MID-STATES CORRIDOR

SCREENING OF ALTERNATIVES REPORT

Mid-States Corridor
Tier 1 Environmental Impact Study

Prepared for

Indiana Department of Transportation
Mid-States Regional Development Authority

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Prepared by

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INDIANA DEPARTMENT OF TRANSPORTATION
INDOT

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1 PRELIMINARY ALTERNATIVES

This section describes how preliminary alternatives were determined. The process included a review of previous studies, a robust program of public and agency input, and a high-level review to identify fatal flaws in any of the potential preliminary alternatives. See **Section 1.2** and **Section 1.3** which summarize this input program. Non-Highway Alternatives (**Section 1.4**) were determined to be incapable of addressing the project's Purpose and Need.

Section 1 is a brief summary of this process. It is fully described in the **Preliminary Alternatives Appendix** (See **Section 2** of that report) and **Analysis of Non-Highway Alternatives Appendix**.

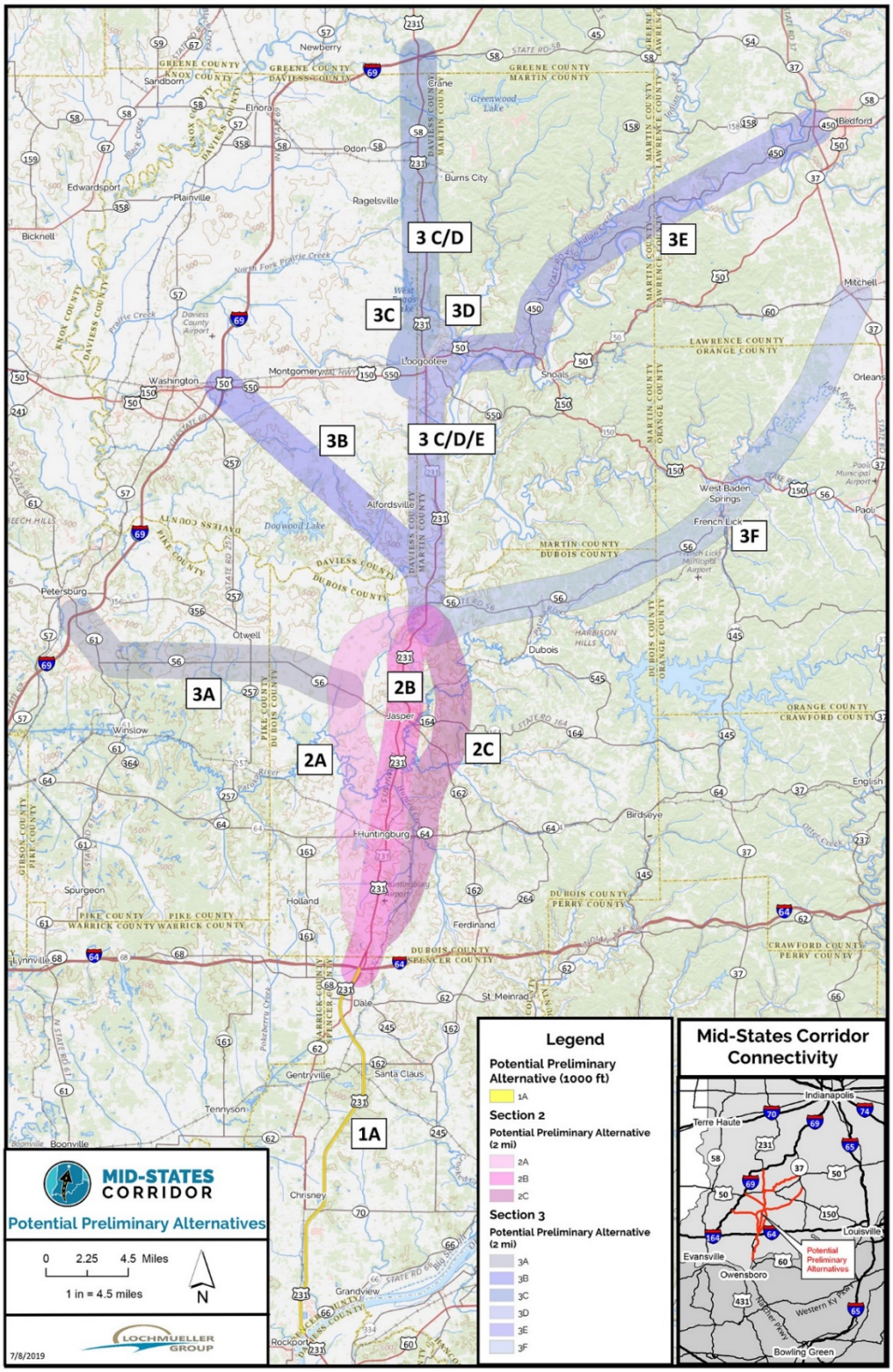
1.1 Previous Studies

Previous studies considered a range of alternatives and (to a limited extent) ranges of alternative types. These were used to specify an initial range of potential preliminary alternatives.

- **US 231 Jasper/Huntingburg – 2004 DEIS and 2011 SDEIS.** This DEIS analyzed two bypass alternatives in detail. These included one alternative east of Jasper/Huntingburg and one alternative west of Jasper/Huntingburg. Both were expressways (four-lane divided facilities with partial access control). The 2011 SDEIS updated the Purpose and Need Analysis for the 2004 DEIS. It did not further analyze the two alternatives from the 2004 DEIS.
- **I-67 Corridor Feasibility Study (2012).** This planning study (funded by the I-67 Development Corporation, a private entity) considered a limited access facility via US 231 from Rockport, a bypass to the east of Huntingburg and Jasper, and a connection to I-69 at Washington. It assumed this facility was designed to Interstate (freeway) standards.
- **Blue Ribbon Panel on Transportation Infrastructure – Final Report to Governor Pence (2014).** This report evaluated a limited access facility built to Interstate (freeway) standards via US 231 from Rockport, a bypass to the west of Huntingburg and Jasper, with a connection to I-69 at Petersburg.
- **Conexus Indiana Southwest Regional Council – A Plan for Growing Southwest Indiana's Logistic Sector (2015).** This report evaluated two alternatives. One was an upgrade of US 231 from Dale (I-64) to NSA Crane (I-69). It included an eastern bypass of Huntingburg and Jasper. The other alternative was a new highway between the Ohio River at Rockport and I-69 at Washington. Both highways were assumed to be fully access-controlled freeways.

Based upon these previous studies, a map **(Figure 1.1)** showing potential preliminary alternatives was presented to Regional Issues Involvement Teams in July 2019.

Figure 1-1 – Potential Preliminary Alternatives – Presented to Regional Issues Involvement Teams



1.2 Regional Issues Involvement Teams

INDOT established four Regional Issues Involvement Teams (RIIT) within the Project Study Area to learn about local interests and to share project information. The four geographic regions are: Southcentral, Northwest, Northcentral and Northeast.

Each RIIT includes members representing various public interests. Members of the RIITs are drawn from a cross-section of affected groups, agencies, and organizations. The total size of each RIIT is limited (no more than 30 - 35 people) to ensure opportunities for interaction among RIIT members.

The first meetings with the four RIITs were held on July 9 and 10, 2019. A main topic at each meeting was to present the potential preliminary alternatives shown in **Figure 1.1**. RIIT members were asked to suggest additional routes. **Section 2.2.1** of the **Preliminary Alternatives Appendix** provides maps and text describing alternatives suggested by RIIT members.

1.3 Public and Agency Input

Three public input meetings were conducted on August 5, 6 and 8, 2019 in Washington, French Lick and Jasper, respectively. An early coordination letter was sent to agencies on August 5, and an accompanying map of potential alternatives was provided to agencies on August 6. This map is provided as **Figure 2-3** in the **Preliminary Alternatives Appendix**. **Section 2** of the **Preliminary Alternatives Appendix** describes all routes suggested during the public and agency input process.

1.4 Consideration of Non-Highway Alternatives

The Non-Highway Alternatives Analysis reviews existing strategies, services, programs, infrastructure, and policies in the study area that could address at least one of the stated goals in the purpose in need. The types of non-highway alternatives included in this review range from economic development incentives and programs to passenger, rail and freight transportation. This review is documented in the **Analysis of Non-Highway Alternatives Appendix** to this document.

The non-highway alternatives reviewed include;

- Opportunity Zones,
- Tax Abatements,
- Tax Increment Financing,
- Community Development Financial Institutions (CDFIs),
- Job Training and Workforce Development,
- Improving Business Access to Capital,
- Revolving Loan Funds,
- Start-ups, Entrepreneurship, and Innovation,
- Funding for Industrial Development,
- Tax Credits and Exemptions,
- Urban Enterprise Zones,
- United States Department of Agriculture (USDA) Funding and Programs,
- Broadband Access and Development,
- Energy Efficiency and Sustainability Initiatives,
- 21st Century Talent Region,
- Transit and Passenger Rail,

- Freight Rail, and
- Autonomous Vehicles.

This comprehensive analysis of resources available to the Mid-States study area did not reveal any alternative that would address the project's purpose and need. Most non-highway alternatives address the goal of supporting economic development. Some indirectly support the goal of reducing crashes (by improving transit or autonomous vehicle access, fewer highway crashes may occur). Some improve connectivity, but the scale and geographic scope of that connectivity is limited to small portions of the study area. None of the non-highway alternatives directly address reduction in truck vehicle miles traveled (VMT) and highway connectivity.

The key conclusions to this review of alternatives are:

- The scope and scale of non-highway alternatives are not regional or not applicable to most geographies and employment centers in the study area.
- Funding is not available, or technology is not yet developed for non-highway alternatives to reach the scope and scale necessary to adequately address the purpose and need.
- The non-highway alternatives are not coordinated or centralized for the region, minimizing their current and potential impact on the study area.

Some of these alternatives and strategies will be of use to regional planning and economic development agencies. **Section 4** of the **Analysis of Non-Highway Alternatives Appendix** specifies which strategies can supplement highway alternatives' ability to address project needs. However, they cannot address the core goals of the Purpose and Need, which relate to accessibility and truck movements in the project Study Area.

1.5 Identification of Fatal Flaws

Potential preliminary alternatives were reviewed to assess (at a high level), whether any had a "fatal flaw." Alternatives with fatal flaws are defined as having one of the following two characteristics:

- Alternatives which are not able to satisfy the project Purpose and Need
- Alternatives which have major impacts to key resources when there are similar alternatives which avoid these impacts.

As described in **Section 2.2** of the **Preliminary Alternatives Appendix**, several routes which were suggested during the public input process were not considered because they did not serve either Jasper or Huntingburg. These are shown in **Figure 2-2** of the **Preliminary Alternatives Appendix.** These routes were not considered because they could not satisfy Purpose and Need Goal 1 (Increase accessibility to major business markets) or Goal 7 (increase access to major rail and air intermodal centers). Alternatives which don't serve Jasper/Huntingburg would not be able to address these core goals.

Within the three families[1] of alternatives, alternatives have similar potential to impact key resources. All alternatives have the potential for significant residential, business and agricultural impacts. In addition, several agencies cited the greater potential for alternatives in the Northeast Family to have higher impacts to sensitive forest and karst habitats. However, within each family there do not appear to be any alternatives which have major impacts which other alternatives in the same family avoid.

[1] See **Section 1.6** for discussion of alternative families.

Accordingly, no alternatives were identified as having a fatal flaw due to major impacts which similar alternatives avoid.

1.6 Alternative Families

As described in **Section 1.3** of the **Preliminary Alternatives Appendix**, alternatives are grouped into three geographic categories (designated as "families"). Alternatives are designated as belonging to the Northwest, North Central or Northeast Family.

This screening of alternatives differs from the typical EIS. Alternatives are grouped into families according to common geographic characteristics. In determining which routes are carried forward for detailed analysis, routes are compared (on the basis of Purpose and Need, cost and impacts) only with alternatives in their same family. The alternatives carried forward will be those which offered the best combination of performance, cost and impacts within their respective family.

This grouping by families assures that a geographically diverse array of alternatives is carried forward for detailed study. Geographic diversity is important for the Mid-States Corridor Tier 1 EIS for two reasons:

- Carrying forward a geographically diverse range of alternatives provides the best possible chance of finding an alternative that meets project goals while addressing environmental concerns and minimizes costs.
- Carrying forward a geographically diverse range of alternatives provides the opportunity to consider the interests and viewpoints of all potentially affected communities within Southern Indiana. This consideration should be afforded before a final decision is made about which cities, counties and towns will be directly served by the project.

The screening analysis considers most important, but by no means all, components of impacts, costs and benefits. Retaining alternatives in three geographic regions ensures that selected alternative is able to maximize project benefits at a reasonable cost while avoiding and minimizing impacts. Specifically, the screening analysis does not consider;

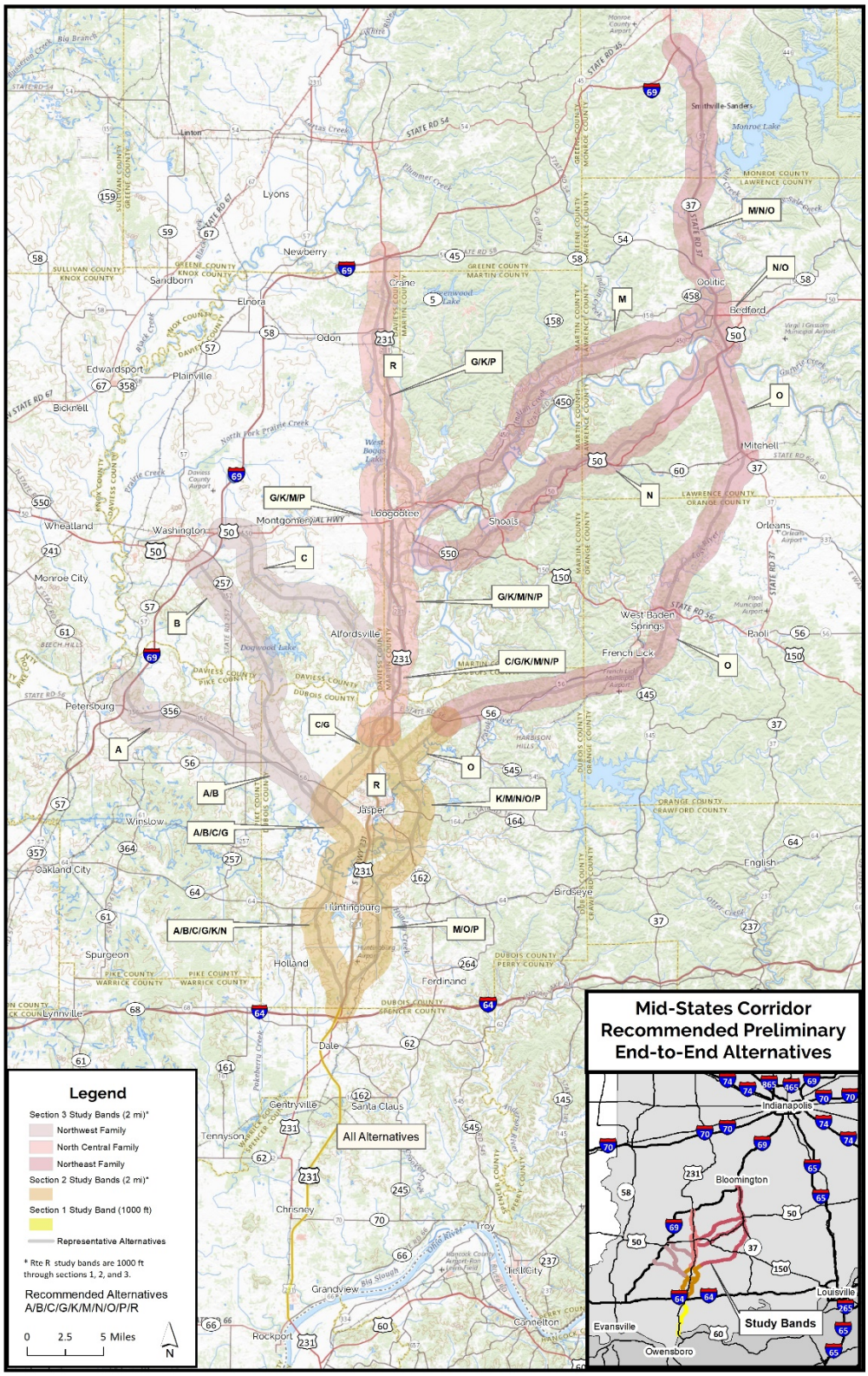
- **Impacts to many resources.** Screening analysis considers impacts to eight types of natural resources and four types of human resources. DEIS will consider impacts to approximately twice this number of resources.
- **All costs.** Screening analysis considers only construction costs. It does not consider right-of-way, relocation, design, construction management, utility relocation and contingency costs.
- **Several categories of project benefits.** Screening analysis considers only 4 of the 7 project goals. It does not consider increases in business activity, increases in economic well-being, or congestion relief.

This approach of screening alternatives by geographic groups was successfully used in the I-69 Tier 1 EIS in Indiana. In addition to the information cited above, this approach was important to maintaining a wide level of public involvement throughout that project.

Figure 1-2 shows the Mid-States Corridor preliminary alternatives. The northern portions of these alternatives (designated as Section 3) are color-coded to designate families. A detailed description of each alternative (grouped by family) is presented in **Section 5** of the **Preliminary Alternatives Appendix**. All alternatives have a common route (existing US 231) in Section 1. Alternatives have similar routes in central Dubois County in Section 2. They are differentiated into families by their Section 3 routings. Alternatives in the Northwest Family terminate at I-69 near Petersburg or Washington. Alternatives in

the North Central Family terminate at I-69 near Naval Support Activity Crane (Crane NSA). Alternatives in the Northeast Family access SR 37 between Mitchell and Bedford, using SR 37 to reach I-69 south of Bloomington.

Figure 1-2- Preliminary Alternatives, Color-Coded by Family



1.7 Define Preliminary Alternatives

This section summarizes the process for identifying preliminary alternatives. The following two subsections provide an overview of the methodology, and a description of the route of each preliminary alternative. This process is fully documented in the **Preliminary Alternatives Appendix**.

1.7.1 Overview of Preliminary Alternative Selection Methodology

Project staff prepared maps of potential preliminary alternatives which were presented to Regional Issues Involvement Teams (**Section 1.2**), at Public Information Meetings (**Section 1.3**) and to federal and state agencies (**Section 1.3**).

The preliminary alternatives were selected from among the potential preliminary alternatives by using the following approaches:

- Potential preliminary routes which had "fatal flaws" were discarded.
- Similar potential preliminary routes were combined.
- Potential preliminary routes were divided into three geographic sections. These sections are depicted in **Figure 1-2**.
    - Routes in Section 1 are located in Spencer County. In Section 1, only one route (existing US 231, including possible upgrades) was considered.
    - Routes in Section 2 are located in Dubois County. They begin at I-64 and terminate in northern Dubois County.
    - Routes in Section 3 extend to provide access to I-69.
- Routes in Sections 1, 2, and 3 were combined to provide end-to-end alternatives.
- Eighteen (18) potential preliminary alternatives were grouped geographically into families, based upon their routing in Section 3.
    - The Northwest Family of potential preliminary alternatives provides access to I-69 in Pike or Daviess County.
    - The North Central Family of potential preliminary alternatives provides access to I-69 in Greene County.
    - The Northeast Family of potential preliminary alternatives provides access to I-69 in Monroe County, using connections to SR 37 in Orange or Lawrence County.
- Ten (10) of the 18 potential preliminary alternatives were selected as preliminary alternatives. These are shown in **Figure 1-2**. These are analyzed for their relative performance on project goals, costs and impacts to identify alternatives carried forward for detailed study.

The **Preliminary Alternative Appendix** did not consider or recommend facility types for these 10 preliminary alternatives. With one exception (Alternative R), all of the preliminary alternatives will be evaluated using three facility types. A description of these facility types, and how they will be compared, is provided in **Section 2. Table 1-1** lists all preliminary alternatives.

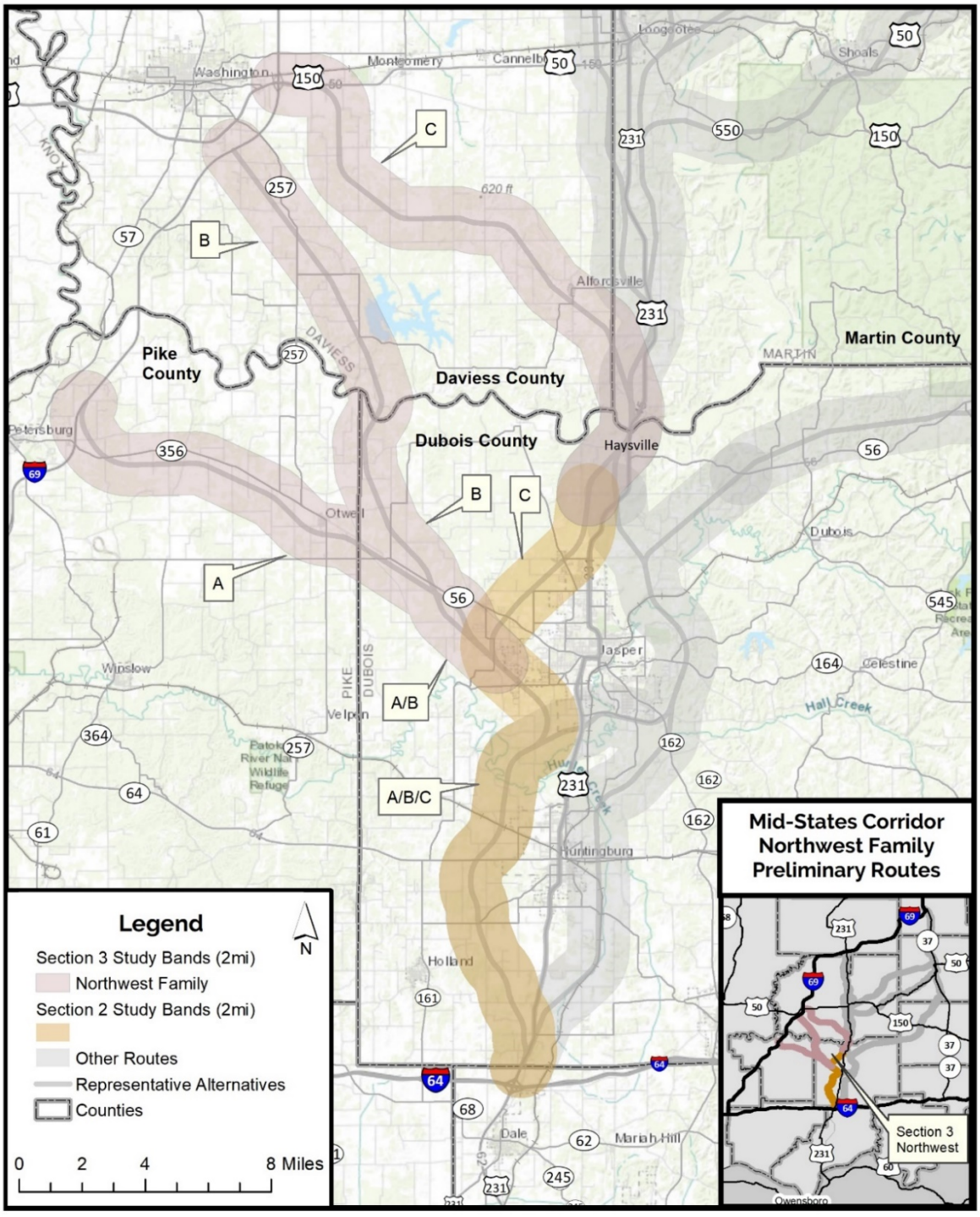
Table 1-1 – Preliminary Alternatives

Potential Preliminary Alternative	Section 1	Section 2	Section 3	Facility Type As:
A	S1-1	S2-W1	S3-W2	Super 2/Expressway/Freeway
B	S1-1	S2-W1	S3-W3	Super 2/Expressway/Freeway
C	S1-1	S2-W1	S3-W4	Super 2/Expressway/Freeway
G	S1-1	S2-W1	S3-C2W	Super 2/Expressway/Freeway
K	S1-1	S2-C2	S3-C2E	Super 2/Expressway/Freeway
M	S1-1	S2-E1	S3-E1	Super 2/Expressway/Freeway
N	S1-1	S2-C2	S3-E2	Super 2/Expressway/Freeway
O	S1-1	S2-E2	S3-E3	Super 2/Expressway/Freeway
P	S1-1	S2-E1	S3-C2E	Super 2/Expressway/Freeway
R	S1-1	S2-C1	S3-C1	Super 2 only

1.7.2 Description of Preliminary Alternatives

As described in **Section 1.6**, Alternatives are grouped into three geographic families. For this Screening of Alternatives, alternatives will be compared only with other alternatives within their same family. At least one alternative will be carried forward from each family. With the exception of Alternative R, all alternatives will be evaluated for the three facility types described in **Section 2.1**. These alternatives are shown in **Figure 1-3** (Northwest Family), **Figure 1-4** (North Central Family) and **Figure 1-5** (Northeast Family).

Figure 1-3 – Northwest Family Alternatives



1.7.2.1 Northwest Family of Preliminary Alternatives

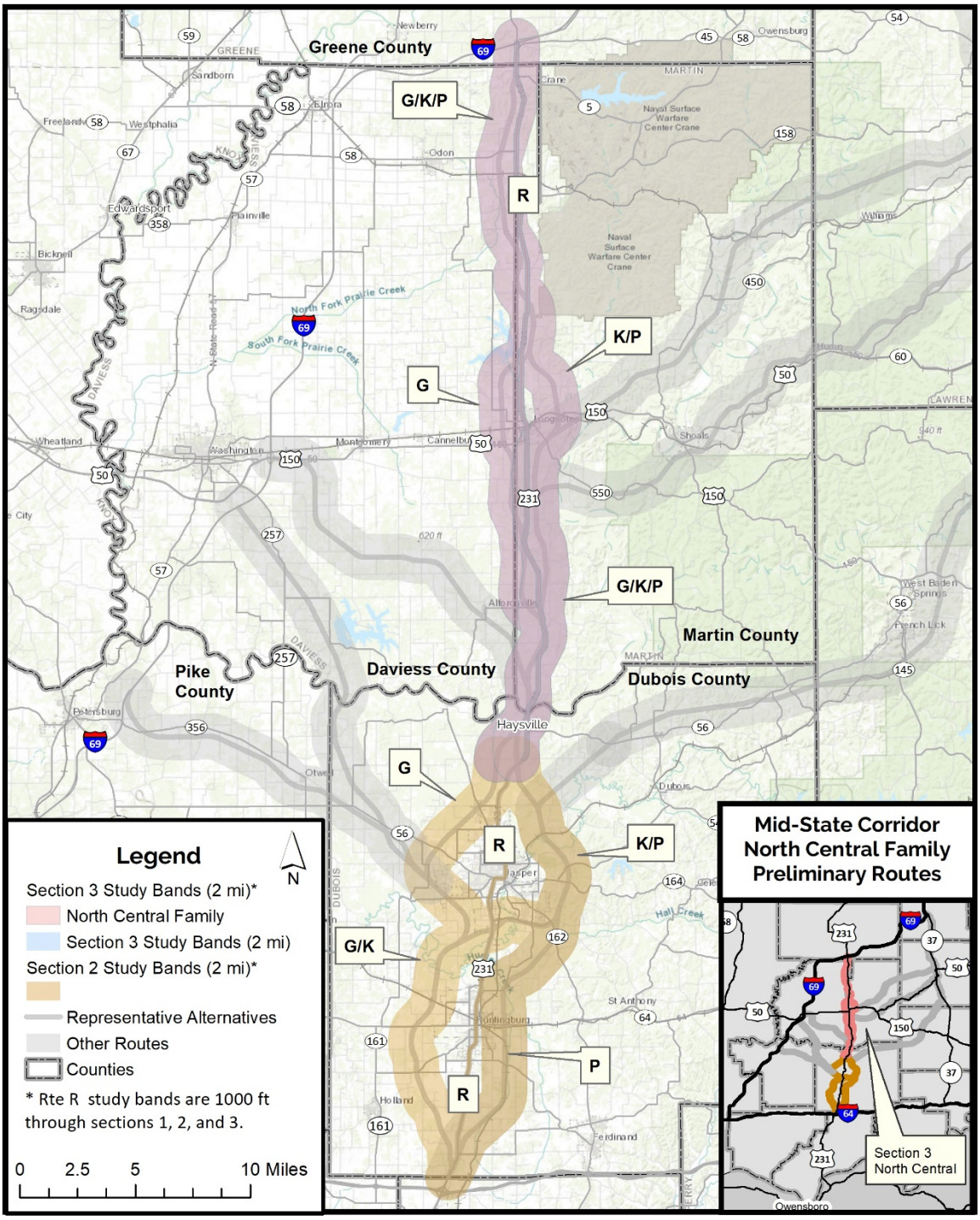
Preliminary alternatives in the Northwest Family terminate at I-69 in Pike or Daviess County.

Preliminary Alternative "A" extends 32 miles from I-64/US 231 to I-69 near Petersburg, Indiana. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the west, avoiding developed areas near these cities. It then continues northwest either using, or paralleling, the existing SR 56 and SR 356 alignments. This alternative connects to I-69 using right-of-way that was previously acquired for an I-69 interchange that was never constructed.

Preliminary Alternative "B" extends 34 miles from I-64/US 231 to I-69 near Washington, Indiana. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the west, avoiding developed areas near these cities. It then continues northwest on a new route west of Glendale Fish and Wildlife Area and connects to I-69 at a new interchange south of the US 50 interchange.

Preliminary Alternative "C" extends 42 miles from I-64/US 231 to I-69 at the existing US 50 interchange. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the west, avoiding developed areas near these cities. It then continues northwest on a new route, east of Glendale Fish and Wildlife Area and connects to I-69 at the existing US 50 interchange, using a portion of US 50 east of the interchange.

Figure 1-4 – North Central Family Alternatives



1.7.2.2 North Central Family of Preliminary Alternatives

Preliminary alternatives in the North Central Family terminate at I-69 in Greene County near Crane NSA.

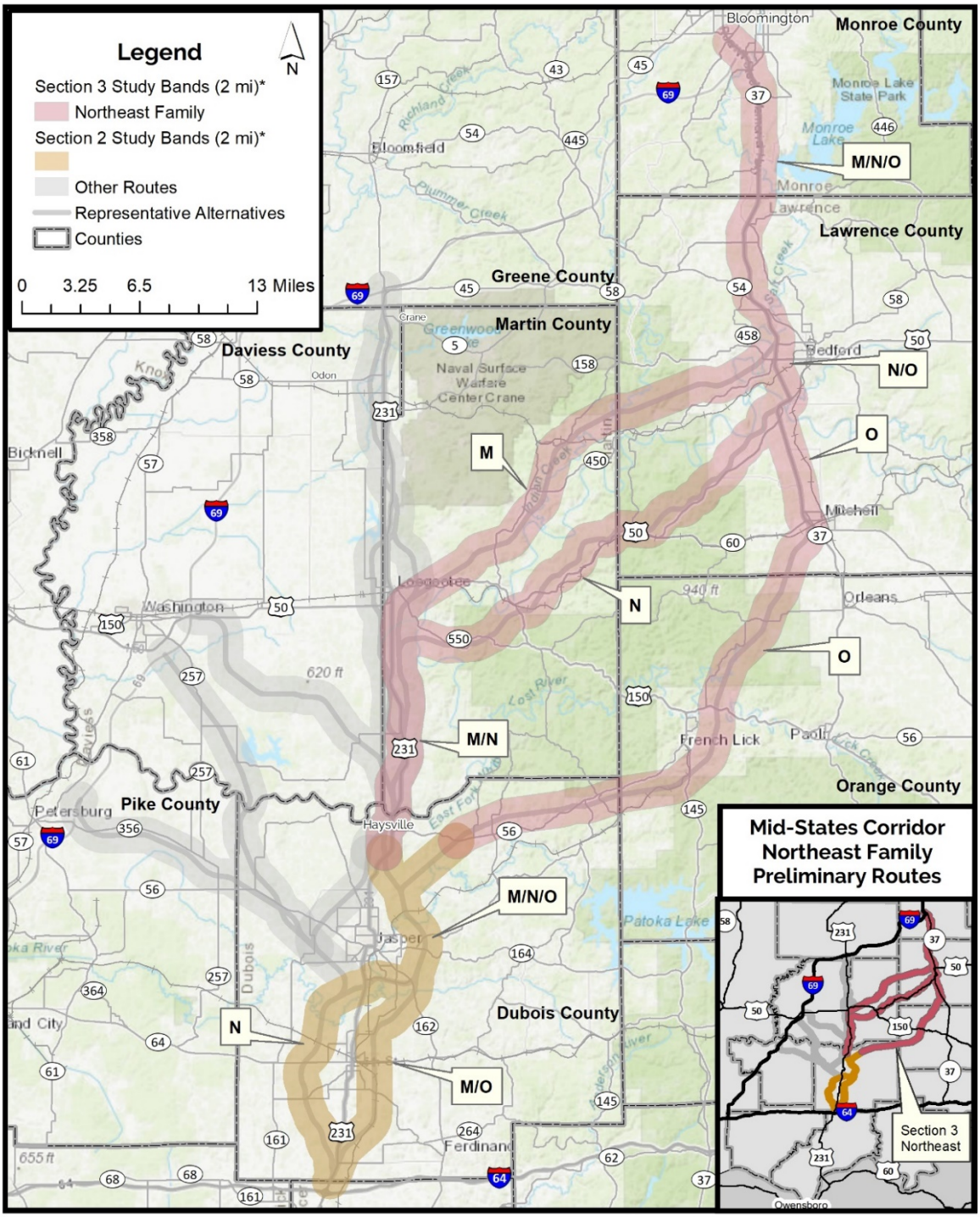
Preliminary Alternative "G" extends 55 miles from I-64/US 231 to I-69 at the existing US 231 interchange. This alternative begins at the I-64/US 231 interchange bypasses Huntingburg and Jasper to the west, avoiding developed areas near these cities. It then continues north, parallel to and west of the existing US 231 alignment. This alternative bypasses Loogootee to the west and West Boggs Park to the east and ends at the existing I-69 interchange at US 231.

Preliminary Alternative "K" extends 56 miles from I-64/US 231 to I-69 at the existing US 231 interchange. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg to the west and Jasper to the east, using the existing US 231 and SR 162 alignments where possible. It then continues north, mostly parallel to the existing US 231 alignment. This alternative bypasses Loogootee and West Boggs Park to the east and ends at existing I-69 interchange at US 231.

Preliminary Alternative "P" extends 54 miles from I-64/US 231 to I-69 at the existing US 231 interchange. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the east, avoiding developed areas near these cities. It then continues north, parallel to and east of the existing US 231 alignment. This alternative bypasses Loogootee to the east and ends at the existing I-69 interchange at US 231.

Preliminary Alternative "R" extends 52 miles from I-64/US 231 to I-69 at the existing US 231 interchange. This alternative begins at the I-64/US 231 interchange and follows the existing US 231 route, going through Huntingburg, Jasper, and Loogootee. This route uses the existing US 231 corridor. The route will be evaluated for the Super-2 facility type only. It would not be possible to construct an expressway or freeway through Huntingburg, Jasper and Loogootee and maintain appropriate design speeds without unacceptably high impacts.

Figure 1-5 – Northeast Family Alternatives



1.7.2.3 Northeast Family of Preliminary Alternatives

Preliminary alternatives in the Northeast Family terminate at SR 37 in Orange and Lawrence County. They connect to I-69 via SR 37 just south of Bloomington. For freeway facility types (see **Section 2.1** for a discussion of facility types), SR 37 would be upgraded to a freeway south of I-69 to the point where these alternatives join SR 37.

Preliminary Alternative "M" extends 40 miles from I-64/US 231 to SR 37 near Bedford. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the east, avoiding developed areas near these cities. It then continues north, mostly parallel to the existing US 231 alignment. It bypasses Loogootee to the east and continues northeast either using or paralleling the existing SR 450 alignment. It continues to SR 37 at Bedford.

Preliminary Alternative "N" extends 44 miles from I-64/US 231 to SR 37 near Bedford. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg to the west and Jasper to the east, using the existing US 231 and SR 162 alignments where possible. It then continues north, mostly parallel to the existing US 231 alignment. South of Loogootee it goes northeast along the SR 550 and US 50 corridors. It continues to SR 37 south of Bedford.

Preliminary Alternative "O" extends 51 miles from I-64/US 231 to SR 37 near Mitchell. This alternative begins at the I-64/US 231 interchange and bypasses Huntingburg and Jasper to the east, avoiding developed areas near these cities. It then continues northeast parallel to the existing SR 56 alignment to French Lick. It bypasses French Lick and West Baden Springs to the south and then continues northeast, connecting to SR 37 south of Mitchell.

2 PRELIMINARY ALTERNATIVES SCREENING

The Screening of Alternatives uses a phased approach to evaluate combinations of routes and facility types. It would be impractical and create undue complexity to provide detailed traffic forecasts for the full range of routes and facility types at the preliminary alternatives stage. Mid-States is the third tiered EIS which INDOT has produced. The two previous tiered EISs were reviewed for guidance in considering a range of routes and facility types in a tiered EIS.

For the I-69 Tier 1 EIS, federal legislation (TEA-21, 1998) specified that this project would be completed as an Interstate Highway, I-69. For this reason, the scoping process for that study considered only Interstate Highway alternatives (See I-69 Tier 1 FEIS, **Section 3.1.2** for details).

The Illiana Tier 1 EIS used a limited-access facility as the basic alternative type. It also provided two preliminary alternatives which were upgrades of existing arterial corridors; most preliminary alternatives were evaluated only as limited-access facilities.[2] This Mid-States Tier 1 EIS uses a similar approach, although it is more detailed than that used for the Illiana project.

[2] **Alternatives Evaluation Report**, Tier One Illiana Corridor Study, February 2013. See Section 4, especially **Table 4-1** and **Table 4-2**.

Three facility types are considered for Mid-States Corridor preliminary alternatives. **Section 2.1** describes each facility type.

- ***Fully access-controlled freeway.***
- ***Partially access-controlled expressway.***
- ***Super-2 arterial.***

Alternative R is an upgrade of US 231 using the existing alignment. This upgrade includes the alignment through the cities of Huntingburg, Jasper and Loogootee. It is evaluated only as a Super-2 arterial.

Relative costs and impacts are estimated for all alternatives for all facility types. For purposes of traffic forecasting and benefit calculations, a full range of facility types are evaluated for one representative alternative serving each of the three families. The use of representative alternatives to evaluate traffic flows and project benefits is discussed in **Section 2.6**.

2.1 Facility Type Assumptions

Following are the characteristics of the three highway types which will be used to evaluate alternatives. These characteristics may be modified when analyzing alternatives carried forward for detailed study.

2.1.1 Freeway

This type of highway has the following features.

- **Multiple travel lanes (at least two) in each direction of travel.** The number of lanes may be greater than two in each direction if warranted by traffic forecasts.
- **Median separating roadways in opposite directions.** These will be grassy medians, at least 60 feet in width.
- **Access is provided only at interchanges.** Grade separations (overpasses or underpasses) are provided for all crossroads which do not have interchange access to the freeway.

2.1.2 Expressway

This type of highway has the following features.

- **Multiple travel lanes (at least two) in each direction of travel.** The number of lanes may be greater than two in each direction if warranted by traffic forecasts.
- **Median separating roadways in opposite directions.** Generally, these will be grassy medians, at least 60 feet in width. In order to avoid impacts in residential areas, it may provide narrower medians and/or median barriers.
- **Access is provided by a combination of interchanges and at-grade intersections with state and local roads.**

2.1.3 Super-2

This type of highway has the following features.

- **One travel lane in each direction, in addition to a passing/auxiliary lane the length of the alternative.** Use of the passing/auxiliary lane alternates between the two directions of travel. This provides a three-lane typical section.

- **Higher design standards.** This includes wider shoulders and a 70 mph design speed in rural areas[3]. The posted speed limit will be less than 70 mph.
- **This facility may provide access to private drives.**
- **The facility has the potential to be used as one direction of a future freeway or expressway.**

2.2 Working Alignment Assumptions

A working alignment is specified within each preliminary alternative study band for calculation of costs and impacts. Assumptions for each working alignment are given in the following subsections.

2.2.1 Geometric Design Assumptions

Geometric design considerations vary depending on the location of each preliminary alternative. The following geometric design considerations were used to develop the preliminary working alignments:

- **Terrain.** All alternatives are classified as having either level or rolling terrain. Generally speaking, east of US 231 terrain is rolling and west of US 231 terrain is level. Locations of terrain transitions were determined by reviewing available contour data. Easily identifiable features within terrain transition zones were then used to develop the geographic limits between level and rolling terrain. Designation of terrain types is specified in **Table 2-1.**

Table 2-1: Terrain Designation	
County	**Terrain Description**
Spencer	All Level
Dubois	All areas level except those east of SR 545 and north of SR 56.
Daviess	All Level
Martin	All areas level except those east of a Line ¼ mile west of the East Fork of the White River
Orange	All Rolling
Lawrence	All Rolling

- **Rural vs. Urban.** All alternatives are considered rural, except for those with portions passing through Huntingburg, Jasper, Loogootee, Mitchell and Bedford. Locations of rural to urban transitions were determined through review of aerial photography and are generally based upon density of development. Typically, the transition from rural to urban is within the vicinity of the corporation limits of each community. Specific geographic limits used to distinguish rural and urban areas are presented in **Table 2-2.**

[3] This higher design speed provides for such features as flatter grades, longer sight distances, and curves with greater radii. Posted speed limits will conform to appropriate legal requirements.

Table 2-2: Terrain Designation	
Urban Area	**Urban Limits**
Huntingburg	CR 750 S to Phoenix Drive
Jasper	SR 162 to CR 400 N
Loogootee	Broadway Street to Line Street
Mitchell	Boone Lane to Hamilton Boulevard
Bedford	Yockey Road to 5th Street

2.2.2 Typical Section Assumptions

Typical sections were developed for each facility type based upon design criteria established by the Indiana Design Manual, 2013 Revision (IDM) for "New Construction / Reconstruction" (4R) projects. Cross section elements for each facility type are summarized below.

- **Freeway.** Freeway cross section elements are defined by IDM Figure 53-1 and are consistent with those used for the recently constructed I-69, Sections 2 & 3. Existing median widths will be retained when upgrading an existing expressway to a freeway. For alternatives carried forward for detailed study, these cross section elements will be reevaluated.

Table 2-3: Freeway Cross Section Elements	
Cross Section Element	**Definition**
Travel Lane Width	12 ft
Right Shoulder Width	11 ft Usable / 10 ft Paved
Left Shoulder Width	5 ft Usable / 4 ft Paved
Median Width	60 ft (Includes Left Shoulder Width)

- **Expressway.** Expressway cross section elements are defined by IDM Figure 53-2 for a rural facility with four or more lanes. In locations where an expressway typical section already exists, existing median widths will be retained. For purposes of screening preliminary alternatives, cross section elements for an expressway are consistent with those of the freeway facility type. It should be noted that US 231 from the Ohio River to I-64 has a median width of approximately 80 feet rather than 60 feet. For alternatives carried forward for detailed study, these cross section elements will be reevaluated.

Table 2-4: Expressway Cross Section Elements	
Cross Section Element	**Definition**
Travel Lane Width	12 ft
Right Shoulder Width	11 ft Usable / 10 ft Paved
Left Shoulder Width	5 ft Usable / 4 ft Paved
Median Width	60 ft (Includes Left Shoulder Width)

- **Super-2 Arterial.** A Super 2 facility is not explicitly defined by INDOT. Guidance to specify the elements of a Super-2 facility for this study was taken from a Texas Transportation Institute report published in cooperation with the Federal Highway Administration and the Texas Department of Transportation. This June 2011 report is entitled "Operations and Safety of Super-2 Corridors with Higher Volumes". This report recommends desirable lane widths of 12

feet and shoulder widths of 10 feet. Passing lane lengths of 1.5 to 2 miles were recommended as being desirable but passing lanes of up to 4 miles were acceptable for higher volume facilities.

The Super-2 cross section elements recommended by the Texas Transportation Institute were correlated to facility types defined by the IDM. The rural facility type is a 2-Lane Rural Arterial (IDM Figure 53-2) with desirable cross section elements and a passing (or auxiliary) lane the entire length of the alternative. The design speed for rural elements is 70 mph.

Table 2-5: Rural Super-2 Cross Section Elements	
Cross Section Element	**Definition**
Travel Lane Width	12 ft
Usable Shoulder Width	11 ft
Paved Shoulder Width	10 ft
Auxiliary Lane Width	12 ft

A Super-2 in an urban area is defined for this study as an Urban Arterial (IDM Figure 53-6, Intermediate) with desirable cross section elements, two travel lanes in each direction and a center two-way left turn lane. An urban Super-2 facility also includes curbing and sidewalks.

Table 2-6: Urban Super-2 Cross Section Elements	
Cross Section Element	**Definition**
Travel Lane Width	12 ft
Usable Shoulder Width	8 ft
Paved Shoulder Width	Same as Usable
Two-Way Left Turn Width	16 ft

2.2.3 Buffer Width Assumptions

For impact calculations, a buffer width was attributed to each working alignment. Buffer widths for each facility type and designation (i.e. rural/urban & level/rolling) were determined through analysis of previously constructed similar projects and defined typical sections. Buffer widths are meant to be a general representation of the limits for which impacts could reasonably be expected in order to compare alternatives. A summary of buffer widths is presented in **Table 2-7.**

Table 2-7: Working Alignment Buffer Widths per Facility Type	
Facility Type	**Buffer Width**
Freeway Urban/Flat	350'
Freeway Rural/Flat	400'
Freeway Rural/Hilly	600'
Expressway Urban/Flat	350'
Expressway Rural/Flat	400'
Expressway Rural/Hilly	600'
Super 2 Urban/Flat:	125'
Super 2 Rural/Flat	300'
Super 2 Rural/Hilly	500'

Additional details regarding buffer width determinations follow:

- **Freeway.** Various sections of I-69 from Evansville to Indianapolis were used as representative corridors for determining buffer widths for new terrain freeway construction. I-69 Sections 1 thru 3 were used to determine buffer widths for a rural/flat designation, I-69 Section 4 for a rural/hilly designation and I-69 Section 5 in Bloomington for an urban flat designation.
- **Expressway.** Because the Expressway typical section definition is the same as that of the Freeway, the buffer widths are also the same.
- **Rural Super-2**. A Super-2 is not an INDOT defined facility type. There are not representative projects available for comparison. For the preliminary alternatives screening, the buffer width for a rural Super-2 was based upon the buffer width for a freeway, assuming that the only difference between a Freeway and Super 2 was the width (or makeup) of cross section elements between edge of usable shoulder to edge of usable shoulder. This difference in cross section element width was then applied to the Freeway buffer width to obtain the Super-2 rural buffer width.
- **Urban Super-2.** There are existing corridors within Southwestern Indiana that are representative of an Urban Super-2 typical section. These corridors were used to determine the Urban Super-2 buffer width. These facilities (all located in Evansville) include:
    - Fulton Avenue From Lloyd Expressway to Delaware Street
    - St. Joseph Avenue From Lloyd Expressway to Columbia Street
    - Green River Road from Morgan Avenue to Lynch Road

2.3 Purpose and Need Assessment

The performance of the preliminary alternatives is evaluated using the Mid-States Corridor Project regional traffic forecasting model. Performance on purpose and need measures are made by comparing assigned networks for Forecast Year (2045) No Build and Build assignments. No Build assignments assume the existing transportation network and committed projects exist, but that the Mid-States Corridor is not built. Build assignments assume the No Build network, as well as one of the build alternatives being in place. Performance on the purpose and need measures are calculated by comparing each alternative's Build traffic assignment with the No Build traffic assignment.

Preliminary alternatives are being evaluated against the project's core goals. These core goals are stated in the Draft Purpose and Need Statement. These include:

Goal 1 – Increase accessibility to major business markets

- Reduction in travel time between Jasper and Indianapolis, Chicago and Louisville
- Reduction in travel time between NSA Crane and Jasper, Rockport and Louisville
- Reduction in travel time between Bedford and Louisville and Rockport
- Reduction in travel time between French Lick and Indianapolis, Louisville and Rockport
- Increase in labor force with 30-minute access to Jasper, Crane, Washington, French Lick and Bedford (calculated separately for each city)

Goal 2 – Provide more efficient truck/freight travel in Southern Indiana

- Reduction in truck vehicle hours of travel (VHT) for trips solely within 12-county study area

Goal 4 – Reduce crashes in southern Indiana

- Reduction in serious crashes (fatal and serious injury) in 12-county study area

Goal 7 – Increase access to major rail and air intermodal centers

- Reduction in travel time to major rail and air intermodal centers from Jasper
- Reduction in travel time to major rail and intermodal centers from NSA Crane

Goals 3, 5 and 6 are not designated as core goals for the Mid-States Corridor Tier 1 EIS. See **Section 6** of the *Draft Purpose and Need Statement* for the Mid-States Corridor Tier 1 EIS for details. This screening-level analysis considers only performance on core goals. This corresponds to evaluation of impacts only to key resources (**Section 2.4**, initial text) and considering only construction costs (**Section 2.5**) in the screening evaluation.

Traffic forecasts for preliminary alternatives will not account for induced growth and traffic due to economic development.

2.4 Impact Assessments

Only impacts to key resources will be calculated for the preliminary alternatives. These impacts will be calculated using the working alignments described in **Section 2.2**. The following sections describe the key resources which may be impacted by preliminary alternatives and the associated data sources. See **Impact Calculation Appendix** for a description of data sources for impact calculations, as well as a description of the impact calculation methodology.

2.4.1 Wetland Impacts

The alternatives screening evaluation for potential impacts to wetlands was conducted using the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) data set. Wetlands within the NWI system are determined through interpretation of aerial photography, NRCS soil data, location within the landscape (i.e., floodplain), previous wetland investigations, and other sources. The acreage of wetland impacts for each alternative was itemized into two categories: 1) palustrine forest, shrub, and emergent; and 2) ponds. The most prominent wetland areas within the immediate vicinity of the alternatives are associated with the Patoka River, Hunley Creek, and Ell Creek between Jasper and Huntingburg; the Big Bottom area along the Patoka River in western Dubois County, and the Buffalo Flats and other Patoka River associated floodplain areas northeast of Jasper. Wetland resources are also associated with the East Fork White River floodplain and oxbow areas, but are less extensive and more fragmented in distribution. Most ponds potentially impacted are small and randomly distributed throughout the project area with no appreciable skew in regional density.

Alternatives K and N which cross from a western bypass around Huntingburg to an eastern bypass around Jasper have greater potential for wetland impacts due to encroachments upon large areas of Patoka River floodplain wetlands between Huntingburg and Jasper, and northeast of Jasper. No alternatives are anticipated to affect any large impounded reservoirs or lakes.

2.4.2 Floodplain Impacts

Potential encroachments upon floodplains for the screening alternatives was assessed using the Indiana Department of Natural Resources FIRM Floodplains and Flood Hazard Zones in Indiana dataset based on the total acreage of Zone A/AE (floodway and 100-year floodplain) encroached upon by the respective facility type buffer. The primary floodplains for the area include the Patoka River and East Fork White River, with secondary floodplains associated with Bruner Creek, Hunley Creek, Short Creek, Ell Creek,

Crooked Creek, Alter Creek, Mill Creek, Ackerman Branch, Little Creek, Little Flat Creek, Veale Creek, Slate Creek, Haw Creek, Friends Creek, West Boggs Creek, Doans Creek, Beaver Creek, Lost Creek, French Lick Creek, Davis Creek, Upper Sulphur Creek, Salt Creek, Goose Creek, and Clear Creek.

All alternatives cross the Patoka River floodplain; Alternative O crosses it twice and Alternative K crosses it multiple times. Each alternative (except for Alternative A) would also cross the East Fork White River; Alternative N crosses it twice. The widest floodplain span of the East Fork White River would be associated with Alternative B.

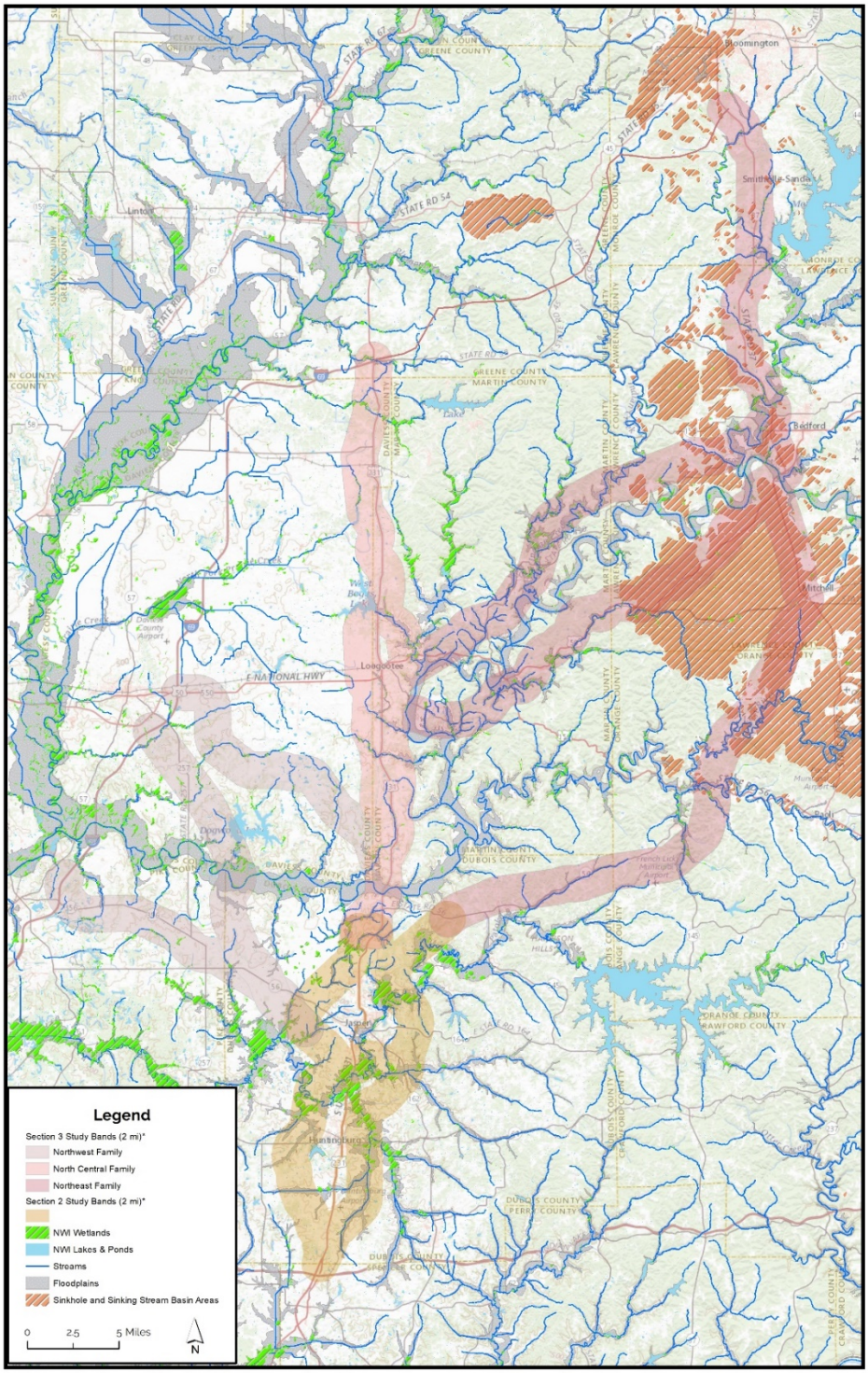
2.4.3 Karst Resource Impacts

The assessment of potential impacts to karst geology features was based on an overview of the encroachment acreage for each screening alternative using the Indiana Geological Survey Sinkhole Area and Sinking Stream Basin GIS coverage layer. Karst topography within the project area is confined to the Dubois, Martin, Orange, Lawrence, Greene, and Monroe counties east of US 231. The largest portions of these general karst basin areas are located within southern Lawrence, northeastern Orange, and west-central Monroe counties. Although sinkholes can and do occur beyond the limits of the Sinkhole Area coverage, this area represents the highest concentration of sinkhole features in the Study Area.

Due to their location west of the karst dominated Crawford Upland and Mitchell Plateau physiographic regions, the western Alternatives A, B, and C, as well as the central Alternatives G, K, P, and R are unlikely to impact sensitive karst features.

Figure 2-1 shows aquatic-related resources (wetlands, floodplains and karst resources) within the Section 2 and Section 3 portions of the project area.

Figure 2-1 – Project Area Aquatic Resources



2.4.4 Residential Impacts

Anticipated impacts to residential properties was assessed using the county land parcel data set prepared by the Indiana Geographic Information Office (IGIO) as part of the Indiana Data Sharing Initiative (IDSI). Because estimation of potential residential family unit relocations was not practical at the alternatives screening level, residential properties impacted was used as a surrogate to assess relative impacts to households by the screening alternatives. All properties designated as "residential" in the data set included single family, multiple family, mobile home, condominiums, and leased land properties. These properties potentially range from a single residence on a small lot to a residence on over 40 acres.

By virtue of its alignment along US 231 including through Huntingburg, Jasper, and Loogootee, Alternative R (Super-2) has a high potential to impact residential properties.

2.4.5 Business Impacts

Anticipated impacts to business properties was assessed using the county land parcel data set prepared by the Indiana Geographic Information Office (IGIO) as part of the Indiana Data Sharing Initiative (IDSI). Again, because the estimation of potential business relocation/impacts was not practical at the alternatives screening level, business properties directly affected was used as a surrogate to assess relative impacts to businesses by the screening alternatives. This category includes all properties designated as "commercial" or "industrial" in the data set. These include a large variety of classifications from heavy manufacturing, to warehouses, offices, retailers, services, recreation/entertainment, hotels, apartments, and health care facilities.

By virtue of its alignment along US 231 including through Huntingburg, Jasper, and Loogootee, Alternative R (Super-2) has a high potential to impact business properties.

2.4.6 Managed Land Impacts

Managed lands include a variety of public, non-profit, and privately owned properties that range from national forest, state parks, state recreation areas, municipal parks, nature preserves, fish and wildlife areas, conservation areas, public access sites, trails, to fish hatcheries. The larger and most notable managed lands in the project area include Hoosier National Forest, Patoka River National Wildlife Refuge, Glendale Fish and Wildlife Area, Patoka Lake, Martin State Forest, and Lake Monroe. However, there are a number of smaller natural areas that are equally significant for their unique natural and geological resources such as Fromme Wildlife Habitat Area, Orangeville Rise of Lost River, Plaster Creek Seeps Nature Preserve, Wesley Chapel Gulf, Jug Rock Nature Preserve, Buffalo Pond Nature Preserve, Wenning-Sheritt Seep Springs Nature Preserve, and Bluffs of Beaver Bend Nature Preserve. Unavoidable direct or indirect impacts to Section 4(f) and Section 6(f) resources will necessitate coordination with the respective official with jurisdiction over the resource to determine whether the proposed actions are "*de minimis.*"

With a few exceptions, direct impacts to managed lands were avoided during alignment development of the screening alternatives. However, there are a few instances where Alternatives M, N, O, and R would directly encroach upon managed lands without further refinement. Alternative M has the potential to impact a small amount of IDNR Martin State Forest property and USFWS conservation easements along the East Fork White River. Alternative N has the potential to affect a large block of Martin State Forest property and multiple tracts of U.S. Forest Service Hoosier National Forest property. Alternative O would encroach upon the corner of a Hoosier National Forest tract. With the expansion of the right-of-way along US 231 for the Alternative R Super-2 facility type, there is the potential for impacts to the IDNR

Froome Wildlife Habitat Area and the IDNR Barnes-Seng Wetland Conservation Area between Huntingburg and Jasper, as well as West Boggs Park (Daviess-Martin County Park Board).

2.4.7 Cultural Resource Impacts

The assessment of potential impacts to cultural resources (historic sites and districts) for the alternatives was conducted using the State Historic Architectural and Archaeological Research Database (SHAARD) which includes location and description data on historic districts, buildings, bridges, and miscellaneous objects[4]. The data set includes features that are listed on the National Register of Historic Places, as well as sites not on the list designated as outstanding, notable and contributing historic features. There are 37 recorded historic districts within the 12 county project area including the Bedford Courthouse Square Historic District, Lincoln Boyhood National Memorial, Huntingburg Commercial Historic District, French Lick Springs Hotel, Jasper Downtown Historic District, Mitchell Downtown Historic District. There are currently 101 sites within the 12-county project area included on the National Register of Historic Places. The majority of these sites are considerable distance from the alternatives. Those within relative proximity of the alternatives include:

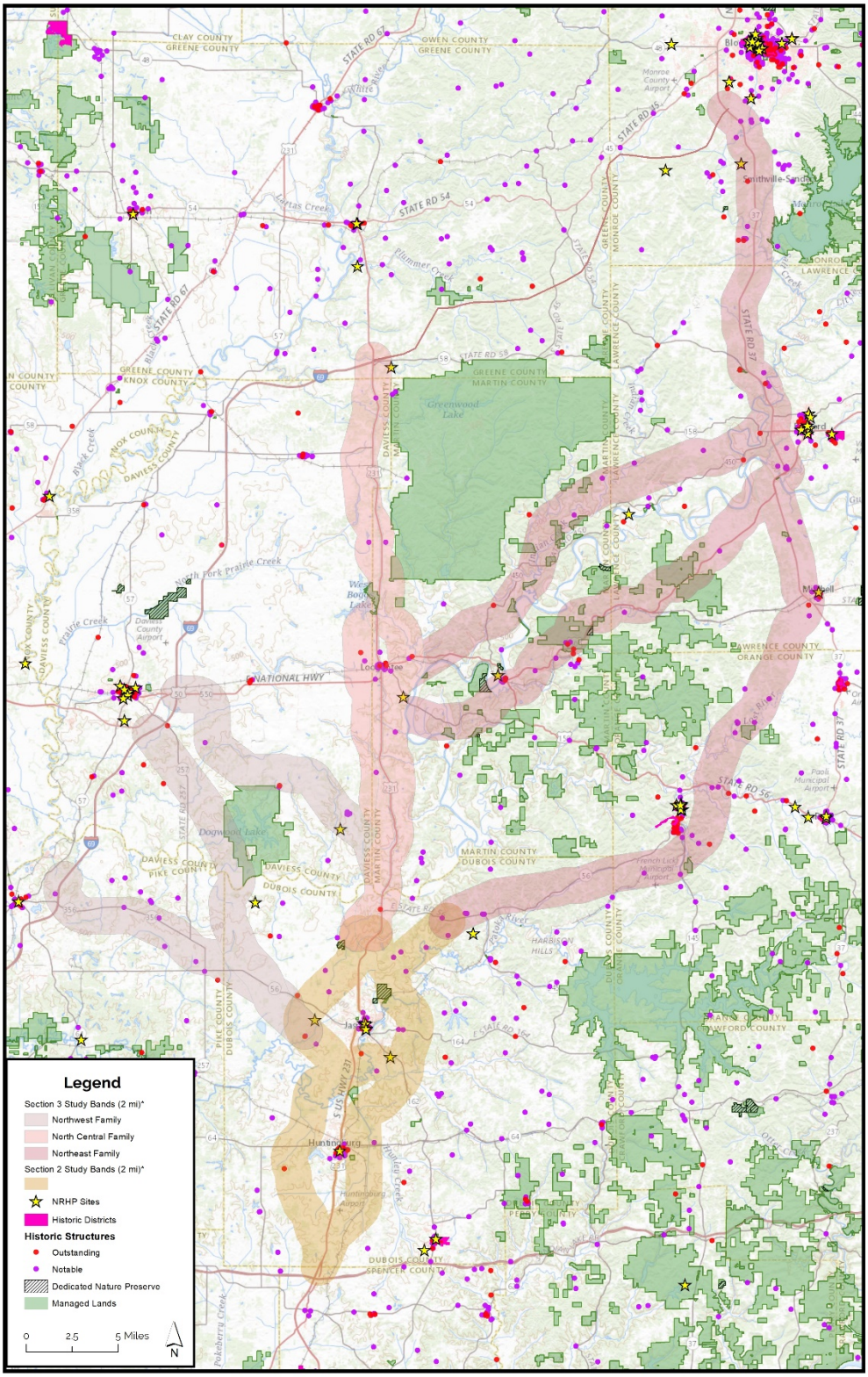
- Dubois County
  - Huntingburg Town Hall and fire Engine House,
  - John Opel House (southeast Jasper)
  - Saint Joseph Catholic Church, Gramelspacher-Gutzweiler house, Dubois County Courthouse, Louis H. Sturm Hardware Store (downtown Jasper)
  - Shiloh Meeting House and Cemetery (west Jasper)
  - Lemmon's Church and Cemetery (northwest Dubois County)
  - Evangelische Lutherische Emanuels Kirche (northeast Dubois County)
- Daviess County
  - Old Union Church and Cemetery (southeast Daviess County)
- Martin County
  - Lewis Brooks Home (southeast of Loogootee)
  - Martin County Courthouse (downtown Shoals)
- Lawrence County
  - Williams Bridge (southwest Lawrence County)
  - Mitchell Opera House (downtown Mitchell)
- Orange County
  - West Baden Spring Hotel, First Baptist Church, Homestead Hotel, Dixie Garage, Oxford Hotel, West Baden National Bank (West Baden Springs)

The Alternative R Super-2 facility type is likely to impact the Huntingburg Commercial Historic District and the Jasper Downtown Historic District. Additionally, Alternative R also is likely to impact at least some of the more than 50 notable or contributing sites along US 231. These include the Gramelspacher-Gutzweiler House and the Saint Joseph Catholic Church, both of which are National Register listed.

[4] For reasons of confidentiality, information about archaeological sites is not available at this stage of the analysis. For archaeological resources, detailed alternatives will be compared for their relative impacts to known sites from the SHAARD database. The area of potential effects will be identified as the footprint of the working alignment for each detailed alternative.

Figure 2-2 shows human environment resources (managed lands, cultural resources) within the Section 2 and Section 3 portions of the project area.

Figure 2-2 – Project Area Human Environment Resources



2.4.8 Forest Impacts

The evaluation of the potential impacts for forest resources by each of the screening alternatives was conducted using the U.S. Department of Agriculture (USDA) 2016 NASS Cropland Data Layer using the deciduous forest, evergreen forest, and mixed forest classes. Forest habitat is more east of US 231, covering greater than 50% of the land area. Large expanses of forest habitat are also associated with the Patoka River within the western portion of the project area in Pike County and north of the East Fork White River in Daviess County, but total cover is under 50%.

2.4.9 Threatened and Endangered Species Impacts

Assessment of potential impacts to threatened and endangered species at the screening alternatives level was conducted using the IDNR-maintained Indiana Natural Heritage Data Center database that includes documented occurrences of state and federally listed species. Regionally, for the twelve county project area, the USFWS identified nine federally-listed species[5]:

- 3 bat species
  - Indiana bat (*Myotis sodalis*) – endangered
  - Northern long-eared bat (*Myotis septentrionalis*) – threatened
  - gray bat (*Myotis grisescens*) – endangered
- 5 mussel species
  - sheepnose mussel (*Plethobasus cyphyus*) – endangered
  - fat pocketbook mussel (*Potalmilus capax*) – endangered
  - rough pigtoe mussel (*Peurobema plenum*) – endangered
  - fanshell mussel (*Cyprogenia stegaria*) – endangered
  - rabbitsfoot mussel (*Quadrula quadrula*) – endangered
- 1 bird species
  - Least tern (*Sterna antillarum*) – endangered

In addition to the current federally-listed species, USFWS also noted that the newly described Hoosier cavefish (*Amblyopsis hoosieri*) is known to occur in the project area. The northern cavefish (*Amblyopsis spelaea*) is currently under consideration for listing by the USFWS. Because the Hoosier cavefish (Indiana population) is a recent species split from the northern cavefish, the USFWS suggests that this species might be added to the listing plan also.

In addition to the federally-listed species, there are a multitude of species considered state endangered or threatened by the IDNR with occurrence records in the project area. Because the unique karst landscape of the project area east of US 231 in the Mitchell Plain has historically experienced less disturbance than the largely agricultural land use west of US 231, the density of federal and state listed endangered species accounts is greater. Many of these endangered species are dependent on cave and spring habitats or utilize these habitats during a phase of their life cycle.

For the western Alternatives, the clubshell mussel (*Pleurobema clava*), tubercled blossom mussel (*Epioblasma torulosa*), and the fat pocketbook mussel are federally listed species associated with the East Fork White River in the vicinity of the Alternative B crossing. Additional state listed species include the loggerhead shrike (*Lanius ludovicianus*), barn owl (*Tyto alba*), round hickory nut mussel (*Obovaria subrotunda*), and pyramid pigtoe mussel (*Pleurobema rubrum*).

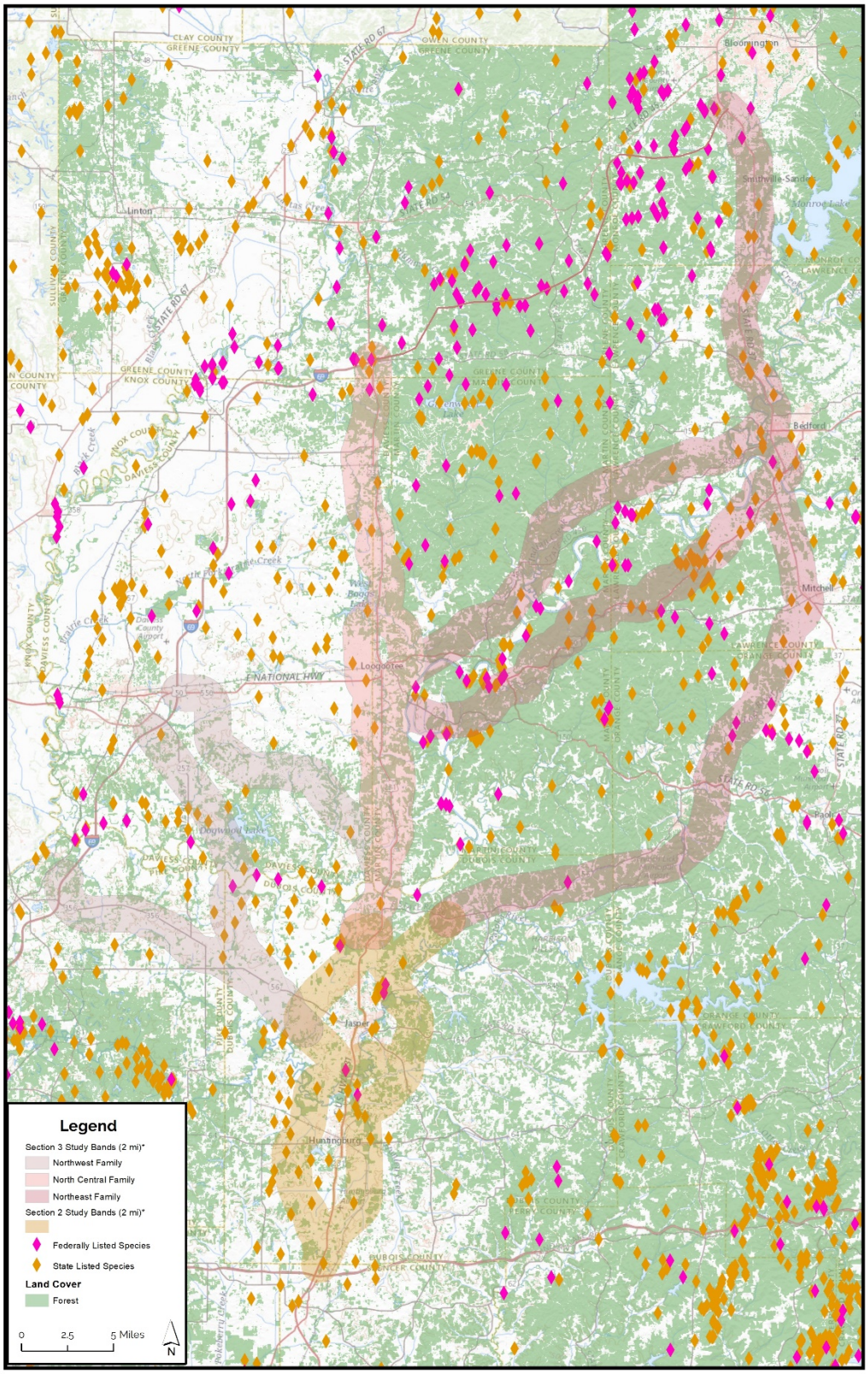
[5] Letter from Scott Pruitt, USFWS to Jason DuPont, Lochmueller Group. September 12, 2019

For the central Alternatives G, K, P, and R, the northern long-eared bat and the copperbelly watersnake (*Nerodia erythrogaster neglecta*) (Patoka River wetlands between Huntingburg and Jasper) are the only federally listed species with a nearby occurrence record. However, the little brown bat (*Myotis lucifigus*), currently under review for listing by the USFWS, has been documented within the Doans Creek in Greene County. Additional state listed species include the loggerhead shrike, barn owl, little spectaclecase mussel (*Villosa lienosa*), tricolored bat (Perimyotis subflavus), eastern red bat (Lasiurus borealis), evening bat (Nycticeius humeralis), northern crawfish frog (*Lithobates areolatus circulosus*), Mississippi buttercup (*Ranunculus laxicaulis*), and a panic grass (*Dichanthelium yadkinense*).

For the eastern Alternatives M, N, and O, the copperbelly watersnake is the only federally listed species (single record) in the vicinity of the alignments. However, the little brown bat (USFWS candidate) has been documented within the Clear Creek watershed south of Bloomington and the Hoosier cavefish has been documented from multiple locations in the Orangeville area. Additional state listed species include the little spectaclecase mussel, tricolored bat, Eastern red bat, common mudpuppy (*Necturus maculosus*), eleven cave invertebrate species, Mississippi buttercup, round-leaf water-hyssop (*Bacopa rotundifolia*), gray beardtongue (*Penstemon canescens*), hairy lipfern (*Cheilanthes lanosa*), grassleaf ladies'-tresses (*Spiranthes vernalis*) and panic grasses (*Dichanthelium mattamuskeetense* and *Dichanthelium bicknellii*).

Figure 2-3 shows terrestrial resources (forests, listed species occurrences) within the Section 2 and Section 3 portions of the project area.

Figure 2-3 - Project Area Terrestrial Resources



2.5 Construction Cost Estimates

Construction costs for each alternative are calculated on a unit cost basis that considers facility type and terrain. Only construction costs were calculated for preliminary alternatives. These exclude costs for right-of-way, relocations, design, construction management, utility relocation, and contingencies. These non-construction costs will be provided for alternatives in the DEIS. Construction costs were determined using previously constructed projects similar to the facility types analyzed in this report.

Representative projects were analyzed to determine a per mile roadway cost on a contract by contract basis. The **Cost Estimating Appendix** describes these representative projects and associated costs.

Table 2-8 summarizes per mile roadway costs for each of the respective facility types being considered as part of this analysis.

Table 2-8: Per Mile Road Costs for Each Facility Type

Facility Type	Rural		Urban	
	Level	Rolling	Level	Rolling
Freeway	$11,300,000	$19,000,000	N/A	N/A
Expressway	$8,200,000	$13,800,000	N/A	N/A
Super 2	$6,900,000	$7,500,000	$10,700,000	N/A

Table 2-9 summarizes unit costs for each of the respective access control types being considered as part of this analysis.

Table 2-9: Access Control Unit Costs

Access Control Type	Unit Price
Grade Separation	$6,200,000
Interchange	$20,500,000

2.6 Purpose and Need Ratio Method

It is not practical to provide traffic assignments to calculate benefits for three facility types in each of ten preliminary alternatives. The approach to managing this analysis is to designate a single representative alternative in each of the three Families for Mid-States alternatives. As cited in **Section 2.1**, these orientations, and the associated representative alternative, include:

- **Northwest Family.** These alternatives connect with I-69 in Washington in Daviess County. Alternative C is the representative alternative for the Northwest Family. **Figure 2-3** depicts the Northwest Family of alternatives.
- **North Central Family.** These alternatives connect with I-69 in the vicinity of Crane NSA in Greene County. Alternative P is the representative alternative for the North Central Family. **Figure 2-4** depicts the North Central Family of alternatives.
- **Northeast Family.** These alternatives connect with SR 37 in the vicinity of Bedford in Lawrence County. Alternative M is the representative alternative for the Northeast Family. **Figure 2-5** depicts the Northeast Family of alternatives.

Comparisons of costs, impacts and benefits are provided in **Section 3**.

For each Family, a full range of traffic assignments and performance measures for all facility types is calculated for one representative alternative. For other alternatives in that family, traffic assignments and performance measures are directly calculated for the expressway facility type. Using a ratio approach, performance for these other alternatives is interpolated based upon the variation among the three facility types for the one representative alternative (Alternatives C, P or M) in that family.

The **Purpose and Need Appendix** gives details about the interpolation of performance measures.

3 ALTERNATIVES CARRIED FORWARD FOR DETAILED STUDY

This section compares the performance, relative costs, and impacts and recommends Alternatives Carried Forward for Detailed Study. **Section 3.1** compares alternatives (by Family) using these criteria. **Section 3.2** screens alternatives by Family to recommend alternatives carried forward for detailed study.

3.1 Comparison of Alternatives

The performance, relative costs and impacts for each preliminary alternative are compared to other alternatives within each Family. **Table 3-1**, **Table 3-2** and **Table 3-3** provide this comparison for the Northwest Family, North Central Family, and Northeast Family respectively.

In order to preserve confidentiality, impacts to Threatened and Endangered Species (Heritage Species) are categorized by ranges. These ranges correspond to "quintiles." The difference between 0 impacts (which occurred in some sections for some alternatives) and the highest number of impacts (for a single end-to-end alternative) were evenly divided into five groups. Each group (or quintile) corresponds to one-fifth of the numerical range of impacts. For measures of impacts to Threatened and Endangered Species, each alternative has a designation ranging from "X" to "XXXXX." "X" represents impacts in the lowest one-fifth, and "XXXXX" represents impacts in the highest one-fifth. Other designations correspond to impacts in the second (XX), third (XXX) and fourth (XXXX) quintile of the range of impacts. These designations are used in **Table 3-1** through **Table 3-3**.

Construction costs also are provided by cost quintiles (shown as $ to $$$$$). For the DEIS, actual costs (which will include non-construction costs) will be provided.

3.1.1 Comparison of Alternatives – Northwest Family

The Northwest Family has nine alternatives (combinations of route and facility type). These nine alternatives were evaluated on their relative impacts, costs and performance (benefits) to develop recommended alternatives carried forward for detailed study.

A summary of all impact, cost and performance measures for each route and facility type can be found in **Table 3-1**. Alternatives with green column headers (Alternatives A and B for both the Super-2 and freeway facility types) were determined using a pivot-point analysis, as described in **Section 2.6.1**. **Figure 3-1** through **Figure 3-3** (in the margin of **Table 3-1**) show the Alternatives in the Northwest Family.

Table 3-1: Northwest Family Master Analysis Table[6]

Table 3-1 - Northwest Family of Alternatives - Preliminary Alternatives Evaluation										
		Super-2 Alternatives			Expressway Alternatives			Freeway Alternatives		
		A	B	C	A	B	C	A	B	C
Performance Measures - 2045 Forecast Year										
Increased Accessibility to Major Business Markets										
Travel Time Reduction (Typical weekday travel time)										
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)								
Jasper and Indianapolis	156	0	0	-1	0	0	0	2	2	2
Jasper and Chicago	294	0	0	0	2	3	0	4	4	4
Jasper and Louisville	80	0	0	0	0	0	0	0	0	0
NSA Crane and Jasper	49	0	0	0	0	0	0	0	0	0
NSA Crane and Rockport	98	1	1	7	1	1	9	2	2	13
NSA Crane and Louisville	120	0	0	0	0	0	0	0	0	0
Bedford and Louisville	91	0	0	0	0	0	0	0	0	0
Bedford and Rockport	118	0	0	6	0	0	7	0	0	12
French Lick and Indianapolis	145	0	0	0	0	0	0	0	0	0
French Lick and Louisville	74	0	0	0	0	0	0	0	0	0
French Lick and Rockport	76	0	0	0	0	1	0	0	4	4
Increase in Labor Force Access (Population within 30 minutes, typical weekday travel time)										
Labor Force Access To	Population with 30 minute access (No-Build)	Added Population with 30 Minute Access								
Jasper	65,250	2,000	1,140	1,970	4,390	2,510	4,330	6,490	3,710	6,400
Crane	48,700	0	0	0	0	0	0	0	0	0
Washington	56,150	640	770	550	3,260	3,900	2,780	7,060	8,450	6,020
French Lick	43,040	0	0	0	0	0	0	0	0	160
Bedford	70,500	0	0	0	0	0	0	0	0	0
More Efficient Truck/Freight Travel in Southern Indiana										
Measure	No Build VHT (Annual)	Decrease in Annual Truck VHT								
Study Area Reduction in Annual Truck Vehicle Hours of Travel (VHT)	699,000	10,500	1,900	2,700	11,700	2,100	3,000	23,400	4,200	6,000
Reduce Crashes in Southern Indiana										
Measure	No Build Crash Rate									
Study Area Serious Crash Rate (per 100 Million VMT)	63.2	63.3	63.1	62.8	63	62.8	62.5	62.7	62.5	62.2
Increased Access to Major Rail and Air Intermodal Centers										
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)								
Jasper and CSX Avon Yard	157	0	0	0	0	0	0	1	1	2
Jasper and Senate Avenue Yard (Indianapolis)	155	0	0	0	0	0	0	1	1	2
Jasper and Tell City River Port	54	0	0	0	0	0	0	0	0	0
Jasper and Port of Indiana (Jeffersonville)	88	0	0	0	0	0	0	0	0	0
Jasper and Louisville International Airport	88	0	0	0	0	0	0	0	0	0
Jasper and Indianapolis International Airport	148	0	0	0	0	0	0	1	1	2
NSA Crane and CSX Avon Yard	122	0	0	1	0	0	1	0	0	0
NSA Crane and Senate Avenue Yard (Indianapolis)	118	0	0	0	0	0	0	0	0	-1
NSA Crane and Tell City River Port	102	0	0	0	0	0	1	0	0	5
NSA Crane and Port of Indiana (Jeffersonville)	127	0	0	0	0	0	0	0	0	0
NSA Crane and Indianapolis International Airport	113	0	0	0	0	0	0	0	0	0
NSA Crane and Louisville International Airport	128	0	0	0	0	0	0	0	0	0

[6] Performance measures for alternatives with green column headers interpolated using ratio approach. See **Section 2.6.1** and Purpose and Need Appendix for details.

Figure 3-1 - Alternative A

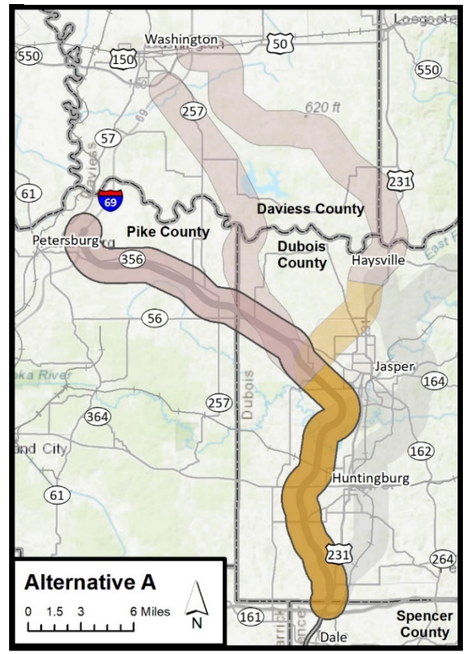


Figure 3-2 - Alternative B

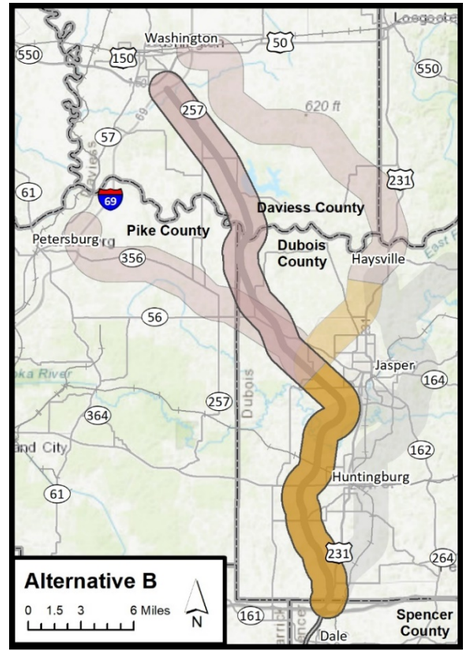
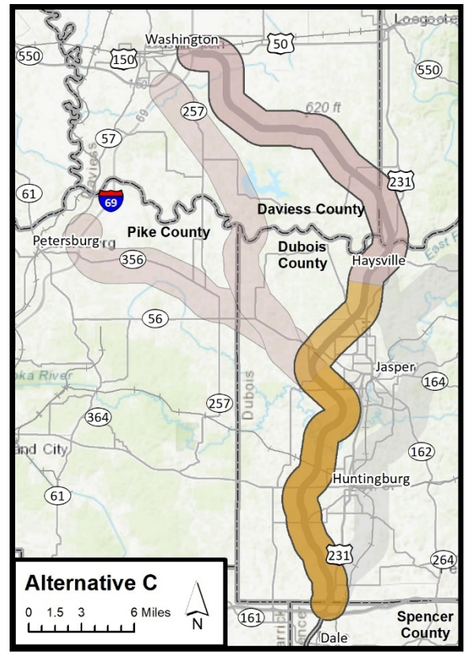


Table 3-1 - Northwest Family of Alternatives - Preliminary Alternatives Evaluation

			Super-2 Alternatives			Expressway Alternatives			Freeway Alternatives		
		No Build[7]	A	B	C	A	B	C	A	B	C
Daily Forecasted Traffic - 2045											
Immediately North of I-64	Autos	5,190	5,890	6,720	9,250	4,640	5,300	7,290	5,350	6,110	8,400
	Trucks	620	3,800	4,790	4,250	3,230	4,070	3,610	3,760	4,740	4,200
	Total	5,810	9,690	11,510	13,500	7,870	9,370	10,900	9,110	10,850	12,600
Highest Traffic Location Between I-64 and SR 37/I-69	Location	N. of 6th St., Jasper	South of SR 64	South of SR 64	North of SR 56	South of SR 64	South of SR 64	North of SR 56	South of SR 64	North of SR 56	South of SR 64
	Autos	21,700	4,430	5,190	8,050	5,040	5,900	9,150	4,790	5,610	8,700
	Trucks	500	2,950	3,720	2,930	3,250	4,100	3,230	4,230	5,330	4,200
	Total	22,200	7,380	8,910	10,980	8,290	10,000	12,380	9,020	10,940	12,900
On I-69 Immediately North of SR 37	Autos	40,760	40,500	40,600	40,800	40,600	40,700	40,900	40,400	40,500	40,700
	Trucks	23,610	23,850	24,000	23,900	23,750	23,900	23,800	23,950	24,100	24,000
	Total	64,370	64,350	64,600	64,700	64,350	64,600	64,700	64,350	64,600	64,700
Project Length and Cost											
Project Length (Miles) from US 231/SR 64 to I-69/SR 37 (showing length of different road types as well as total project length)											
Using Existing Roads (No Improvement)			87.6	77.8	75.0	87.6	77.8	75.0	65.2	55.4	52.7
Upgrade Existing Roads									22.4	22.4	22.4
New Terrain Road			31.5	33.9	41.6	31.5	33.9	41.6	31.5	33.9	41.6
Total Project Length			119.1	111.7	116.6	119.1	111.7	116.6	119.1	111.7	116.7
Relative Project Cost (Scale of 1 to 5)											
Cost Quintile ($ being least expensive and $$$$$ being most expensive)			$	$	$	$	$	$	$$	$$	$$
Natural Resource Impacts											
Total Acres New Right-of-Way			1,145	1,234	1,513	1,526	1,645	2,017	1,620	1,739	2,111
Forest Impacts (Acres)			144	164	281	194	221	378	222	249	406
Stream Impacts (Linear Feet)			38,729	35,972	36,178	52,374	47,738	48,833	55,069	50,434	51,529
Wetland Acres (other than ponds)			26	27	26	36	36	36	37	37	37
Wetland Acres (ponds)			7	12	15	10	16	21	11	17	21
Floodplain Impacts (acres)			116	175	161	153	234	217	179	259	242
Agricultural Impacts (acres)			934	994	1,104	1,243	1,321	1,476	1,278	1,357	1,512
Heritage Species (within 1,000 foot of preliminary alternative buffer)			X	XX	X	X	XX	X	X	XX	X
Sinkhole and Sinking Stream Areas (acres)			0	0	0	0	0	0	0	0	0
Community Resource Impacts											
Residential Property Acreage			62	71	87	82	94	116	86	98	120
Commercial/Industrial Property Acreage			0	0	4	0	0	6	5	5	11
Number of Residential Parcels			96	103	102	110	121	121	131	142	142
Number of Commercial/Industrial Parcels			0	0	4	0	0	4	8	8	12
Number of Historic Sites			1	3	3	1	3	4	1	3	4
Number of Historic Districts			0	0	0	0	0	0	0	0	0
Managed Lands (Acres)			0	0	0	0	0	0	0	0	0

Figure 3-3 - Alternative C



7 First two locations (just north of I-64 and in Jasper) are on existing US 231.

Performance on Project Goals

Alternative A (for all facility types) underperforms when compared to Alternatives B and C for the following performance measures:

- Reduced Crashes in Southern Indiana
- Daily Forecasted traffic

Alternative A is the highest performer on reduction in annual truck vehicle hours of travel.

All alternatives generally perform equally for the following performance measures:

- Accessibility to Major Business Markets
- Access to Major Rail and Air Intermodal Centers
- Labor force access (Alternative B performs better than others on labor force access to Washington, but performs poorer than others on labor force access to Jasper).

The one exception is that for the Major Business Market accessibility, Alternative C provides higher improvements in travel time reduction between NSA Crane and Rockport (7 to 13 minutes) as well Bedford and Rockport (6 to 12 minutes).

Impacts

All alternatives are similarly impactful to natural and community resources, with the major differences being that Alternative A does not cross the White River leading to lesser floodplain impacts and Alternatives A and C are less impactful to listed species than Alternative B. Generally speaking, natural and community resources impacts are directly related to the length of new terrain road within each alternative.

Cost

All alternatives are in the first cost quintile for the Super-2 and Expressway facility types, and in the second cost quintile for the freeway facility type. Cost is not a significant differentiator between alternatives.

3.1.2 Comparison of Alternatives – North Central Family

The North Central Family has ten alternatives (combinations of route and facility type). These ten alternatives were evaluated for their relative impacts, costs and performance (benefits) to develop recommended alternatives carried forward for detailed study.

A summary of all impact, cost and performance measures for each route and facility type can be found in **Table 3-2**. Alternatives with green column headers (Alternatives G and K for both the Super-2 and freeway facility types) were determined using a pivot-point analysis, as described in **Section 2.6.1**. **Figure 3-4** through **Figure 3-7** (in the margin of **Table 3-2**) show the Alternatives in the North Central Family.

Table 3-2: North Central Family Master Analysis Table[8]

Table 3-2 - North Central Family of Alternatives - Preliminary Alternatives Evaluation												
		Super-2 Alternatives				Expressway Alternatives			Freeway Alternatives			
		G	K	P	R	G	K	P	G	K	P	
Performance Measures - 2045 Forecast Year												
Increased Accessibility to Major Business Markets												
Travel Time Reduction (Typical weekday travel time)												
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)										
Jasper and Indianapolis	156	2	4	3	1	3	6	5	5	10	8	
Jasper and Chicago	294	0	0	0	0	0	0	0	0	0	4	
Jasper and Louisville	80	0	0	0	0	0	0	0	0	0	0	
NSA Crane and Jasper	49	2	3	3	1	2	4	4	2	3	3	
NSA Crane and Rockport	98	8	7	9	0	11	10	13	15	14	18	
NSA Crane and Louisville	120	1	2	2	0	1	4	4	2	7	7	
Bedford and Louisville	91	0	0	0	0	0	0	0	0	0	0	
Bedford and Rockport	118	8	7	10	0	9	8	11	16	14	19	
French Lick and Indianapolis	145	0	0	0	0	0	0	0	0	0	0	
French Lick and Louisville	74	0	0	1	0	1	0	0	0	0	0	
French Lick and Rockport	76	0	0	2	0	0	0	4	0	0	6	
Increase in Labor Force Access (Population within 30 minutes, typical weekday travel time)												
Labor Force Access To	Population with 30 minute access (No-Build)	Added Population with 30 Minute Access										
Jasper	65,250	3,730	5,230	4,600	950	3,850	5,400	4,750	5,510	7,730	6,800	
Crane	48,700	1,330	1,510	1,600	0	1,500	1,700	1,800	3,420	3,870	4,100	
Washington	56,150	190	20	50	100	570	50	150	1,330	120	350	
French Lick	43,040	110	190	110	10	260	460	260	360	640	360	
Bedford	70,500	0	0	0	0	0	0	0	0	0	0	
More Efficient Truck/Freight Travel in Southern Indiana												
Measure	No Build VHT (Annual)	(Decrease)/Increase in Daily Truck VHT/VMT										
Study Area Reduction in Annual Truck Vehicle Hours of Travel (VHT)	699,000	4,900	8,200	8,400	300	7,800	13,200	13,500	11,800	19,900	20,400	
Reduce Crashes in Southern Indiana												
Measure	No Build Crash Rate											
Study Area Serious Crash Rate (per 100 Million VMT)	63.2	62.2	62.1	62.1	63.2	62.1	62.0	62.0	61.7	61.6	61.6	
Increased Access to Major Rail and Air Intermodal Centers												
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)										
Jasper and CSX Avon Yard	157	2	4	4	1	3	6	6	4	8	8	
Jasper and Senate Avenue Yard (Indianapolis)	155	2	4	3	1	3	6	5	5	10	8	
Jasper and Tell City River Port	54	0	0	0	0	0	0	0	0	0	0	
Jasper and Port of Indiana (Jeffersonville)	88	0	0	0	0	0	0	0	0	0	0	
Jasper and Louisville International Airport	88	0	0	0	0	0	0	0	0	0	0	
Jasper and Indianapolis International Airport	148	2	5	4	0	3	7	6	5	11	9	
NSA Crane and CSX Avon Yard	122	0	0	0	1	0	0	0	0	0	0	
NSA Crane and Senate Avenue Yard (Indianapolis)	118	0	0	0	0	0	0	0	0	0	0	
NSA Crane and Tell City River Port	102	3	9	9	0	4	11	11	5	14	14	
NSA Crane and Port of Indiana (Jeffersonville)	127	0	2	2	0	0	4	4	0	7	7	
NSA Crane and Indianapolis International Airport	113	0	0	0	0	0	0	0	0	0	0	
NSA Crane and Louisville International Airport	128	1	3	3	1	2	5	5	3	7	7	

Figure 3-4 - Alternative G

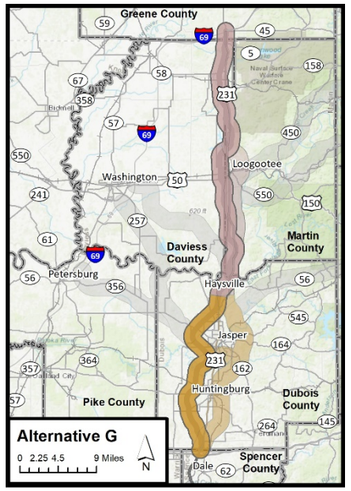
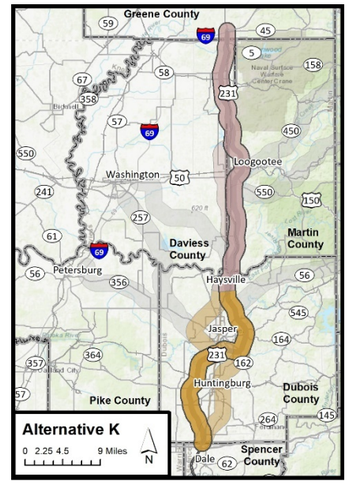


Figure 3-5 – Alternative K



[8] Performance measures for alternatives with green column headers interpolated using ratio approach. See **Section 2.6.1** and Purpose and Need Appendix for details.

Table 3-2 - North Central Family of Alternatives - Preliminary Alternatives Evaluation

			Super-2 Alternatives				Expressway Alternatives			Freeway Alternatives		
Daily Forecasted Traffic - 2045		**No Build[9]**	**G**	**K**	**P**	**R**	**G**	**K**	**P**	**G**	**K**	**P**
Immediately North of I-64												
Immediately North of I-64	Autos	5,190	6,450	5,500	7,050	5,350	8,320	7,100	9,100	12,020	10,260	13,150
	Trucks	620	4,330	3,750	4,350	700	4,980	4,310	5,000	10,910	9,440	10,950
	Total	5,810	10,780	9,250	11,400	6,050	13,300	11,410	14,100	22,930	19,700	24,100
Highest Traffic Location Between I-64 and SR 37/I-69	Location	N. of 6th St., Jasper	North of West Portion of SR 56	South of SR 164	South of SR 164	North of SR 164	North of West Portion of SR 56	South of SR 164	South of SR 164	North of West Portion of SR 56	South of SR 164	South of I-69
	Autos	21,700	10,370	10,970	11,700	28,620	11,300	11,950	12,750	15,010	15,880	16,940
	Trucks	500	4,280	4,640	5,300	580	4,850	5,250	6,000	9,690	10,490	11,990
	Total	22,200	14,650	15,610	17,000	29,200	16,150	17,200	18,750	24,700	26,370	28,930
On I-69 Immediately North of SR 37	Autos	40,760	40,920	40,820	40,650	40,690	40,750	40,650	40,480	40,020	39,920	39,750
	Trucks	23,610	23,860	23,900	24,200	23,540	24,250	24,290	24,600	25,980	26,020	26,350
	Total	64,370	64,780	64,720	64,850	64,230	65,000	64,940	65,080	66,000	65,940	66,100
Project Length and Cost												
Project Length (Miles) from US 231/SR 66 to I-69/SR 37 (showing length of different road types as well as total project length)												
Using Existing Roads (No Improvement)			49.8	49.8	49.8		49.8	49.8	49.8	27.4	27.4	27.4
Upgrade Existing Roads						101.5				22.4	22.4	22.4
New Terrain Road			54.6	56.4	53.5		54.6	56.4	53.5	54.6	56.4	53.5
Total Project Length			104.4	106.2	103.3	101.5	104.4	106.2	103.3	104.4	106.2	103.3
Relative Project Cost (Scale of 1 to 5)												
Cost Quintile ($ being least expensive and $$$$$ being most expensive)			$	$	$	$$	$$	$$	$$	$$$	$$$	$$$
Natural Resource Impacts												
Total Acres New Right-of-Way			1,987	2,051	1,946	1,061	2,649	2,735	2,595	2,743	2,829	2,689
Forest Impacts (Acres)			462	673	633	205	619	900	850	646	928	878
Stream Impacts (Linear Feet)			47,512	62,390	57,459	25,209	65,252	84,447	76,110	67,948	87,143	78,806
Wetland Acres (other than ponds)			27	78	27	14	39	105	37	40	106	38
Wetland Acres (ponds)			8	10	3	3	13	16	6	14	16	7
Floodplain Impacts (acres)			185	337	375	61	249	449	499	275	475	525
Agricultural Impacts (acres)			1,384	1,200	1,158	124	1,848	1,606	1,547	1,883	1,642	1,583
Heritage Species (within 1,000 foot of preliminary alternative buffer)			XX	XX	XX	XX	XX	XX	XX	XXX	XXX	XX
Sinkhole and Sinking Stream Areas (acres)			0	0	0	0	0	0	0	0	0	0
Community Resource Impacts												
Residential Property Acreage			101	81	57	279	134	109	78	138	113	82
Commercial/Industrial Property Acreage			0	5	6	67	0	9	8	5	14	13
Number of Residential Parcels			120	76	56	862	143	92	70	164	113	91
Number of Commercial/Industrial Parcels			0	8	2	401	1	8	3	9	16	11
Number of Historic Sites			4	2	3	53	5	2	4	5	2	4
Number of Historic Districts			0	0	0	1	0	0	0	0	0	0
Managed Lands (Acres)			0	0	0	13	0	0	0	0	0	0

Figure 3-6 - Alternative P

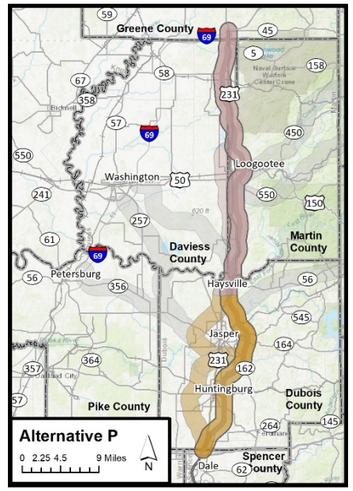


Figure 3-7 - Alternative R

[9] First two locations (just north of I-64 and in Jasper) are on existing US 231.

Performance on Project Goals

Alternative R (existing US 231 upgrade to Super 2 facility with a 5-lane section through urban areas of Huntingburg and Jasper) provides the poorest performance of all alternatives within the North Central Family. For all performance measures it performs much poorer than other alternatives.

Alternative R has lower natural resource impacts primarily due to its comparably low new right-of-way. However, its community resource impacts are many times higher than any other alternative. It impacts over 10 times the number of residential/commercial parcels than any other alternative. It also has ten times the cultural resource impacts as other alternatives. These greatly increased impacts are attributable to the required improvements through the developed areas (Huntingburg, Jasper and Loogootee) as well as impacts to development along the existing route in rural areas.

Alternatives K and P perform similarly in satisfying project goals. Alternative G performs significantly poorer than Alternatives K and P on improved freight access and intermodal access. In addition, Alternative G attracts somewhat less traffic than Alternatives K and P.

Impacts

With one noteworthy exception, there is no clear advantage for reduced impacts among Alternatives G, K and P. That one exception is wetland impacts. Alternative K has more than 2½ times the wetland impacts of Alternative G and P. This is attributable to Alternative K's routing in Section 25. In Section 2, Alternative K's alignment "crosses over" from an alignment to the west of Huntingburg to an alignment east of Jasper. This alignment has significant wetland impacts between Huntingburg and Jasper. Wetland impacts in Section 2 for expressway alternatives are 35 and 31 acres (for Alternatives G and P), compared with 98 acres for Alternative K. Differences for other facility types are similar.

A detailed review of section-level impacts by alternative suggests further opportunities to minimize impacts by combining alternative elements in the North Central Family. The only significant difference among Alternatives G, K and P in Section 3 is that Alternatives K and P bypass Loogootee to the east, while Alternative G bypasses Loogootee to the west. This difference in bypass treatments results in the following differences in impacts in Section 3 for the expressway facility type. Variances for other facility types are similar:

- Floodplain – 109 acres (Alternative G); 188 acres (Alternatives K and P)
- Streams – 31,300 linear feet (Alternative G); 42,000 linear feet (Alternatives K and P)
- Agricultural Land – 1,039 acres (Alternative G); 889 acres (Alternatives K and P)
- Forests – 464 acres (Alternative G); 583 acres (Alternatives K and P)
- Total Relocations – 39 (Alternative G); 30 (Alternatives K and P)

The western bypass of Loogootee has significantly lower natural resource impacts in several categories. **Figure 2.1** (Project Area Aquatic Resources) and **Figure 2-3** (Project Area Terrestrial Resources) illustrate the greater presence of natural resources east of Loogootee compared to west of Loogootee. The western bypass does have somewhat higher relocation and agricultural land impacts.

Costs

With one exception, alternatives of the same facility type fall into the same cost quintile. The exception is that Alternative R is in the second cost quintile; by comparison, other Super-2 alternatives are in the first cost quintile.

3.1.3 Comparison of Alternatives – Northeast Family

The Northeast Family has nine alternatives (combinations of route and facility type). These nine alternatives were evaluated for their relative impacts, costs and performance (benefits) to develop recommended alternatives carried forward for detailed study.

A summary of all impact, cost and performance measures for each route and facility type can be found in **Table 3-3**. Alternatives with green column headers (Alternatives N and O for both the Super-2 and freeway facility types) were determined using a pivot-point analysis, as described in **Section 2.6.1**. **Figure 3-8** through **Figure 3-10** (in the margin of **Table 3-3**) show the Alternatives in the Northwest Family.

Performance on Project Goals

Alternatives M, N and O (for all facility types) generally have similar performance on project goals. Each project performance measure is shown, with the best-performing alternative in parentheses.

- Accessibility to Major Business Markets (Alternatives M and O)
- Labor Force Access (Alternative O)
- Freight Efficiency (Alternative O)
- Safety (Alternative M)
- Intermodal Access (Alternative M and N)

Alternative M is forecasted to attract the highest levels of traffic. Alternative N is forecasted to attract the lowest levels of traffic.

Impacts

Alternative M is the least impactful to natural resources. Alternative N is the most impactful to natural resources. Alternatives N and O have significantly higher impacts to karst resources. Alternative M has much higher wetland impacts (116 acres compared with 46 acres for Alternative O and 48 acres for Alternative M). Alternative M also has fewer stream impacts than Alternatives N and O.

Alternative N has higher community resource impacts than Alternative M or Alternative O. Alternative N has particularly high impacts to managed lands (256 acres) compared to 55 acres for Alternative M and 0 acres for Alternative O.

Cost

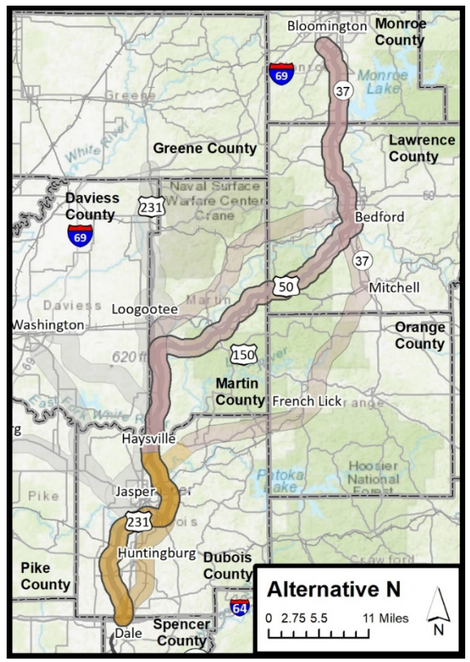
All alternatives are in the second cost quintile for the Super-2 facility type, the third cost quintile for the Expressway facility type, and the fifth (highest) cost quintile for the Freeway facility type. Cost is not a significant differentiator between alternatives of the same facility type.

Table 3-3: Northeast Family Master Analysis Table[10]

Table 3-3 - Northeast Family of Alternatives - Preliminary Alternatives Evaluation										
		Super-2 Alternatives			Expressway Alternatives			Freeway Alternatives		
		M	N	O	M	N	O	M	N	O
Performance Measures - 2045 Forecast Year										
Increased Accessibility to Major Business Markets										
Travel Time Reduction (Typical weekday travel time)										
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)								
Jasper and Indianapolis	156	1	1	0	2	1	0	6	3	0
Jasper and Chicago	294	0	0	0	0	0	0	0	0	0
Jasper and Louisville	80	0	0	0	1	0	0	3	0	0
NSA Crane and Jasper	49	0	0	0	1	3	0	3	9	0
NSA Crane and Rockport	98	9	6	6	12	8	8	19	13	13
NSA Crane and Louisville	120	0	0	0	3	2	0	6	4	0
Bedford and Louisville	91	0	0	0	0	0	0	0	0	0
Bedford and Rockport	118	14	15	16	16	17	18	30	32	34
French Lick and Indianapolis	145	0	0	4	0	0	7	0	0	14
French Lick and Louisville	74	0	0	0	0	1	1	0	2	2
French Lick and Rockport	76	2	0	4	4	0	7	6	0	11
Increase in Labor Force Access (Population within 30 minutes, typical weekday travel time)										
Labor Force Access To	Population with 30 minute access (No-Build)	Added Population with 30 Minute Access								
Jasper	65,300	3,900	4,100	4,880	4,000	4,200	5,000	7,300	7,670	9,130
Crane	48,700	200	90	0	450	200	0	1,000	440	0
Washington	56,200	0	0	0	100	0	0	100	0	0
French Lick	43,000	100	450	8,900	200	900	17,800	200	900	17,800
Bedford	70,500	500	1,500	1,000	500	1,500	1,000	500	1,500	1,000
More Efficient Truck/Freight Travel in Southern Indiana										
Measure	No Build VHT (Annual)									
Study Area Reduction in Annual Truck Vehicle Hours of Travel (VHT)	699,000	10,200	9,200	11,200	12,300	11,100	13,500	17,400	15,700	19,100
Reduce Crashes in Southern Indiana										
Measure	No Build Crash Rate									
Study Area Serious Crash Rate (per 100 Million VMT)	63.2	62.3	62.7	62.6	62.2	62.6	62.5	61.7	62.1	62.0
Increased Access to Major Rail and Air Intermodal Centers										
Origin-Destination Pair	No-Build Travel Time (minutes)	Travel Time Reduction (minutes)								
Jasper and CSX Avon Yard	157	1	1	0	2	2	0	7	7	0
Jasper and Senate Avenue Yard (Indianapolis)	155	1	1	0	2	1	0	6	3	0
Jasper and Tell City River Port	54	0	0	0	1	0	0	2	0	0
Jasper and Port of Indiana (Jeffersonville)	88	0	0	0	2	0	0	4	0	0
Jasper and Louisville International Airport	88	0	0	0	2	0	0	3	0	0
Jasper and Indianapolis International Airport	148	1	2	0	1	2	0	6	12	0
NSA Crane and CSX Avon Yard	122	0	0	0	1	0	0	0	0	0
NSA Crane and Senate Avenue Yard (Indianapolis)	118	0	0	0	0	0	0	0	0	0
NSA Crane and Tell City River Port	102	7	8	0	9	10	6	13	14	9
NSA Crane and Port of Indiana (Jeffersonville)	127	1	1	0	2	2	0	7	7	0
NSA Crane and Indianapolis International Airport	113	0	1	0	0	1	0	0	2	0
NSA Crane and Louisville International Airport	128	1	1	0	3	2	0	6	4	0

Figure 3-8 - Alternative M

Figure 3-9 - Alternative N



[10] Performance measures for alternatives with green column headers interpolated using ratio approach. See **Section 2.6.1** and Purpose and Need Appendix for details.

Table 3-3 - Northeast Family of Alternatives - Preliminary Alternatives Evaluation

			Super-2 Alternatives			Expressway Alternatives			Freeway Alternatives		
		No Build[11]	M	N	O	M	N	O	M	N	O
Daily Forecasted Traffic - 2045											
Immediately North of I-64	Autos	5,190	7,150	5,350	6,690	8,550	6,400	8,000	11,700	8,760	10,950
	Trucks	620	3,600	2,610	2,870	4,200	3,050	3,350	7,800	5,660	6,220
	Total	5,810	10,750	7,960	9,560	12,750	9,450	11,350	19,500	14,420	17,170
Highest Traffic Location Between I-64 and SR 37/I-69	Location	N. of 6th St., Jasper	South of SR 164	South of SR 164	South of SR 164	South of SR 164	South of SR 164	South of SR 164	South of SR 164	South of SR 164	South of SR 164
	Autos	21,700	11,300	10,280	10,370	12,200	11,100	11,200	15,200	13,830	13,950
	Trucks	500	4,350	3,400	3,130	4,800	3,750	3,450	8,600	6,720	6,180
	Total	22,200	15,650	13,680	13,500	17,000	14,850	14,650	23,800	20,550	20,130
On I-69 Immediately North of SR 37	Autos	40,760	40,570	40,570	40,720	40,600	40,600	40,750	40,550	40,550	40,700
	Trucks	23,610	24,350	23,950	24,100	24,400	24,000	24,150	25,750	25,330	25,490
	Total	64,370	64,920	64,520	64,820	65,000	64,600	64,900	66,300	65,880	66,190
Project Length and Cost											
Project Length (Miles) from US 231/SR 64 to I-69/SR 37 (showing length of different road types as well as total project length)											
Using Existing Roads (No Improvement)			39.9	44.4	51.0	39.9	44.4	51.0			
Upgrade Existing Roads									39.9	44.4	51.0
New Terrain Road			62.0	63.0	52.3	62.0	63.0	52.3	62.0	63.0	52.3
Total Project Length			101.9	107.4	103.3	101.9	107.4	103.3	101.9	107.4	103.3
Relative Project Cost (Scale of 1 to 5)											
Cost Quintile ($ being least expensive and $$$$$ being most expensive)			$$	$$	$$	$$$	$$$	$$$	$$$$$	$$$$$	$$$$$
Natural Resource Impacts											
Total Acres New Right-of-Way			2,858	2,879	2,623	3,609	3,642	3,257	3,786	3,855	3,555
Forest Impacts (Acres)			1,554	1,480	1,369	1,935	1,841	1,677	1,998	1,916	1,756
Stream Impacts (Linear Feet)			74,335	97,396	86,048	92,332	124,575	105,423	93,050	130,747	114,844
Wetland Acres (other than ponds)			35	88	35	48	116	46	50	118	48
Wetland Acres (ponds)			8	15	6	11	21	8	12	22	9
Floodplain Impacts (acres)			602	408	425	769	527	542	801	570	585
Agricultural Impacts (acres)			1,155	1,226	1,115	1,488	1,576	1,407	1,544	1,634	1,484
Heritage Species (within 1,000 foot of preliminary alternative buffer)			X	XXX	XX	X	XXXX	XX	XXX	XXXXX	XXXX
Sinkhole and Sinking Stream Areas (acres)			152	584	402	183	700	482	163	706	568
Community Resource Impacts											
Residential Property Acreage			119	131	133	151	168	164	183	203	223
Commercial/Industrial Property Acreage			9	13	10	12	20	14	37	47	66
Number of Residential Parcels			102	115	102	119	131	119	255	288	366
Number of Commercial/Industrial Parcels			5	13	8	7	13	10	51	88	133
Number of Historic Sites			4	5	7	5	5	9	5	5	10
Number of Historic Districts			0	0	0	0	0	0	0	0	0
Managed Lands (Acres)			45	213	0	55	256	0	55	256	1

Figure 3-10 – Alternative O

[11] First two locations (just north of I-64 and in Jasper) are on existing US 231.

3.2 Screening of Alternatives

The following subsections identify the recommended alternatives carried forward for detailed study in each family. These alternatives will be analyzed in detail in the Draft Environmental Impact Statement (DEIS).

3.2.1 Alternatives Carried Forward for Detailed Study – Northwest Family

Alternative A (all facility types) is forecasted to attract significantly less traffic than Alternative B or C. Its only performance advantage is with regard to truck VHT saved. Since it is similar in cost and impacts to Alternatives B and C and is forecasted to attract significantly less traffic, Alternative A (for all facility types) is not recommended for further analysis.

Alternative C performs better than Alternative B on the following performance measures:

- Access to Major Business Markets
- Labor Force Access
- Truck VMT Savings
- Safety

Alternative B has fewer impacts than Alternative C for the following resources:

- Acres of new right-of-way
- Forest

Alternatives B and C have similar costs. Alternative C also has the flexibility of being able to connect to an eastern bypass of the City of Jasper.

For the reasons stated above, both Alternatives B and C (routes only) are recommended as alternatives carried forward for detailed study. Discussion regarding facility types for Alternatives B and C follows below.

The expressway facility type consistently outperforms the Super-2 facility type. This is especially so for these performance measures:

- Labor Force Access
- Safety

The Super-2 facility type is the least impactful to natural and community resources. The differences in impacts at this level of analysis is determined by different assumptions regarding the buffer width/typical section for each facility type. Costs for the Super-2 and expressway facility types are similar. Both fall in the lowest cost quintile.

Given the consistent higher performance for expressways compared to the Super-2 facility type, as well as the similarity in cost, it is recommended that the no alternatives with a Super-2 facility type be carried forward for detailed study in the Northwest Family.

There are significant performance improvements in all categories for the freeway facility type compared to the expressway facility type. Given the minimal length of new terrain roadway and that US 231 (from I-64 to SR 66) would have to be upgraded for access control only, the increase in impacts and relative cost are only moderately significant in the Northwest Family. For these reasons, it is recommended that the freeway facility type be carried forward for additional detailed analysis for Alternative C. Only Alternative C is being recommended for the freeway facility type due to higher performance on project goals than Alternative B. Alternative C also can use existing interchanges, with some modification, at I-64 (US 231) and I-69 (US 50)

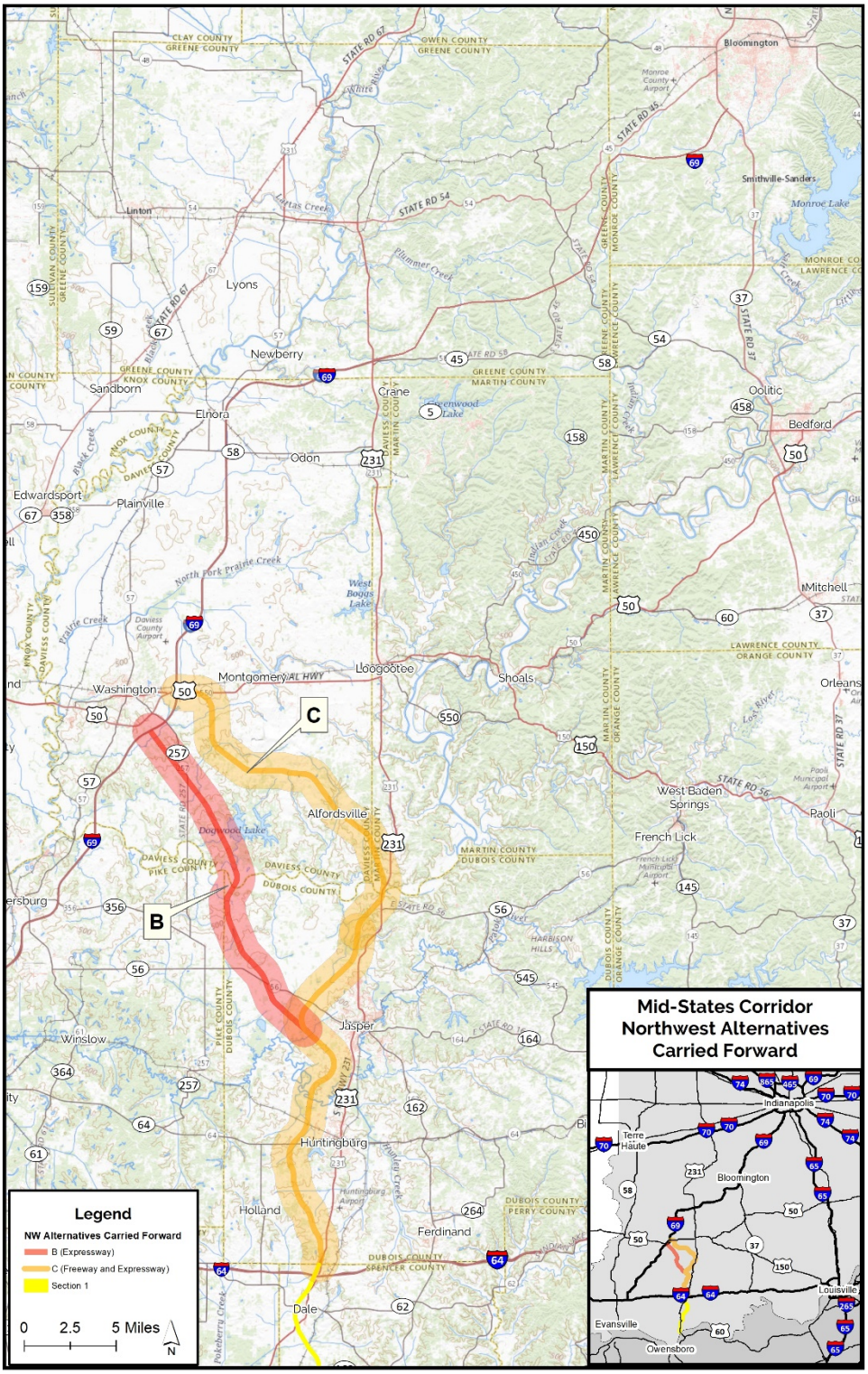
In summary, the following alternatives are being recommended as alternatives carried forward for detailed study in the Northwest Family include:

- Alternative B2 (expressway facility type)
- Alternative C1 (freeway facility type)
- Alternative C2 (expressway facility type)

As previously discussed, Alternative C can connect to either an eastern or western bypass of Huntingburg and Jasper. This will be further evaluated during detailed analysis to ensure that the most optimal route for Alternative C is analyzed.

Figure 3-11 depicts (by route and facility type) the alternatives carried forward for detailed study in the Northwest Family.

Figure 3-11 – Northwest Family Alternatives Carried Forward for Detailed Study



3.2.2 Alternatives Carried Forward for Detailed Study – North Central Family

Alternative R is not recommended for further consideration. It has much poorer performance than other alternatives, along with substantially higher community resource impacts and higher costs (compared to other Super-2 alternatives).

With the exception of Safety (where they have similar performance) Alternatives K and P consistently have higher performance than Alternative G. Alternative K has much higher wetland impacts than Alternative P (105 acres, compared to 37 acres). This is primarily a result of its increased length and orientation of the Patoka River and floodplain crossings between Huntingburg and Jasper to connect from the west side of Huntingburg to the east side of Jasper. Given the significant role that much higher wetland impacts have in permitting under the Clean Water Act, and the lack of any performance advantage, Alternative K (for all facility types) was eliminated from additional consideration.

Comparison of Alternative G versus Alternative P shows that Alternative P provides improved performance over Alternative G in all performance categories evaluated. Their length and cost are similar. They have similar natural resource impacts. Alternative P includes higher forest, stream and floodplain impacts but has reduced wetland and pond impacts compared to Alternative G. Community impacts also vary between these alternatives with Alternative G having higher residential impacts with over twice as many residential parcel impacts as Alternative P and one more historic site impact. Alternative P has two more commercial/industrial parcel impacts compared to Alternative G. Considering this relatively poor performance of Alternative G compared to Alternative P and the comparable resource impacts (acknowledging trade-offs between community and natural resource impacts) Alternative G was eliminated from further consideration. The comparison of impacts in Section 3 provided in **Section 3.1.2** shows that the Alternative G alignment in this section (western bypass of Loogootee) has the potential to reduce aquatic and forest impacts.

When comparing the Super-2 facility type to the expressway, the expressway outperforms the Super-2 for all performance measures. Likewise, when comparing the expressway to the freeway alternatives, the freeway outperforms the expressway for all performance measures, with a notable increase in the Labor Force Access category between the Super-2 and expressway facility types.

The Super-2 facility type is the least impactful to natural and community resources. There are increased impacts for the freeway compared to the expressway facility type, but it is less significant than the increase between the Super-2 and expressway facility types.

When comparing relative project costs, there is relatively equal incremental increase in going from the Super-2 to the expressway facility types and the expressway to the freeway. The costs are in the first, second and third quintiles respectively for the Super-2, expressway and freeway alternatives.

There are significant improvements in performance (specifically travel time, labor force access, and traffic) for the freeway facility type compared to the expressway facility type. While performance measures also show improvement between the Super-2 and expressway facility types, the incremental increase is not as large as that between the expressway and freeway facility types.

Based on these incremental tradeoffs in impacts and costs for performance between all facility types, it is reasonable to evaluate each further at a higher level of detail in the DEIS. The Super-2 facility type provides performance improvement at the lowest cost and impact levels. Similarly, given the more substantial performance improvement of the freeway facility type with a less significant impact increase

compared to the expressway, the freeway alternative will be advanced for more detailed study in the DEIS along with the expressway facility type.

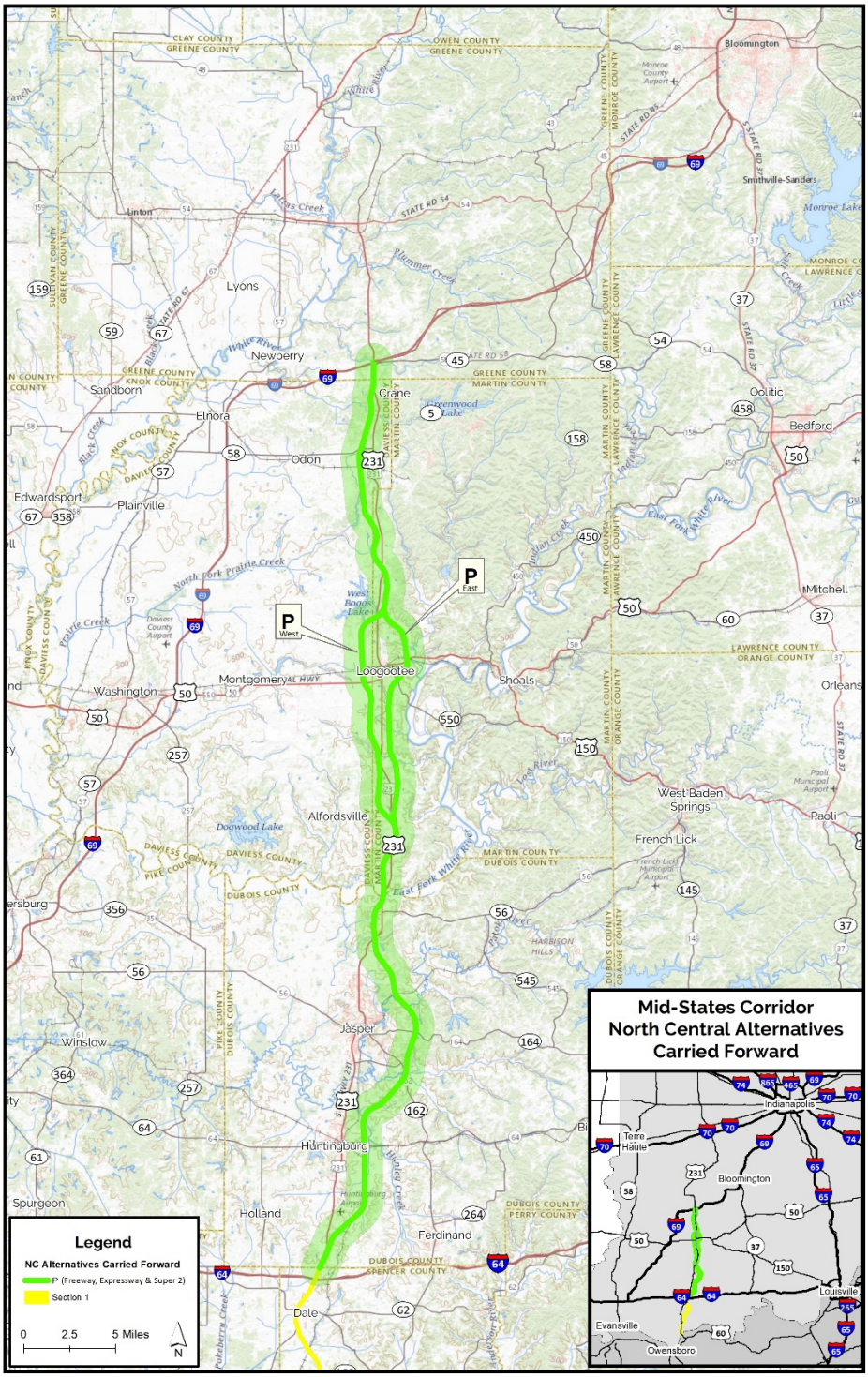
In summary, the following alternatives are being recommended for additional analysis:

- Alternative P1 (freeway facility type)
- Alternative P2 (expressway facility type)
- Alternative P3 (Super-2 facility type)

In addition, Alternative P is recommended to be carried forward with both eastern and western bypass options at Loogootee. This provides opportunities to minimize aquatic and forest impacts.

Figure 3-12 depicts (by route and facility type) the alternatives carried forward for detailed study in the North Central Family.

Figure 3-12 – North Central Family Alternatives Carried Forward for Detailed Study



3.2.3 Alternatives Carried Forward for Detailed Study – Northeast Family

Alternative N generally has the highest levels of impacts, especially to natural resources. It also performs lower in meeting project goals than Alternative M or Alternative O. It does not have any cost advantage over Alternative M or Alternative O. Accordingly, Alternative N (for all facility types) is not recommended for further analysis.

Alternative M outperforms Alternative O in the following categories:

- Access to Major Business Centers
- Safety
- Access to Major Intermodal Centers

Alternative O outperforms Alternative M in the following categories:

- Truck VHT Savings
- Labor Force Access

In addition, Alternative M attracts higher levels of traffic than Alternative O.

Alternative M has lower impacts than Alternative O to the following resources:

- Streams
- Listed Species
- Karst

Alternative O has lower impacts than Alternative M to the following resources:

- Acres of new right-of-way
- Forest
- Floodplains

Alternatives M and O have similar costs.

For the reasons stated above, both Alternatives M and O (routes only) are recommended as alternatives carried forward for detailed study. Discussion regarding facility types for Alternatives M and O follows.

The expressway facility type significantly outperforms the Super-2 facility type only for Truck VHT savings. The two facility types have similar performance in other categories.

The freeway facility type significantly outperforms the expressway facility type in all categories.

The Super-2 facility type is the least impactful to natural and community resources. The differences in impacts at this level of analysis is determined by different assumptions regarding the buffer width/typical section for each facility type.

Costs for the Super-2 and expressway facility types (second and third quintile, respectively) are significantly lower than the freeway facility type (fifth quintile).

In consideration of the following factors, all three facility types are recommended to be carried forward for detailed study.

- Super-2 facility types have similar performance to expressways with lower impacts.
- Freeways have much higher performance than expressways with similar impacts.

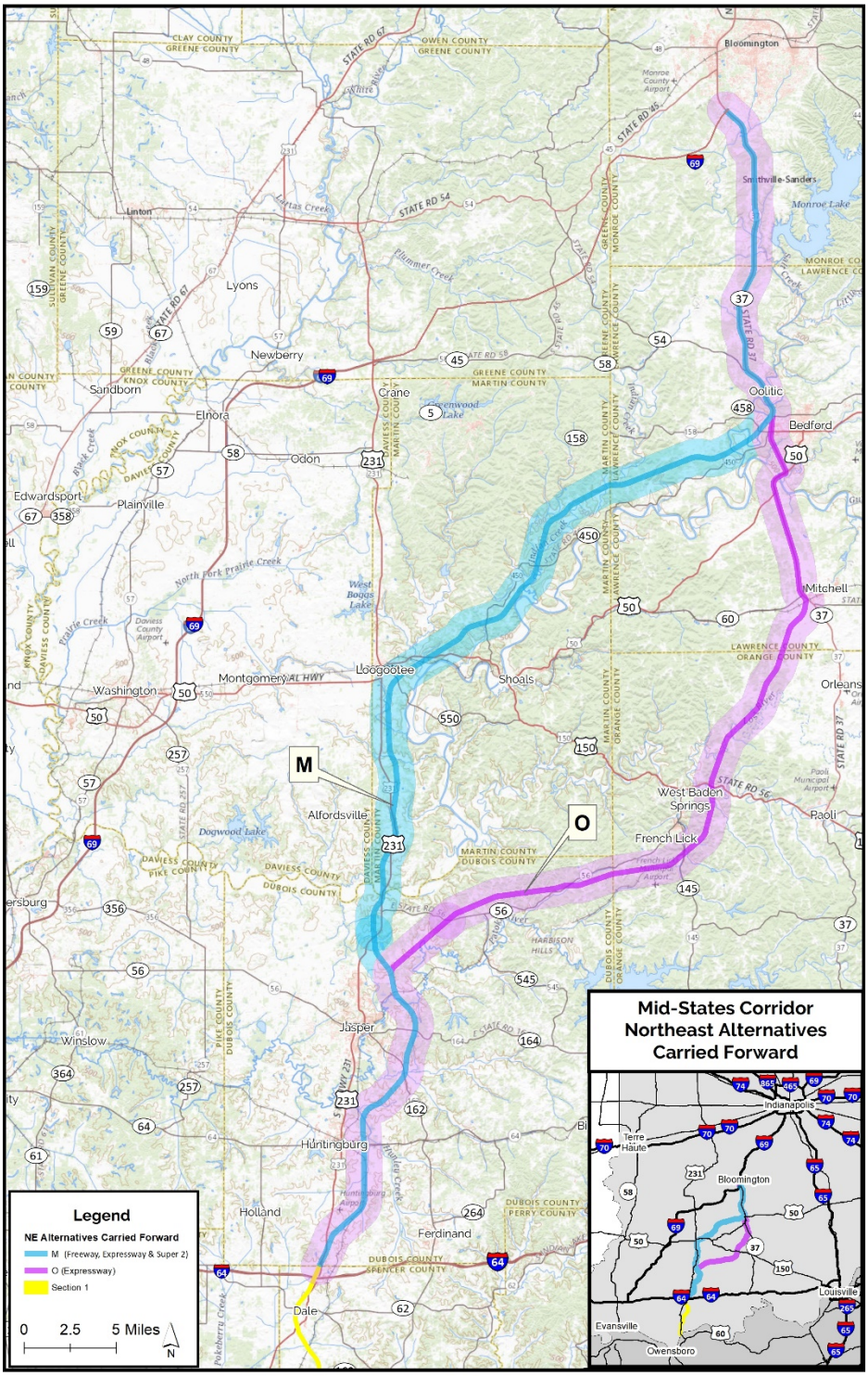
Overall Alternative M has higher levels of performance. It also attracts higher traffic levels. Alternatives M and O have similar costs and impacts; however, Alternative O has higher impacts to karst resources (a key resource in this geographic region), as well as higher impacts to streams and listed species.

Accordingly, the following alternatives are recommended to be carried forward for detailed study.

- Alternative M (Super-2 facility type)
- Alternative M (Expressway facility type)
- Alternative M (Freeway facility type)
- Alternative O (Expressway facility type)

Figure 3-13 depicts (by route and facility type) the alternatives carried forward for detailed study in the Northeast Family.

Figure 3-13 – Northeast Family Alternatives Carried Forward for Detailed Study



3.3 Summary Recommendations

Ten (10) alternatives are recommended to be carried forward for detailed study in the DEIS. These include three alternatives from the Northwest Family, three alternatives from the North Central Family, and four alternatives from the Northeast family. In the DEIS, the benefits, costs and impacts of all alternatives will be compared directly to recommend a single preferred alternative.

Figure 3-14 depicts the recommended alternatives (by route and facility type) to be carried forward for detailed study.

Figure 3-14 – Alternatives Carried Forward for Detailed Study