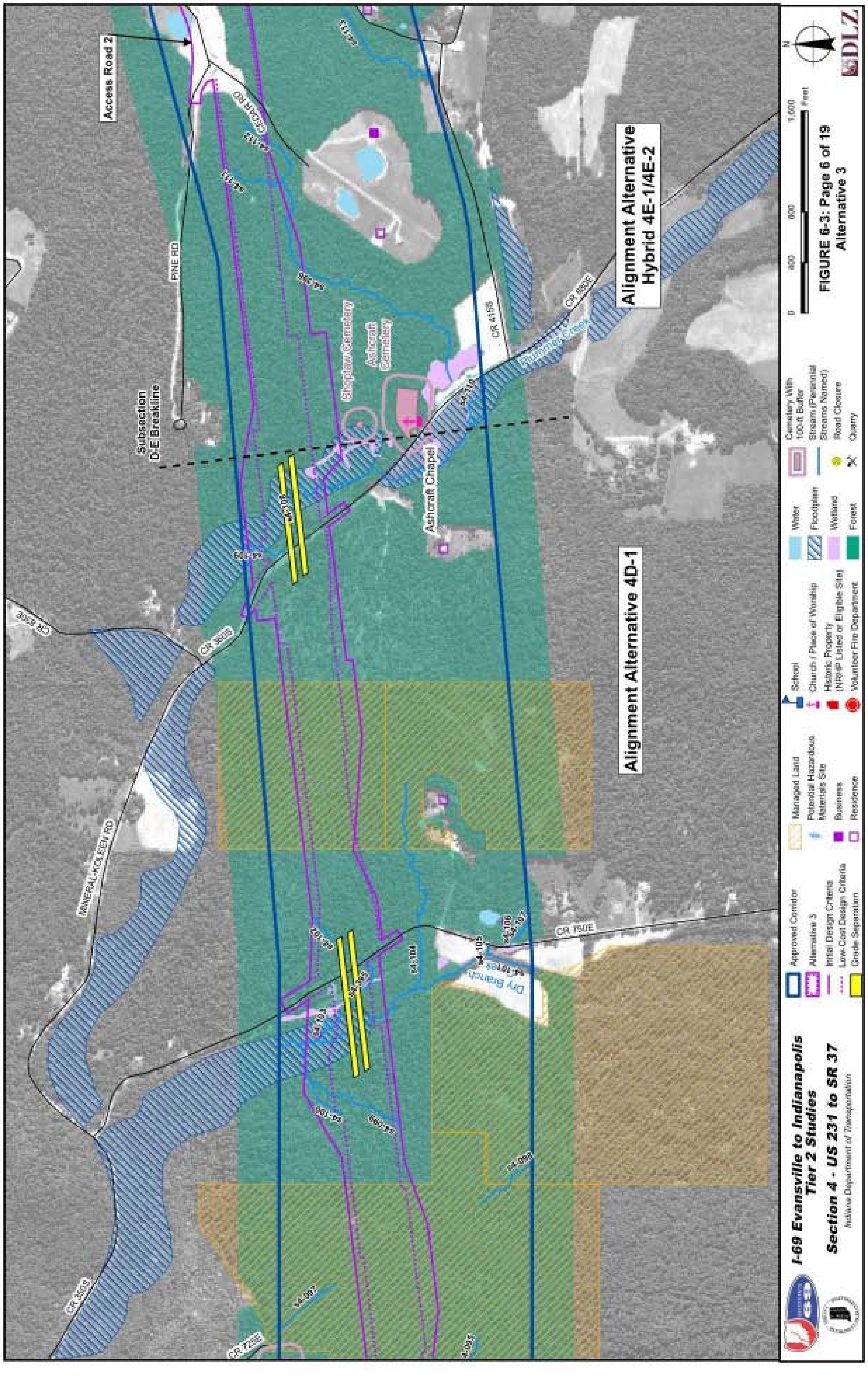
DLZ


Access Road 2
Subsection D-E Breakline
Alignment Alternative Hybrid 4E-1/4E-2
Alignment Alternative 4D-1
Shipman Cemetery
Ashcraft Cemetery
Ashcraft Chapel
PINE RD
CEDAR RD
CR 415S
CR 360S
CR 750E
MINERAL-KOLEEN RD
Dry Branch
FIGURE 6-3: Page 6 of 19
Alternative 3
I-69 Evansville to Indianapolis Tier 2 Studies
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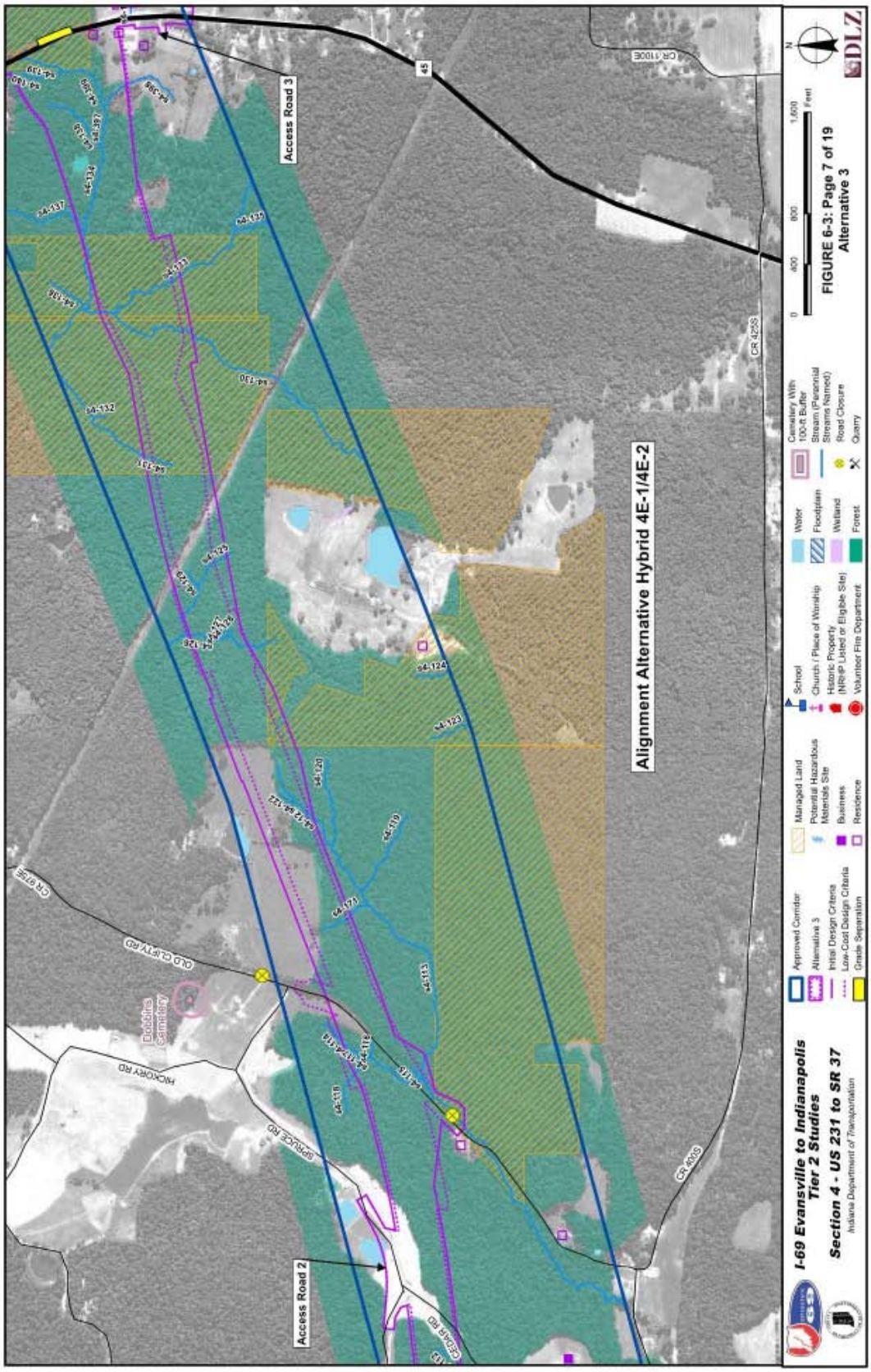
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ


Alignment Alternative Hybrid 4E-1/4E-2
Access Road 3
Access Road 2
45
CR 1100E
CR 425S
CR 400S
CR 975E
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
CEDAR RD
Dobbins Cemetery
FIGURE 6-3: Page 7 of 19
Alternative 3
0 400 800 1,600 Feet
N
DLZ
I-69 Evansville to Indianapolis
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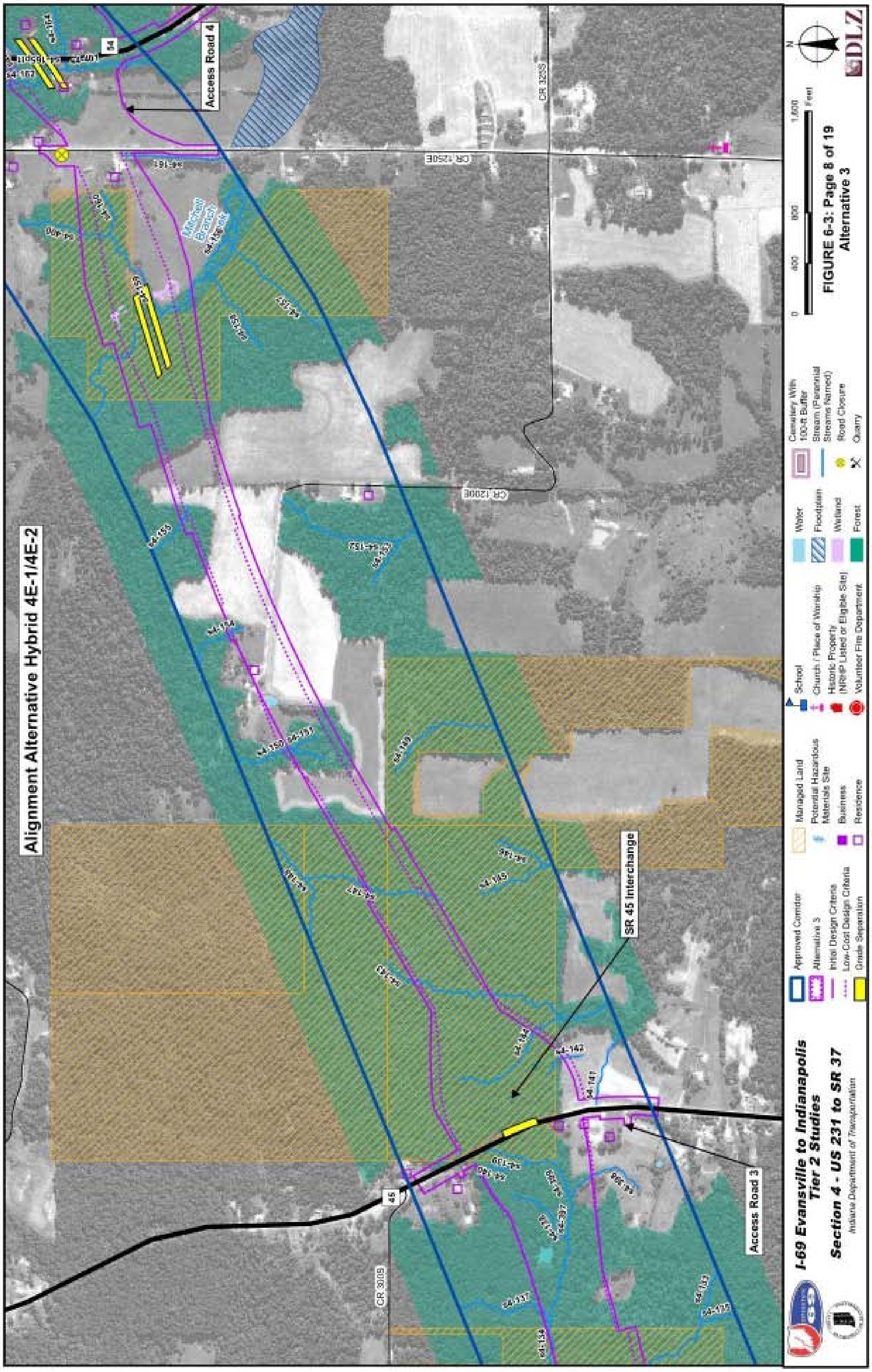
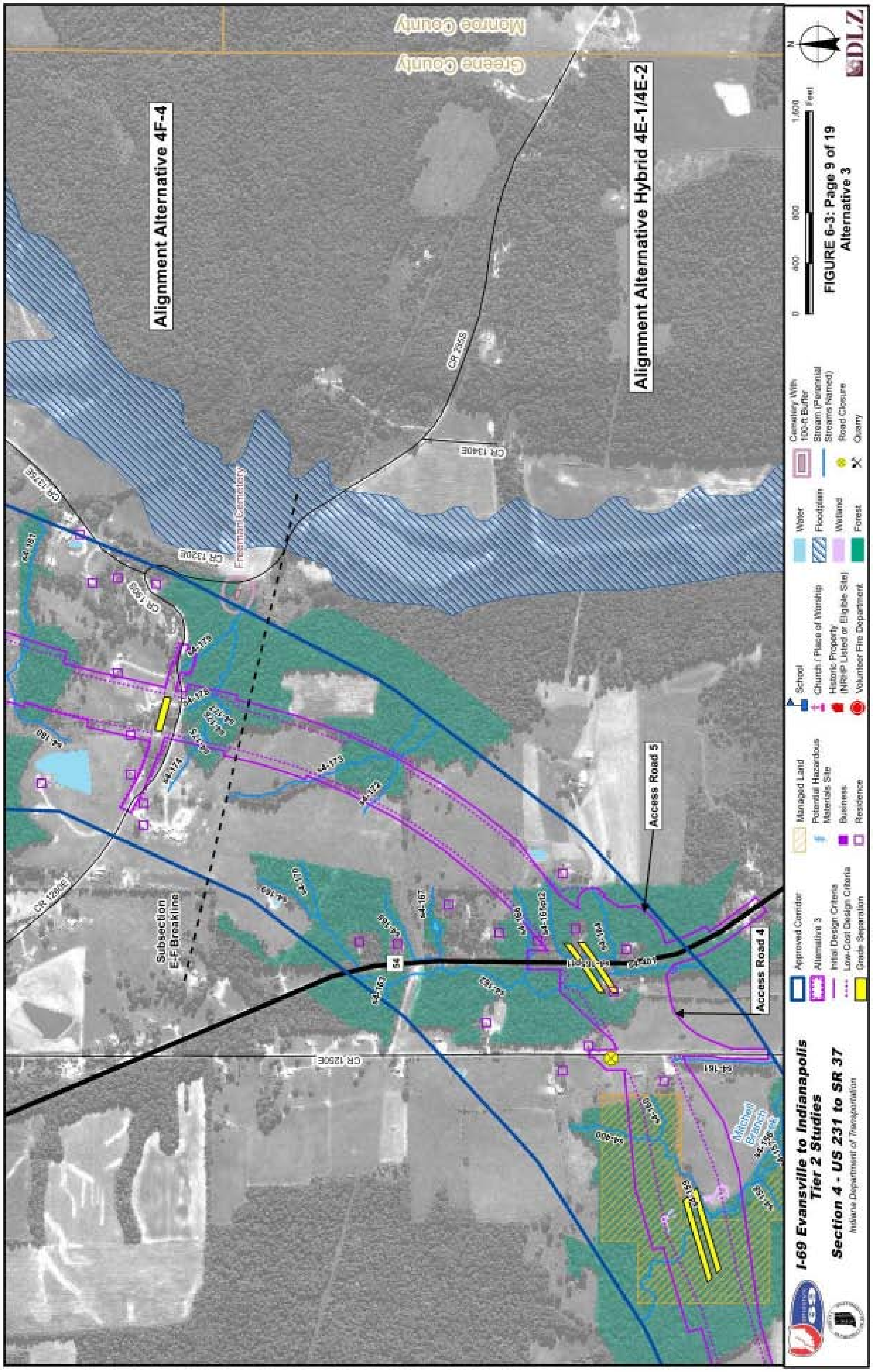
Indiana Department of Transportation
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest


Alignment Alternative Hybrid 4E-1/4E-2
Access Road 4
SR 45 Interchange
Access Road 3
Mitchell Branch
CR 1250E
CR 1200E
CR 325S
CR 300S
45
54
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100ft Buffer
Streams (Perennial Streams Named)
Road Closure
Quarry
0 400 800 1,600 Feet
FIGURE 6-3: Page 8 of 19
Alternative 3
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


Alignment Alternative 4F-4
Alignment Alternative Hybrid 4E-1/4E-2
Greene County
Monroe County
Freeman Cemetery
Access Road 4
Access Road 5
Subsection E-F Breakline
CR 1250E
CR 1340E
CR 265S
Mitchell Branch
I-69 Evansville to Indianapolis Tier 2 Studies
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Initial Design Criteria
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Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-3: Page 9 of 19
Alternative 3
DLZ

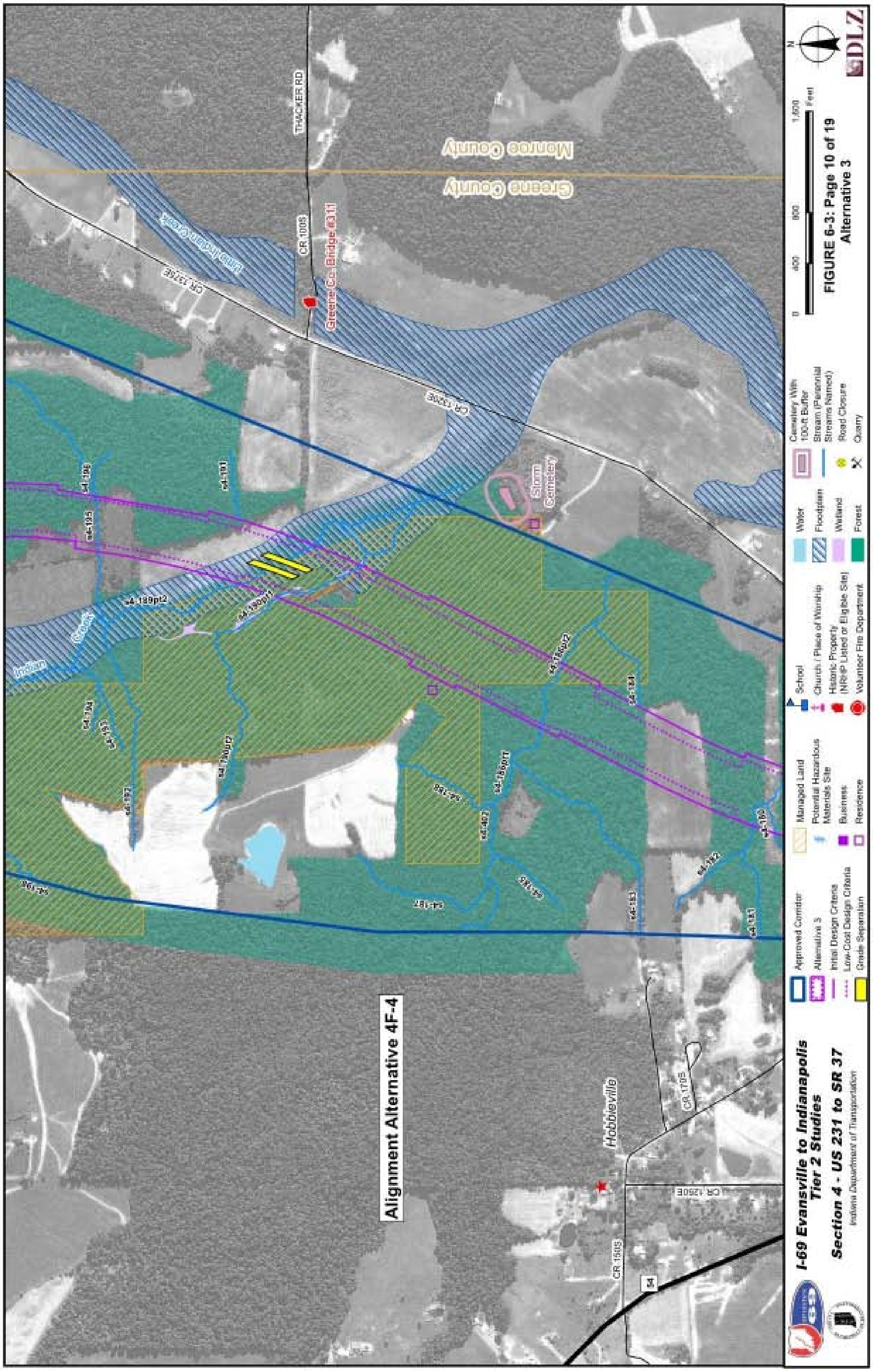
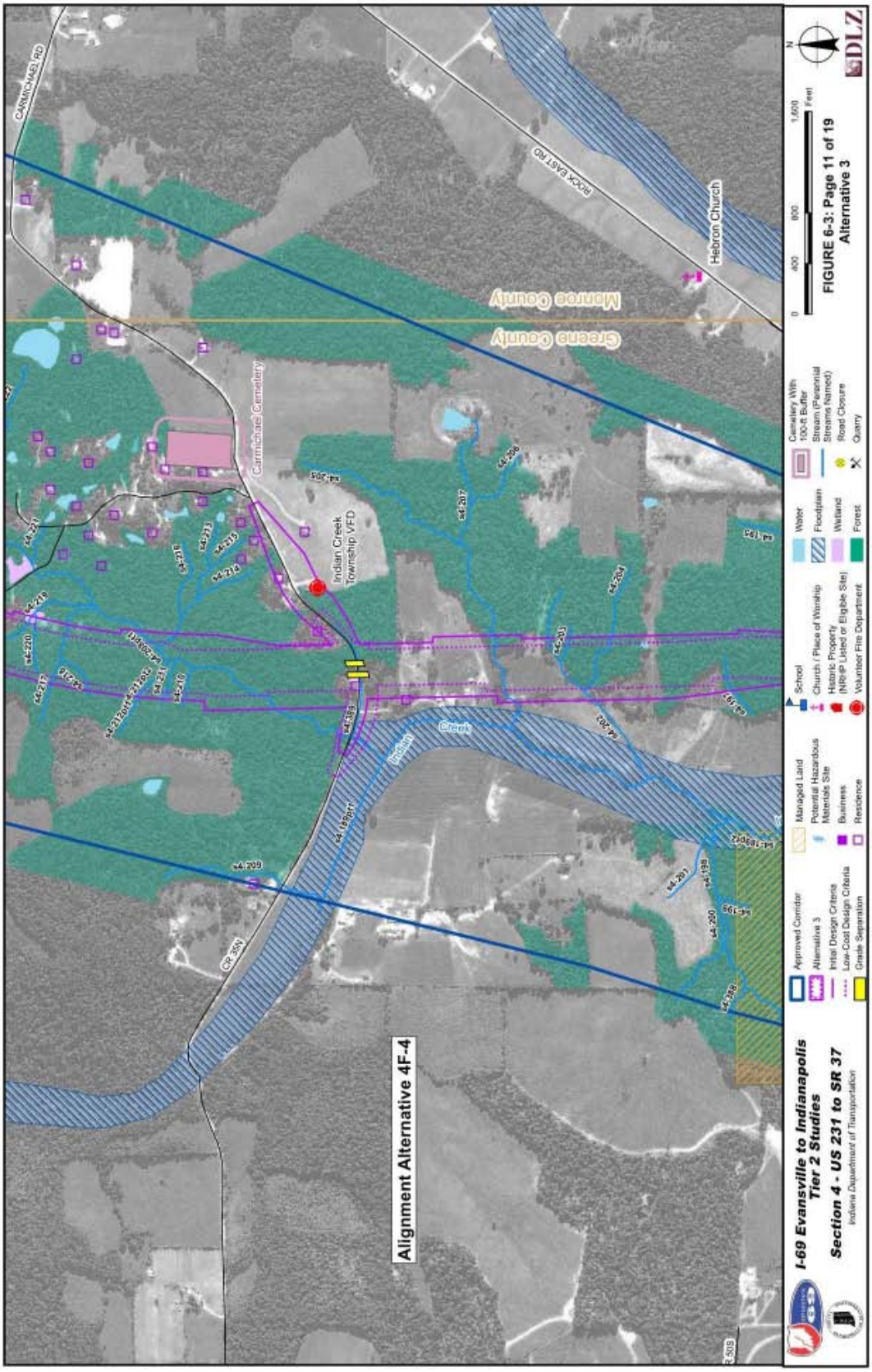
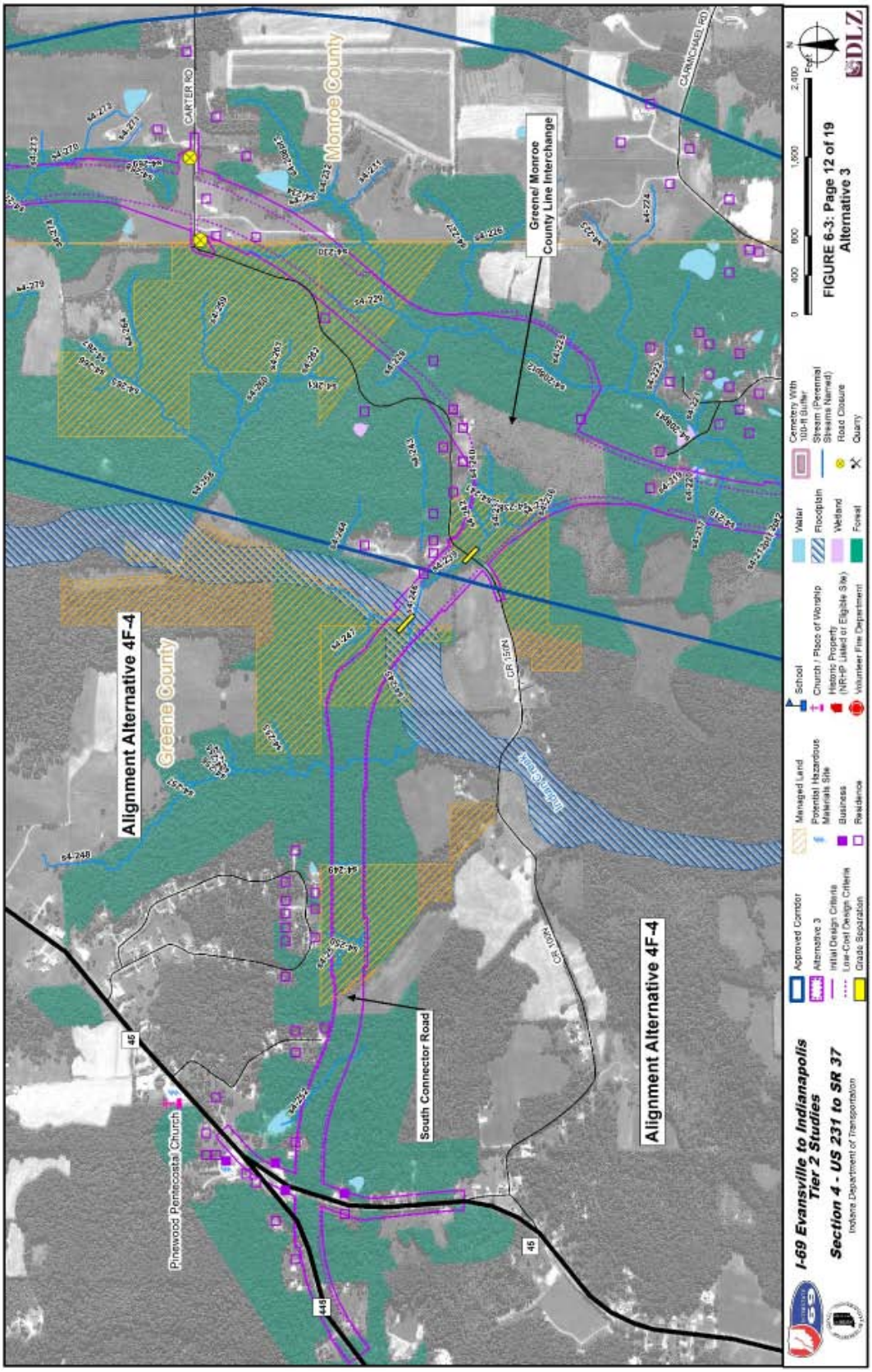
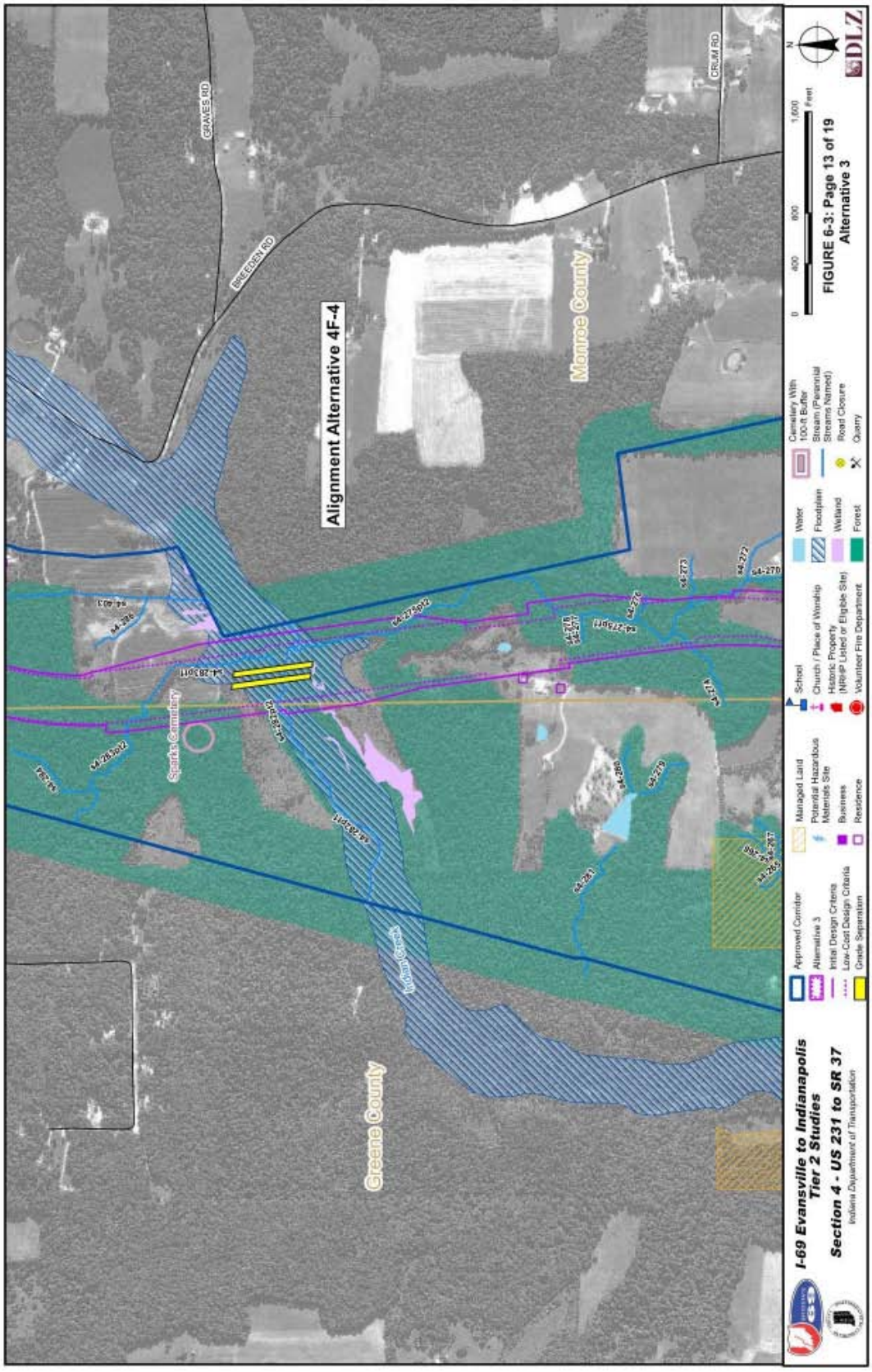
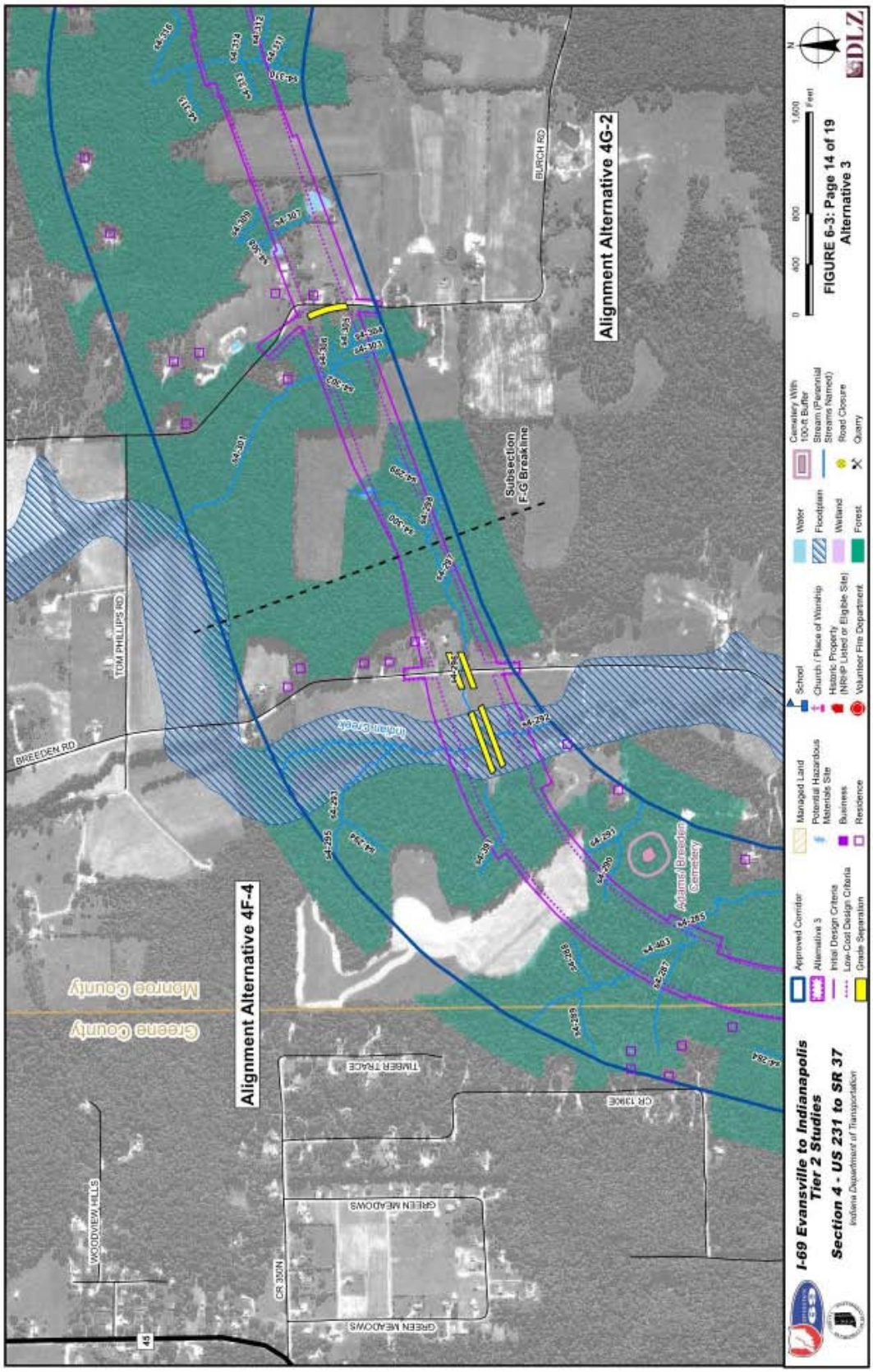


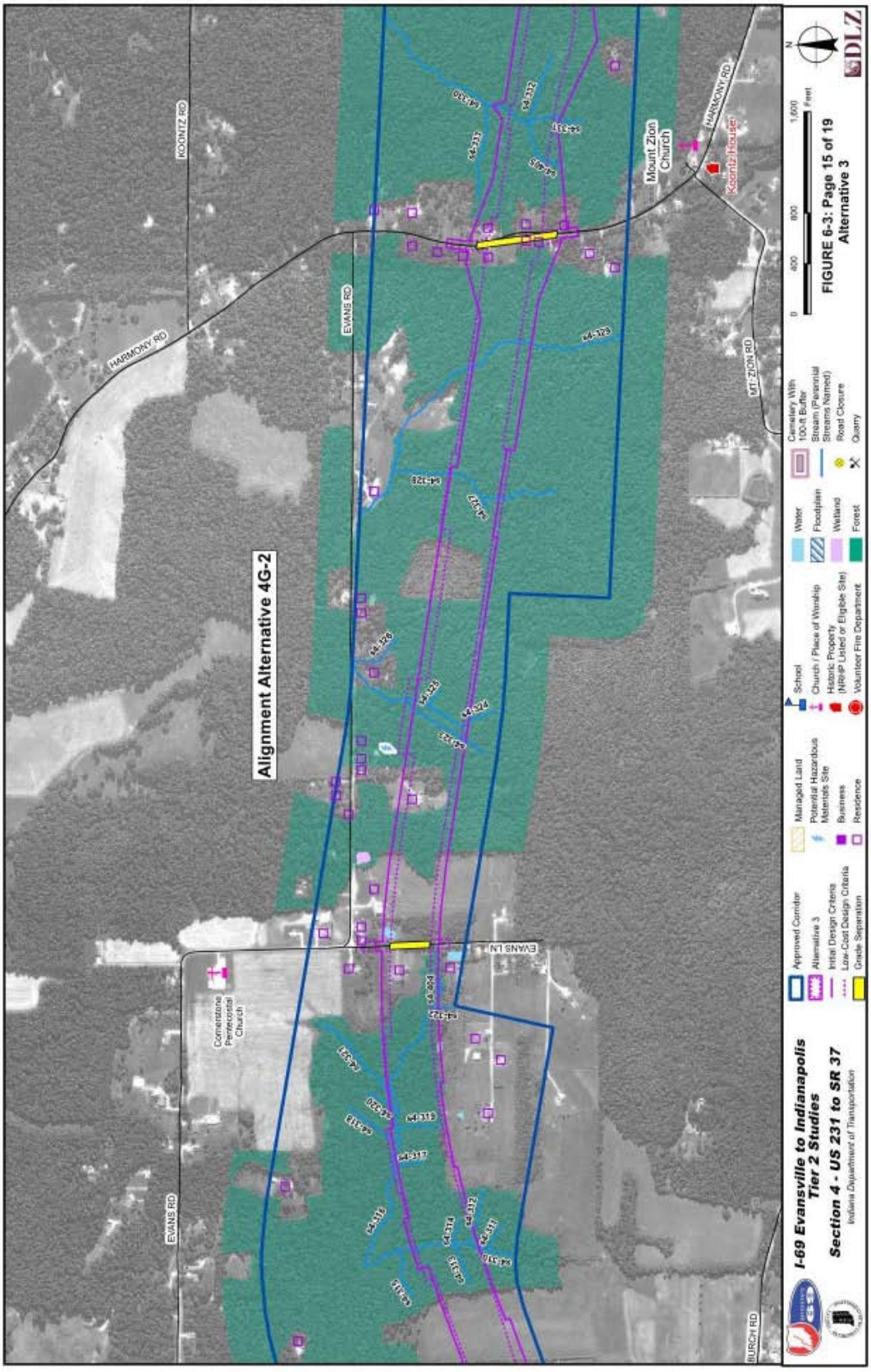
FIGURE 6-3: Page 10 of 19
Alternative 3
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alignment Alternative 4F-4
Monroe County
Greene County
THACKER RD
CR 100S
CR 1320E
CR 1375E
CR 170S
CR 150S
CR 1250E
Greene Co. Bridge #311
Storm Cemetery
Hobbieville
Indian Creek
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ

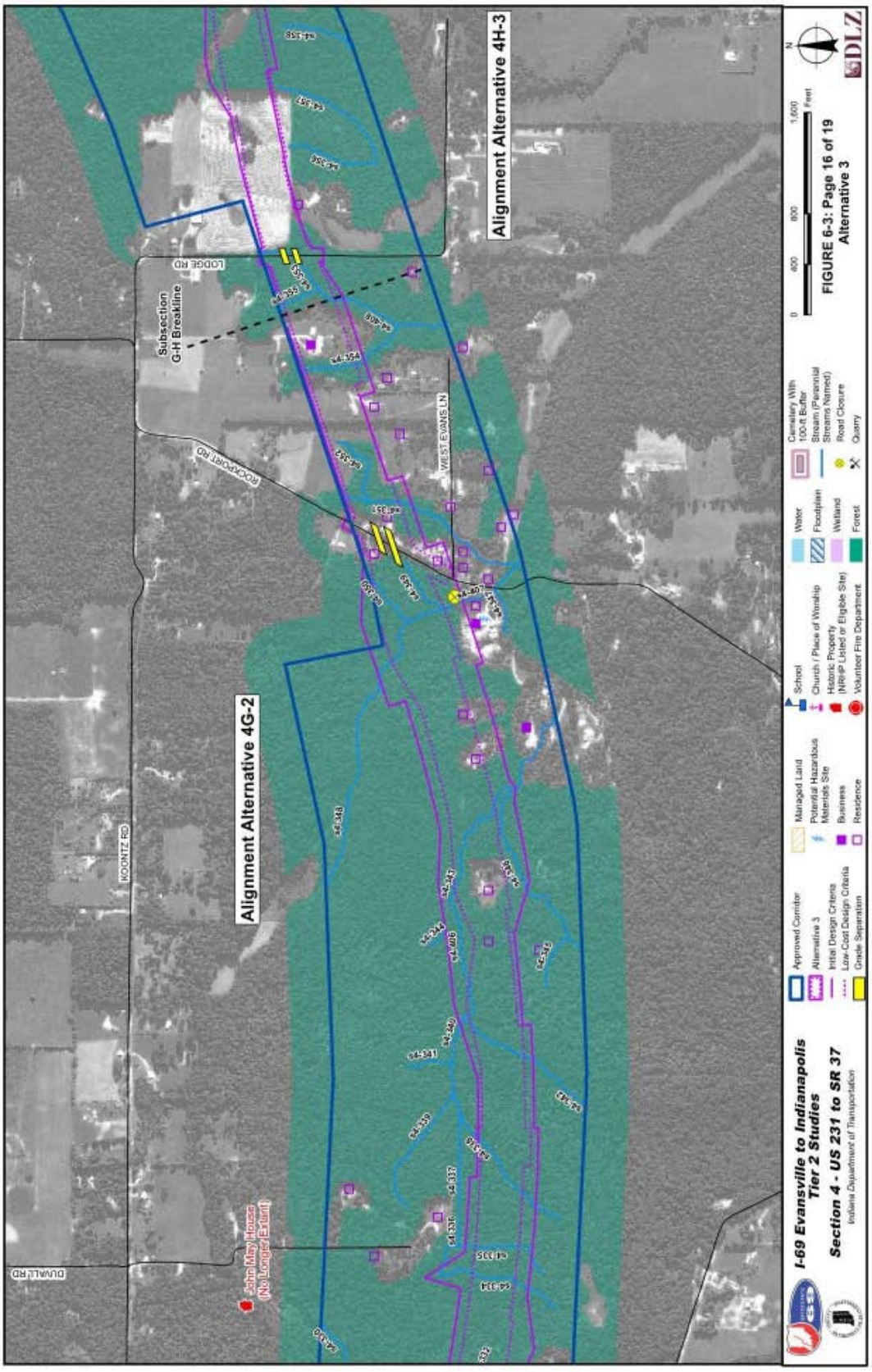

Alignment Alternative 4F-4
Hebron Church
Carmichael Cemetery
Indian Creek Township VFD
Indian Creek
CR 35N
ROCK EAST RD
CARMICHAEL RD
Monroe County
Greene County
FIGURE 6-3: Page 11 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

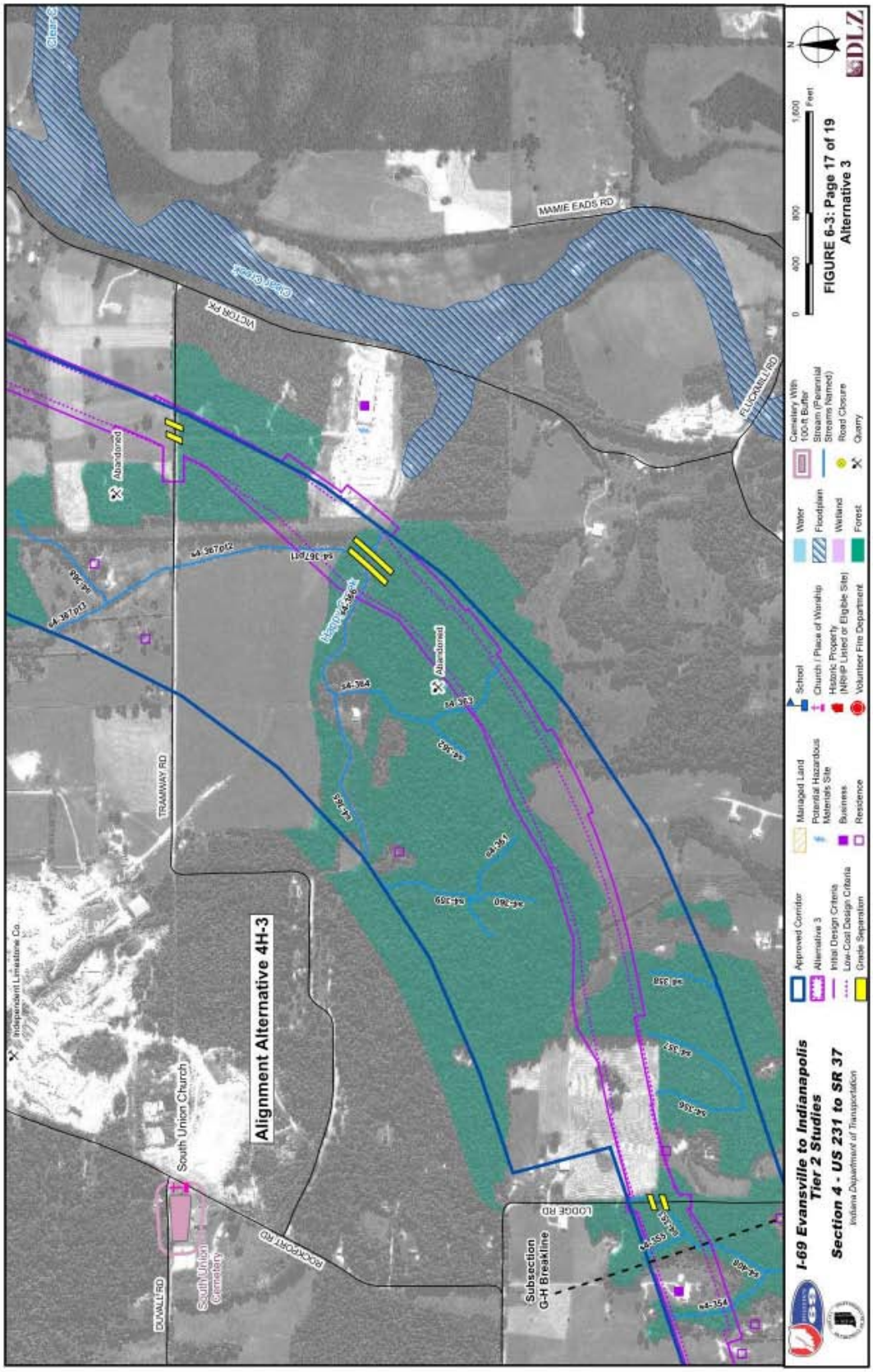

Monroe County
Greene County
Greene/ Monroe County Line Interchange
Alignment Alternative 4F-4
Alignment Alternative 4F-4
South Connector Road
CARTER RD
CARMICHAEL RD
CR 15N
CR 100N
Pinewood Pentecostal Church
45
45
FIGURE 6-3: Page 12 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

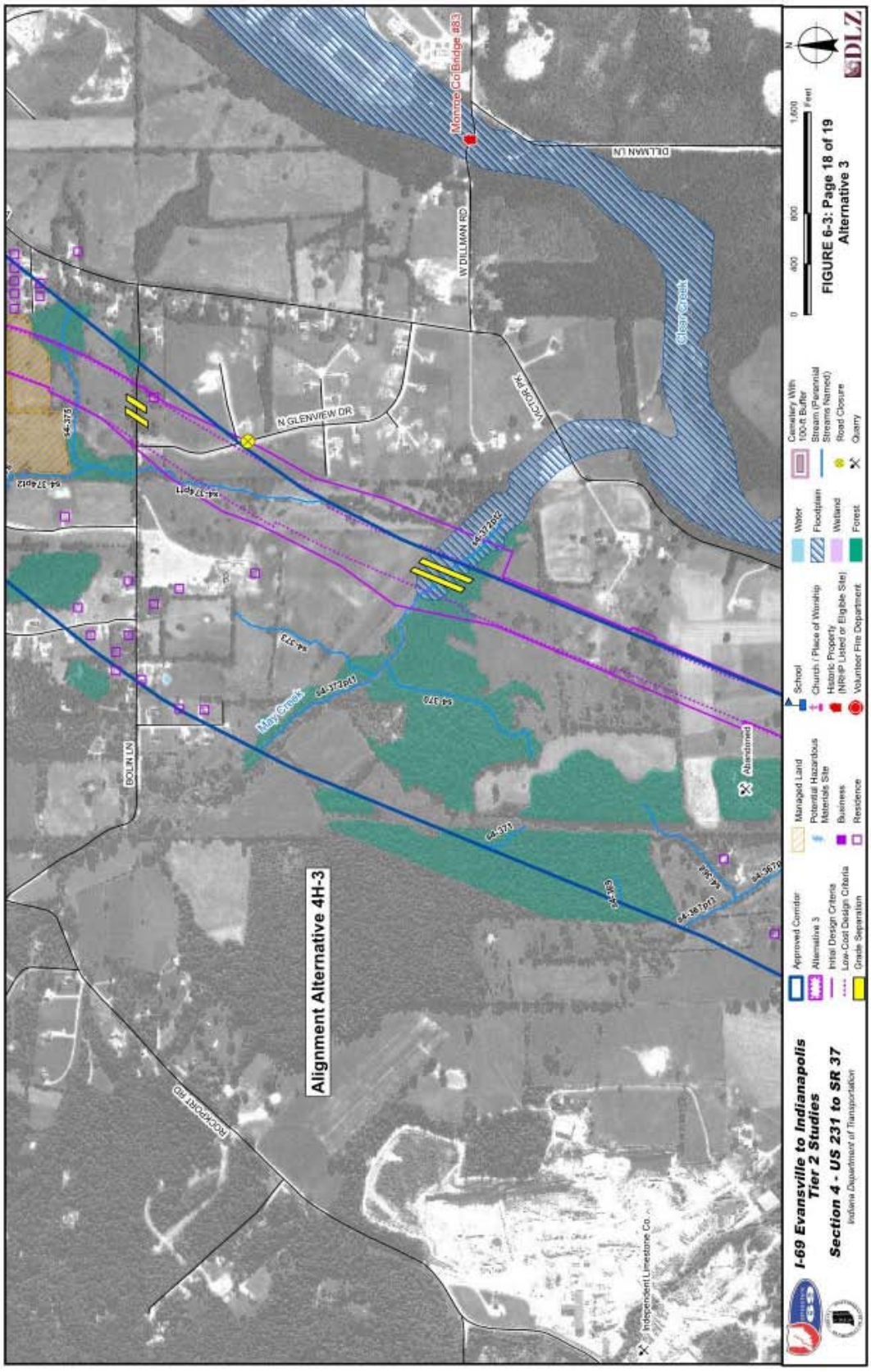

Alignment Alternative 4F-4
Monroe County
Greene County
GRAVES RD
BREEDEN RD
CRUM RD
Sparks Cemetery
Indian Creek
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-3: Page 13 of 19
Alternative 3
DLZ
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet

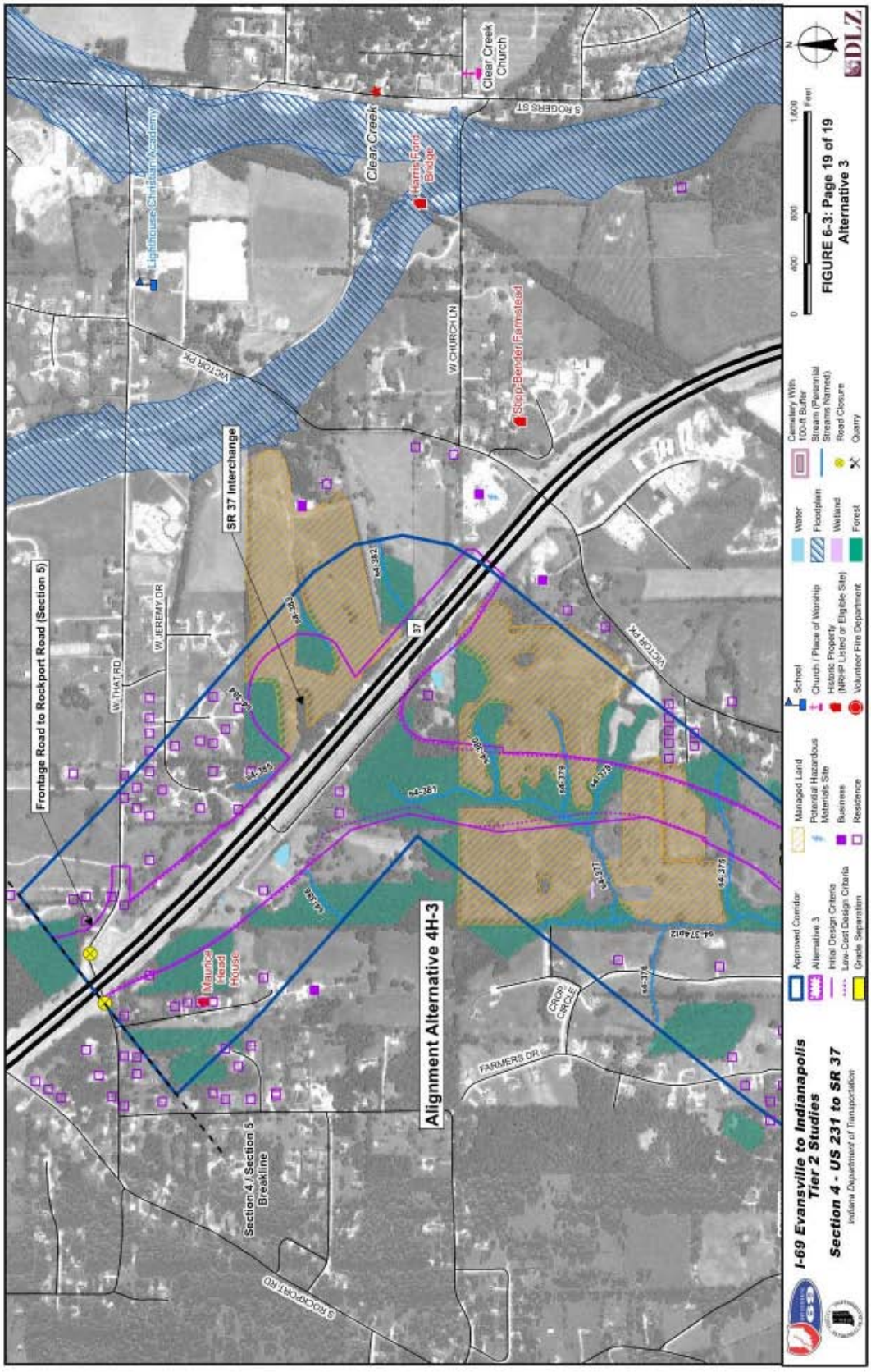

Alignment Alternative 4G-2
Alignment Alternative 4F-4
Subsection F-G Breakline
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
TIMBER TRACE
GREEN MEADOWS
WOODVIEW HILLS
CR 300N
CR 1300E
Adams Breeden Cemetery
Greene County
Monroe County
FIGURE 6-3: Page 14 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

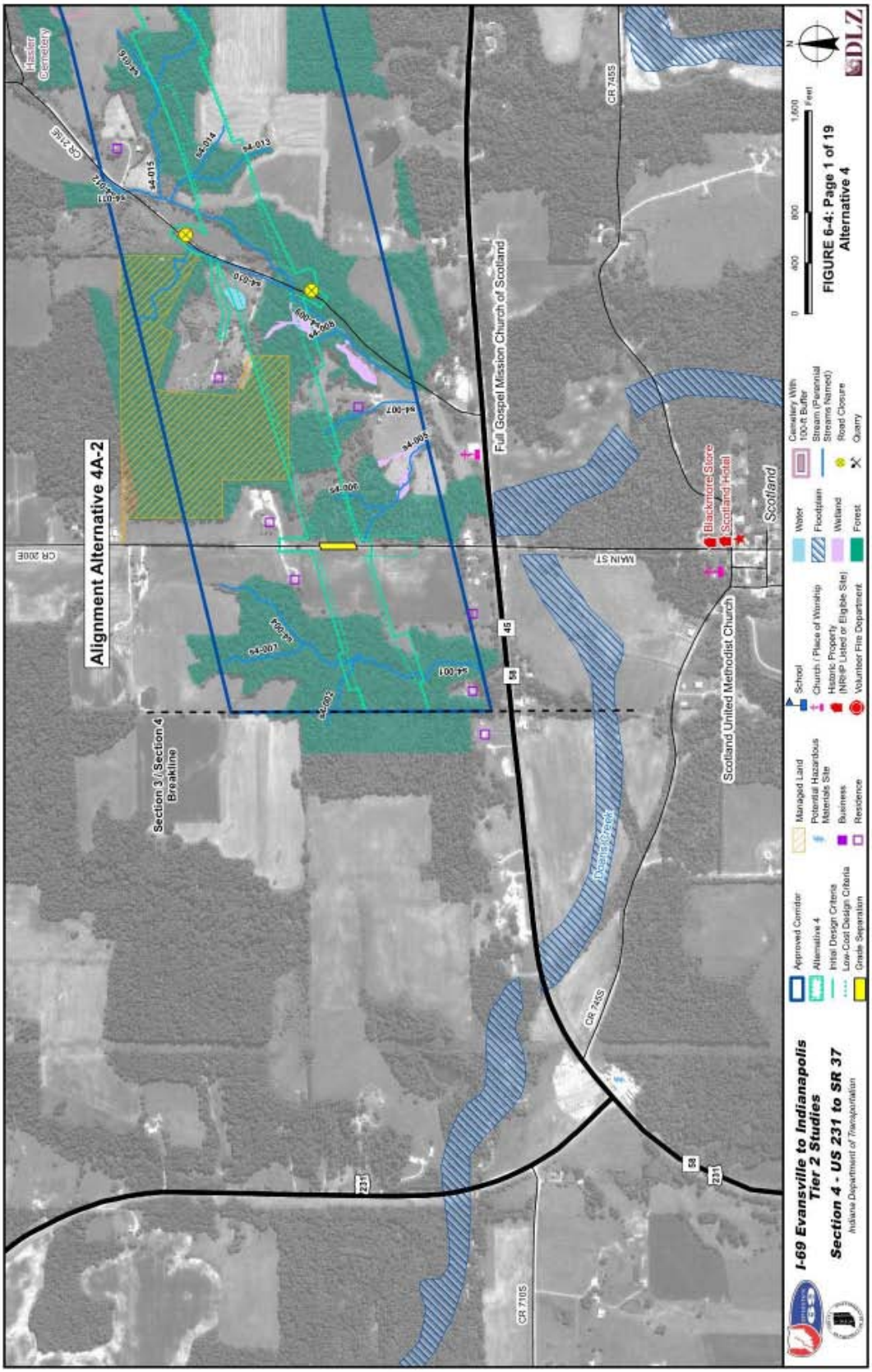

Alignment Alternative 4G-2
HARMONY RD
KOONTZ RD
EVANS RD
EVANS LN
MT ZION RD
BURCH RD
Mount Zion Church
Koontz House
Cornerstone Pentecostal Church
FIGURE 6-3: Page 15 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

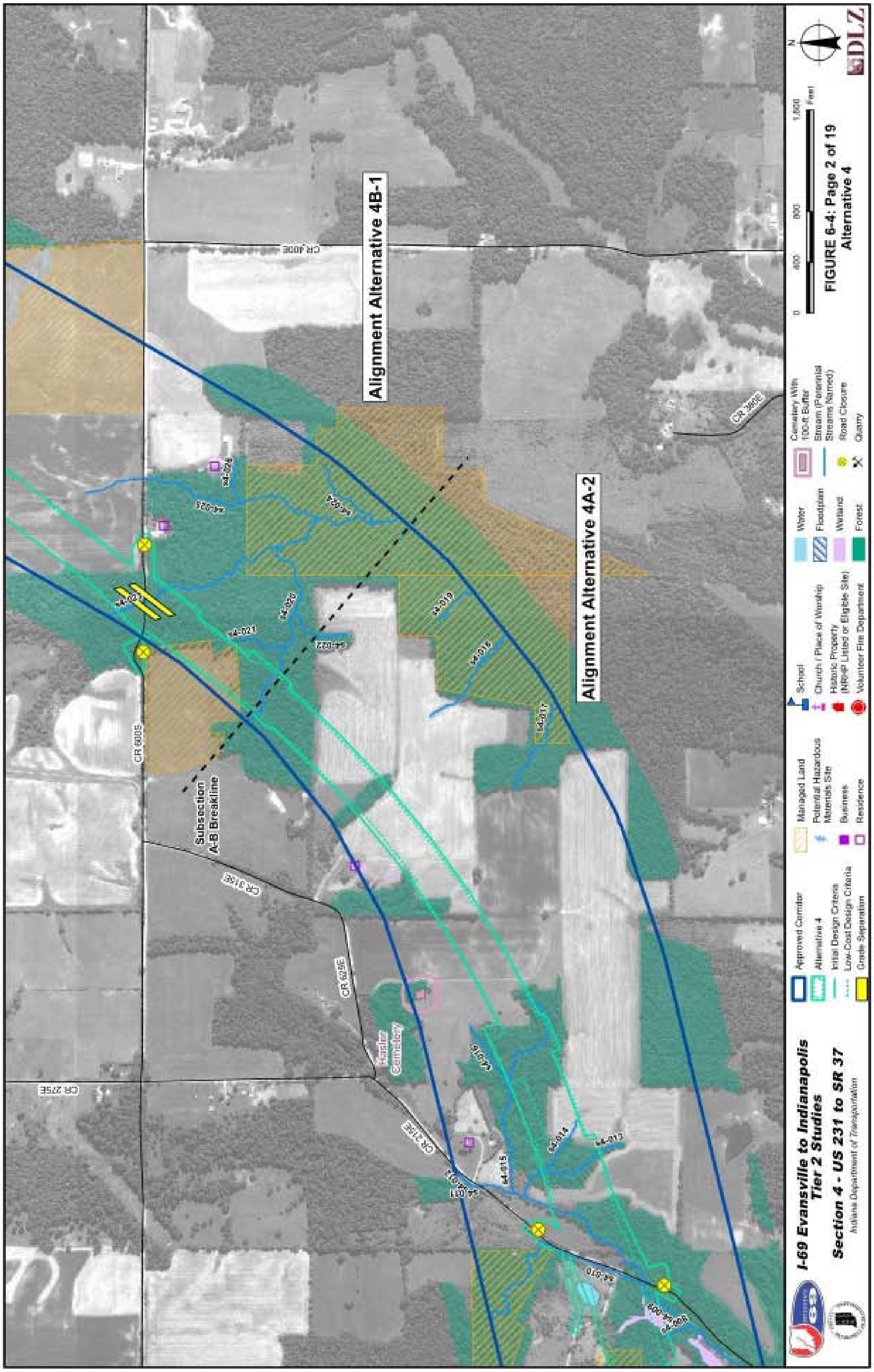

Alignment Alternative 4H-3
Alignment Alternative 4G-2
Subsection G-H Breakline
LODGE RD
MOCKPORT RD
WEST EVANS LN
MOONTZ RD
DUVALL RD
John May House (No Longer Extant)
FIGURE 6-3: Page 16 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry

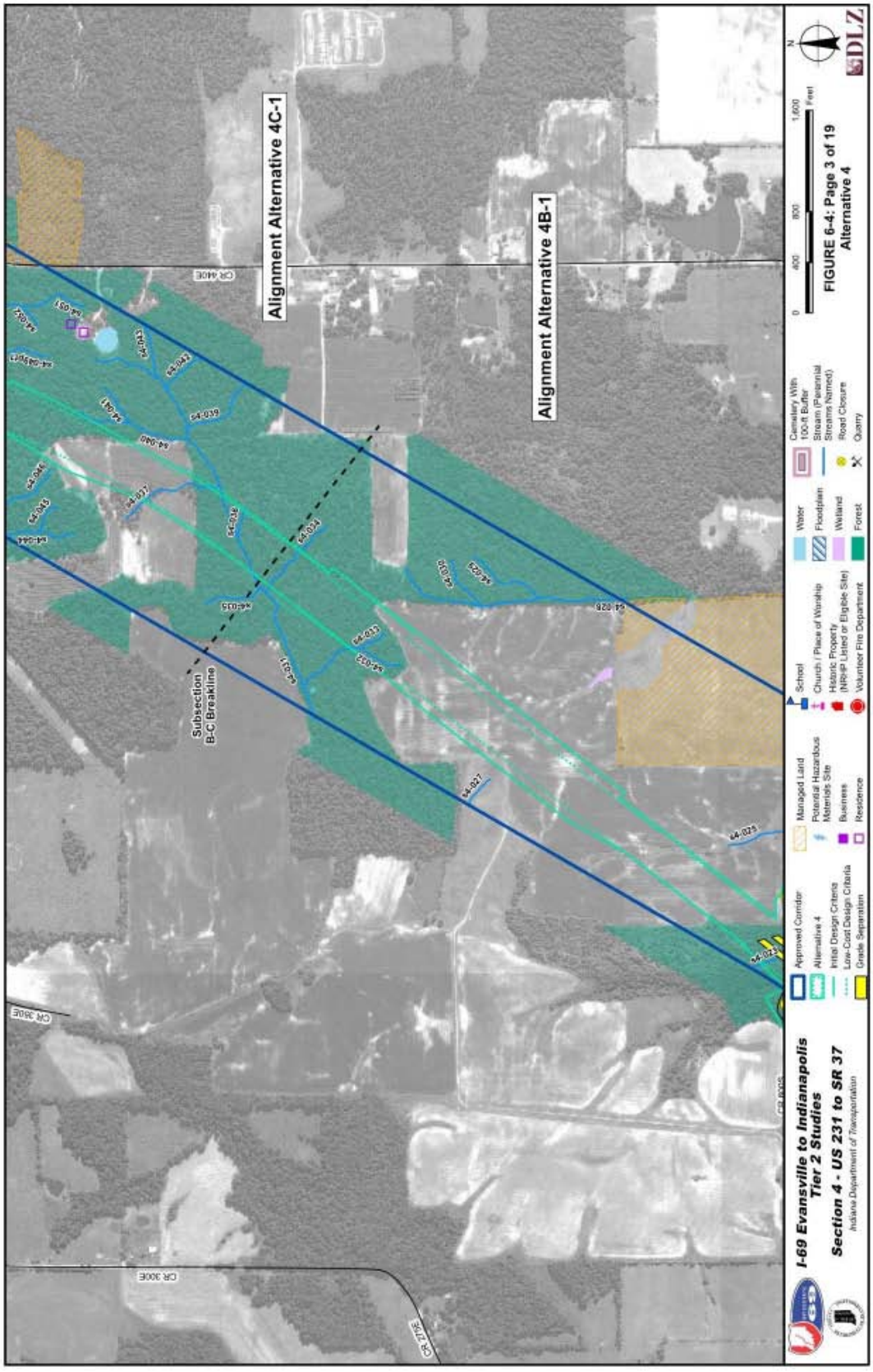

MAMIE EADS RD
VICTOR PK
FLUCKMEL RD
Abandoned
TRAMWAY RD
Alignment Alternative 4H-3
South Union Church
South Union Cemetery
DOWNEY RD
ROCKPORT RD
LOOSE RD
Subsection G-H Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-3: Page 17 of 19
Alternative 3
DLZ
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest

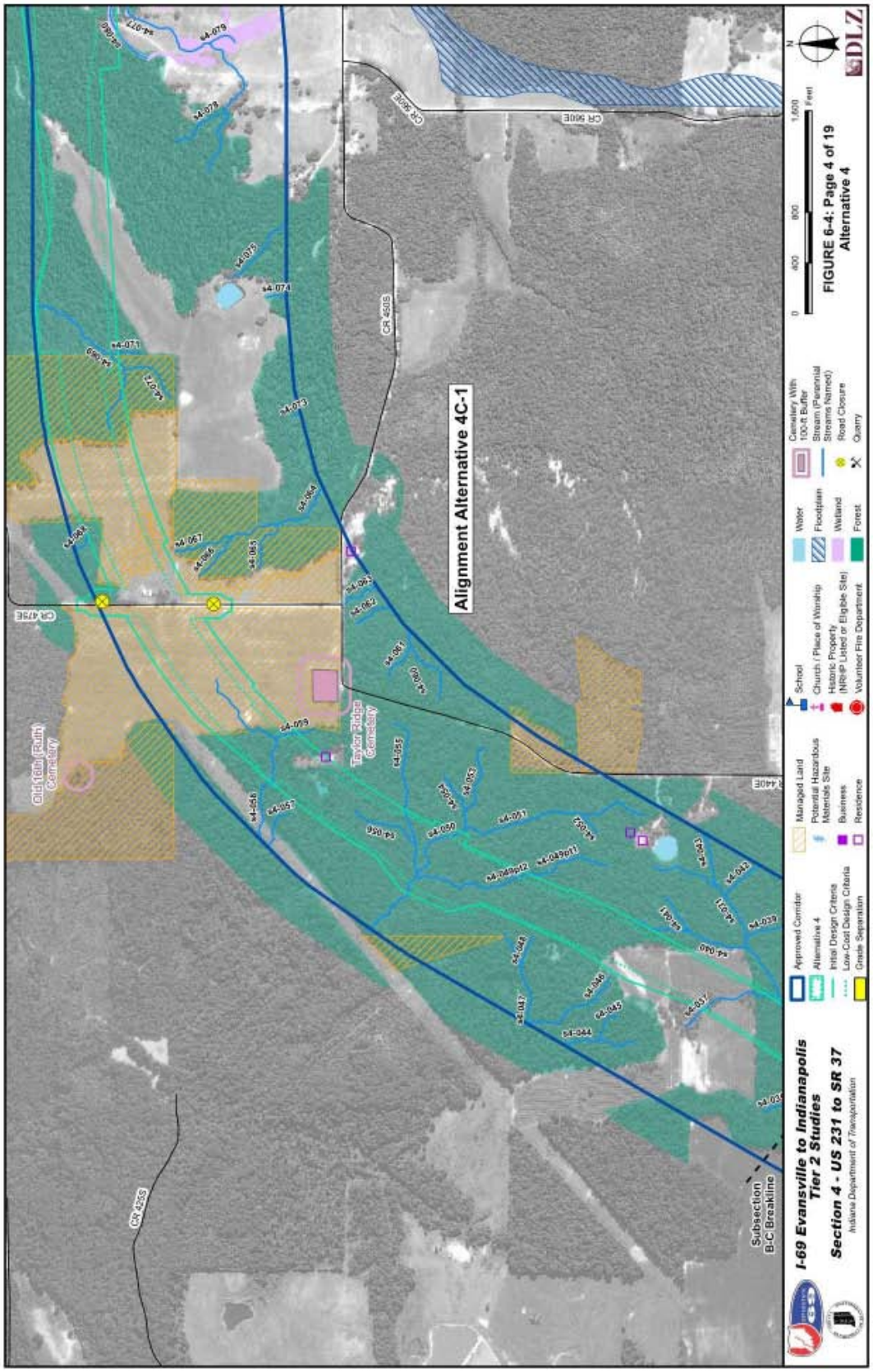

Alignment Alternative 4H-3
Monroe Co Bridge #83
DILLMAN LN
W DILLMAN RD
Clear Creek
N GLENVIEW DR
VICTOR PK
BOLIN LN
May Creek
Abandoned
Independent Limestone Co.
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 3
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-3: Page 18 of 19
Alternative 3

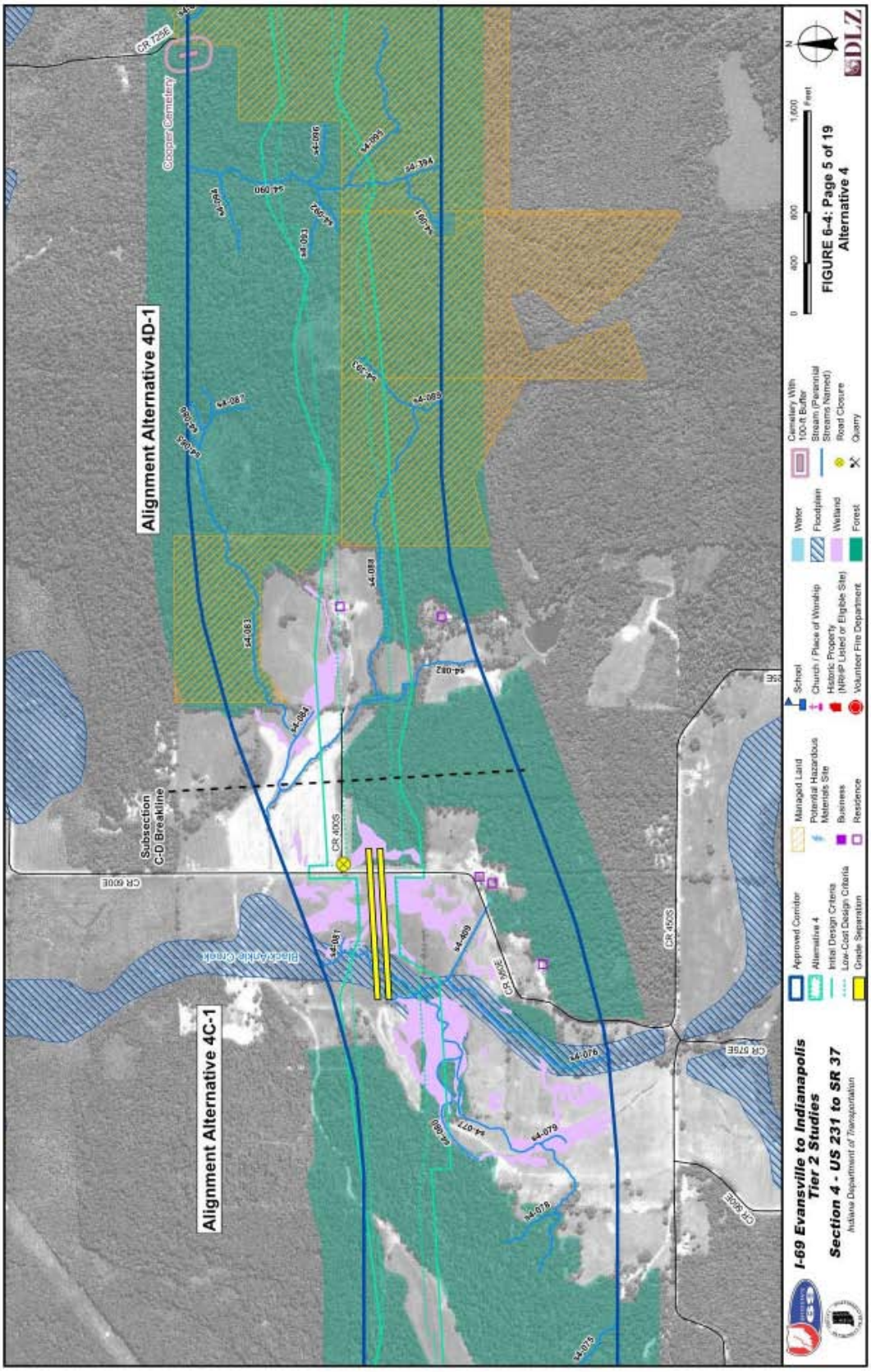

Clear Creek Church
Clear Creek
Harris Ford Bridge
Lighthouse Christian Academy
Stoop Bender Farmstead
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
Alignment Alternative 4H-3
Maunce Head House
Section 4 / Section 5 Breakline
FIGURE 6-3: Page 19 of 19
Alternative 3
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

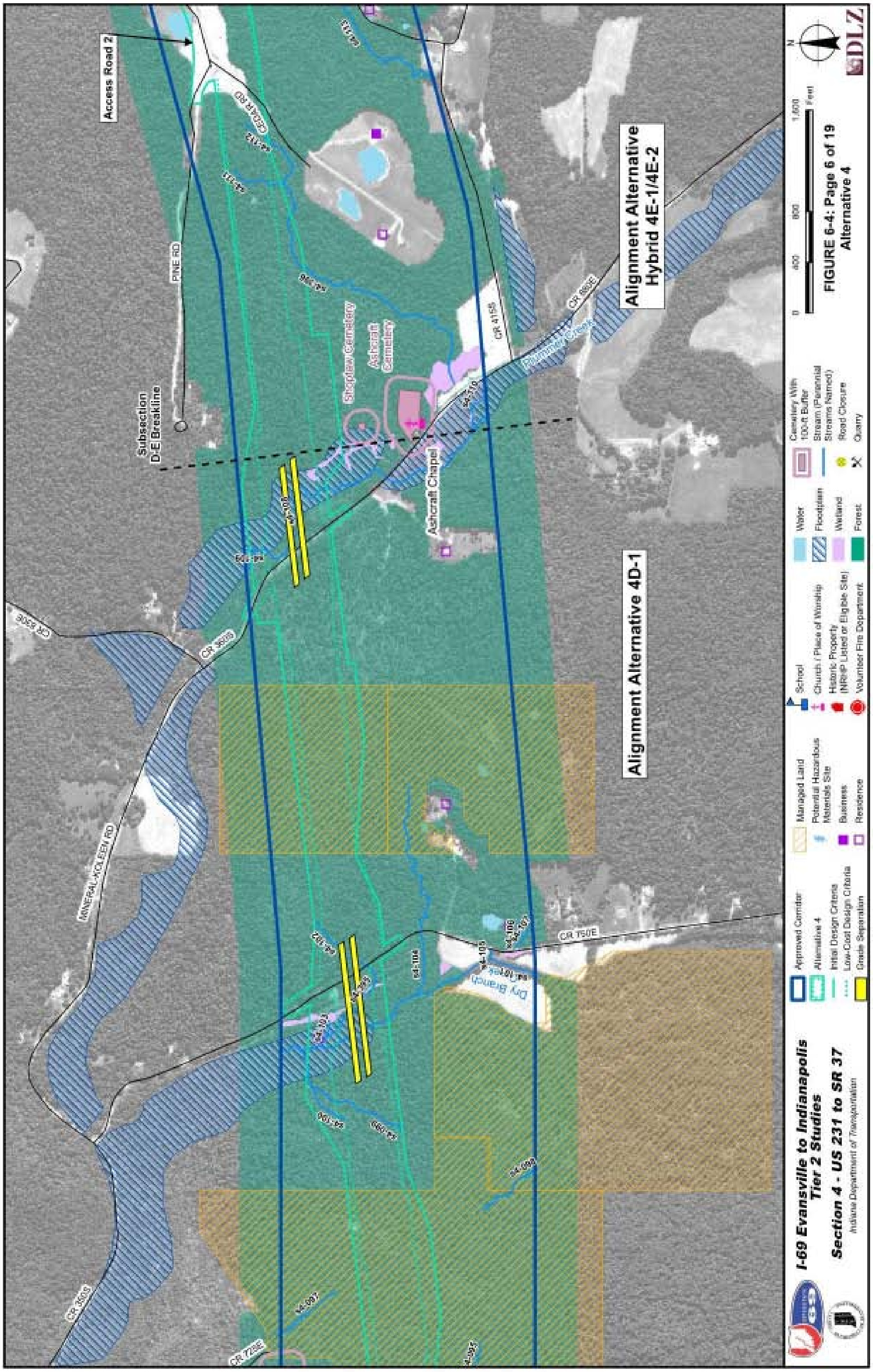

Alignment Alternative 4A-2
Section 3 / Section 4 Breakline
Hester Cemetery
Full Gospel Mission Church of Scotland
Scotland United Methodist Church
Blackmore Store
Scotland Hotel
Scotland
CR 7455
CR 200E
MAIN ST
CR 245S
CR 710S
45
58
231
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4: Page 1 of 19
Alternative 4
DLZ
Feet

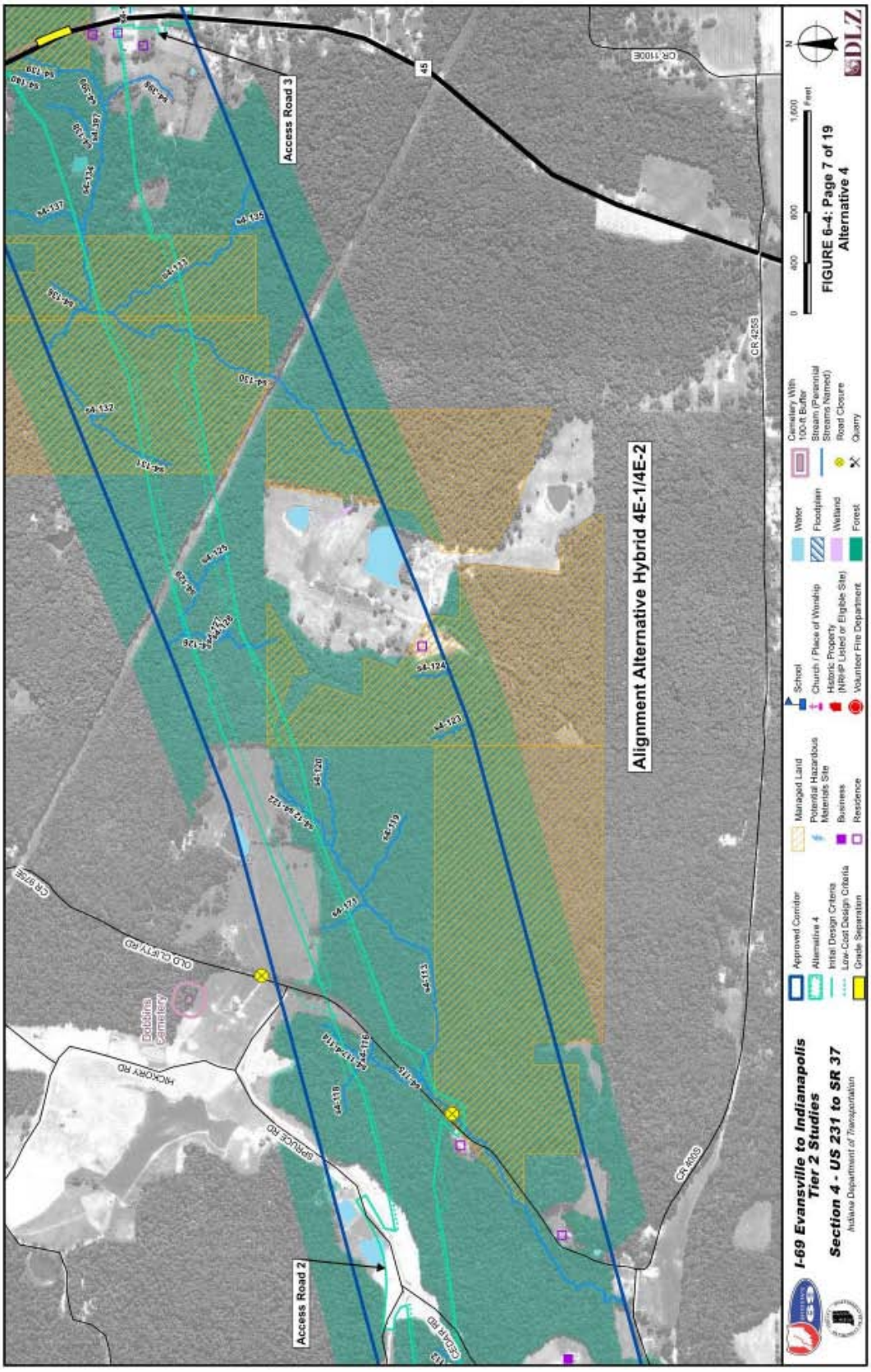

Alignment Alternative 4B-1
Alignment Alternative 4A-2
Subsection
A-B Breakline
CR 600S
CR 400E
CR 625E
CR 275E
CR 380E
Hasler Cemetery
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4: Page 2 of 19
Alternative 4
DLZ

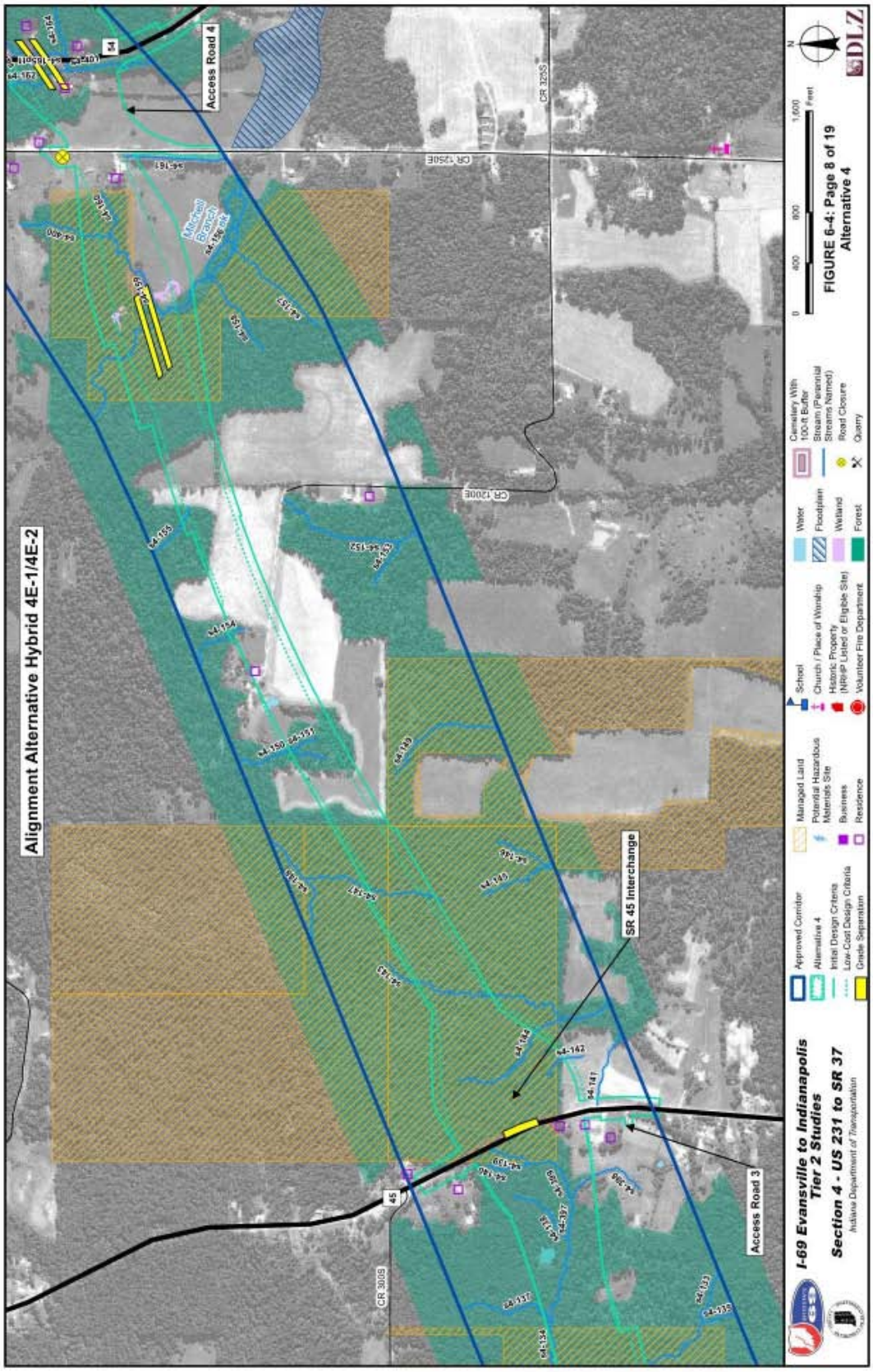

Alignment Alternative 4C-1
Alignment Alternative 4B-1
Subsection B-C Breakline
CR 440E
CR 360E
CR 300E
CR 270E
FIGURE 6-4: Page 3 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N

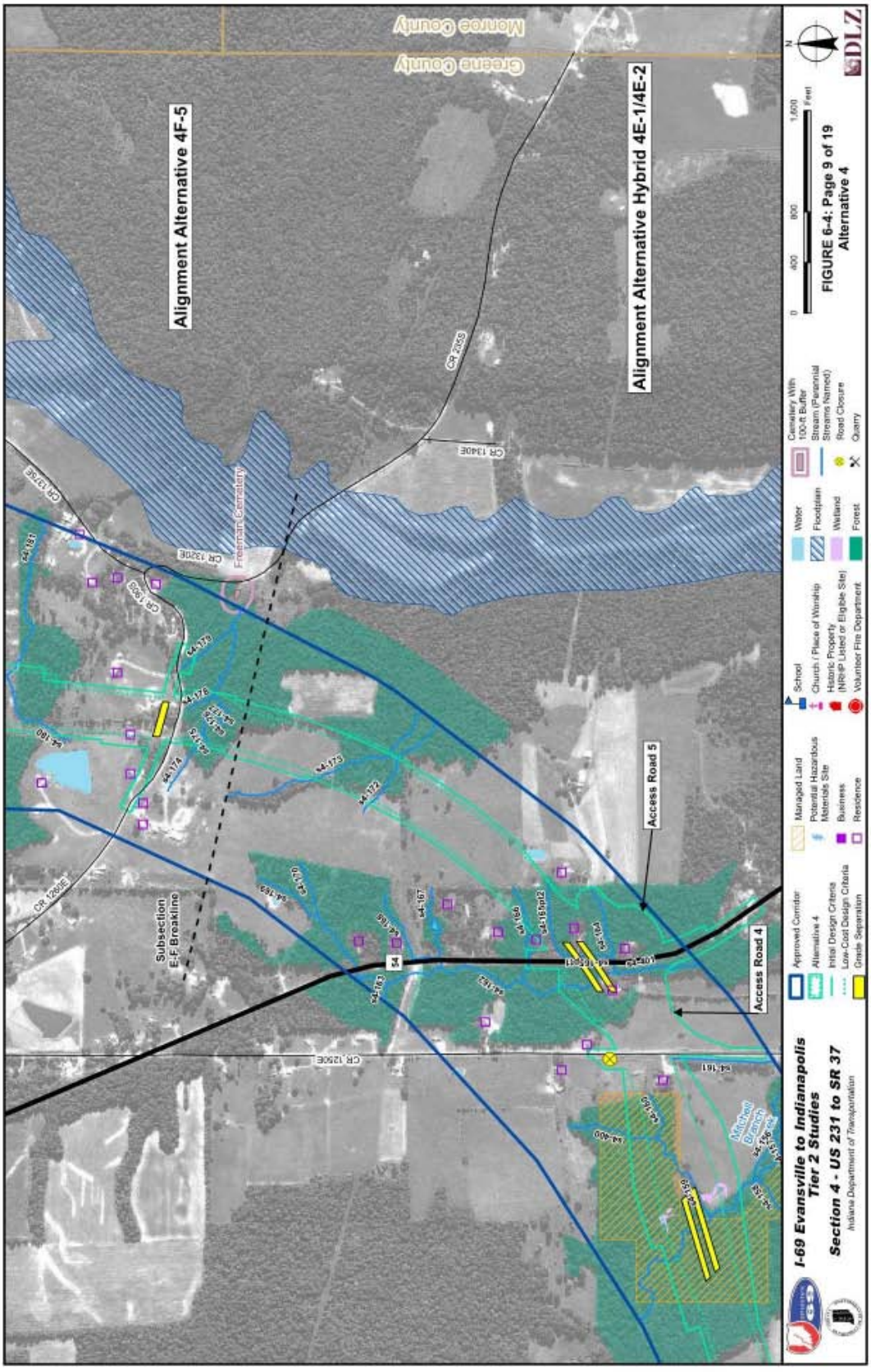

Alignment Alternative 4C-1
Old 16th Earth Cemetery
Taylor Ridge Cemetery
CR 475E
CR 450S
CR 440E
CR 425S
Subsection B-C Breakline
FIGURE 6-4: Page 4 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/eligible Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest
Feet


Alignment Alternative 4D-1
Alignment Alternative 4C-1
Subsection C-D Breakline
Cooper Cemetery
CR 725E
CR 600E
CR 400S
CR 575E
Black Lick Creek
FIGURE 6-4: Page 5 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry


Access Road 2
Subsection D-E Breakline
Alignment Alternative Hybrid 4E-1/4E-2
Alignment Alternative 4D-1
Ashcraft Chapel
Shopfew Cemetery
Ashcraft Cemetery
Plummer Creek
Dry Branch
PINE RD
CEDAR RD
CR 415S
CR 880E
CR 950S
CR 830E
CR 750E
CR 350S
CR 725E
MINERAL-KOLEEN RD
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-4: Page 6 of 19
Alternative 4
DLZ


Alignment Alternative Hybrid 4E-1/4E-2
Access Road 3
Access Road 2
45
CR 425S
CR 400S
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
CEDAR RD
Dobbins Cemetery
FIGURE 6-4: Page 7 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N


Alignment Alternative Hybrid 4E-1/4E-2
Access Road 4
Access Road 3
SR 45 Interchange
CR 325S
CR 125E
CR 200E
CR 300S
Merkel Branch
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4: Page 8 of 19
Alternative 4
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/eligible Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N


Alignment Alternative 4F-5
Alignment Alternative Hybrid 4E-1/4E-2
Monroe County
Greene County
Freeman Cemetery
Subsection E-F Breakline
Access Road 5
Access Road 4
Mitchell Branch
FIGURE 6-4: Page 9 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

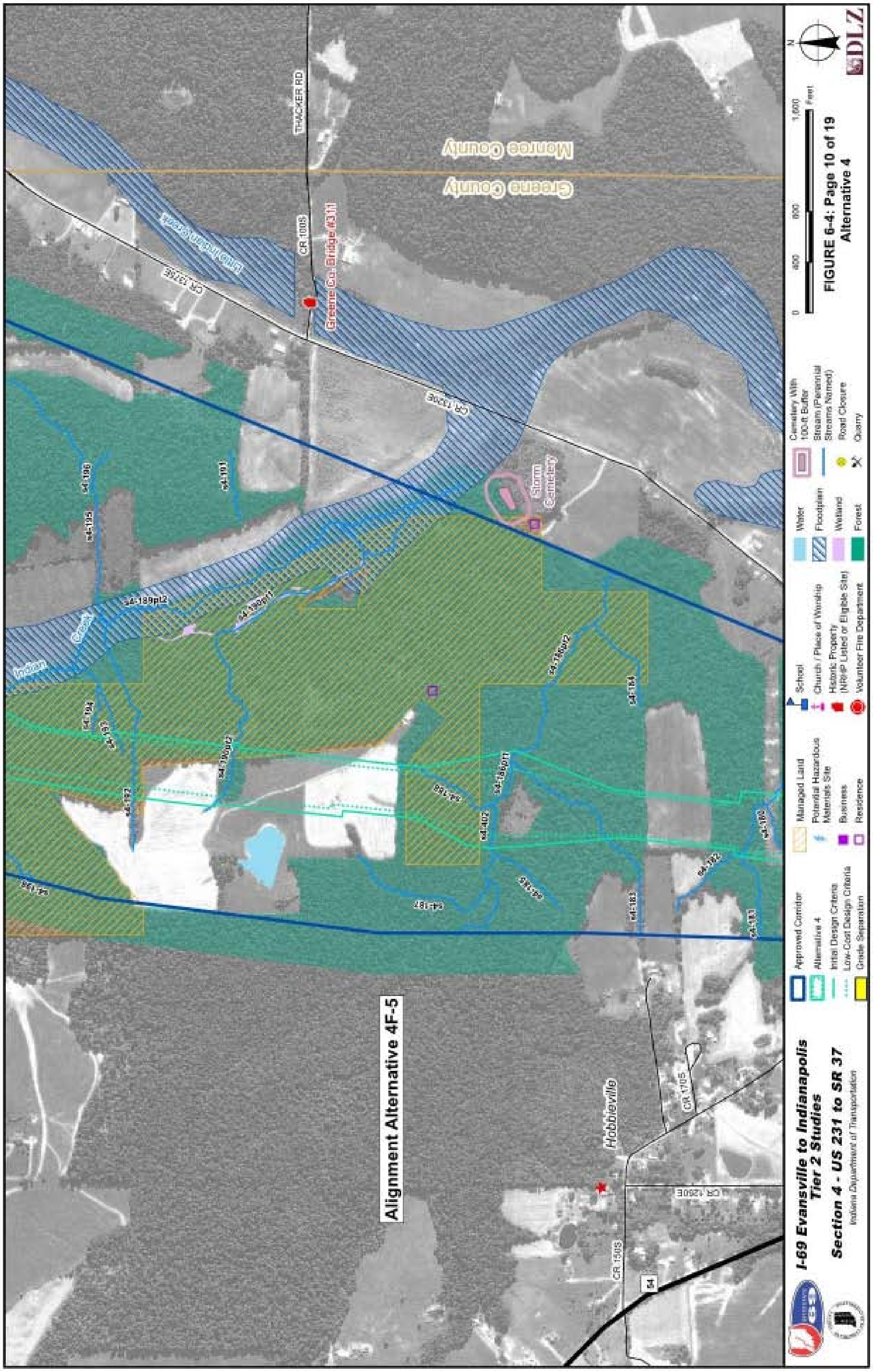
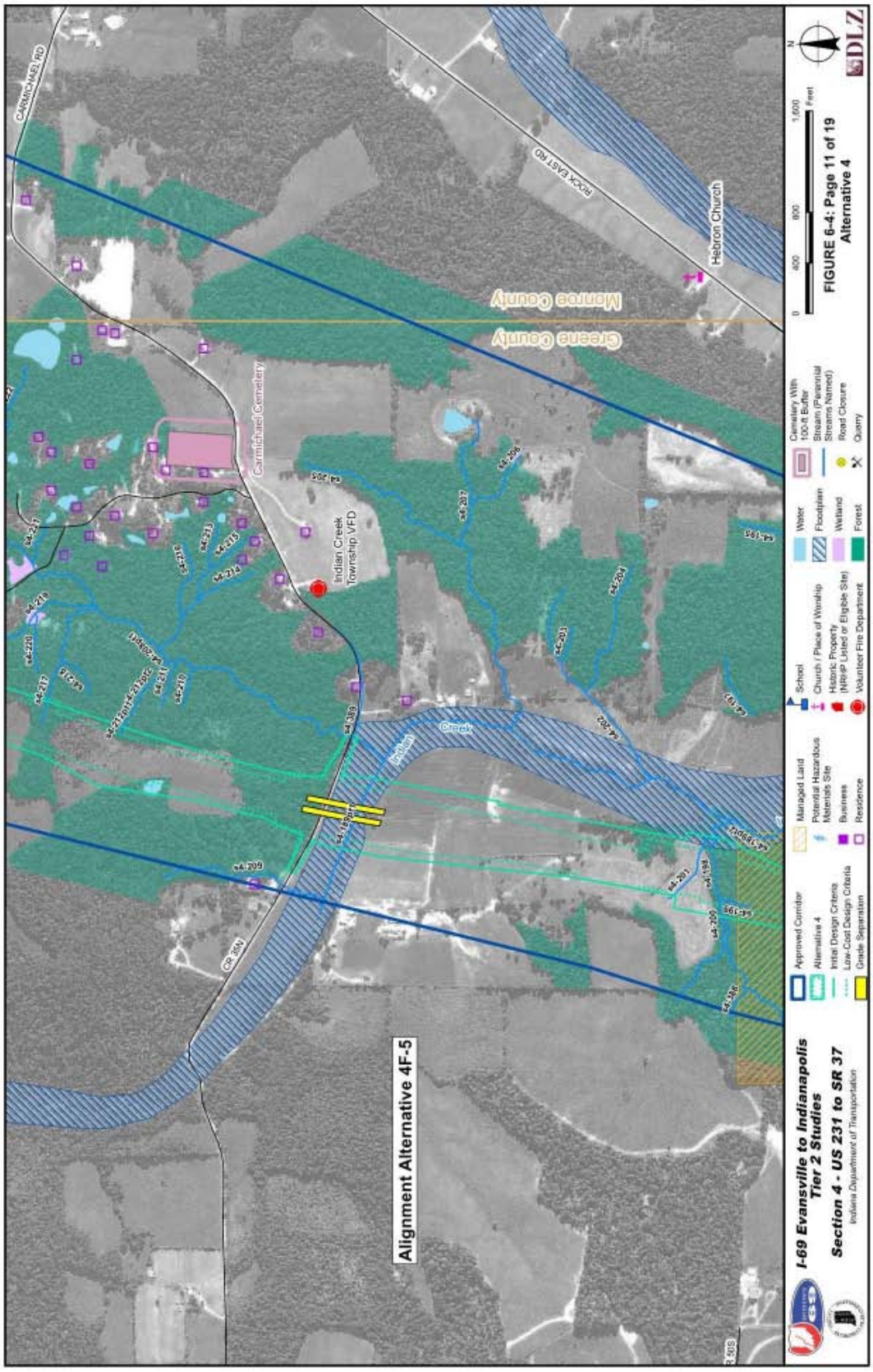


FIGURE 6-4: Page 10 of 19
Alternative 4
Alignment Alternative 4F-5
Monroe County
Greene County
THACKER RD
CR 100S
CR 1375E
CR 1320E
Little Indian Creek
Indian Creek
Greene Co. Bridge #311
Storm Cemetery
Hobbieville
CR 170S
CR 1250E
CR 150S
54
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Streams (Perennial Streams Named)
Road Closure
Quarry
DLZ


Alignment Alternative 4F-5
Greene County
Monroe County
Hebron Church
Carmichael Cemetery
Indian Creek Township VFD
ROCK EAST RD
CARMICHAEL RD
SR 37
FIGURE 6-4: Page 11 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ

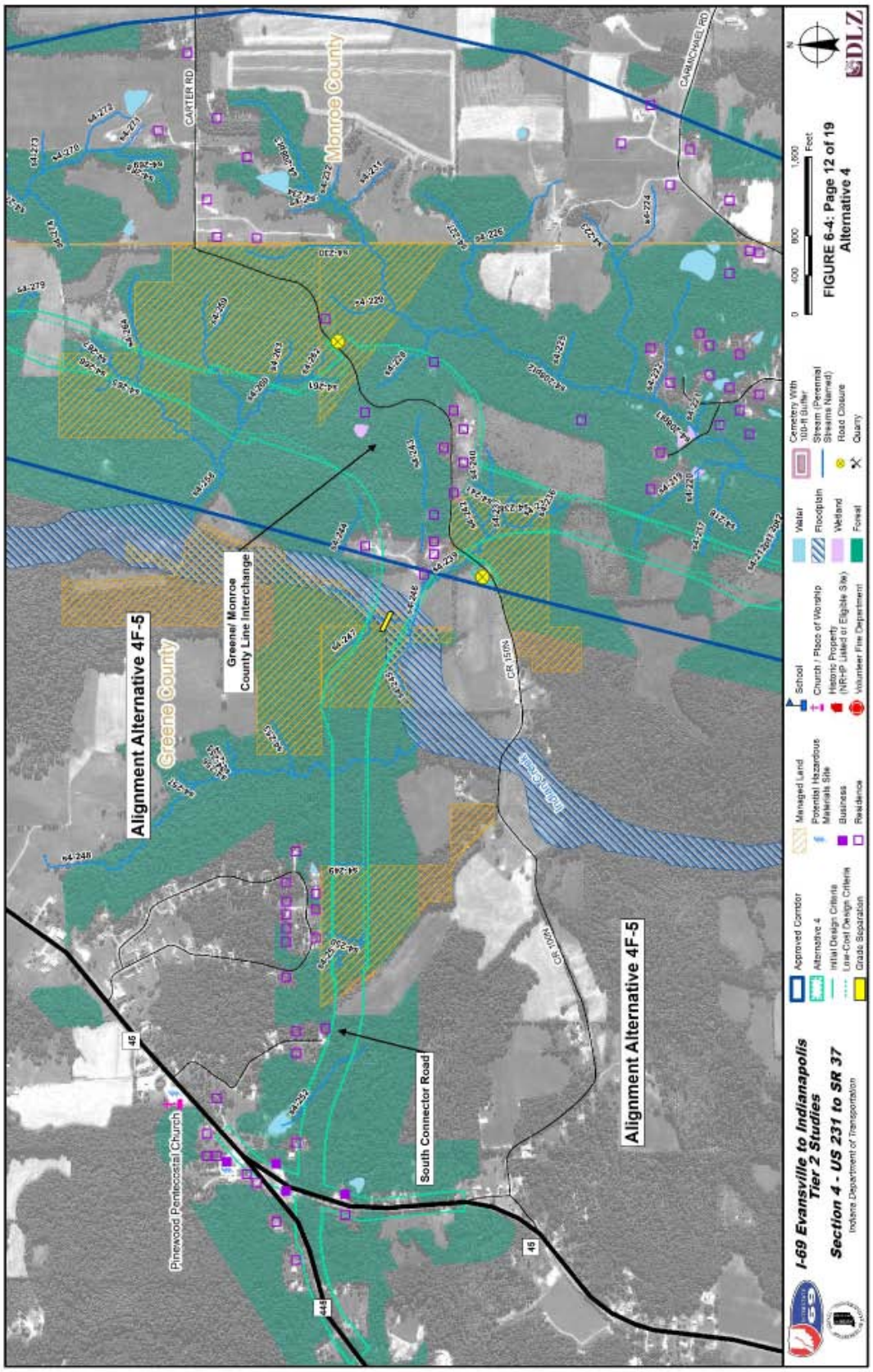

Alignment Alternative 4F-5
Greene/ Monroe County Line Interchange
Greene County
Monroe County
South Connector Road
Alignment Alternative 4F-5
Pinewood Pentecostal Church
CARTER RD
CARMICHAEL RD
CR 150N
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
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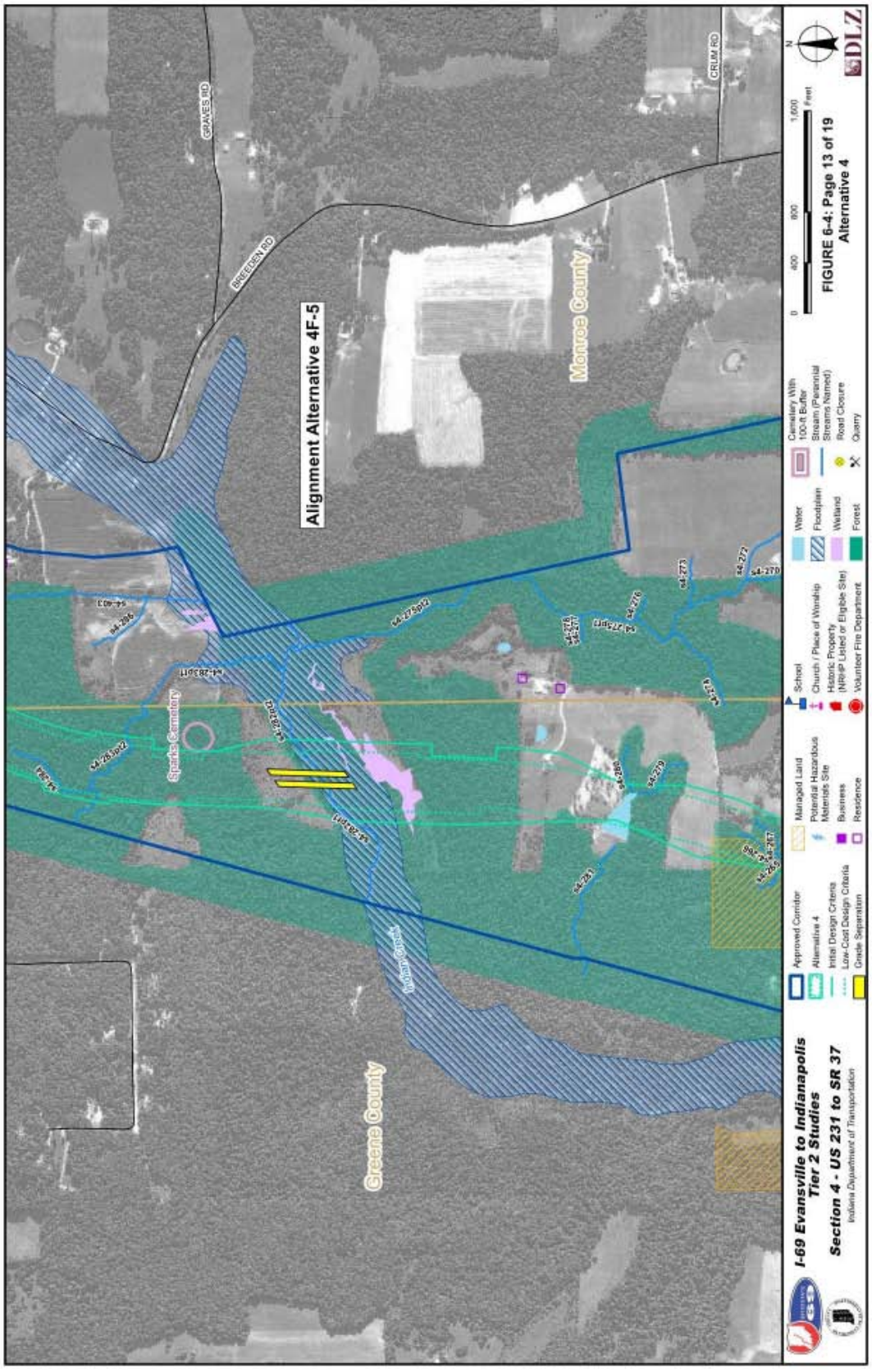
FIGURE 6-4: Page 12 of 19
Alternative 4
DLZ


Alignment Alternative 4F-5
Monroe County
Greene County
GRAVES RD
BREEDEN RD
CRUM RD
Sparks Cemetery
Indian Creek
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
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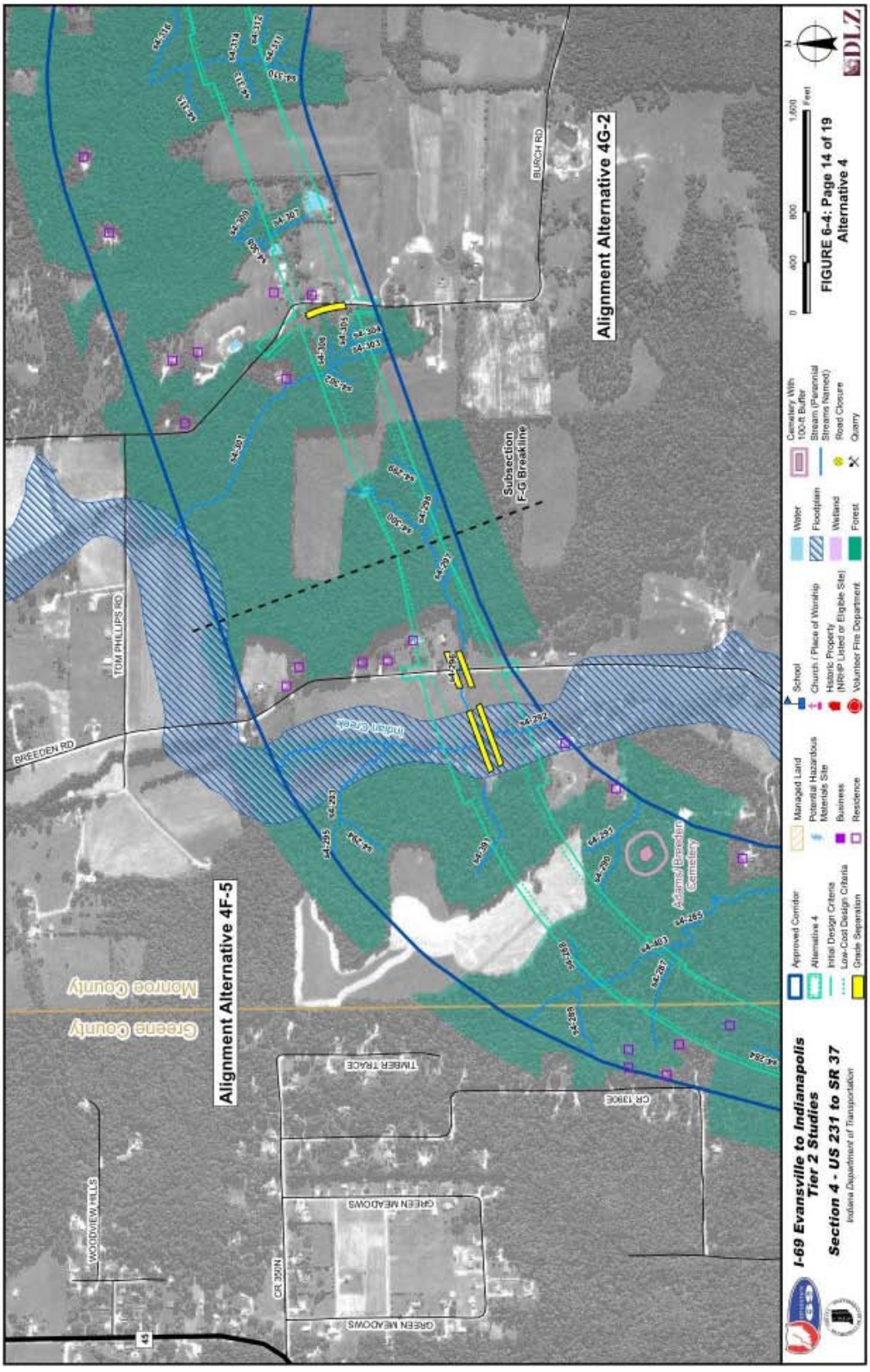
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
FIGURE 6-4: Page 13 of 19
Alternative 4
DLZ


Alignment Alternative 4G-2
Alignment Alternative 4F-5
Subsection F-G Breakline
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Indian Creek
Greene County
Monroe County
TIMBER TRACE
CR 135OE
GREEN MEADOWS
CR 350N
WOODVIEW HILLS
43
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-4: Page 14 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

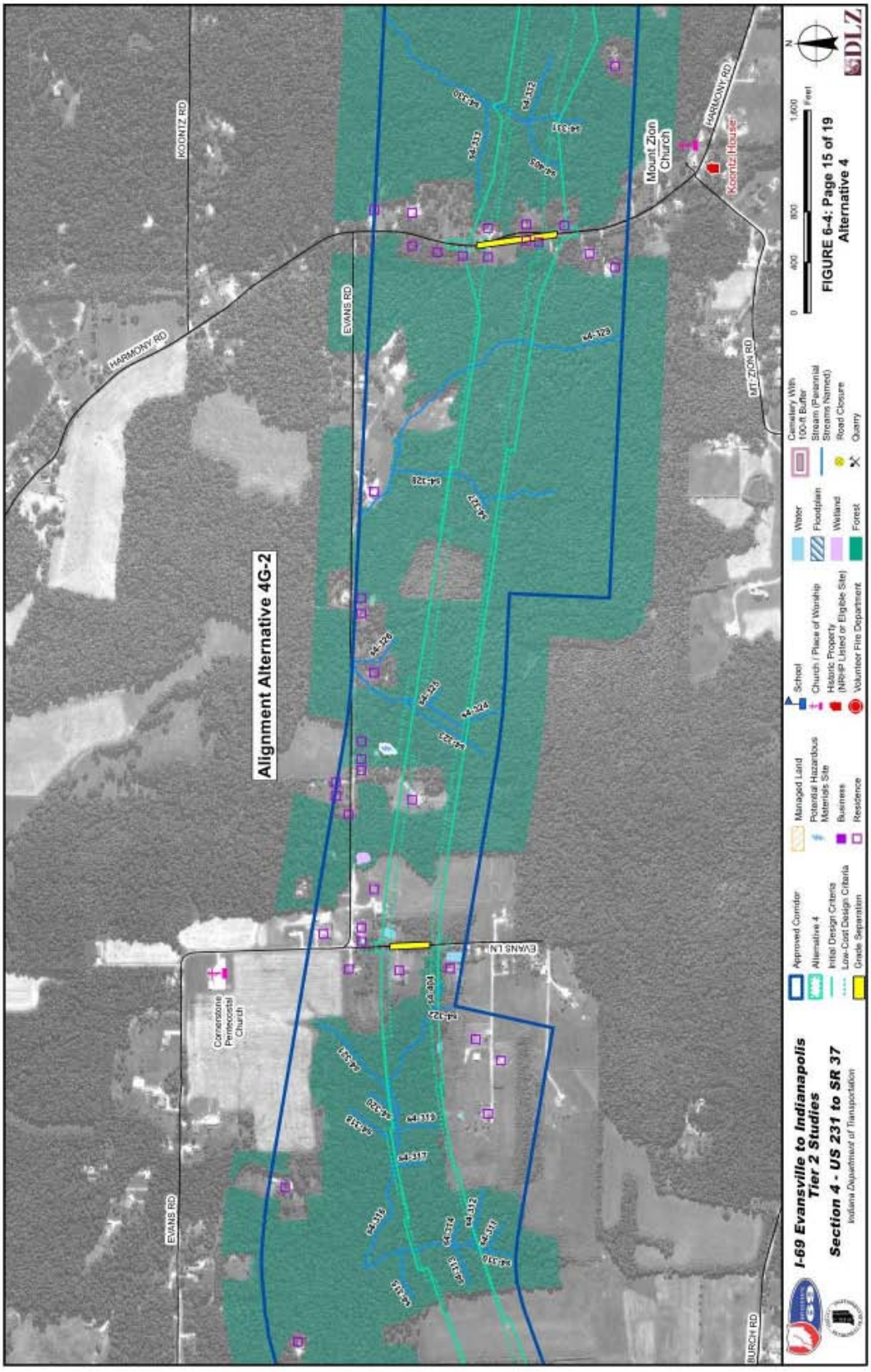

Alignment Alternative 4G-2
HARMONY RD
KOONTZ RD
EVANS RD
EVANS LN
MT ZION RD
BURCH RD
Mount Zion Church
Koontz House
Cornerstone Pentecostal Church
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
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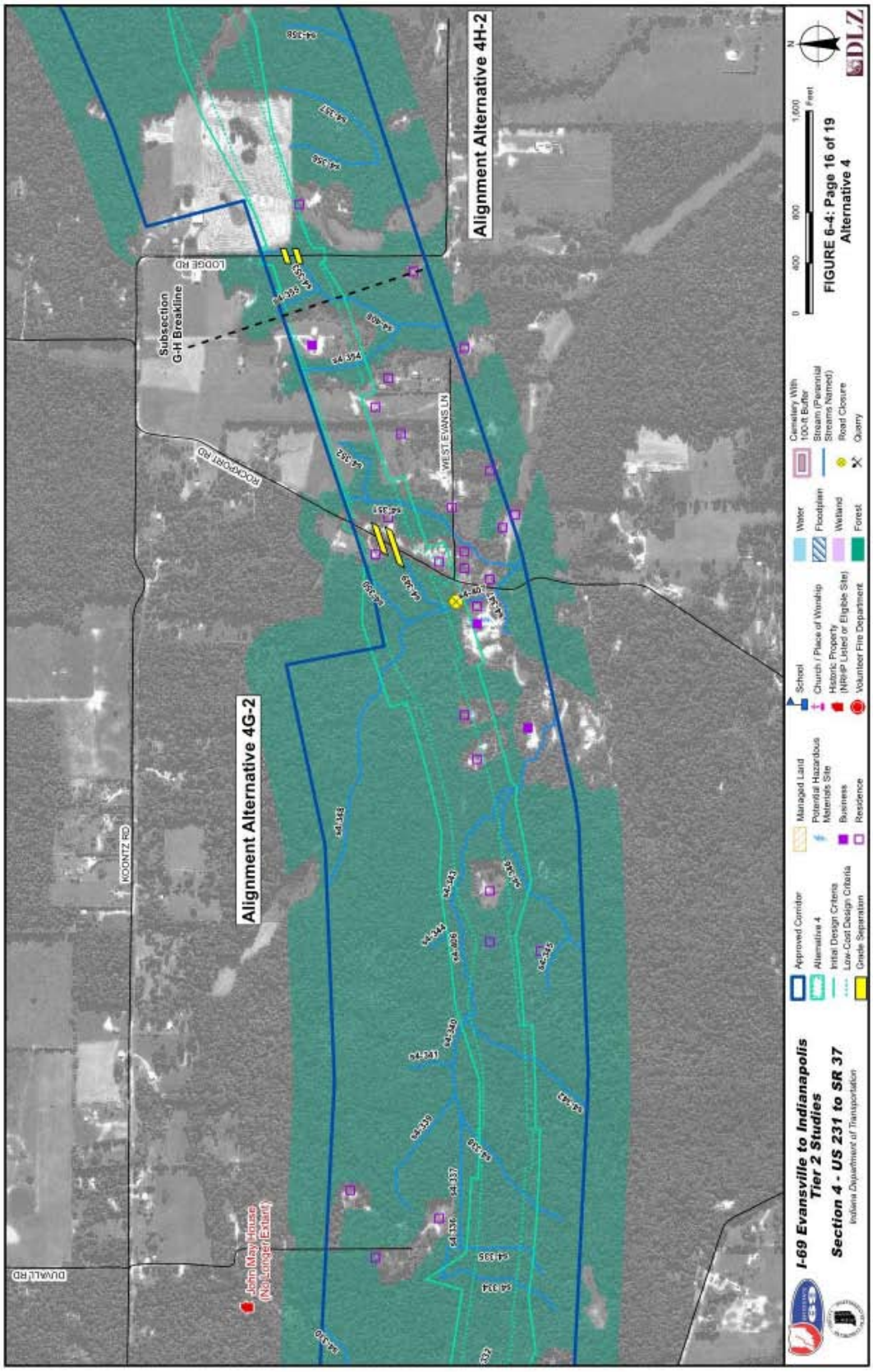
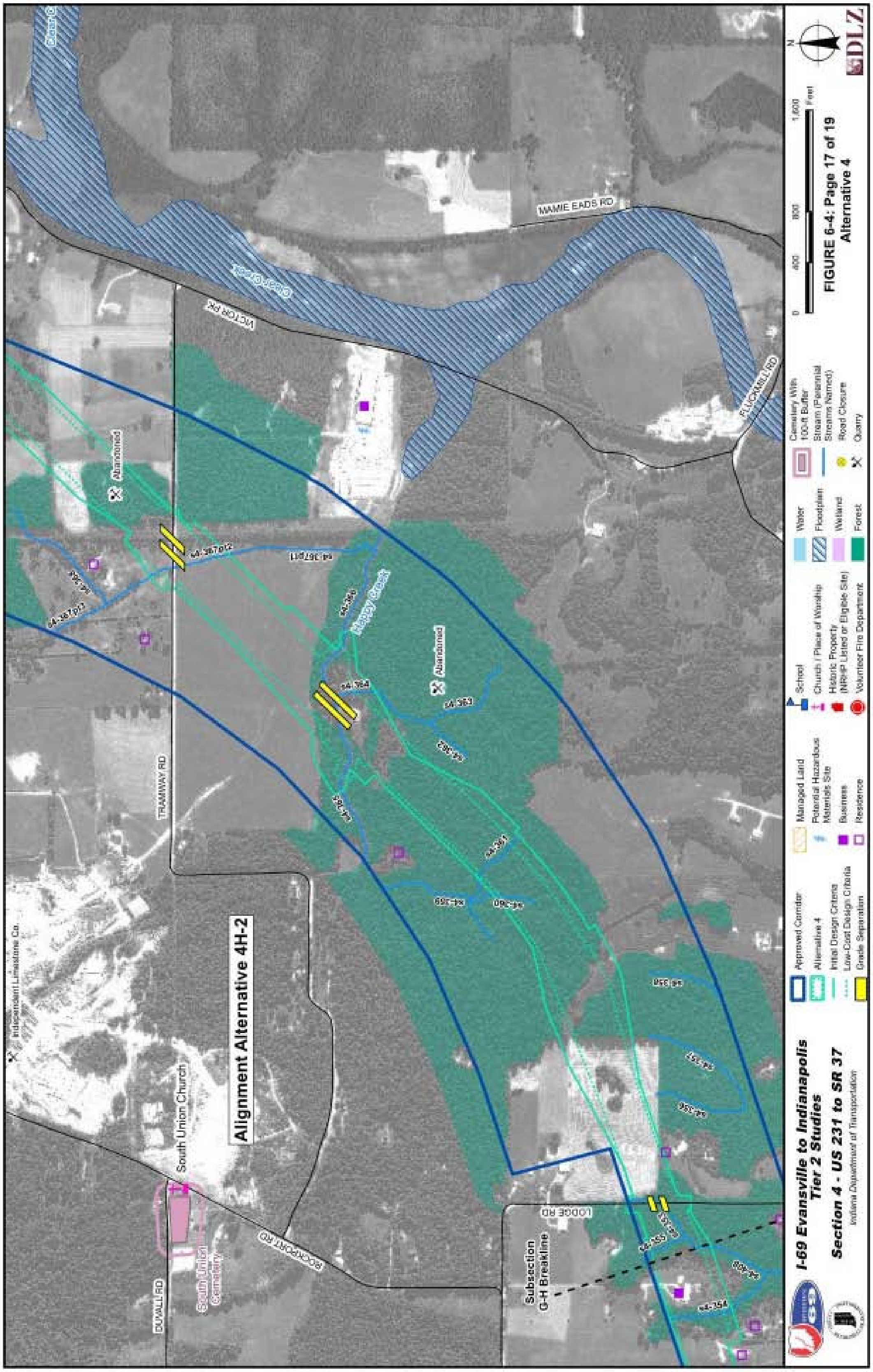
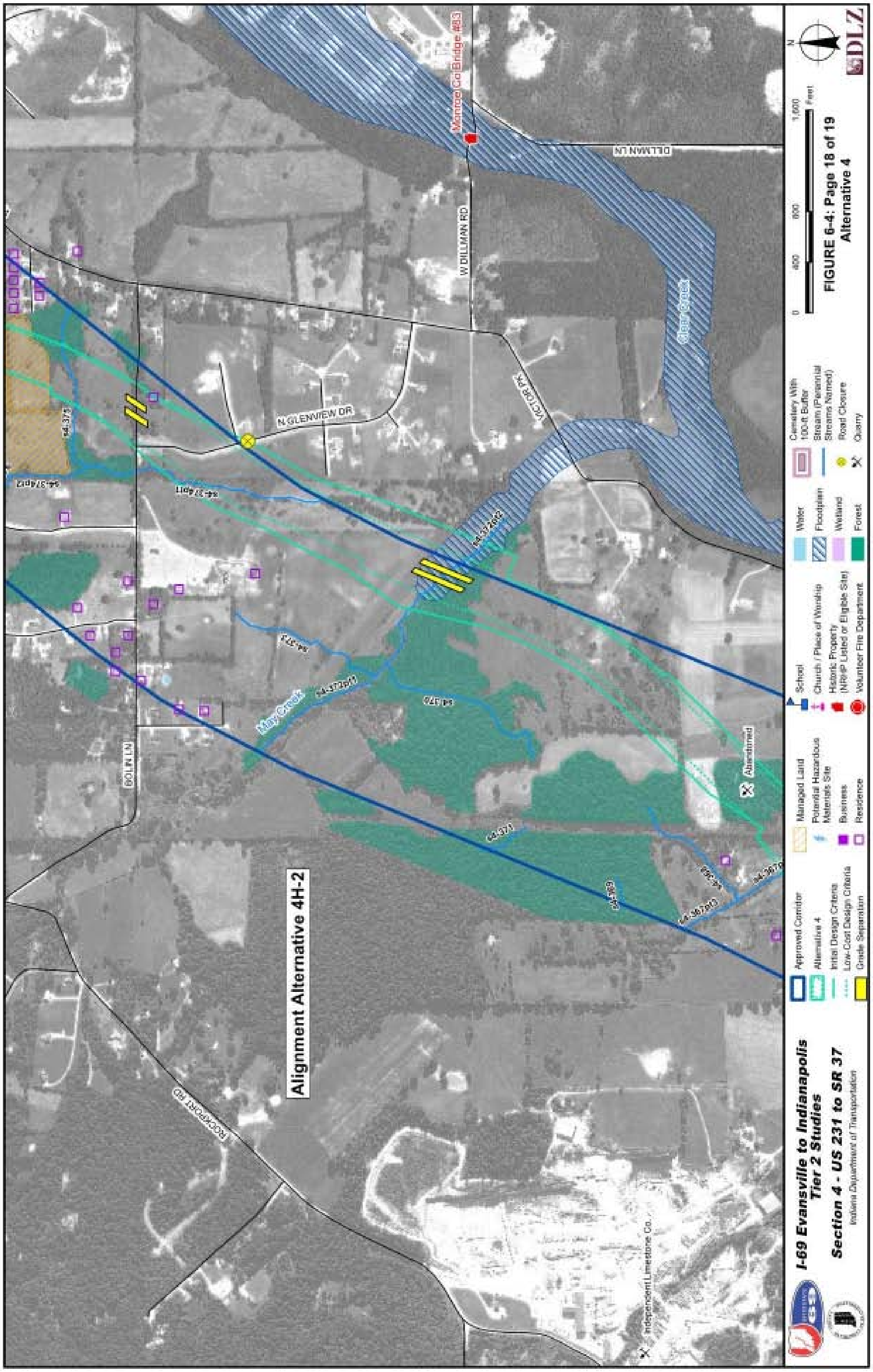
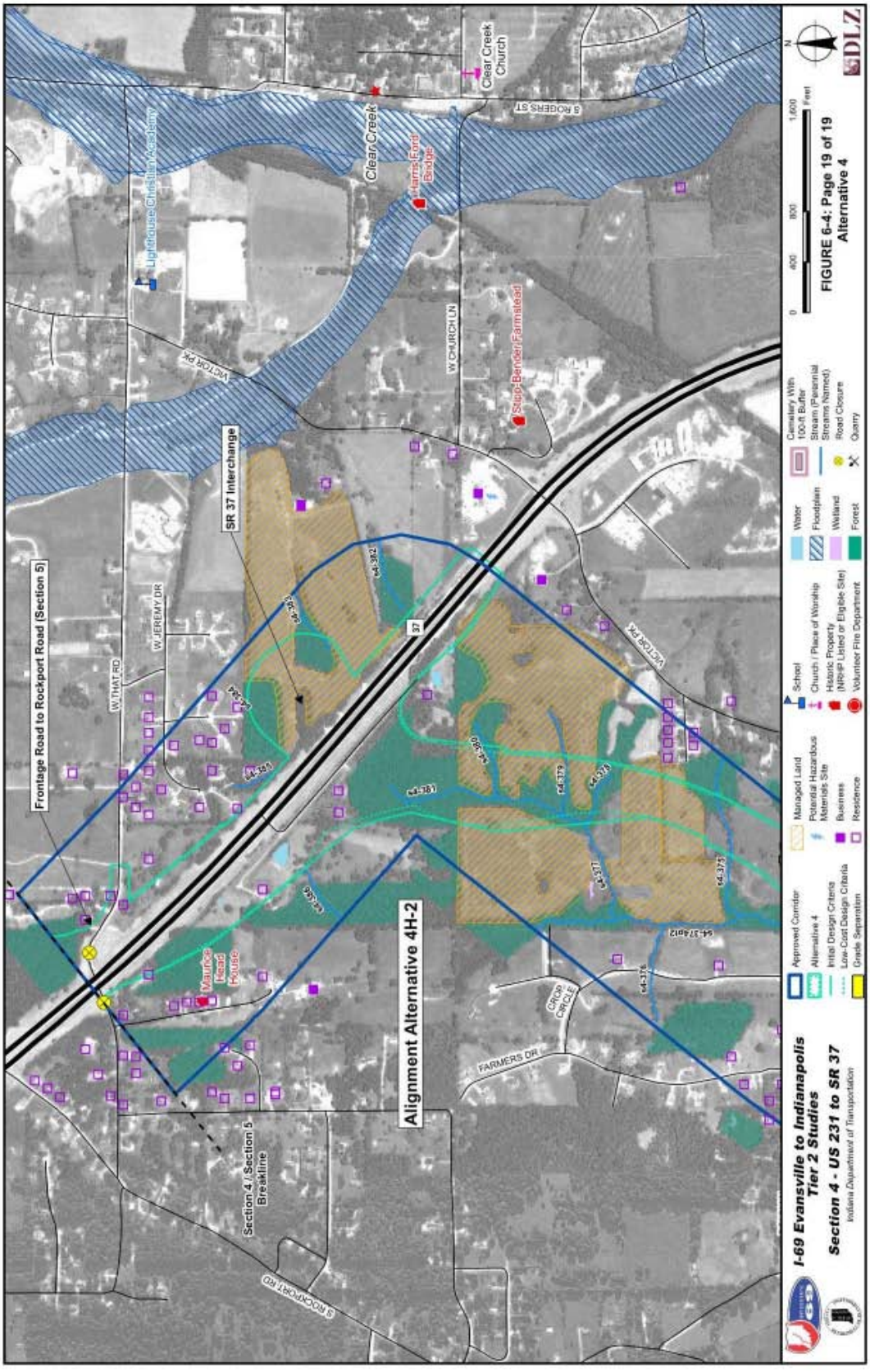
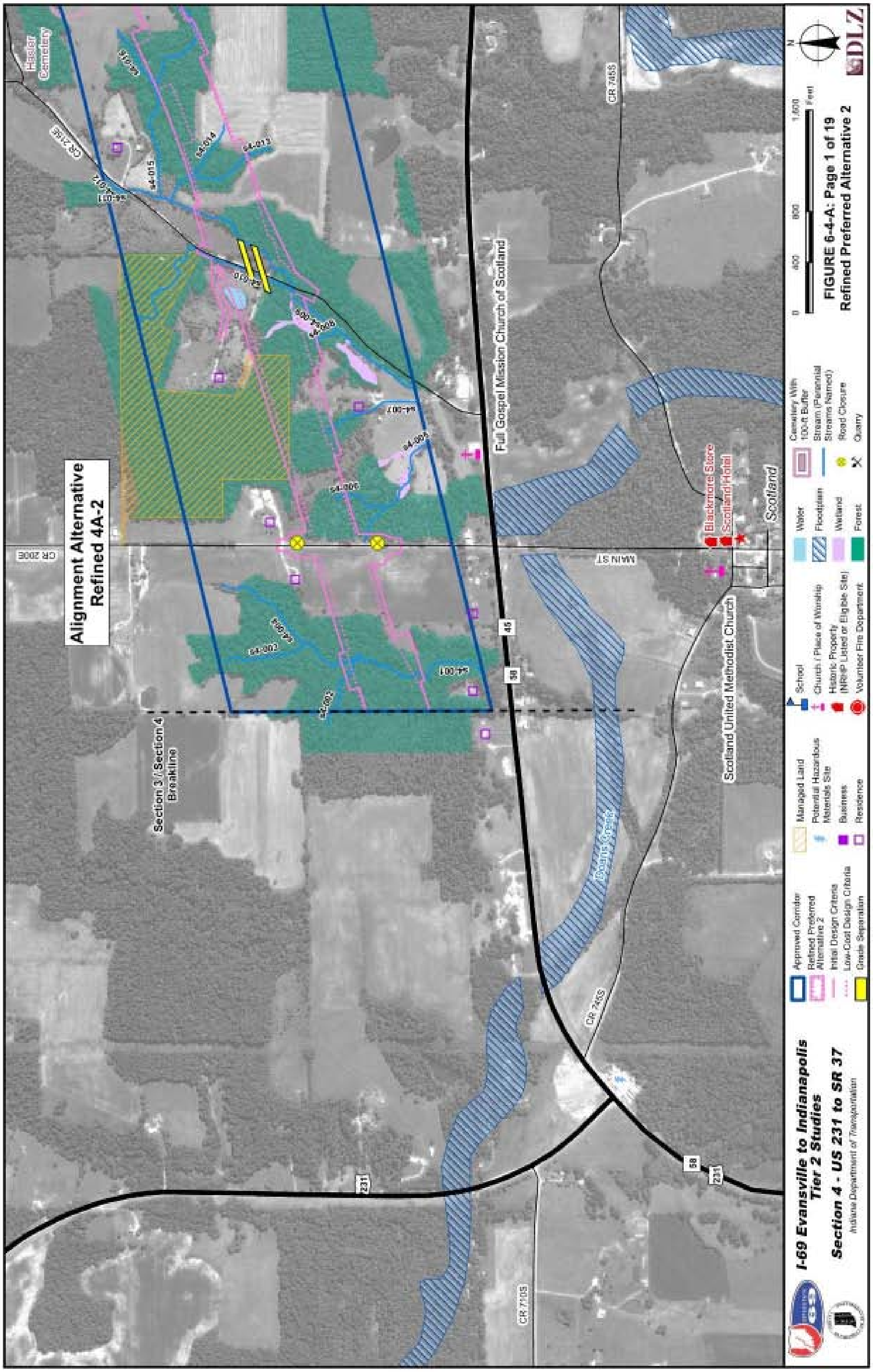
FIGURE 6-4: Page 15 of 19
Alternative 4
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Stream Named)
Road Closure
Quarry

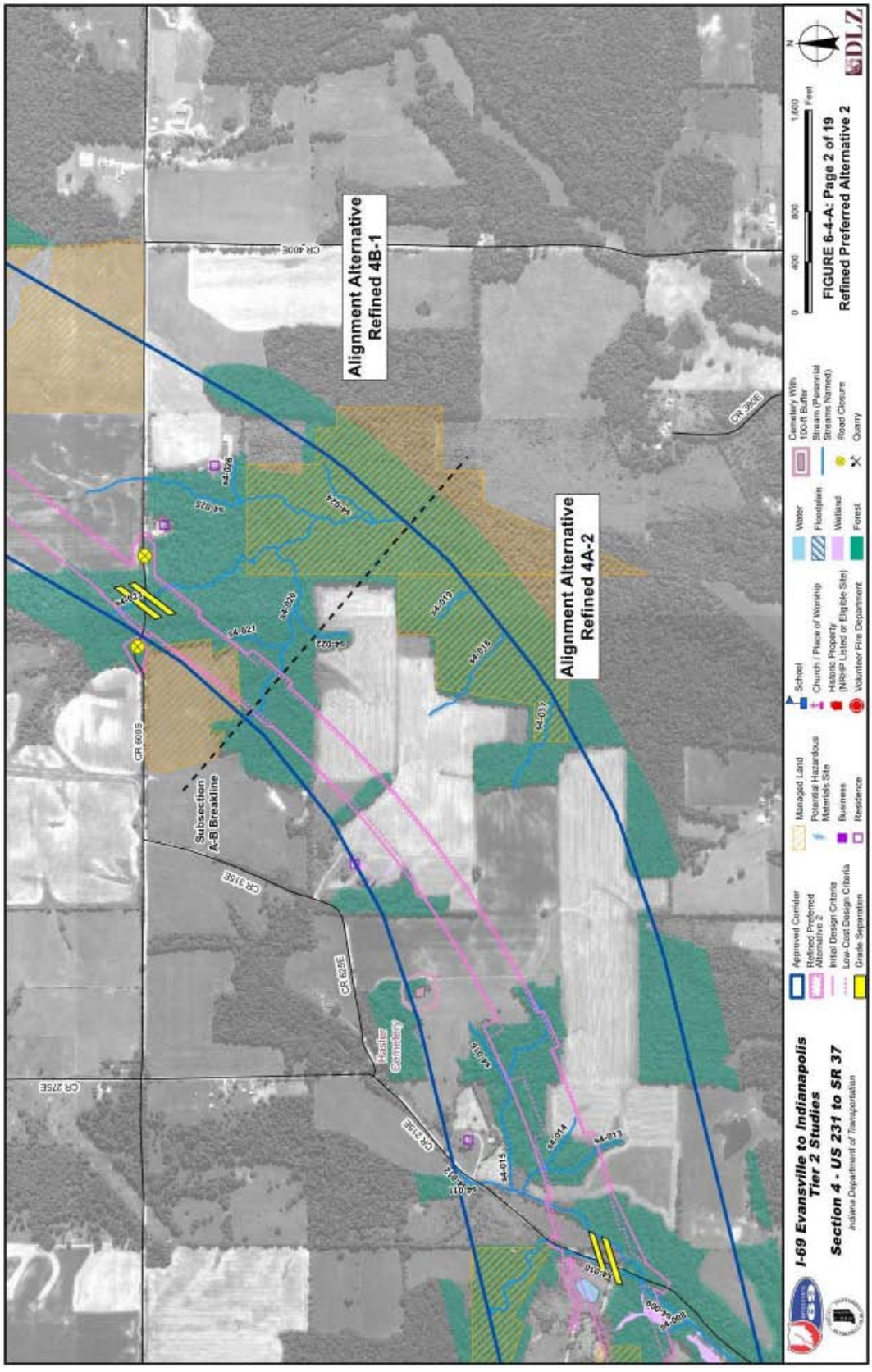

Alignment Alternative 4H-2
Alignment Alternative 4G-2
Subsection G-H Breakline
LODGE RD
ROCKPORT RD
W ST EVANS LN
KOONTZ RD
DUMALL RD
John May House (No Longer Extant)
FIGURE 6-4: Page 16 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet

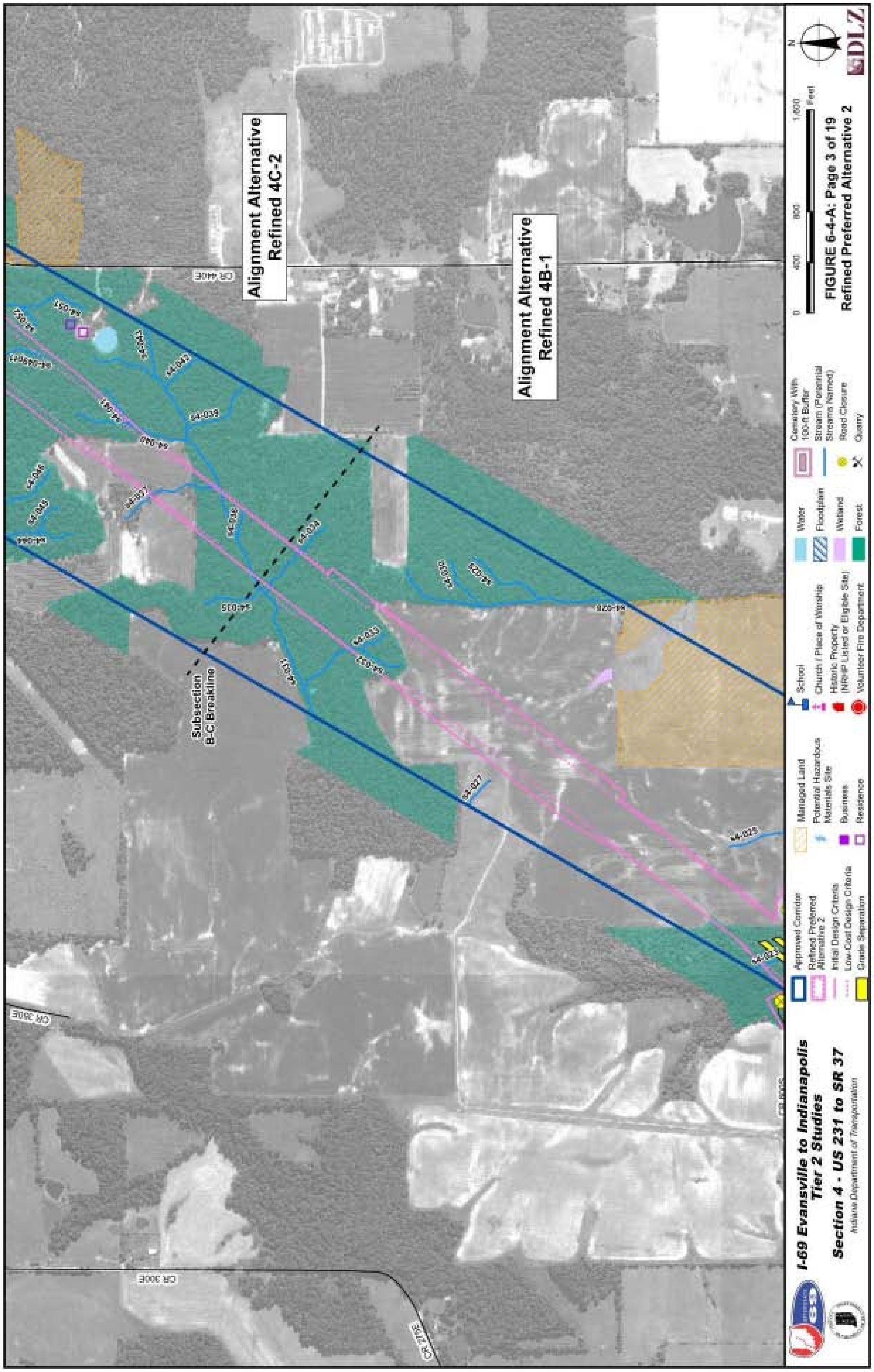

I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4: Page 17 of 19
Alternative 4
Alignment Alternative 4H-2
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
MAMIE EADS RD
VICTOR PK
FLUCKMILL RD
TRAMWAY RD
DUVALL RD
ROCKPORT RD
LODGE RD
Clear Creek
Happy Creek
Abandoned
Independent Limestone Co.
South Union Church
South Union Cemetery
Subsection G-H Breakline

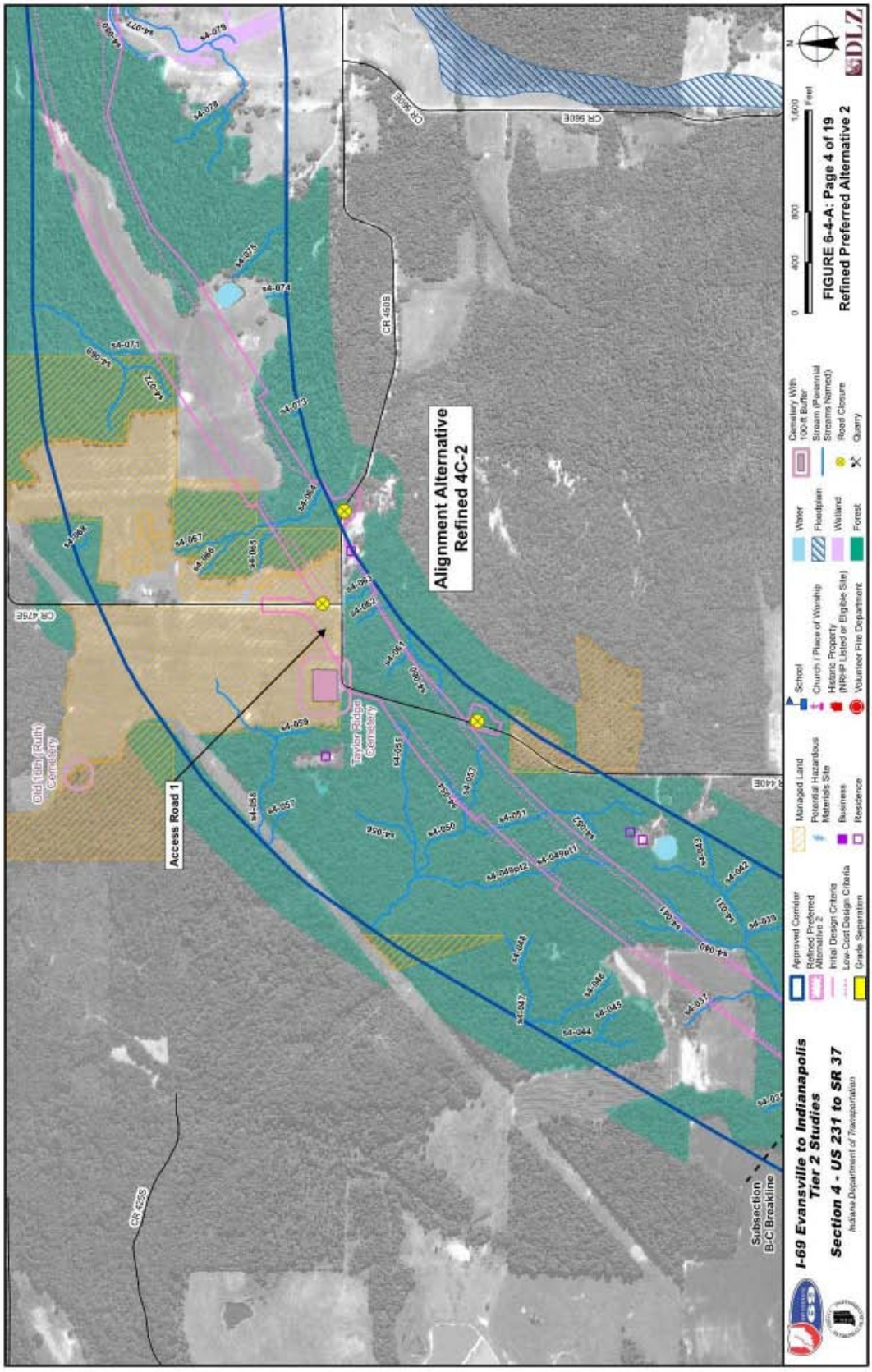

Alignment Alternative 4H-2
FIGURE 6-4: Page 18 of 19
Alternative 4
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Monroe Co. Bridge #83
W DILLMAN RD
DELMAN LN
N GLENVIEW DR
VICTOR PIK
BOLIN LN
ROCKPORT RD
Clear Creek
May Creek
Abandoned
Independent Limestone Co.
DLZ

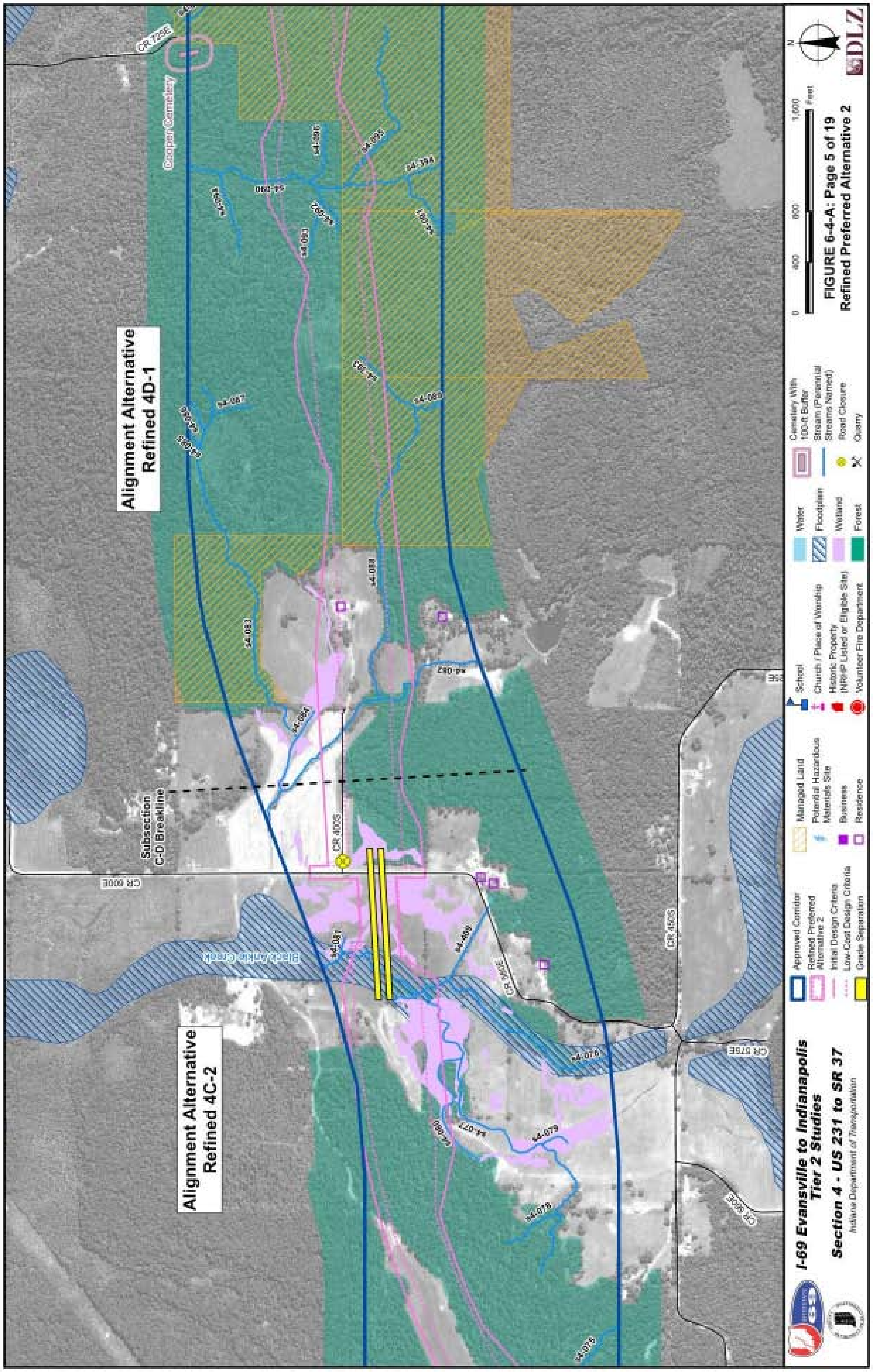

Clear Creek
Clear Creek Church
Lighthouse Christian Academy
Harris Ford Bridge
Stipp-Bender Farmstead
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
Alignment Alternative 4H-2
Maurice Head House
Section 4 / Section 5 Breakline
CROP CIRCLE
FARMERS DR
S ROGERS ST
W CHURCH LN
VICTOR PK
W JEREMY DR
W THAT RD
S ROCKPORT RD
37
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Alternative 4
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-4: Page 19 of 19
Alternative 4

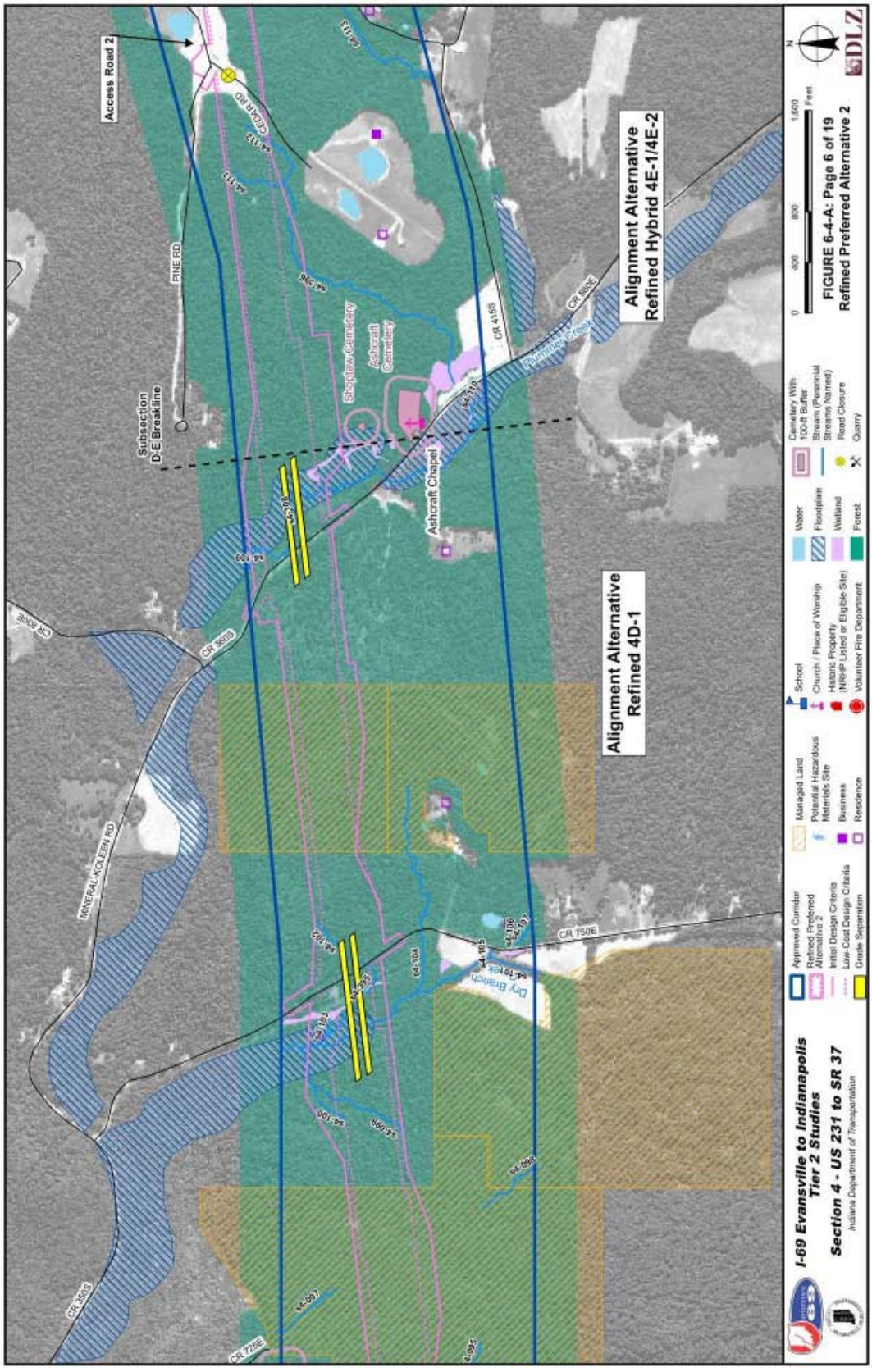

Alignment Alternative
Refined 4A-2
Section 3 / Section 4
Breakline
Full Gospel Mission Church of Scotland
Scotland United Methodist Church
Blackmore Store
Scotland Hotel
Scotland
Hasler
Cemetery
MAIN ST
CR 200E
CR 745S
CR 710S
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-4-A: Page 1 of 19
Refined Preferred Alternative 2
DLZ

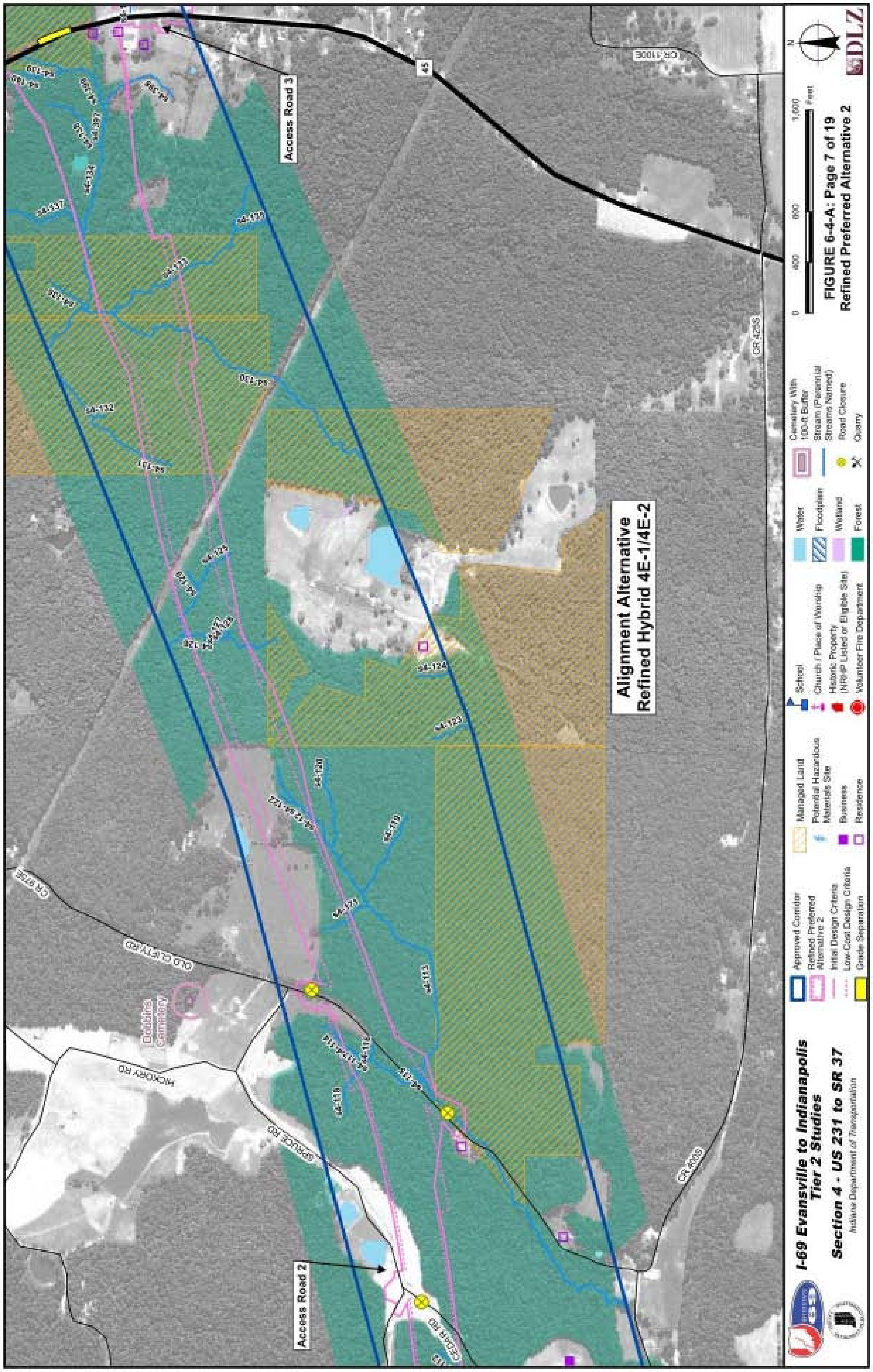

Alignment Alternative Refined 4B-1
Alignment Alternative Refined 4A-2
Subsection A-B Breakline
CR 400E
CR 300E
CR 600S
CR 015E
CR 625E
CR 275E
CR 210E
Hastie Cemetery
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-4-A: Page 2 of 19
Refined Preferred Alternative 2


Alignment Alternative Refined 4C-2
Alignment Alternative Refined 4B-1
Subsection B-C Breakline
FIGURE 6-4-A: 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
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ

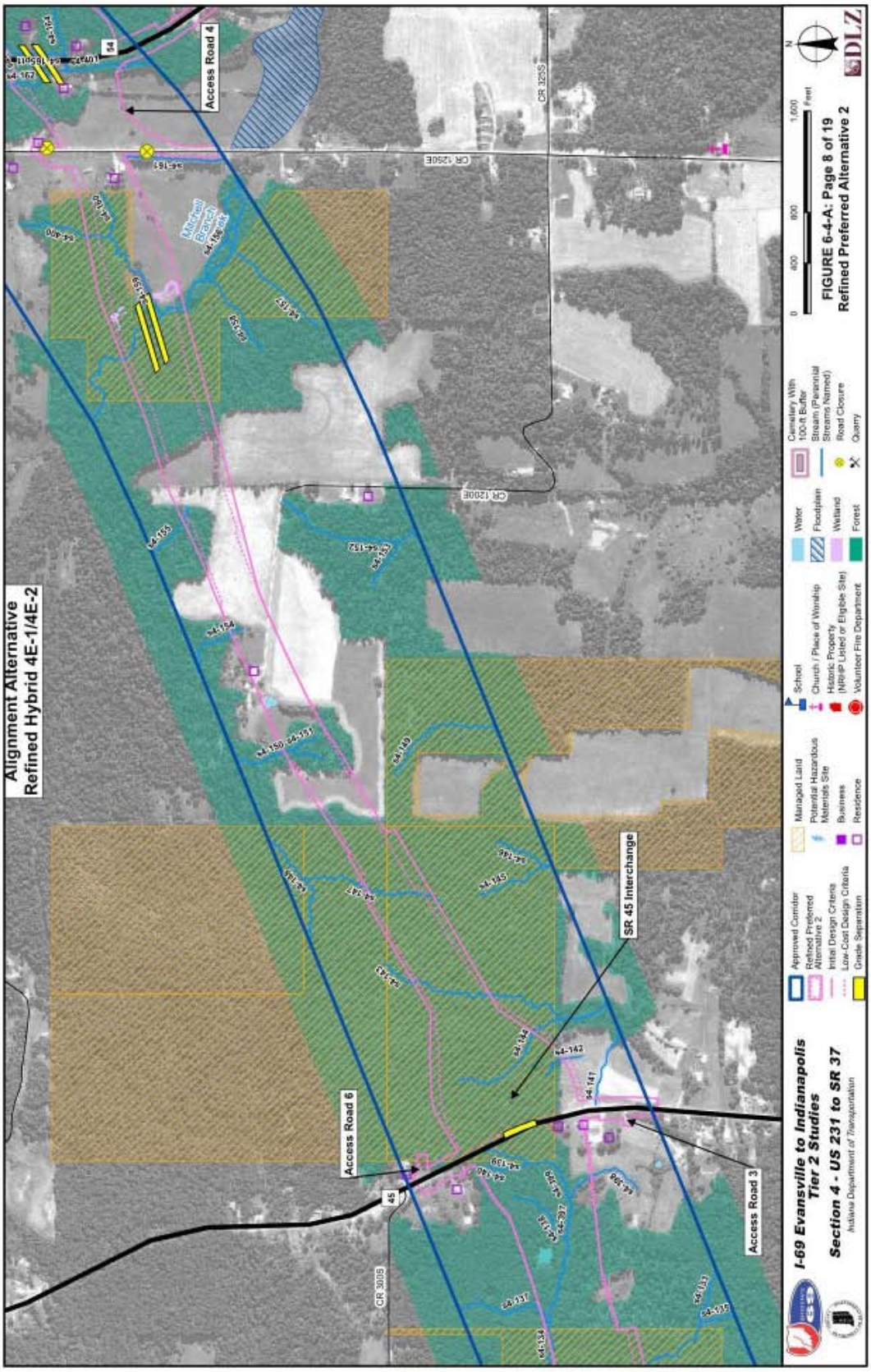

Alignment Alternative
Refined 4C-2
Access Road 1
Old 16th (Ruth) Cemetery
Taylor Ridge Cemetery
CR 450S
CR 456E
CR 440E
CR 425S
Subsection B-C Breakline
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/SI Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-4-A: Page 4 of 19
Refined Preferred Alternative 2

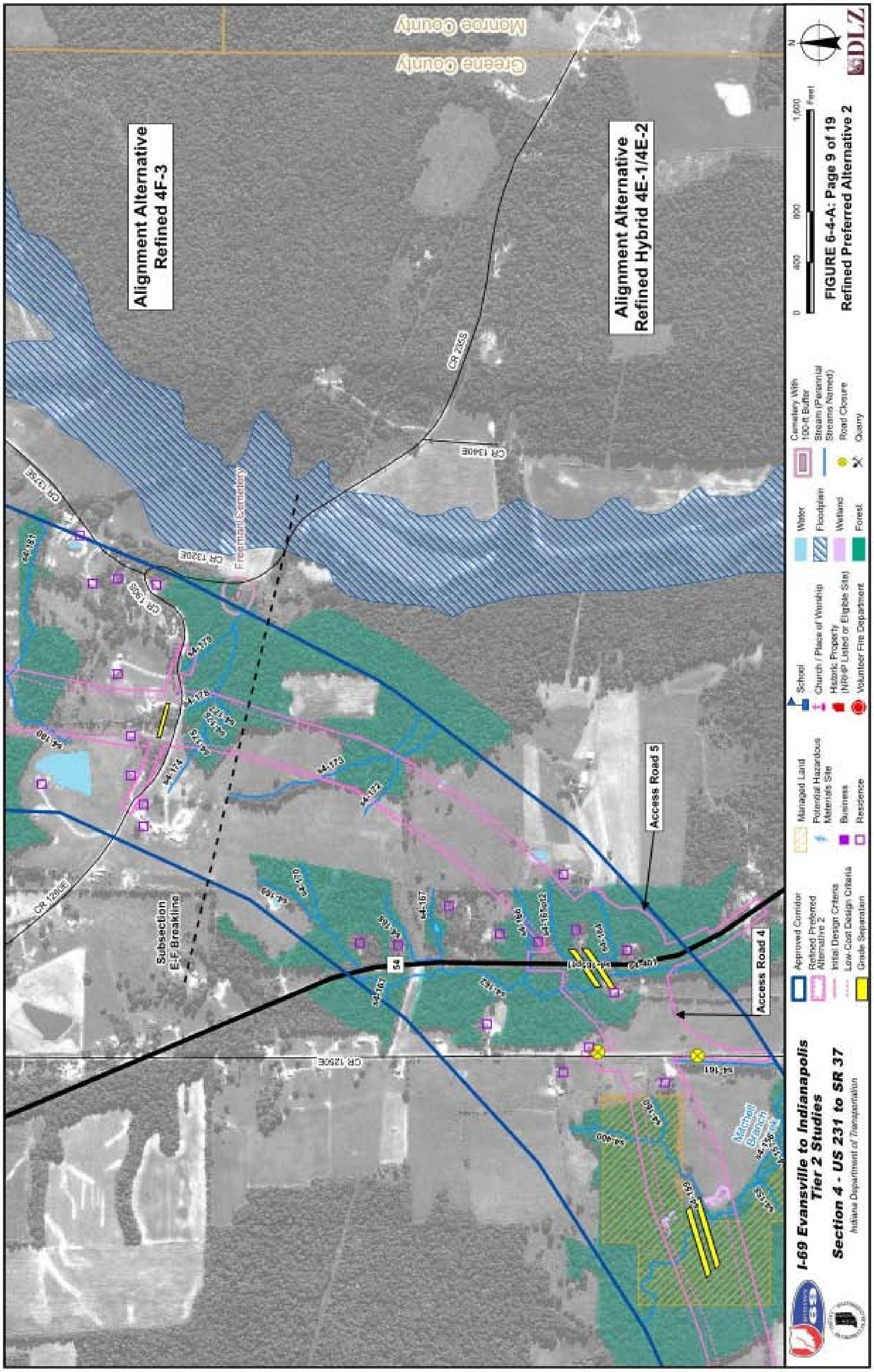

Alignment Alternative Refined 4D-1
Alignment Alternative Refined 4C-2
Subsection C-D Breakline
Cooper Cemetery
Black Ankle Creek
CR 600E
CR 400S
CR 450S
CR 725E
CR 675E
CR 650E
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-4-A: Page 5 of 19
Refined Preferred Alternative 2
DLZ


Access Road 2
PINE RD
Subsection D-E Breakline
Shiloh Cemetery
Ashcraft Cemetery
Ashcraft Chapel
CR 455S
CR 650E
Alignment Alternative Refined Hybrid 4E-1/4E-2
Alignment Alternative Refined 4D-1
CR 960S
CR 650E
MINERAL KOLEEN RD
CR 725E
CR 365S
Dry Branch
FIGURE 6-4-A: Page 6 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



Alignment Alternative
Refined Hybrid 4E-1/4E-2
Access Road 3
Access Road 2
Dobbins Cemetery
OLD CLIFTY RD
HICKORY RD
SPRUCE RD
CEDAR RD
CR 875E
CR 400S
CR 425S
CR 1100E
45
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
FIGURE 6-4-A: Page 7 of 19
Refined Preferred Alternative 2
DLZ


Alignment Alternative
Refined Hybrid 4E-1/4E-2
Access Road 4
SR 45 Interchange
Access Road 6
Access Road 3
CR 325S
CR 1250E
CR 1200E
CR 300S
Marker Branch
FIGURE 6-4-A: Page 8 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


Alignment Alternative
Refined 4F-3
Alignment Alternative
Refined Hybrid 4E-1/4E-2
Greene County
Monroe County
Freeman Cemetery
Subsection E-F Breakline
Access Road 4
Access Road 5
Mitchell Branch
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
FIGURE 6-4-A: Page 9 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

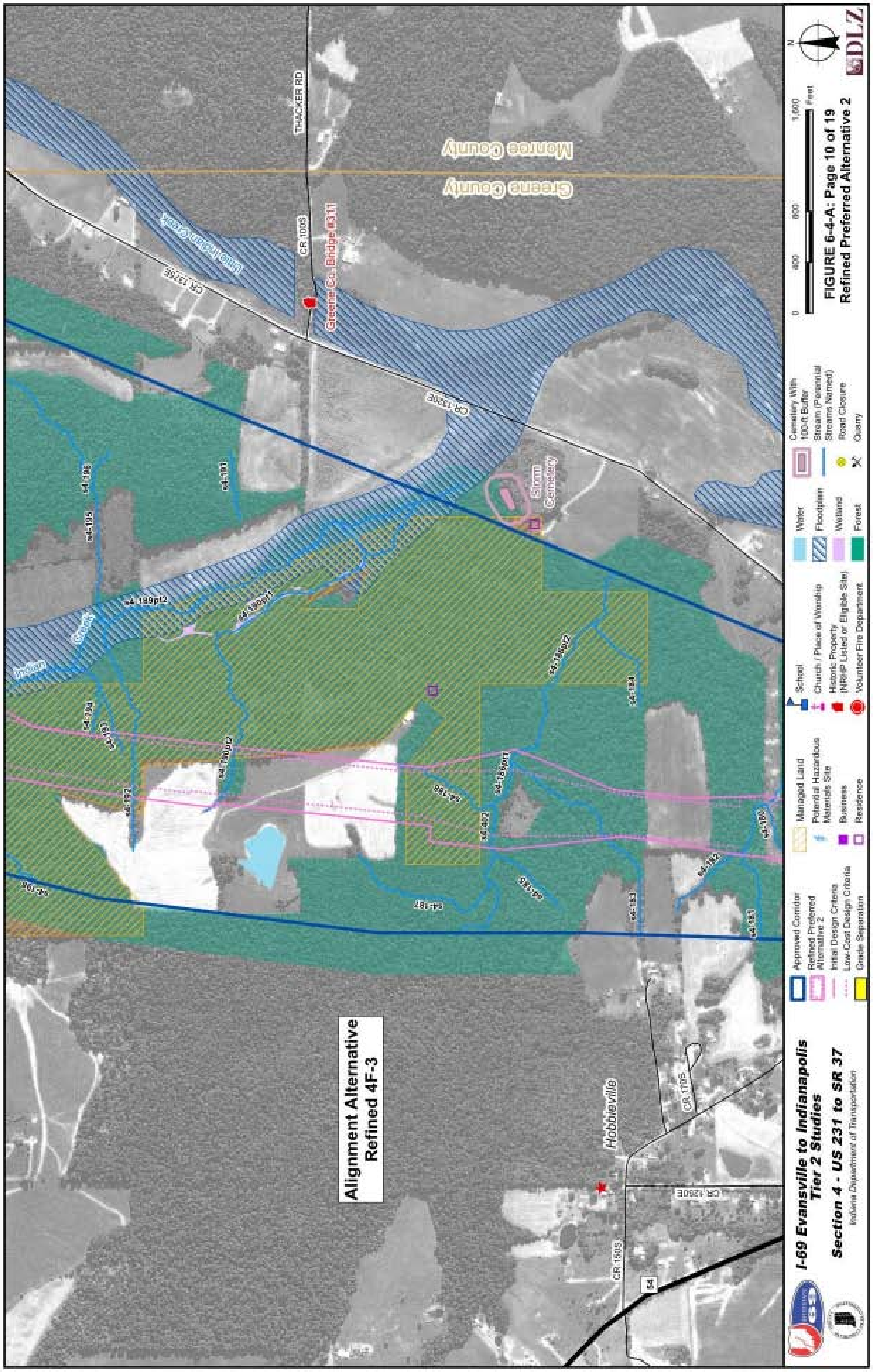
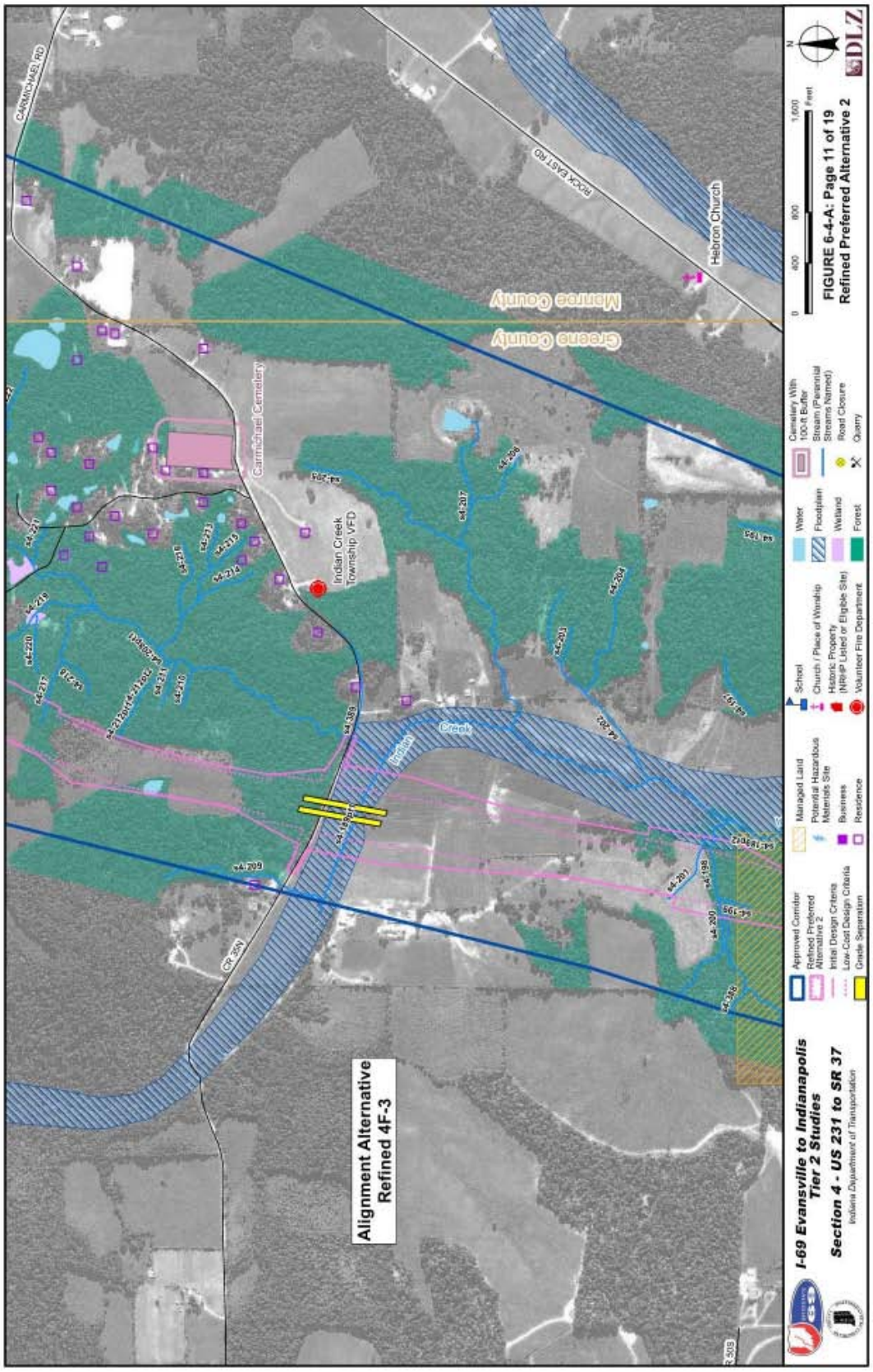


FIGURE 6-4-A: Page 10 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alignment Alternative Refined 4F-3
Monroe County
Greene County
THACKER RD
CR 100S
Greene Co. Bridge #311
Little Indian Creek
Indian Creek
CR 1375E
CR 1320E
Stern Cemetery
Hobbieville
CR 1250E
CR 170S
CR 150S
54
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
DLZ


Alignment Alternative
Refined 4F-3
Greene County
Martine County
Hebron Church
Carmichael Cemetery
Indian Creek Township VFD
Indian Creek
CR 35N
ROCK EAST RD
CARMICHAEL RD
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4-A: Page 11 of 19
Refined Preferred Alternative 2
DLZ
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/IP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry

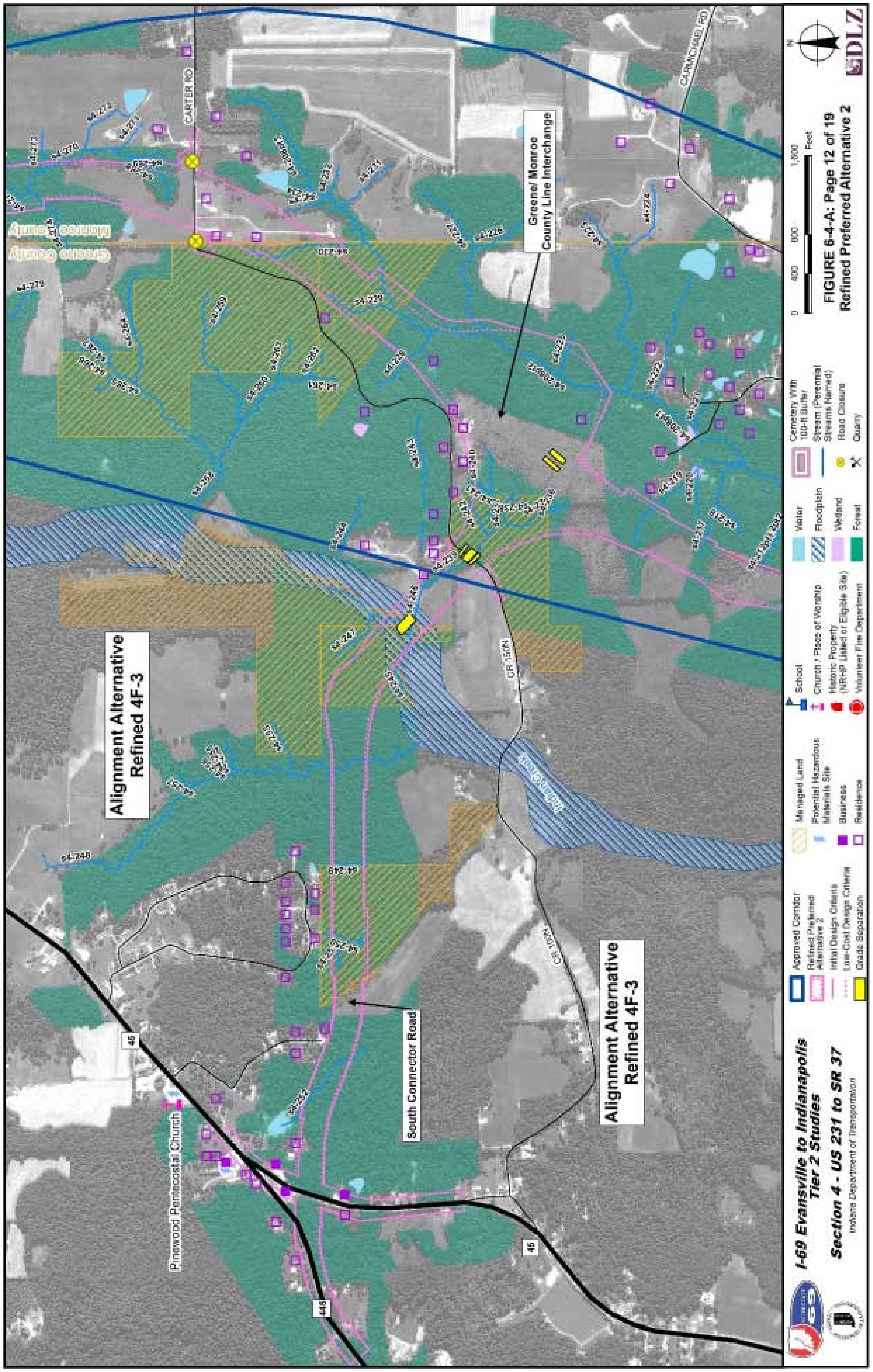
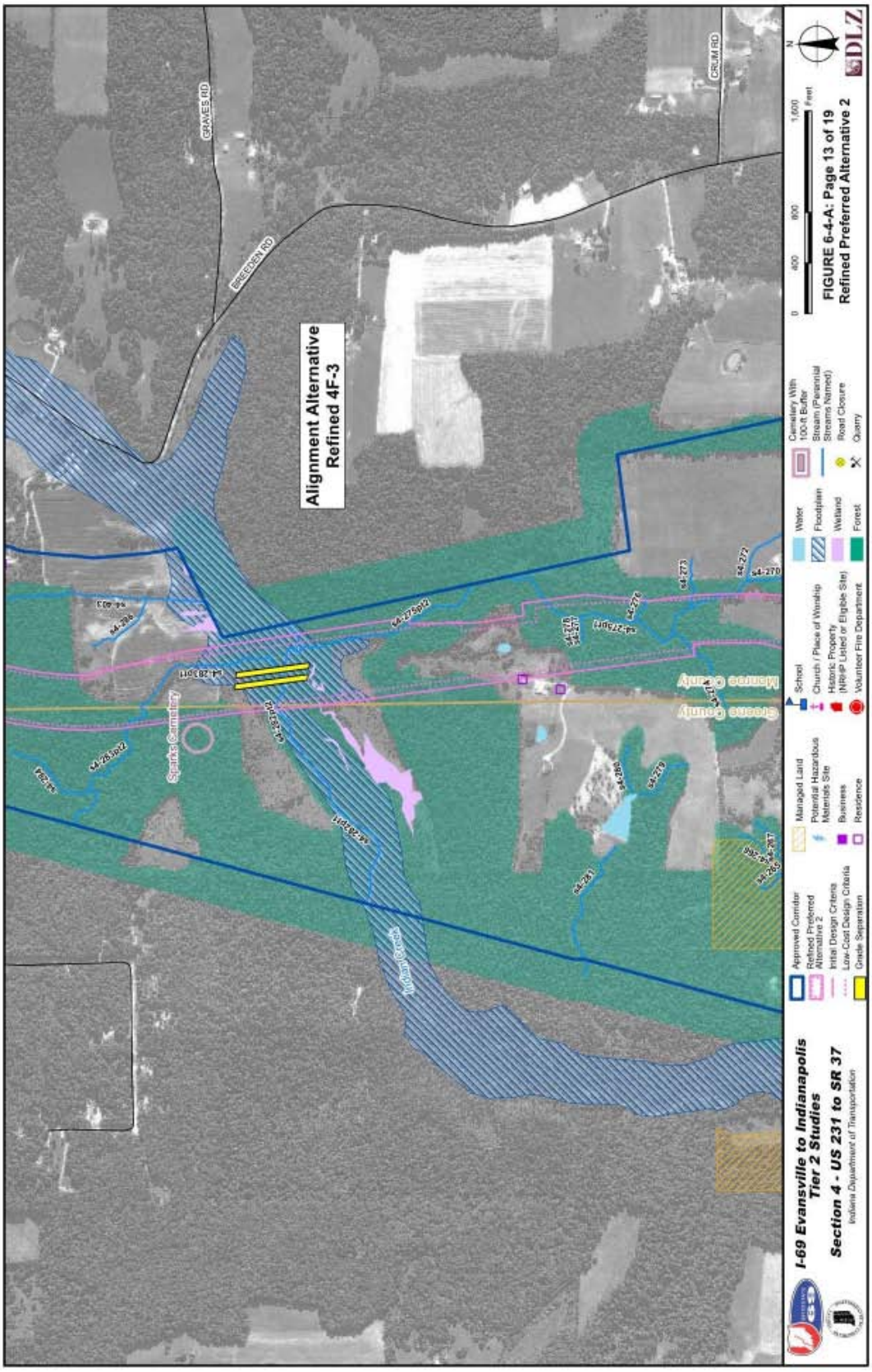
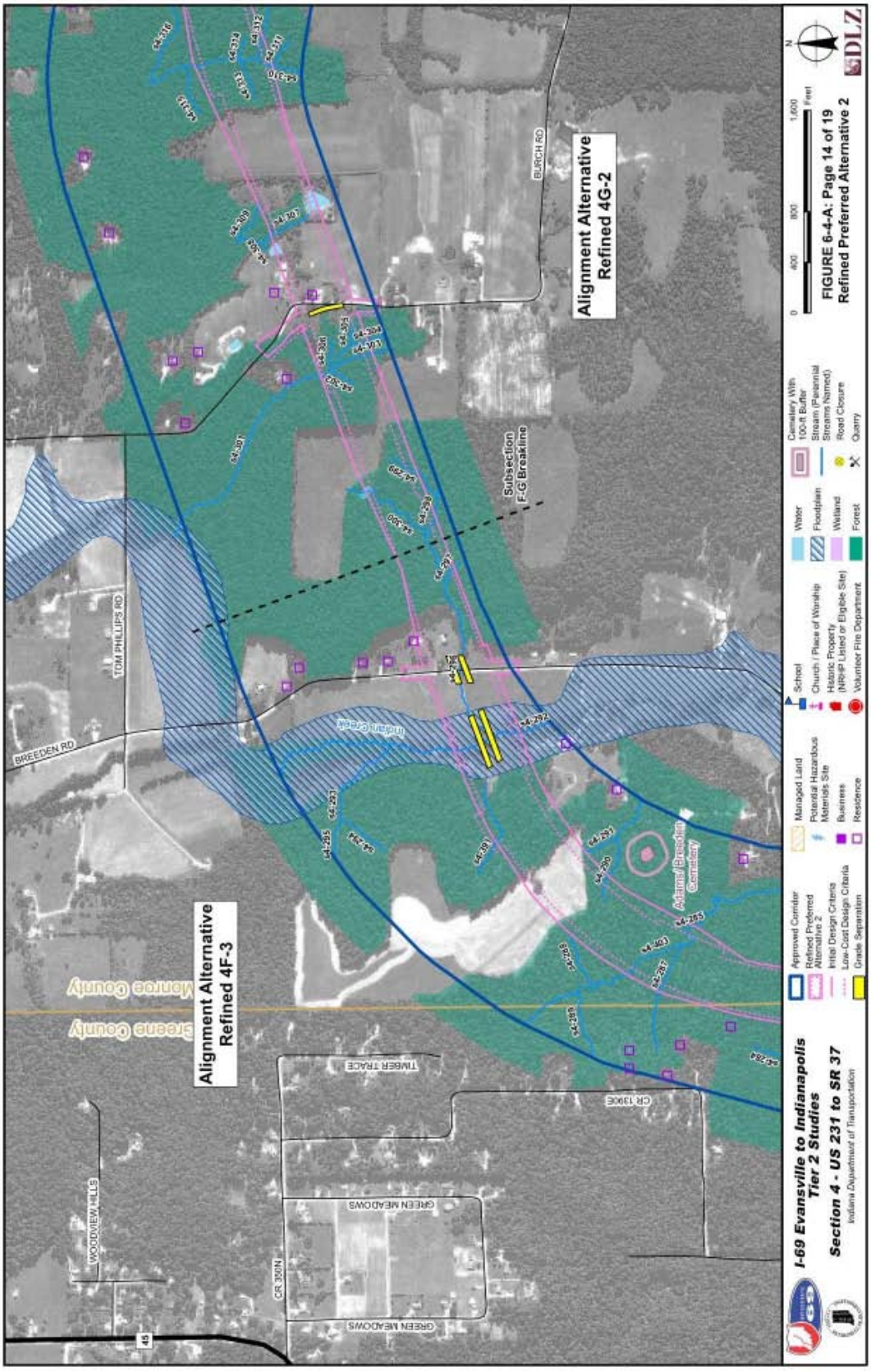
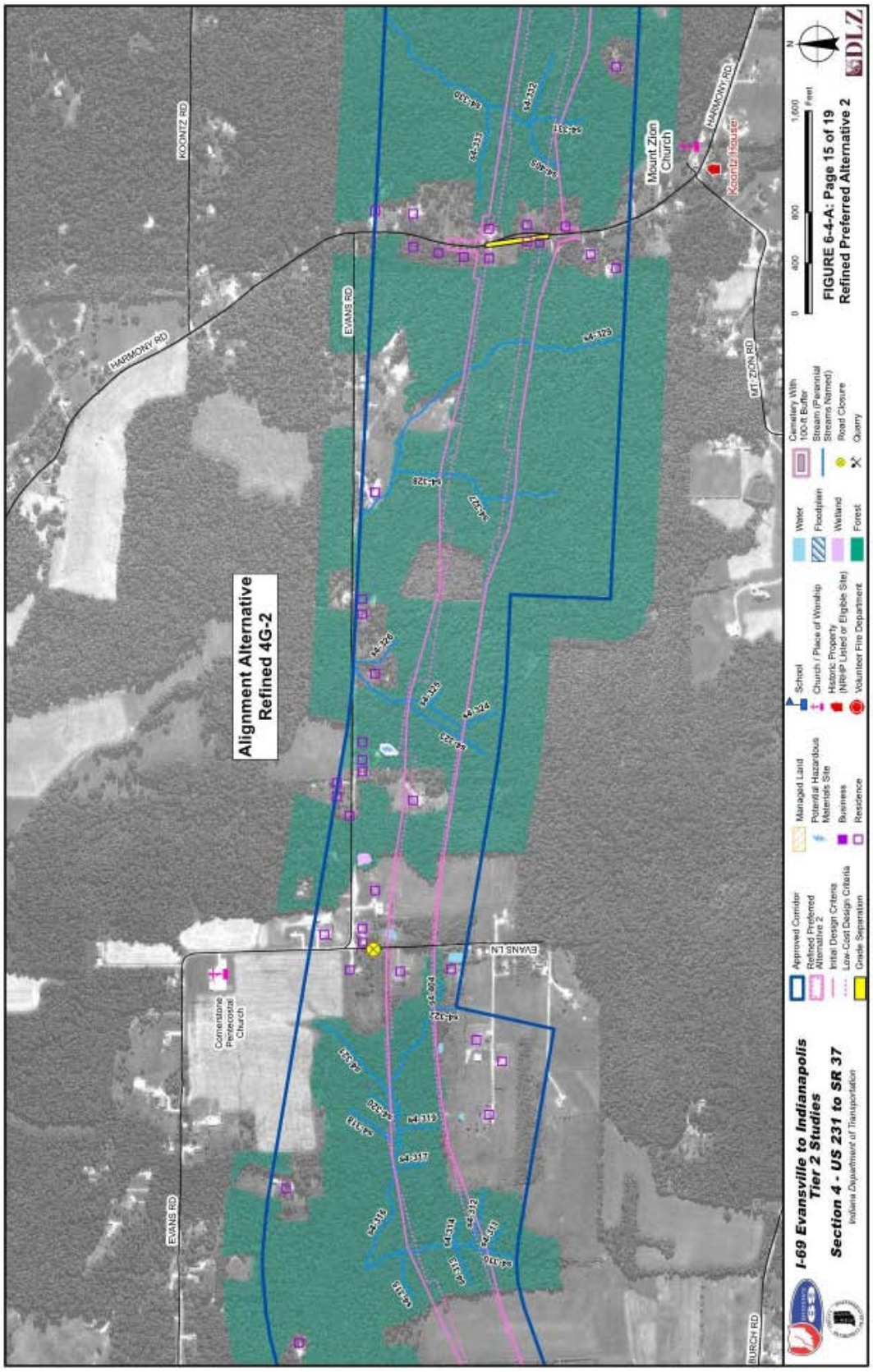
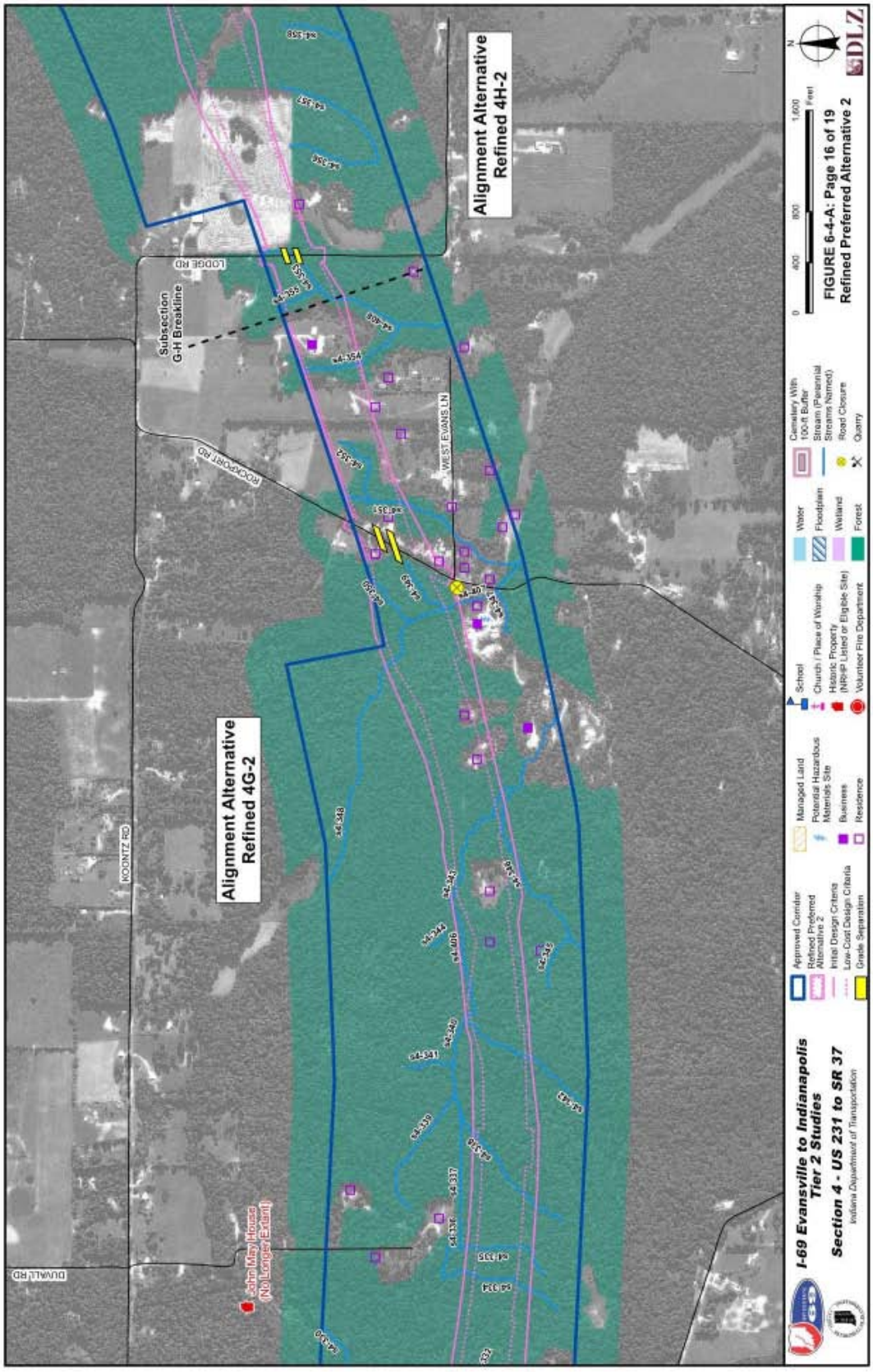


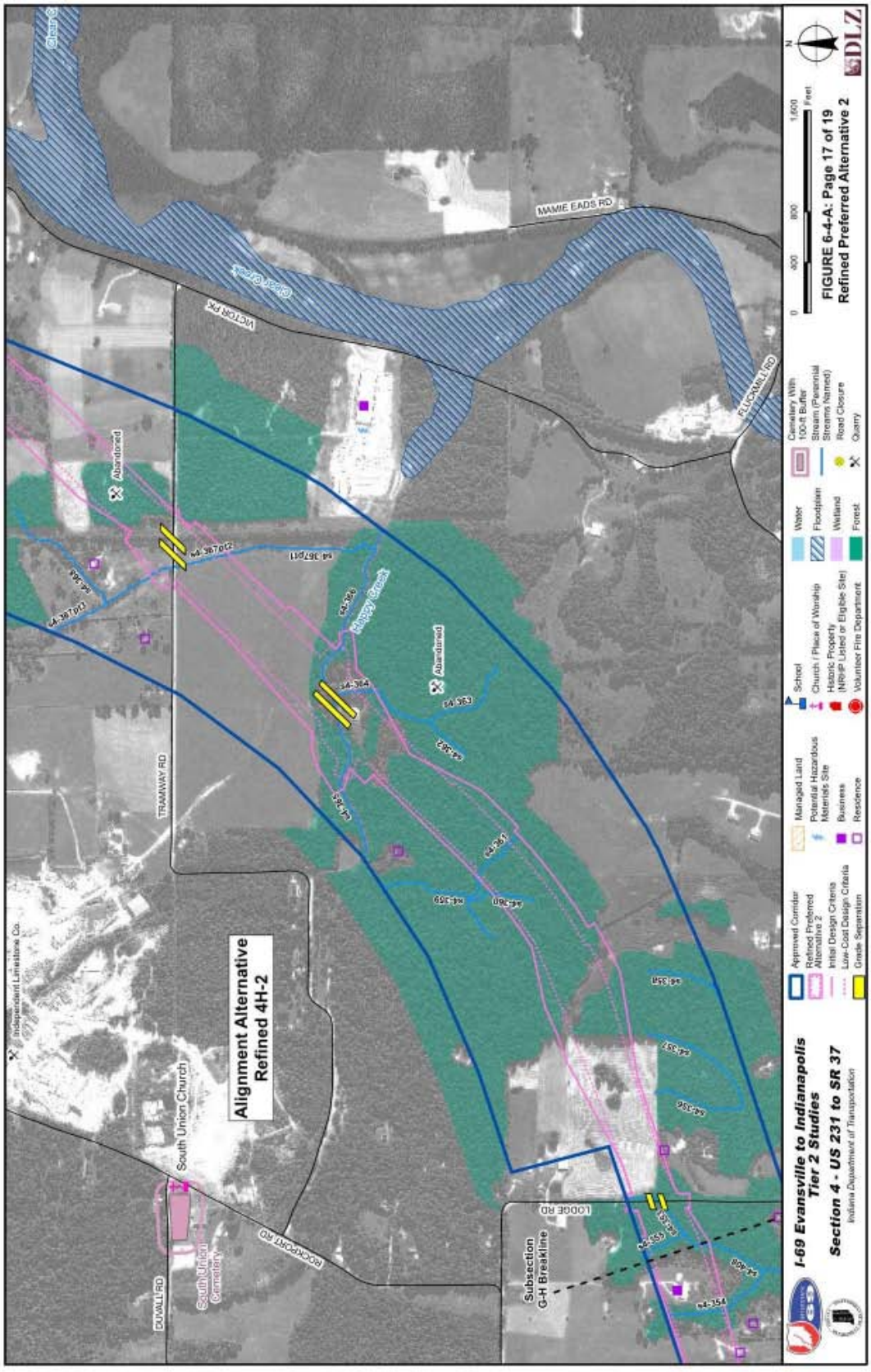
FIGURE 6-4-A: Page 12 of 19
Refined Preferred Alternative 2
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Alignment Alternative Refined 4F-3
Alignment Alternative Refined 4F-3
Greene/ Monroe County Line Interchange
South Connector Road
Pinewood Pentecostal Church
Greene County
Monroe County
CARTER RD
CARMICHAEL RD
CR 150N
CR 100N
Indian Creek
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Feet
DLZ


Alignment Alternative
Refined 4F-3
GRAVES RD
BREEDEN RD
CRUM RD
Spinks Cemetery
Indiana Creek
Monroe County
Greene County
FIGURE 6-4-A: Page 13 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


Alignment Alternative Refined 4G-2
Alignment Alternative Refined 4F-3
Subsection F-G Breakline
BURCH RD
TOM PHILLIPS RD
BREEDEN RD
Adams Breeden Cemetery
TIMBER TRACE
GREEN MEADOWS
WOODVIEW HILLS
CR 300N
CR 199CE
Greene County
Monroe County
FIGURE 6-4-A: 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
DLZ


Alignment Alternative
Refined 4G-2
HARMONY RD
KOONTZ RD
EVANS RD
EVANS LN
MT ZION RD
BURCH RD
Mount Zion Church
Koontz Hauser
Cornerstone Pentecostal Church
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4-A: Page 15 of 19
Refined Preferred Alternative 2
DLZ


Alignment Alternative Refined 4H-2
Alignment Alternative Refined 4G-2
Subsection G-H Breakline
LODGE RD
ROCKPORT RD
WEST EVANS LN
MOONTZ RD
DUVALL RD
John May House (No Longer Extant)
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4-A: Page 16 of 19
Refined Preferred Alternative 2
DLZ
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Stream Named)
Road Closure
Quarry
0
400
800
1,600
Feet


Alignment Alternative
Refined 4H-2
MAMIE EADS RD
VICTOR PK
TRAMWAY RD
South Union Church
South Union Cemetery
DUVALL RD
ROCKPORT RD
LODGE RD
Subsection
G-H Breakline
Abandoned
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property
(NRHP Listed or Eligible Site)
Volunteer Fire Department
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
Water
Floodplain
Wetland
Forest
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
FIGURE 6-4-A: Page 17 of 19
Refined Preferred Alternative 2
Feet
DLZ

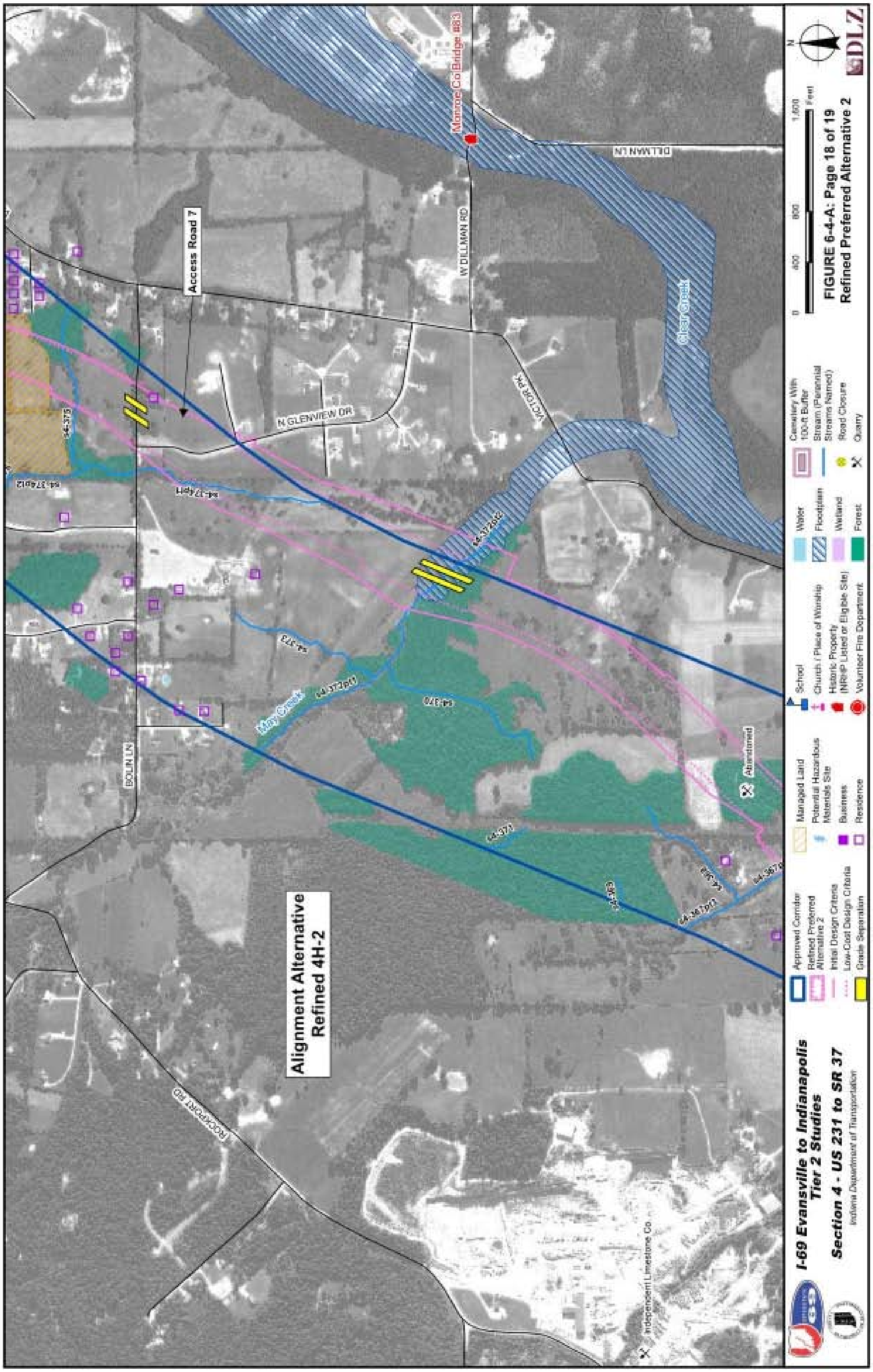
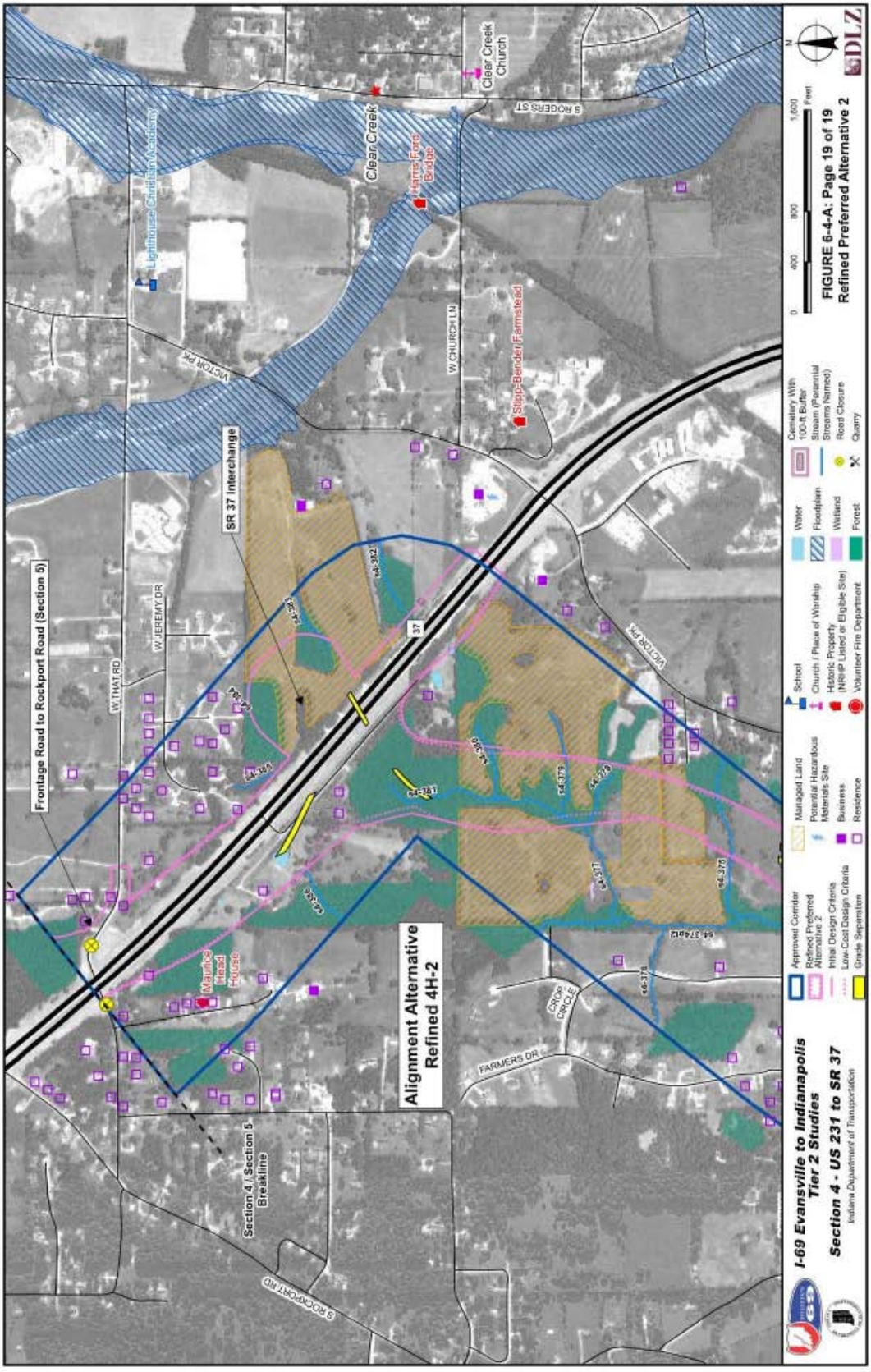
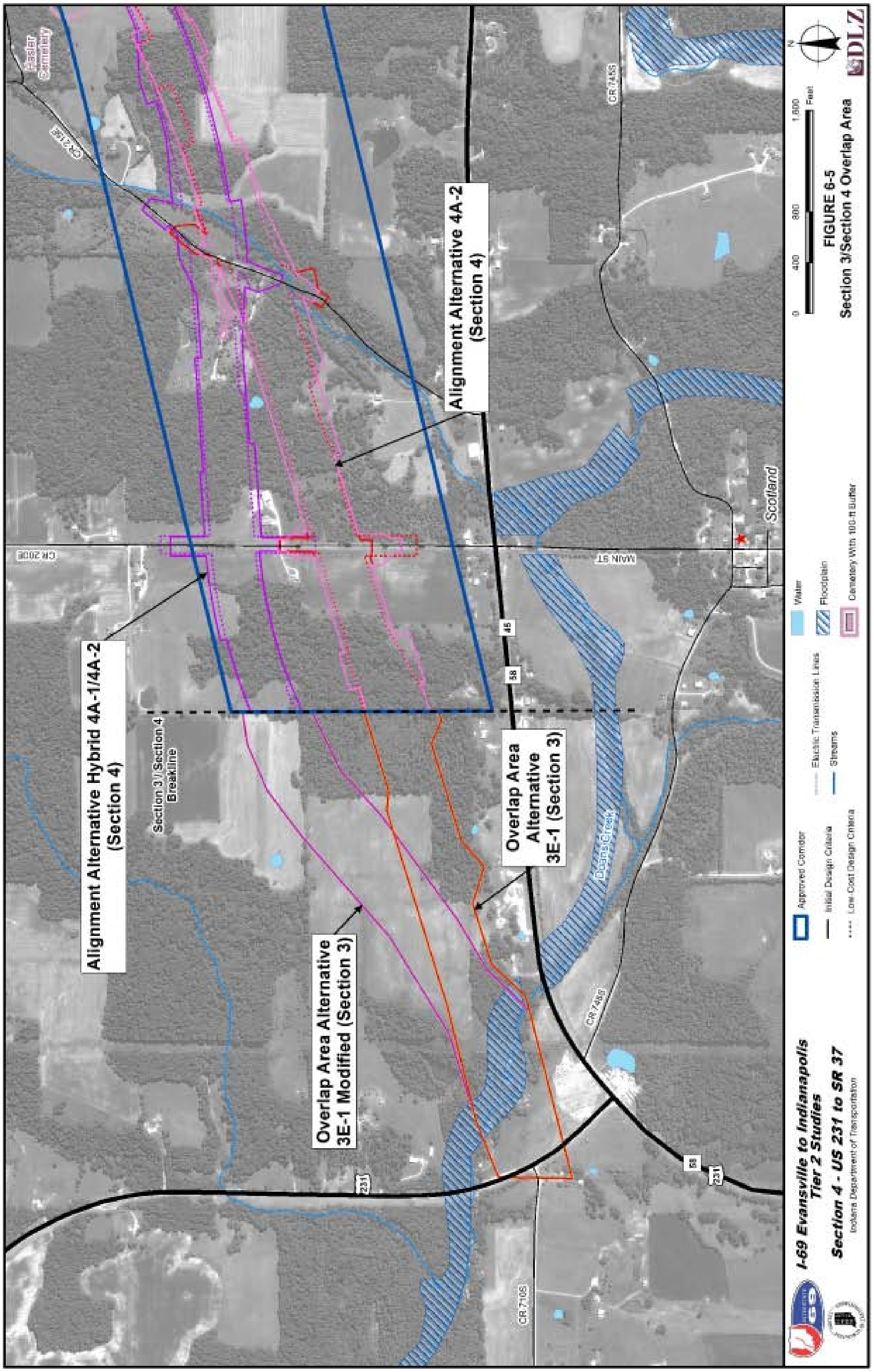
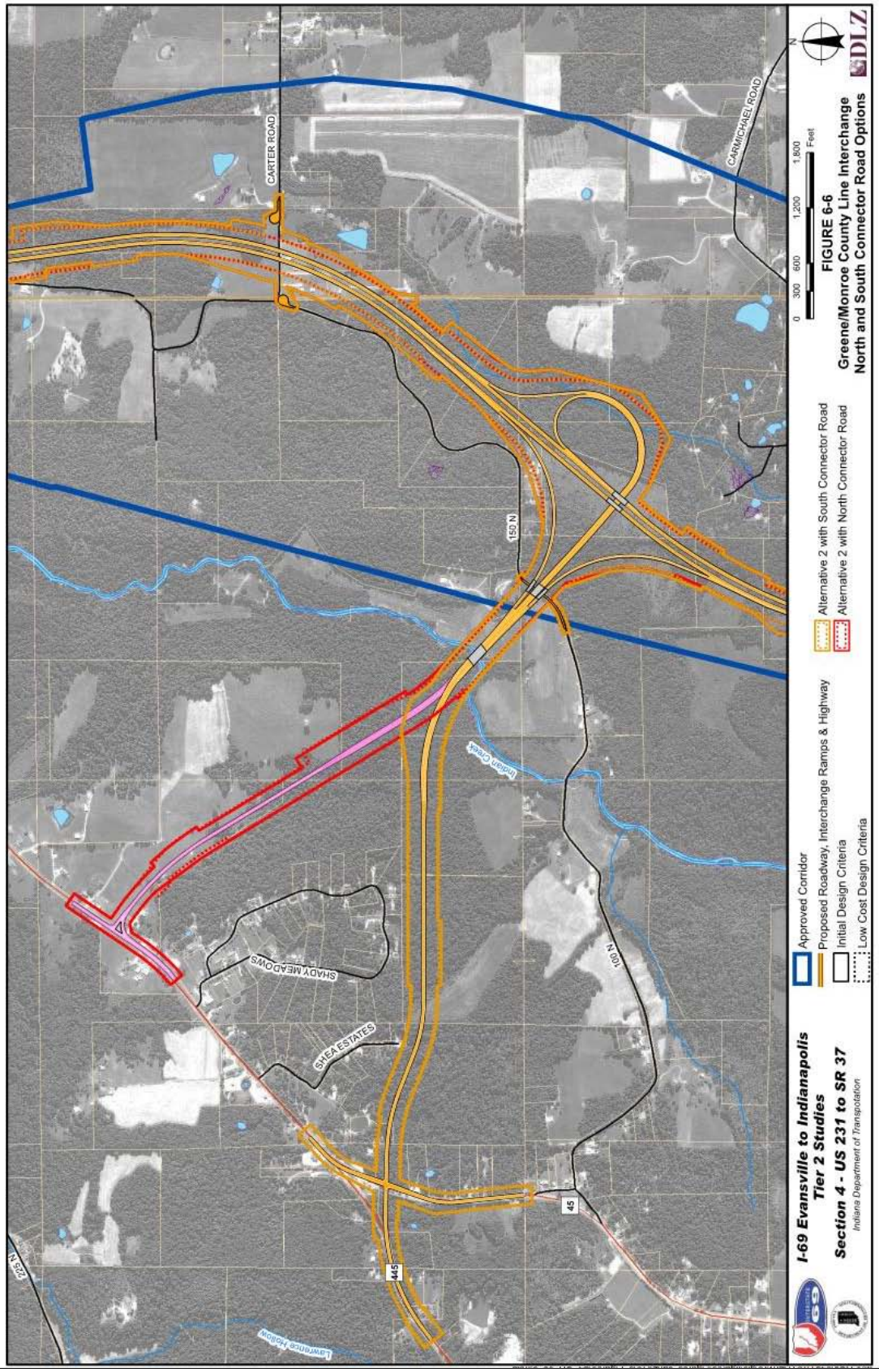


FIGURE 6-4-A: Page 18 of 19
Refined Preferred Alternative 2
Alignment Alternative
Refined 4H-2
Access Road 7
N GLENVIEW DR
W DILLMAN RD
DILLMAN LN
VICTOR PK
BOLIN LN
ROCKPORT RD
Monroe Co Bridge #83
Clear Creek
May Creek
Abandoned
Independent Limestone Co.
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NRHP Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Streams (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ


Clear Creek Church
Clear Creek
Harris Ford Bridge
Lighthouse Christian Academy
Stepp-Bender Farmstead
S ROGERS ST
W CHURCH LN
VICTOR PK
SR 37 Interchange
Frontage Road to Rockport Road (Section 5)
W JEREMY DR
W THAT RD
37
Alignment Alternative Refined 4H-2
Marble Head House
GROUP CIRCLE
FARMERS DR
Section 4 | Section 5 Breakline
S ROCKPORT RD
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
Approved Corridor
Refined Preferred Alternative 2
Initial Design Criteria
Low-Cost Design Criteria
Grade Separation
Managed Land
Potential Hazardous Materials Site
Business
Residence
School
Church / Place of Worship
Historic Property (NR/eligible Listed or Eligible Site)
Volunteer Fire Department
Water
Floodplain
Wetland
Forest
Cemetery With 100-ft Buffer
Stream (Perennial Streams Named)
Road Closure
Quarry
0
400
800
1,600
Feet
N
DLZ
FIGURE 6-4-A: Page 19 of 19
Refined Preferred Alternative 2


Alignment Alternative 4A-2 (Section 4)
Alignment Alternative Hybrid 4A-1/4A-2 (Section 4)
Section 3 / Section 4 Breakline
Overlap Area Alternative 3E-1 (Section 3)
Overlap Area Alternative 3E-1 Modified (Section 3)
Scotland
MAIN ST
CR 200E
Doans Creek
Approved Corridor
Initial Design Criteria
Low-Cost Design Criteria
Electric Transmission Lines
Streams
Water
Floodplain
Cemetery With 100-ft Buffer
FIGURE 6-5
Section 3/Section 4 Overlap Area
I-69 Evansville to Indianapolis Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation
DLZ


CARTER ROAD
CARMICHAEL ROAD
150 N
Indian Creek
SHADY MEADOWS
SHEA ESTATES
100 N
45
925 N
Lawrence Hollow
N
0 300 600 1,200 1,800 Feet
FIGURE 6-6
Greene/Monroe County Line Interchange
North and South Connector Road Options
DLZ
Approved Corridor
Proposed Roadway, Interchange Ramps & Highway
Initial Design Criteria
Low Cost Design Criteria
Alternative 2 with South Connector Road
Alternative 2 with North Connector Road
I-69 Evansville to Indianapolis
Tier 2 Studies
Section 4 - US 231 to SR 37
Indiana Department of Transportation

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