MID-STATES CORRIDOR

APPENDIX D: SCREENING OF ALTERNATIVES REPORT

Mid-States Corridor
Tier 1 Environmental Impact Statement

Prepared for

Indiana Department of Transportation
Mid-States Corridor Regional Development Authority

FEBRUARY 2020

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INDIANA DEPARTMENT OF TRANSPORTATION
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Construction Cost Estimates

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Purpose and Need

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**.

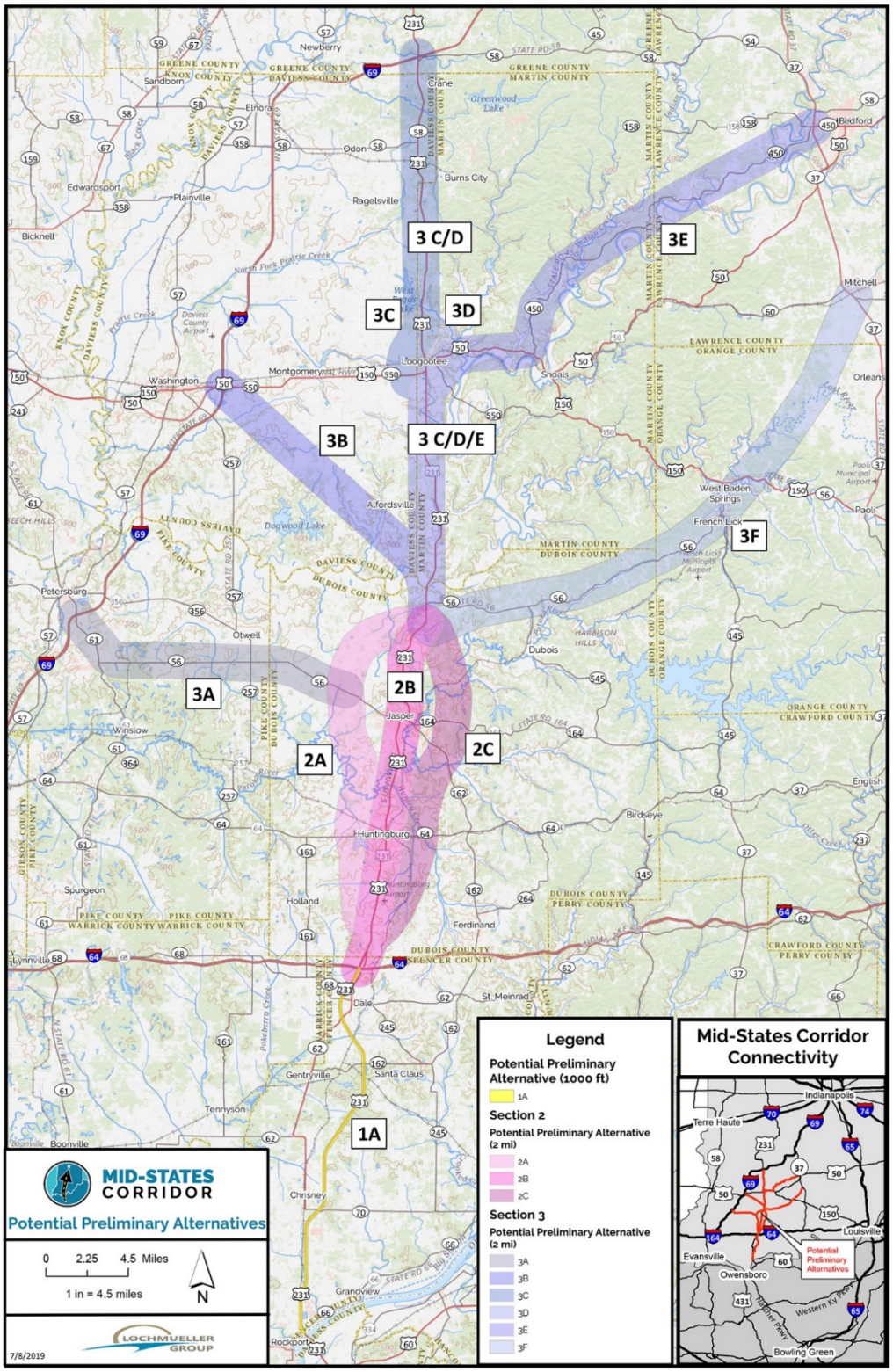
1.1 Previous Studies

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;

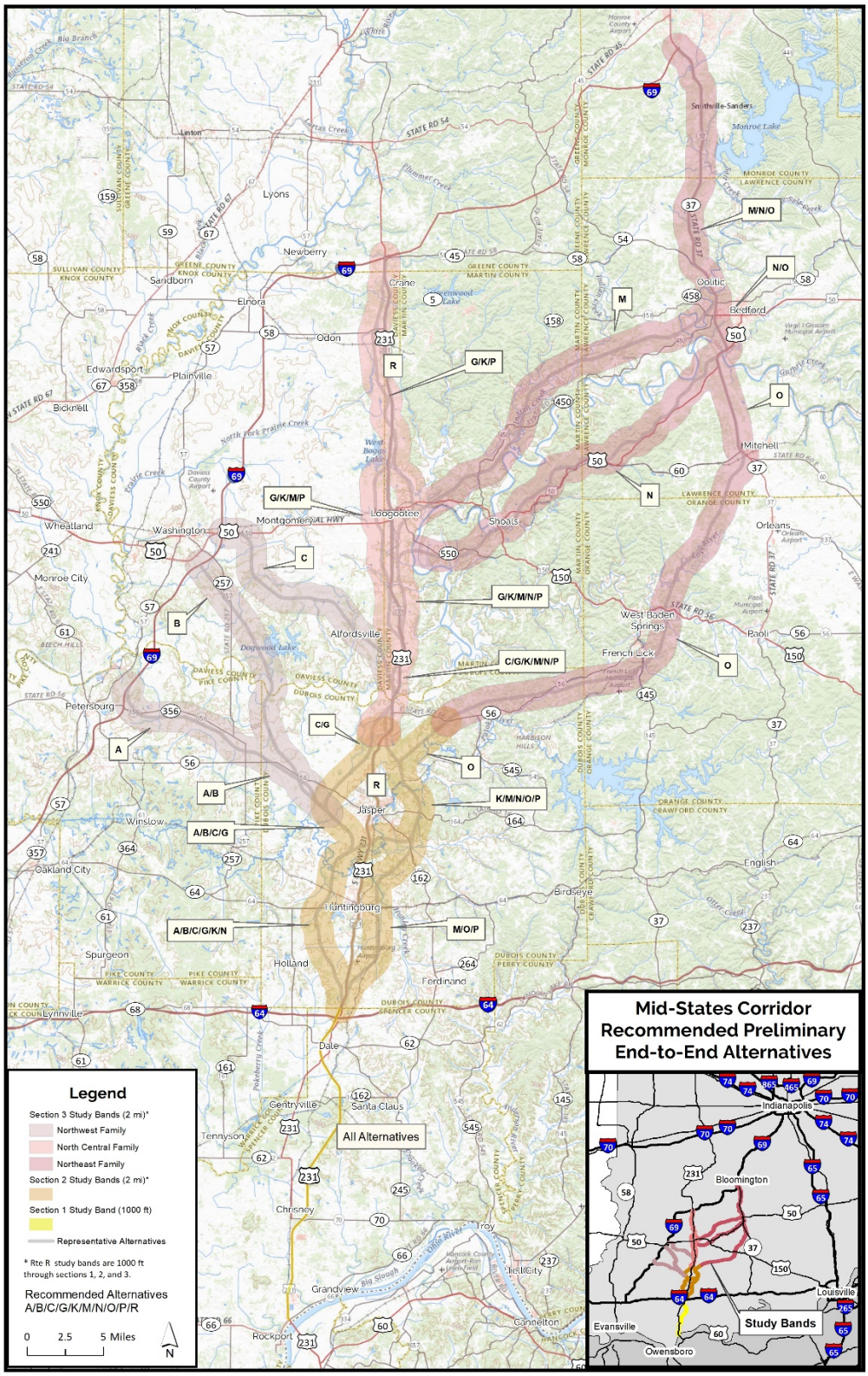
- **Impacts to many resources.** Screening analysis considers impacts to eight types of natural resources and four types of human resources. DEIS will consider impacts to approximately twice this number of resources.
- **All costs.** Screening analysis considers only construction costs. It does not consider 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. The **Preliminary Alternatives Appendix** is provided separately as **Appendix C** in this FEIS.

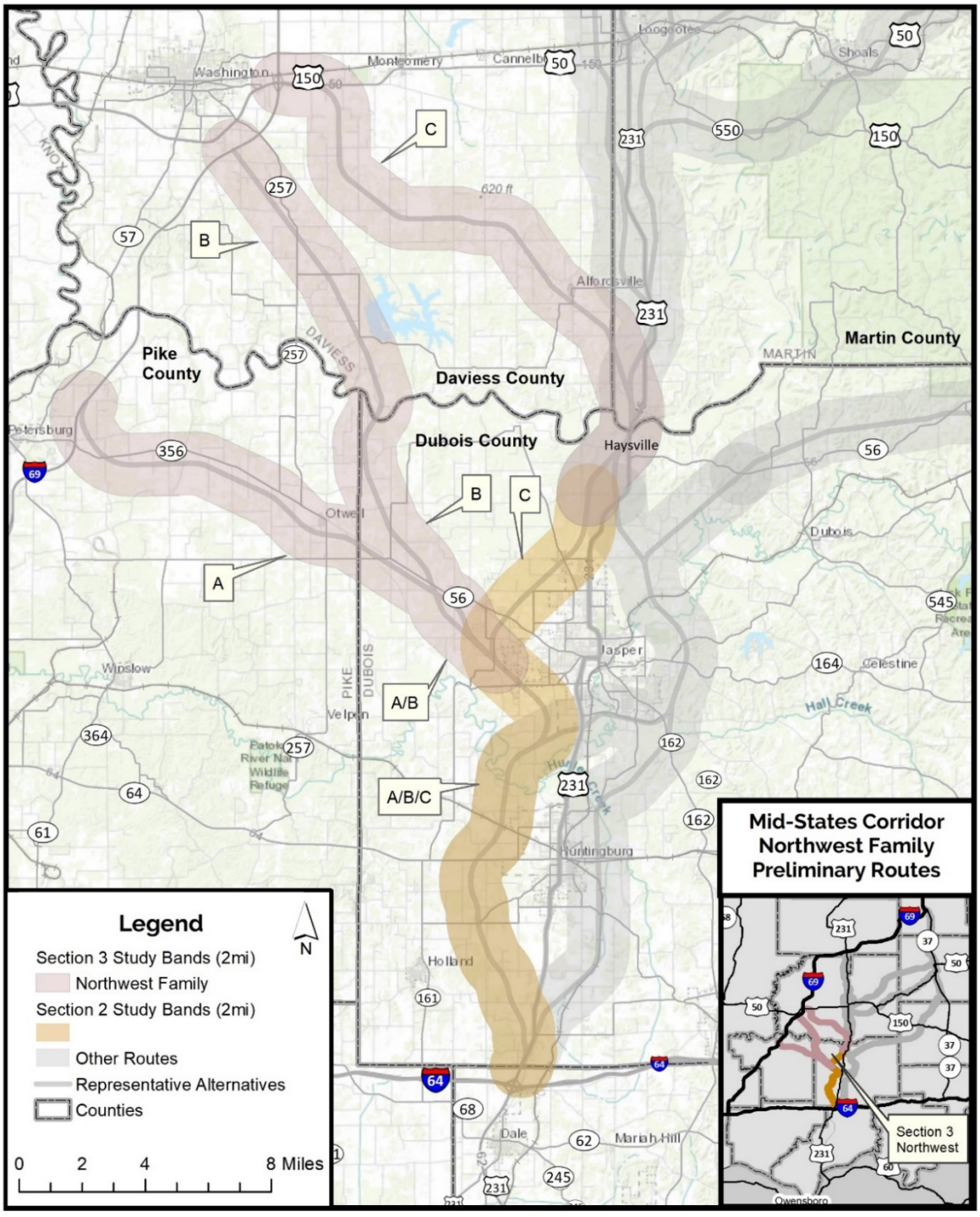
Table 1-1 – Preliminary Alternatives

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

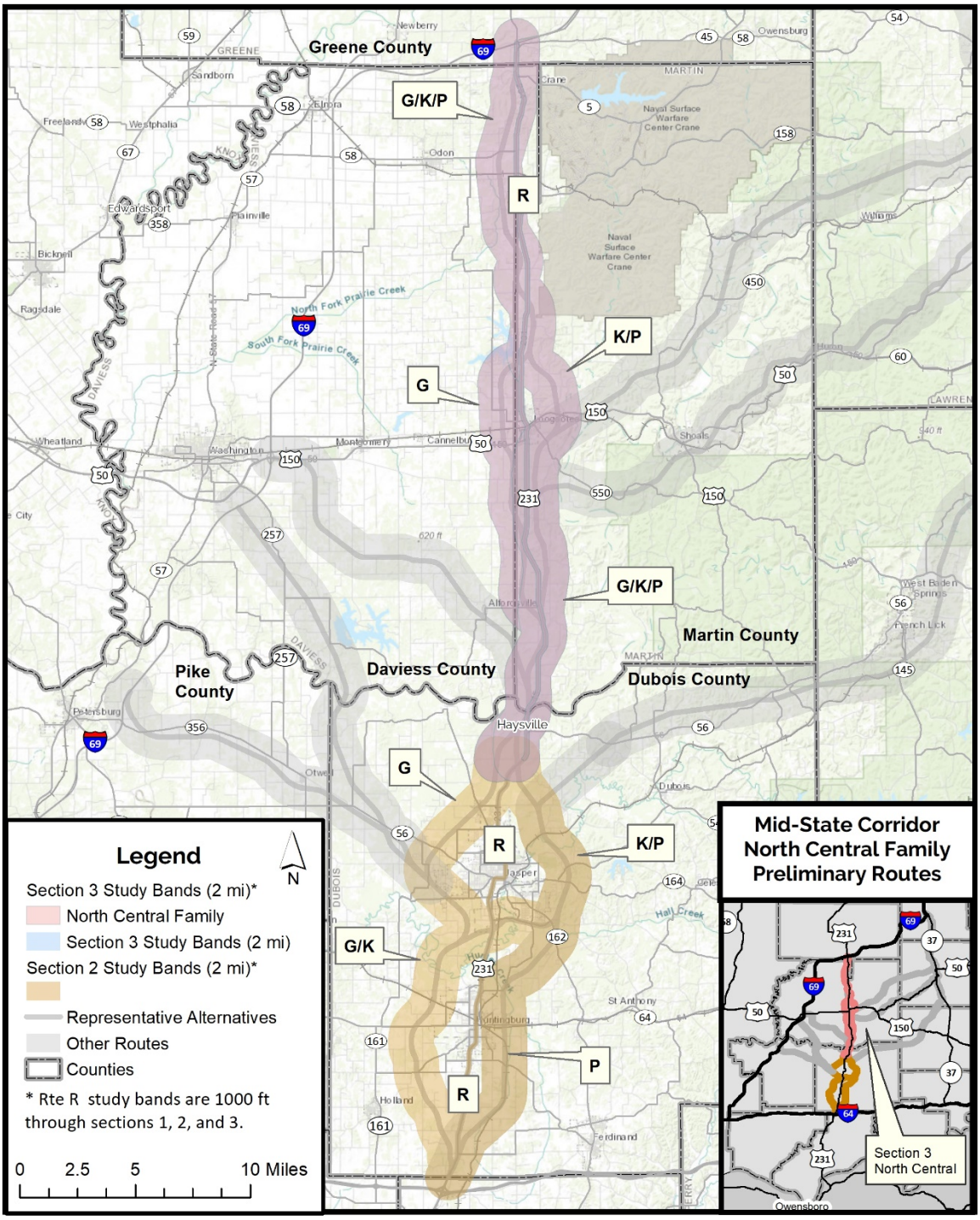
Preliminary alternatives in the Northwest Family terminate at I-69 in Pike or Daviess County.

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.

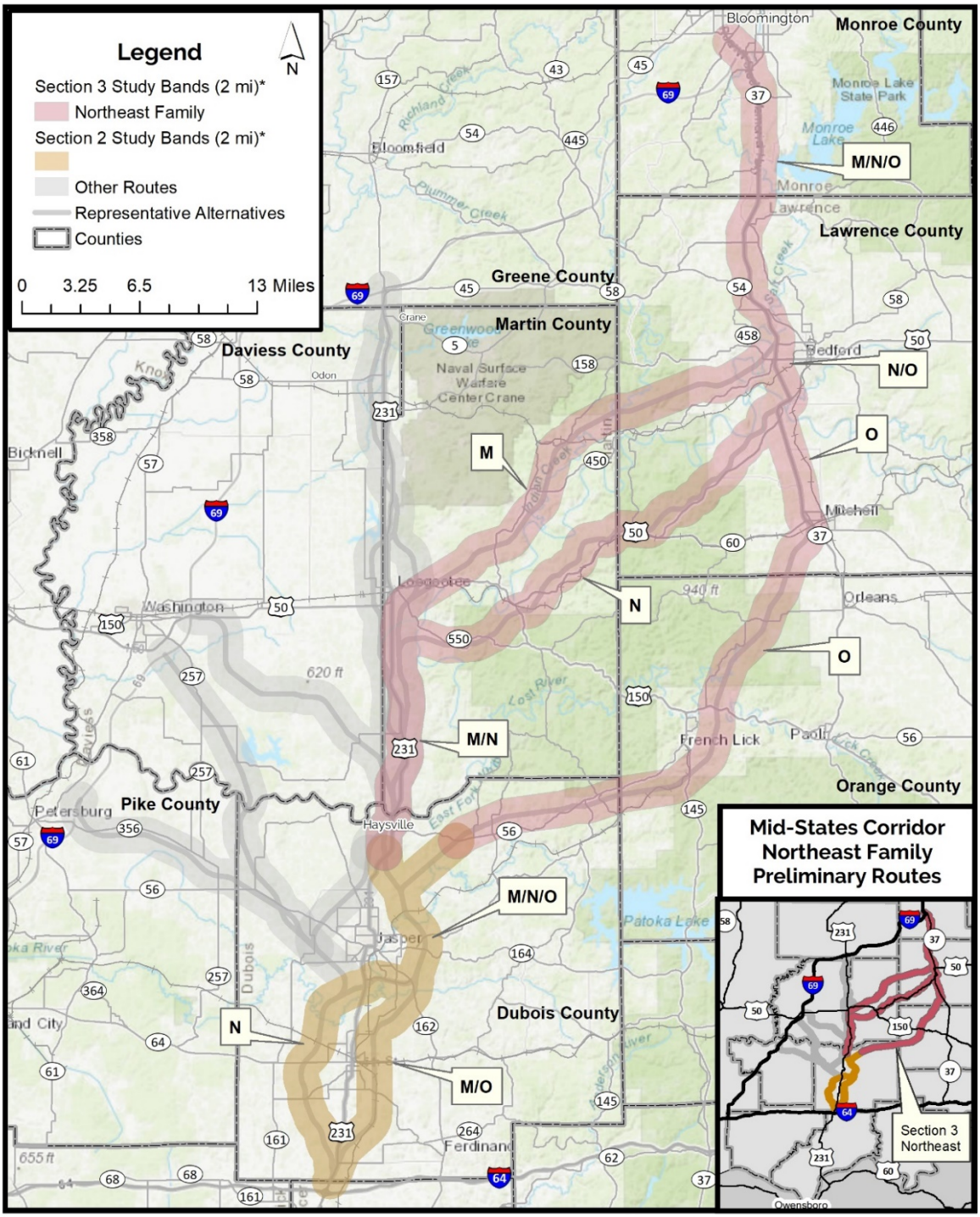
Preliminary Alternative "G" extends 55 miles from I-64/US 231 to I-69 at the existing US 231 interchange. This alternative begins at the I-64/US 231 interchange bypasses Huntingburg and Jasper to the west, avoiding developed areas near these cities. It then continues north, parallel to and west of the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

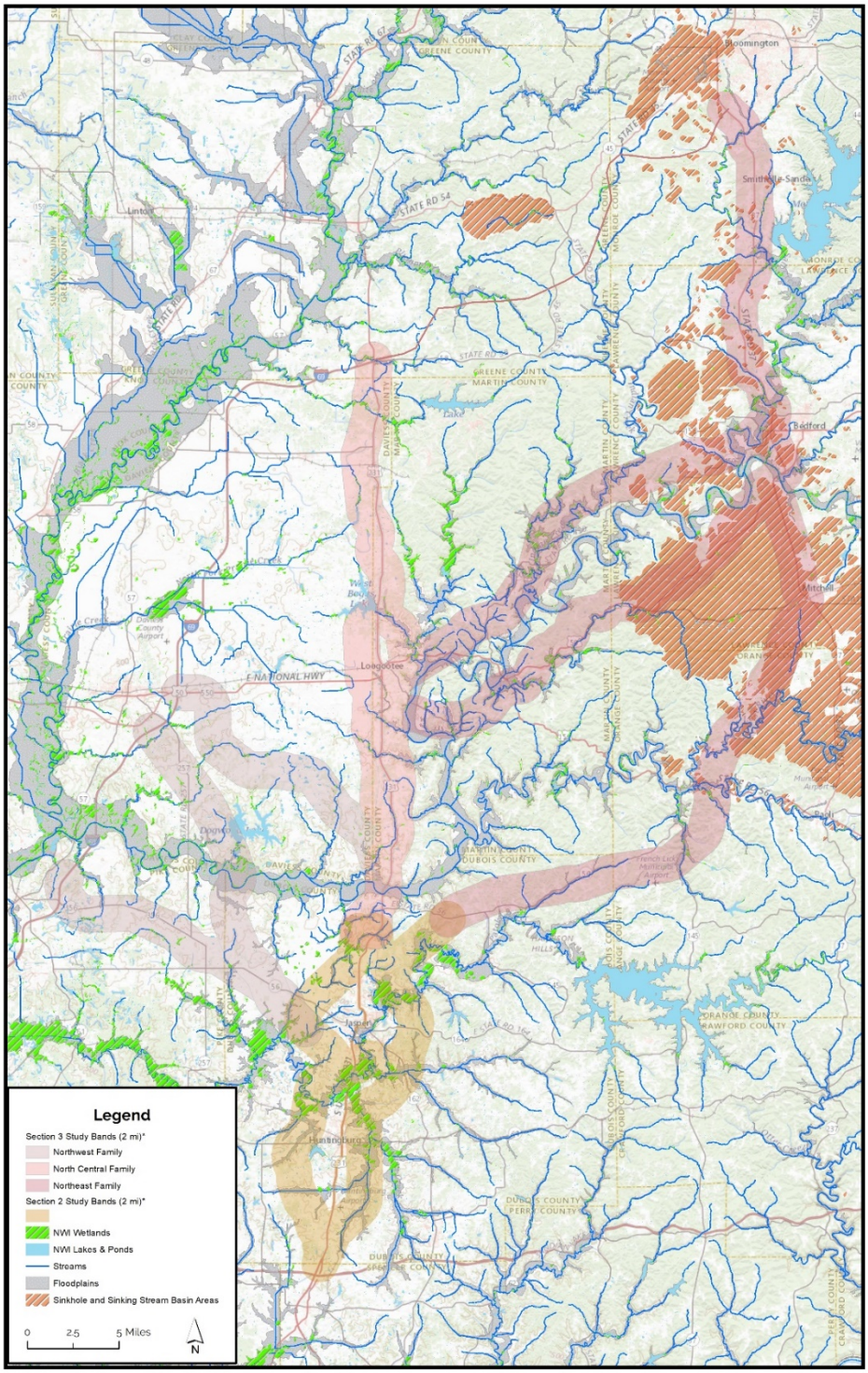
2.4.3 Karst Resource Impacts

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:

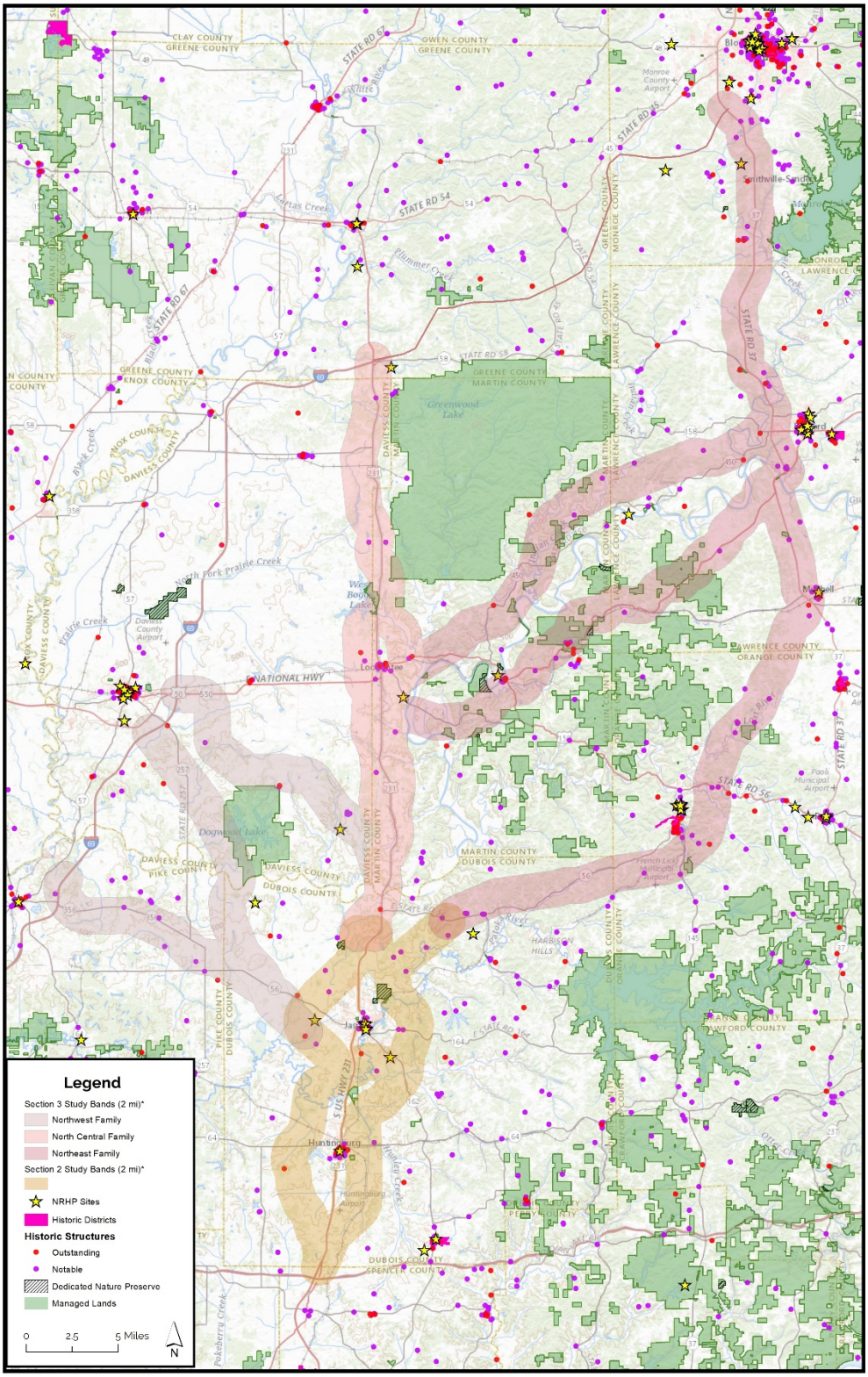
- Dubois County
  - Huntingburg Town Hall and fire Engine House,
  - John Opel House (southeast Jasper)
  - Saint Joseph Catholic Church, Gramelspacher-Gutzweiler house, Dubois County Courthouse, Louis H. Sturm Hardware Store (downtown Jasper)
  - Shiloh Meeting House and Cemetery (west Jasper)
  - Lemmon's 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*).

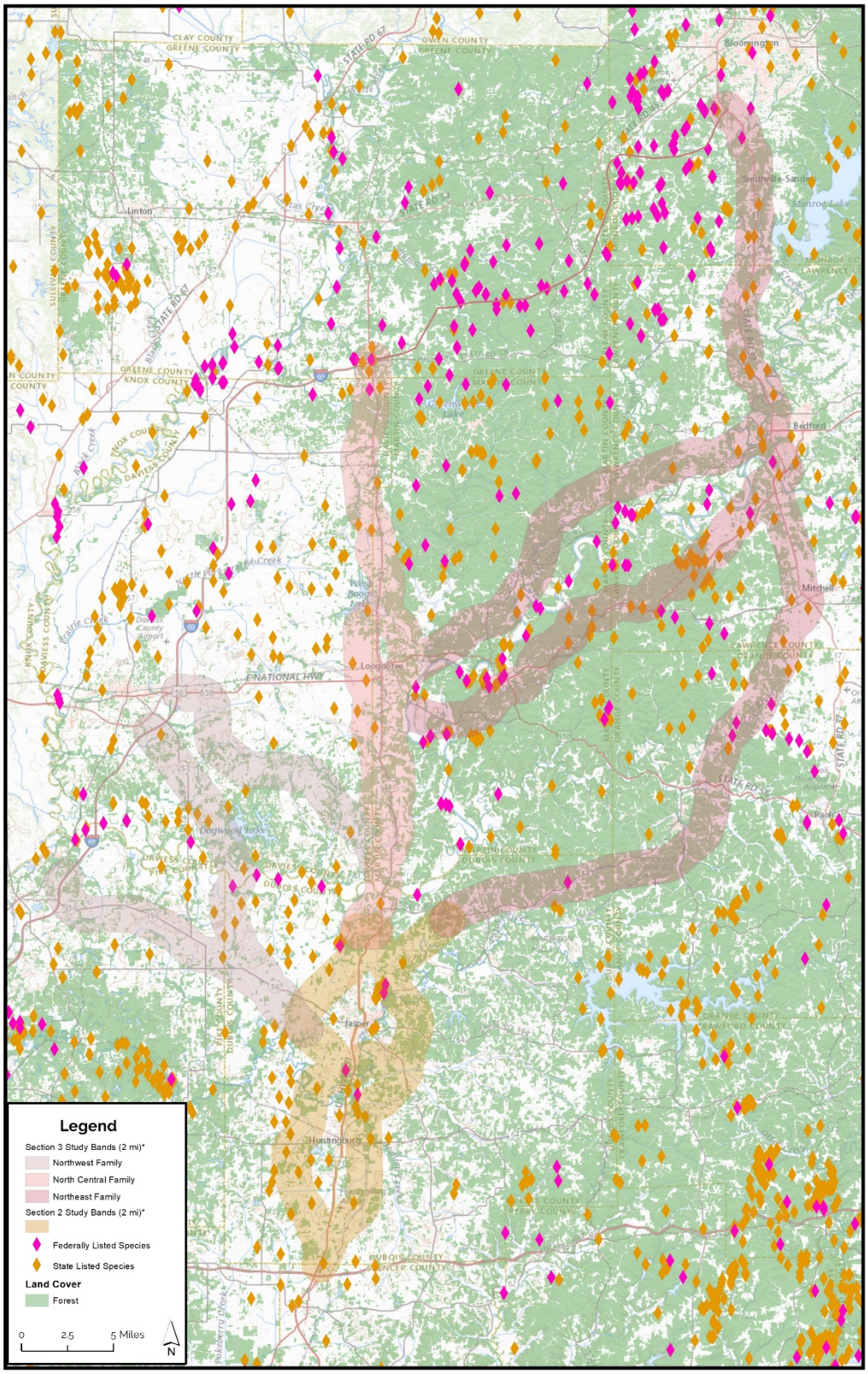
[5] Letter from Scott Pruitt, USFWS to Jason DuPont, Lochmueller Group. September 12, 2019

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

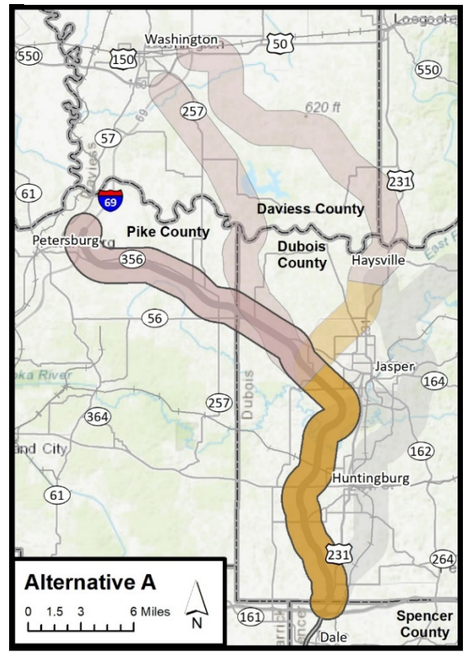


Figure 3-2 - Alternative B

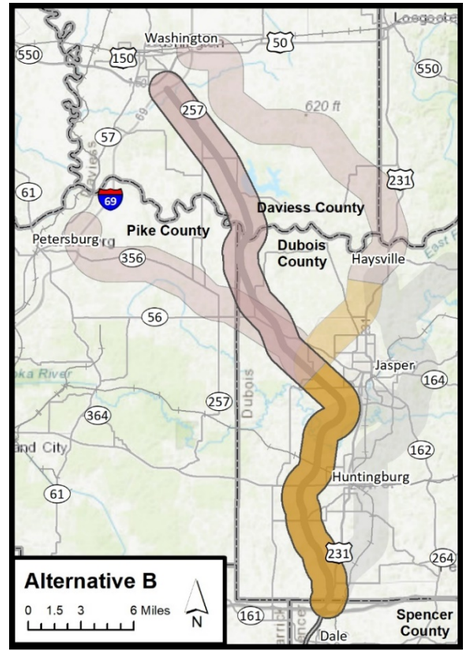
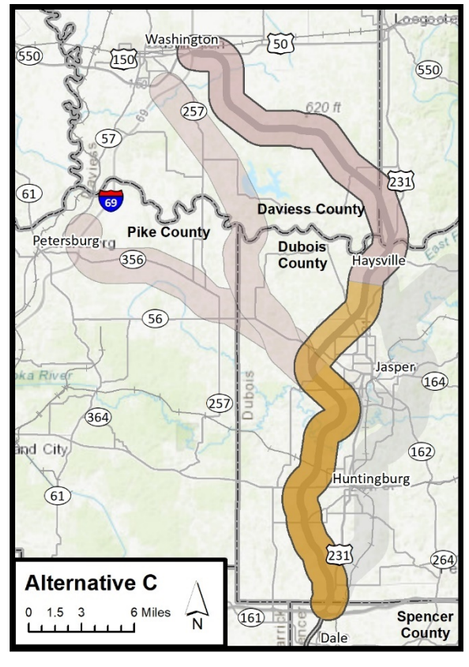


Table 3-1 - Northwest Family of Alternatives - Preliminary Alternatives Evaluation

			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

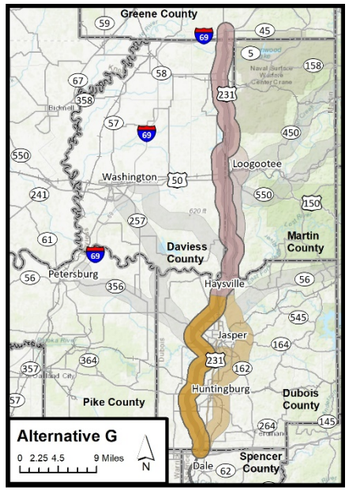
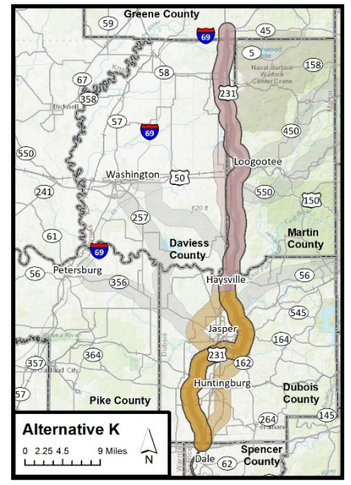


Figure 3-5 – Alternative K



[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

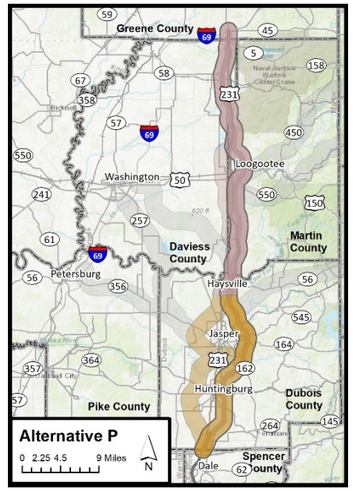
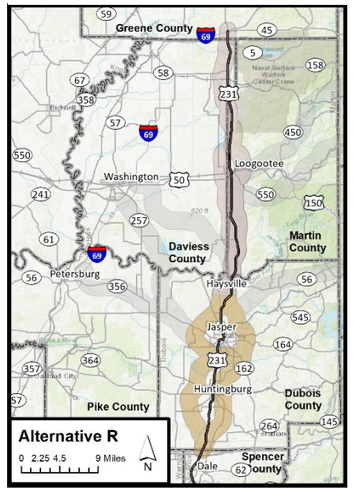


Figure 3-7 - Alternative R



[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

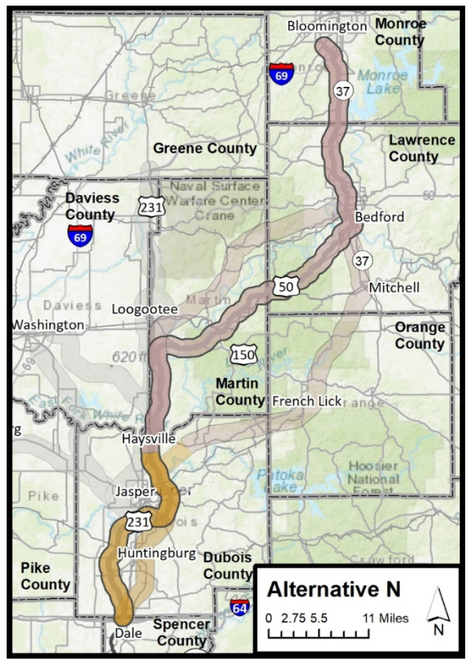
All alternatives are in the second cost quintile for the Super-2 facility type, the third cost quintile for the Expressway facility type, and the fifth (highest) cost quintile for the Freeway facility type. Cost is not a significant differentiator between alternatives of the same facility type.

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)

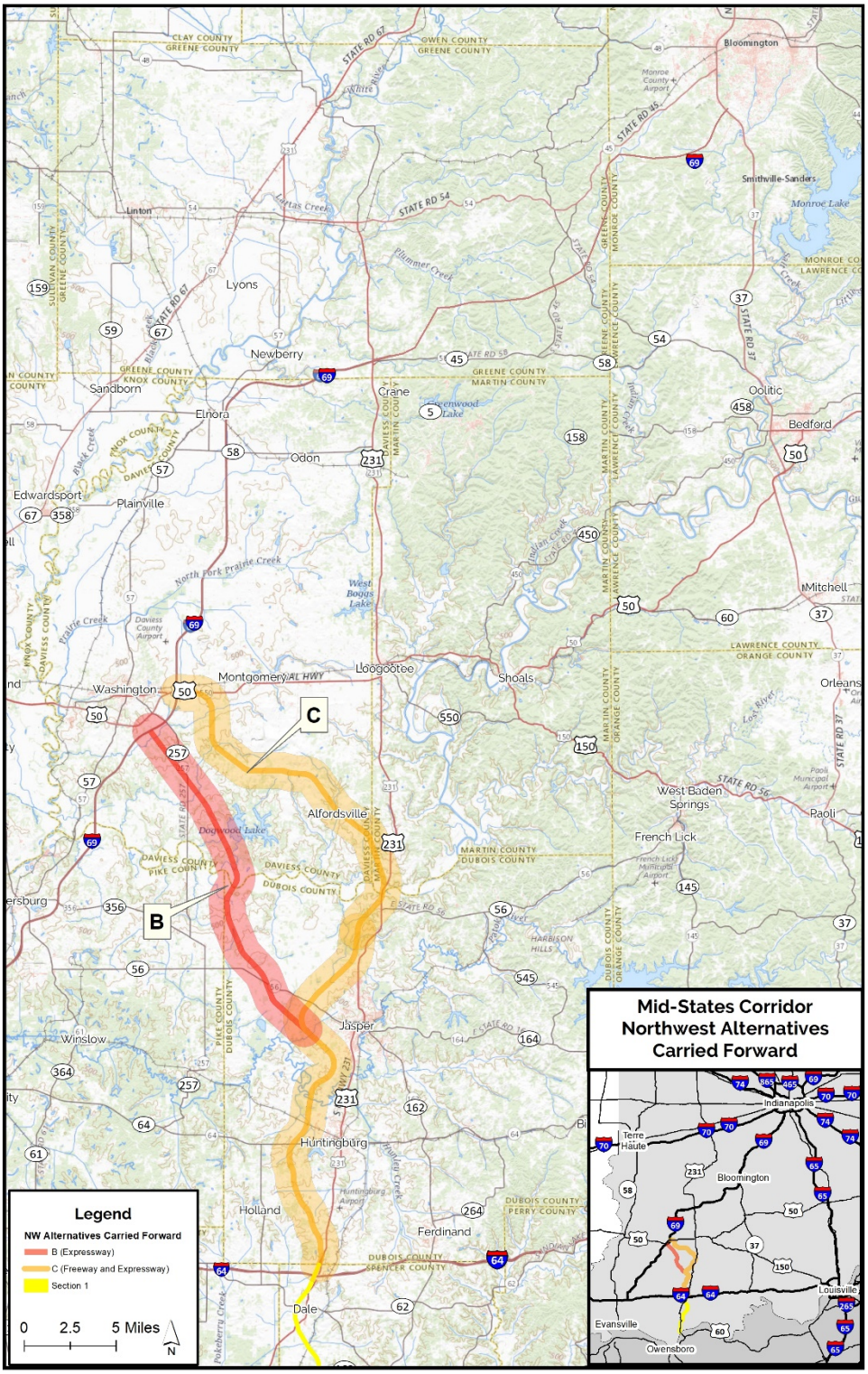
In summary, the following alternatives are being recommended as alternatives carried forward for detailed study in the Northwest Family include:

- 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.

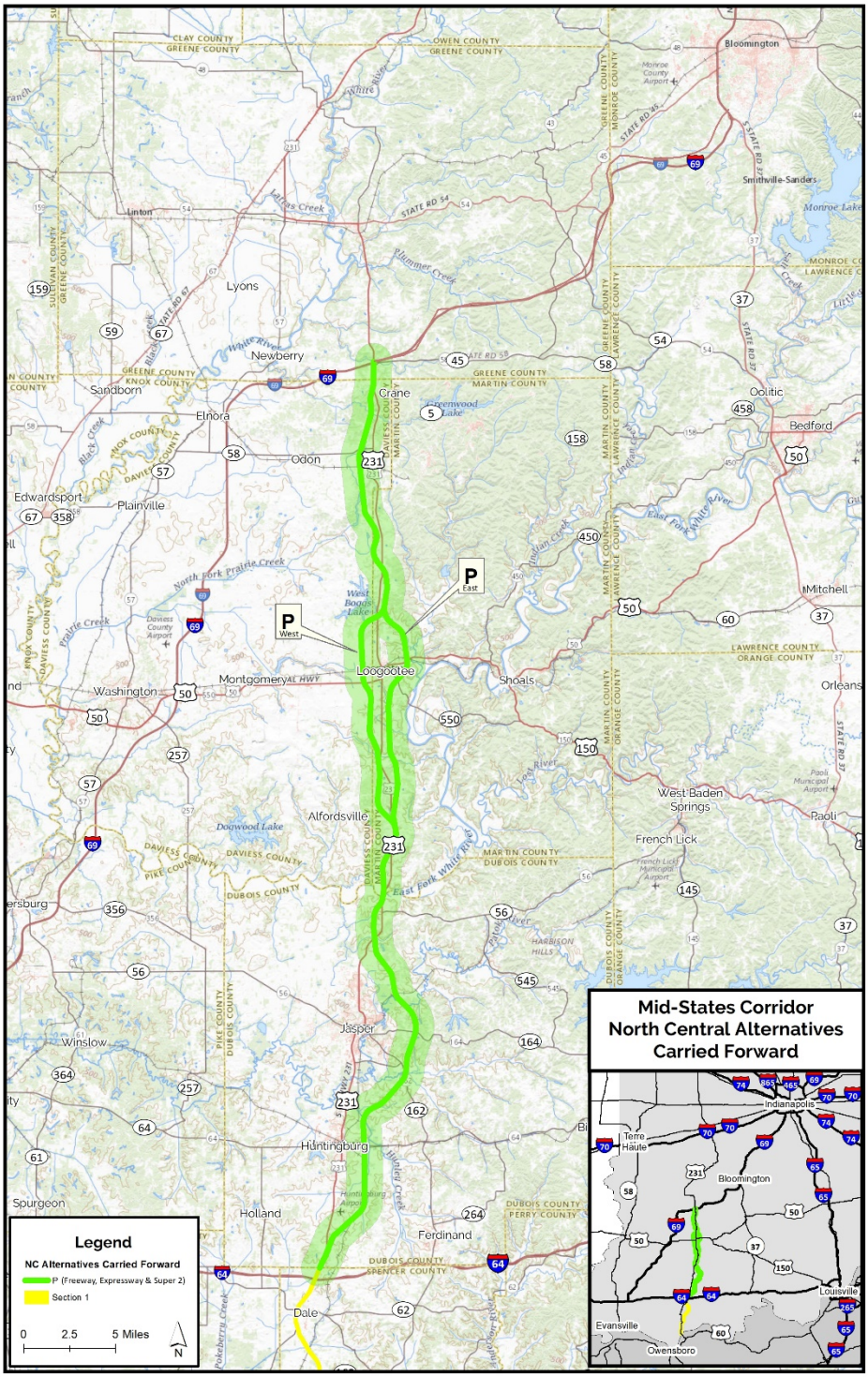
In summary, the following alternatives are being recommended for additional analysis:

- 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.

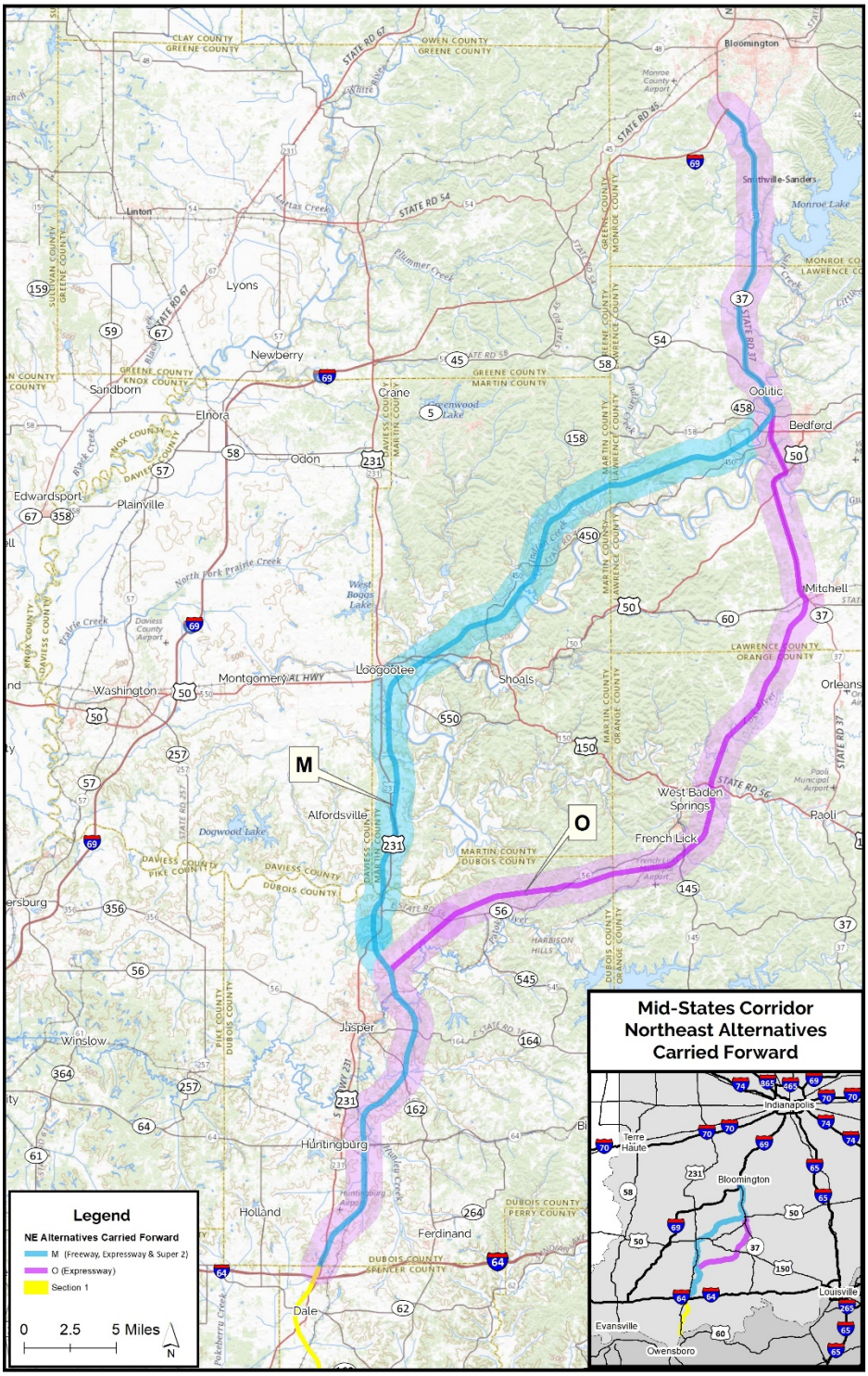
Overall Alternative M has higher levels of performance. It also attracts higher traffic levels. Alternatives M and O have similar costs and impacts; however, Alternative O has higher impacts to karst resources (a key resource in this geographic region), as well as higher impacts to streams and listed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

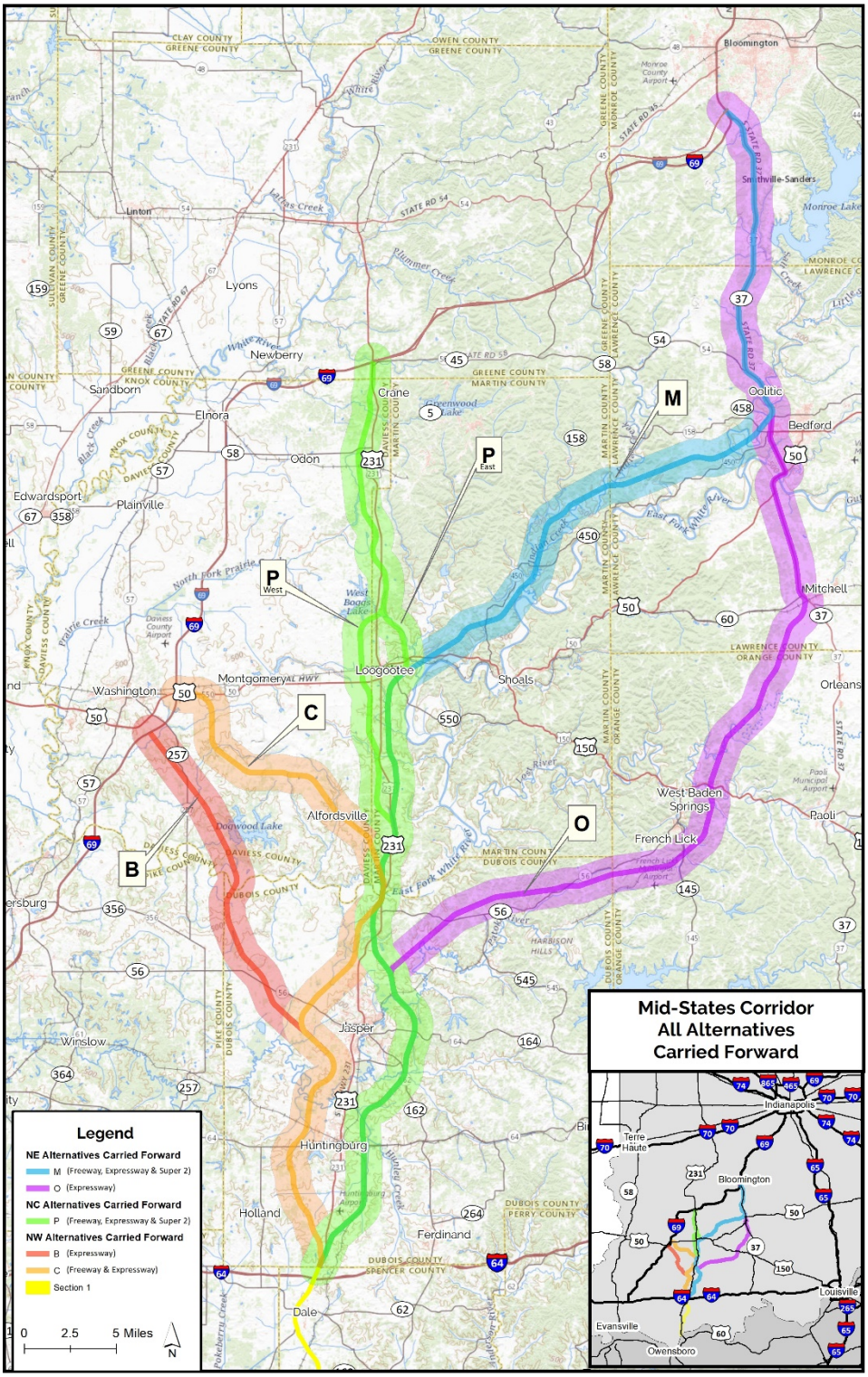


3.3 Summary Recommendations

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



MID-STATES CORRIDOR

SCREENING OF ALTERNATIVES REPORT

NON-HIGHWAY ALTERNATIVES ANALYSIS APPENDIX

Mid-States Corridor
Tier 1 Environmental Impact Statement

Prepared for

Indiana Department of Transportation

Mid-States Corridor Regional Development Authority

FEBRUARY 2020

Prepared by

Mid-States Corridor Project Consultant

INDIANA DEPARTMENT OF TRANSPORTATION INDOT

LOCHMUELLER GROUP
Reinvent Your Future

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1. INTRODUCTION

An important component of an environmental impact statement is the evaluation of alternatives to the proposed action. This ensures that decision-makers do not bypass less environmentally impactful or lower cost strategies. This Non-Highway Alternatives Analysis reviews existing strategies, services, programs, and policies available in the Study Area that potentially could address the project's Purpose and Need. This analysis provides an overview of alternatives and how effectively each could address the Purpose and Need goals identified for the Mid-States Corridor Tier 1 Environmental Impact Statement (EIS).

1.1 Purpose and Need

The purpose[1] of the Mid-States Corridor project is to provide an improved transportation link between the US 231/SR 66 and I-69 (either directly or via SR 37) which

1. Improves business and personal regional connectivity in Dubois County and Southern Indiana;
2. Improves regional traffic safety in Southern Indiana;
3. Supports economic development in Southern Indiana; and
4. Improves highway connections to existing major multi-modal locations from Southern Indiana.

1.2 Non-Highway Alternatives

Section 2 describes non-transportation alternatives which are available within the project Study Area. **Section 3** describes non-personal car alternatives which are available within the Study Area. **Section 4** assesses both the non-transportation alternatives and non-highway transportation alternatives for their potential to satisfy the Purpose and Need for the Mid-States Corridor EIS.

2 NON-TRANSPORTATION ALTERNATIVES

Section 2 describes non-transportation programs which can be used to support the Mid-States EIS Purpose and Need, especially the components related to economic development.

2.1 Opportunity Zones

Opportunity zones are designed to spur economic development by providing tax benefits to investors. Investors can defer tax on any prior gains invested in a Qualified Opportunity Fund (QOF) until the earlier of the date on which the investment in a QOF is sold or exchanged, or December 31, 2026. If the QOF investment is held for longer than five years, there is a 10% exclusion of the deferred gain. If held for more than seven years, the 10% becomes 15%. Also, if the investor holds the investment in the

[1] See *Draft Purpose and Need Statement, Mid-States Corridor Tier 1 EIS*. Available at https://midstatescorridor.com/project-documents/.

Opportunity Fund for at least 10 years, the investor is eligible for an increase in basis cost of the QOF investment equal to its fair market value on the date that the QOF investment is sold or exchanged.

The Tax Cuts and Jobs Act of 2017 allowed governors to nominate certain census tracts as Opportunity Zones, subject to approval from the U.S. Department of Treasury. Up to 25% of a state's low-income census tracts were eligible for designation, which permitted Indiana to nominate up to 156 census tracts as Opportunity Zones.

To be eligible as an Opportunity Zone, census tracts had to qualify as "low-income." To do so, the census tract must have met one of the following requirements:

- The tract has a poverty rate of at least 20%; or
- For a census tract in a metropolitan area, the tract's median family income does not exceed 80% of the greater of: (A) the metropolitan area median family income or the statewide median family income; or (B) For a census tract in a non-metropolitan area, the tract does not exceed 80% of the statewide median family income.

However, if the census tract is located within a high migration rural county, the tract qualifies as low-income if it does not exceed 85% (as opposed to 80%) of statewide median family income. A "high migration rural county" is any rural county that, during the 20-year period ending with the year in which the most recent census was conducted, has a net out-migration of inhabitants from the county of at least 10% of the county population at the beginning of such period.

Eight of the 12 counties in the Study Area have Opportunity Zone census tracts. Four are in Monroe County. Crawford, Daviess, Dubois, Lawrence, Orange, Perry, and Pike counties each have one. Opportunity Zones within the Study Area are listed in **Table A-1** in the **Appendix** and depicted in **Figure 2-1**.

Figure 2-1 – Opportunity Zones (shown in blue) within the Mid-States Study Area

Rural Opportunity Zone Initiative

The Indiana Office of Community and Rural Affairs (OCRA) collaborated with Purdue Center for Regional Development (PCRD) to apply for a USDA Rural Business Enterprise Grant (RBEG). The purpose of the project is to build the capacity of rural-based Opportunity Zones in Indiana. The goals of the RBEG are:

- Inform and educate local officials, organizations, and residents located in Indiana's Rural Opportunity Zones about the key elements of the Opportunity Zone legislation.
- Identify and recruit six Rural Opportunity Zones committed to producing an economic development prospectus to guide and attract private, public and philanthropic investments.
- Develop and market the Opportunity Zone Investment Portfolios of the targeted sites.
- Support the launch of economic development-related programs in interested Opportunity Zones.
- Develop and track key metrics to determine the impacts of the RBEG in launching economic development activities and attracting investments that improve the economic health of the targeted sites.

Of the 156 Indiana Opportunity Zones, 46 are Rural Opportunity Zones based on the OCRA analysis. The 46 communities are eligible to apply to the Rural Opportunity Zone Initiative and six will receive technical assistance and capacity-building support provided by a statewide team of university and agency professionals.

2.2 Tax Abatements

Tax abatements are a common way for local governments to attract private investment and create jobs. Within the 12-county Mid-States region, nearly all counties participate in this program, authorized in the Indiana Code (IC) 6-1.1-12.1 – Deduction for rehabilitation or redevelopment of real property in economic revitalization areas (ERA) program. For a list of total deductions in US dollars due to tax exemptions and abatement activities in each of the 12 Study Area counties from years 2011 to 2017, see **Table A-2** in the Appendix.

Eligibility

Property owners in a locally-designated Economic Revitalization Area (ERA) who make improvements to real property or install eligible new or used personal property may qualify for tax abatement. Eligible uses for tax abatement of real property include manufacturing, research and development, information technology, and logistical distribution. Real property abatements can be granted for both new construction and rehabilitation. The abatement in these cases is limited to the increase in assessed value attributable to the new construction or rehabilitation. The purchase of land does not qualify for tax abatement. Manufacturing equipment must not have been taxed in Indiana to qualify for abatement. Personal property such as laboratory equipment and computers used in experimental research is also eligible for tax abatement.

Duration of Abatement

In Indiana, business property tax abatements are approved by local city and/or county councils for a maximum of 10 years for real property and five years for personal property. Abatement that is granted for multiple years is reduced each year according to a sliding scale. Only in year one is the total amount of new assessed value exempt from property tax. In each succeeding year, the share of the previously exempted assessed value that is taxable increases, decreasing the total discount to the property owner.

In most cases the granting of tax abatement will reduce the amount of property taxes paid by the owner by approximately 50%over the full abatement period.

2.3 Tax Increment Financing

Tax increment financing (TIF) is a public financing method which subsidizes redevelopment, infrastructure, and other community-improvement projects in counties in Indiana. With a TIF, municipalities typically divert future property tax revenue increases from a defined area or district to an economic development project or public improvement project in the community. The net assessed value of the allocation area at the time the TIF District is established is known as the "Base Assessed Value (BAV)". The BAV continues to fund all taxing districts that serve the district at the rate in which they were supported at its creation. Any increases in assessed value after the allocation area is established is known as "incremental assessed value." These incremental funds are available for redevelopment projects. **Figure 2-2** displays a basic TIF model.

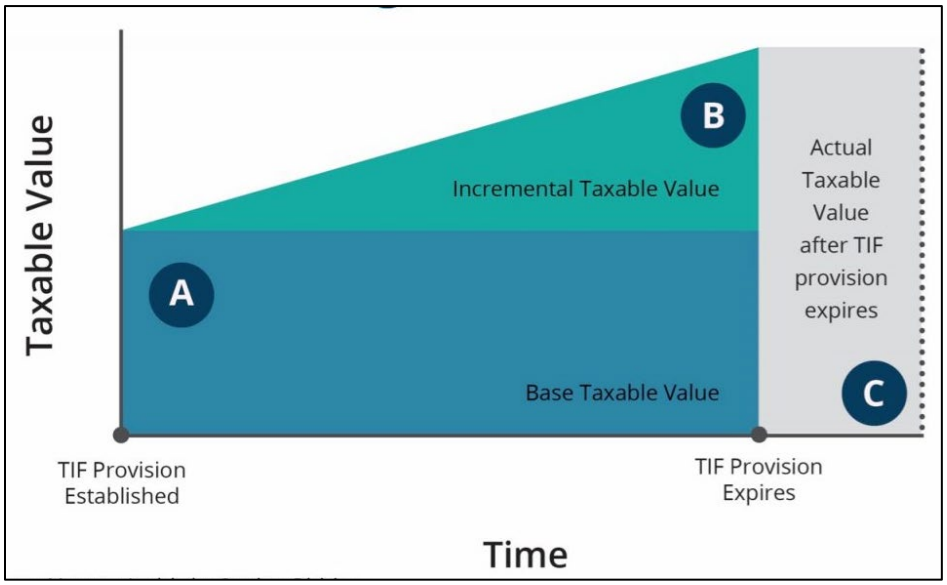

Figure 2-2. Basic TIF Model Illustration
Source: Montana Legislative Services Division

In Indiana, the tax increment generated from the TIF is available for redevelopment that is for "public uses and purposes." Public purposes can include opportunities for redevelopment by private enterprise and the clearance, planning, and redevelopment of areas in need of redevelopment. Public money may be also be spent to acquire private property under this provision. The tax increment is to be spent within the allocation area or serving the allocation area. According to IC 36-7-14-2.5, the TIF funds must benefit the public health, safety, morals, and welfare; increase the economic well-being of the unit and the state; and serve to protect and increase property values in the unit and the state. Common uses of TIF proceeds include:

- Pay expenses of Redevelopment Commission for the public improvements;
- Pay principal and interest on bonds or leases;
- Roads, streets, and sidewalks for access to new development;
- Construction of water and sewer lines;
- Acquisition of real estate;

- Parking facilities;
- Street lighting.

When the TIF expires, the distinction between base assessed value and incremental assessed value is eliminated. The total assessed value reverts to the tax base of the taxing units that serve the district. If successful, the redevelopment projects within the TIF should result in a significant increase in tax base. **Table 2-1** shows the net assessed value of property in TIF areas in the project Study Area.

Table 2-1. Mid-States Study Area Counties – Net Assessed Value of Properties in TIF Districts (2017)

County	Total TIFs	Net Assessed Value
Monroe	11	$ 1,267,839,201
Dubois	8	$ 273,779,413
Daviess	8	$ 194,102,548
Lawrence	5	$ 201,892,647
Warrick	4	$ 234,481,212
Spencer	4	$ 152,953,120
Orange	4	$ 149,393,213
Perry	4	$ 69,817,292
Pike	3	$ 21,948,379
Greene	2	$ 39,127,695
Crawford	1	$ 8,126,540
Martin	1	$ 4,016,355

Source: Interactive Map Accessed October 15, 2019 via http://gateway.ifionline.org/TIFviewer/

2.4 Community Development Financial Institutions (CDFIs)

Bank Enterprise Awards (BEA)

Investment in economically distressed communities is critical to their revitalization. Through the Bank Enterprise Award Program (BEA Program), the CDFI Fund provides monetary awards to FDIC-insured depository institutions (i.e., banks and thrifts) that successfully demonstrate an increase in their investments in CDFIs or in their own lending, investing, or service activities in the most distressed communities. BEA Distressed Communities are defined as census tracts in which at least 30%of residents have incomes that are less than the national poverty level and where the unemployment rate is at least 1.5 times the national unemployment rate. Qualifying and partially qualifying Distressed Communities tracts communities are depicted in **Figure 2-3**. Qualifying census tracts are those that meet both criteria for percent of residents with poverty level incomes and the rate of unemployment being at least 1.5 times that of the national rate. Partially qualifying tracts are those that do not individually meet these minimum criteria, but if/when combined with one or more directly contiguous tracts do meet those minimum requirements.

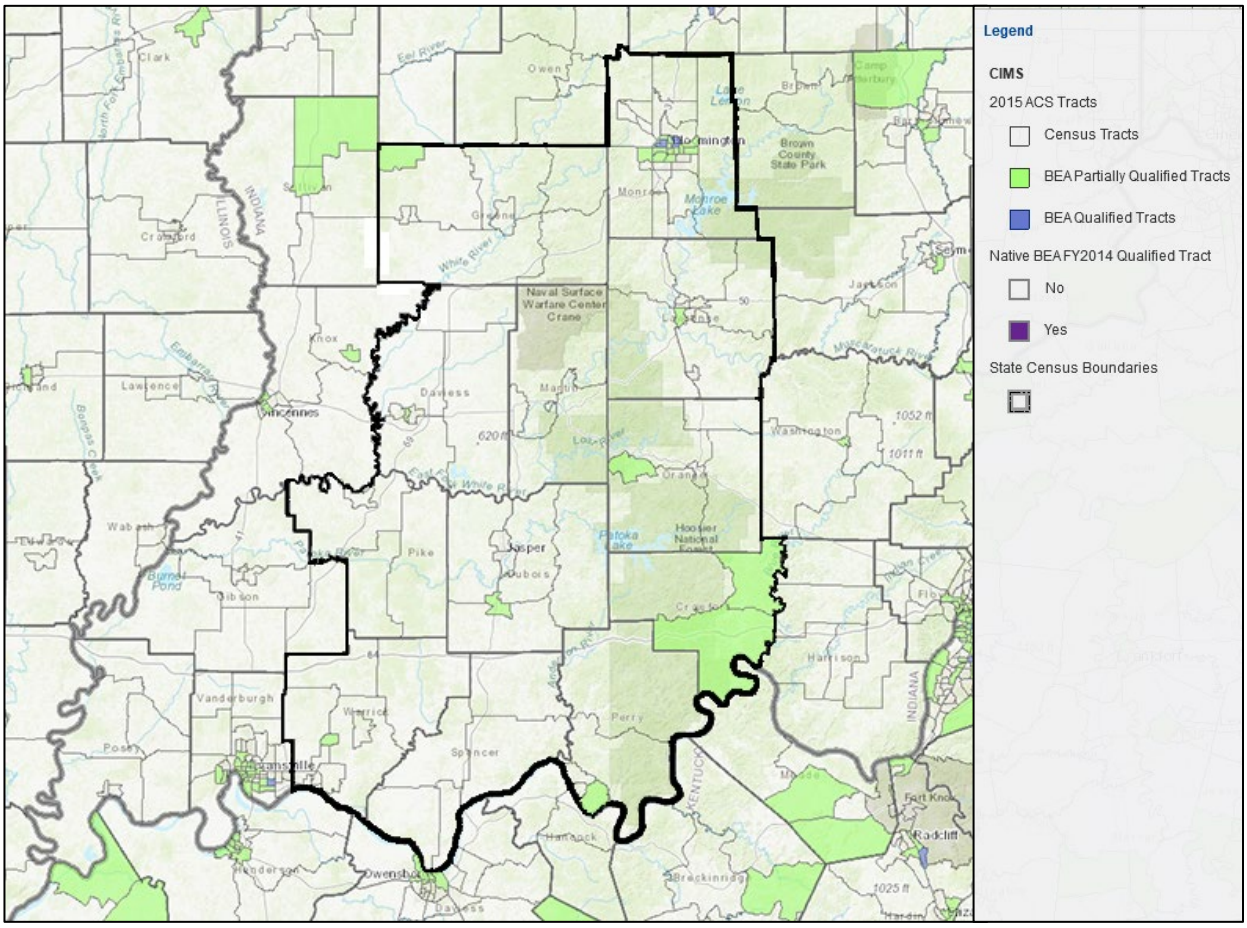

Figure 2-3. Bank Enterprise Award Program Eligible Tracts in Mid-States Study Area

Leveraging BEA Program awards increases the flow of capital to the most distressed communities and creates sound and scalable economic ripple effects. By multiplying the impact of federal investments with private dollars, the BEA Program increases investments in CDFIs, accelerates the growth of businesses, generates jobs, increases the availability and affordability of housing, improves access to financial products and services, and creates real change in the most distressed communities nationwide.

Capital Magnet Fund

Through the Capital Magnet Fund, the CDFI Fund provides competitively awarded grants to CDFIs and qualified non-profit housing organizations. These awards can be used to finance affordable housing activities, as well as related economic development activities and community service facilities.

New Market Tax Credits (NMTC)

Through the NMTC Program, established in 2000, the CDFI Fund allocates tax credit authority to Community Development Entities (CDEs) through a competitive application process. CDEs are financial intermediaries through which private capital flows from an investor to a qualified business located in a low-income community. CDEs use their authority to offer tax credits to investors in exchange for equity in the CDE. Using the capital from these equity investments, CDEs can make loans and investments to businesses operating in low-income communities on better rates and terms and more flexible features than are otherwise unavailable. In exchange for investing in CDEs, investors claim a tax credit worth 39%of their original CDE equity stake, which is claimed over a seven-year period.

NMTC Eligible Census tracts include those that have either a median family Income at or below 80% of Area Median Income (AMI) in the period of 2006-2010/2011-2015 or have a poverty rate of 20% or greater in the period of 2006-2010/2011-2015. Meeting the NMTC Severe Distress or Non-Metropolitan criteria is based on whether or not a given Census tract meets basic NMTC Eligibility, plus one of the following factors: having a median family income at or below 60% of AMI in the period of 2006-2010/2011-2015; having a poverty rate at or above 30% in the period of 2006-2010/2011-2015; having an unemployment rate of at least 1.5 times the national unemployment rate in the period of 2006-2010/2011-2015; or being in a county that is not part of a metropolitan statistical area. **Figure 2-4** shows the eligible and severe distressed tracts in the Study Area, both of which are eligible for NMTC. A list of the number of qualifying tracts per county in the Mid-States Study Area can be found in **Table A-3** in the Appendix.

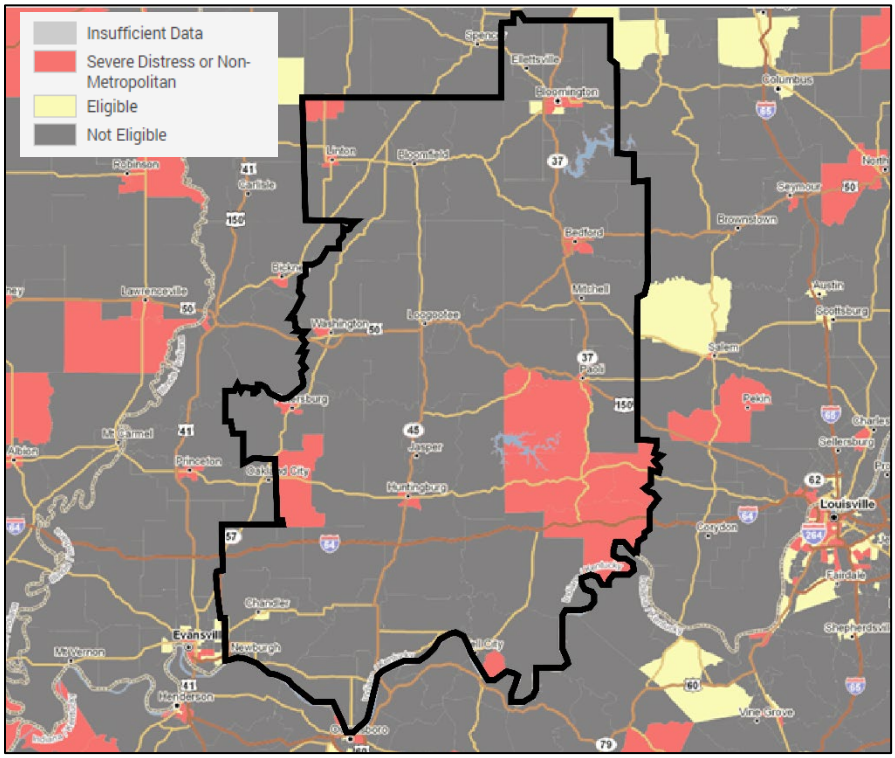

Figure 2-4. Map of NMTC eligible census tracts in Mid-States Study Area[2]

Qualified active low-income community businesses (QALICBs) receive NMTC investments. While called "businesses," QALICBs can be for-profit or nonprofit enterprises. Urban Institute calculations based on data from the CDFI Fund found that for NMTC projects reporting from 2003 to 2015, 61%went to for-profit QALICBs, and 31%to nonprofits. Tribal entities received 0.3%of investments, with the remaining projects missing or described as "other". QALICBs can be used to finance equipment, operations, or real estate. Real estate financing can purchase or rehabilitate retail, manufacturing, agriculture, community facilities (e.g., health services, museums, or charter schools), rental or for-sale housing, or combinations of these.

[2] Interactive Map Accessed October 25, 2019 via https://www.policymap.com/widget?sid=117&wkey=4D2AFE10710D41918F180775F0A353F2

2.5 Job Training

Job training plays an important role in economic development. Workforce training for in-demand skills benefits employers, workers, families, and communities. Following is a summary of job training opportunities within the Study Area.

Skills Enhancement Fund (SEF) Workforce Training Grant[3]

The Skills Enhancement Fund (SEF) is a grant program operated by the Indiana Economic Development Corporation (IEDC) that supports businesses efforts to train and upgrade skills of employees and increase new capital investments. The grant may be used to reimburse a portion (typically 50%) of eligible training costs over a period of two full calendar years from the commencement of the project.

Grants from the SEF must lead to post-secondary credentials, a nationally-recognized industry credential, or specialized company training for both new hires and existing workers. It must also result in an increase in wages for existing employees.

Next Level Jobs[4]

Next Level Jobs is part of Governor Eric Holcomb's Next Level Indiana agenda. It offers free statewide training in in-demand industries and reimbursements for employers of up to $50,000 to train their employees in identified high-growth fields. They offer training in advanced manufacturing, building construction, health and life sciences, IT and business services, and transportation and logistics.

Indiana Division of Workforce Development (DWD)[5]

Indiana's DWD houses several workforce and economic development programs. DWD administers programs and provides resources for employers and job seekers. DWD administers adult education programs authorized by the federal Adult Education and Family Literacy Act (AEFLA, Title II of the Workforce Investment Act (WIA) of 1998). DWD offers professional development resources and programs such as Jobs for America's Graduates (JAG), the Office of Work-Based Learning and Apprenticeship, WorkOne, and others.

- The Office of Work-Based Learning and Apprenticeship develops and implements several work-based learning pathways for youth and adult populations. Pathways include Registered Apprenticeships, State Earn and Learn (SEALs), Adult Education with On the Job Training (OJT), Internship and Capstone Courses, Career and Technical Education (CTEs), and Job Shadowing opportunities.
- DWD operates the Jobs for America's Graduates (JAG) program, a state-based, national non-profit organization dedicated to preventing dropouts among young people who are most at-risk to have serious barriers to graduation and/or employment. JAG's class of 2018's graduation rate was 96% and its employment rate was 65%. About 40% of JAG's 2018 class enrolled in post-secondary education.
- WorkOne offices are the regional representation of the DWD across the state. WorkOne offices provide adult education, workforce development, career services resources, and programs. The project Study Area is part of four of the 12 WorkOne regions (regions 5, 8, 10,

[3] Website Accessed October 16, 2019 via https://iedc.in.gov/incentives/skills-enhancement-fund-sef
[4] Website Accessed October 16, 2019 via https://www.nextleveljobs.org/
[5] Website Accessed October 16, 2019 via https://www.in.gov/dwd/2910.htm

and 11). Ten of the 12 Mid-States counties have WorkOne offices. **Figure 2-5** is a map of WorkOne region boundaries.

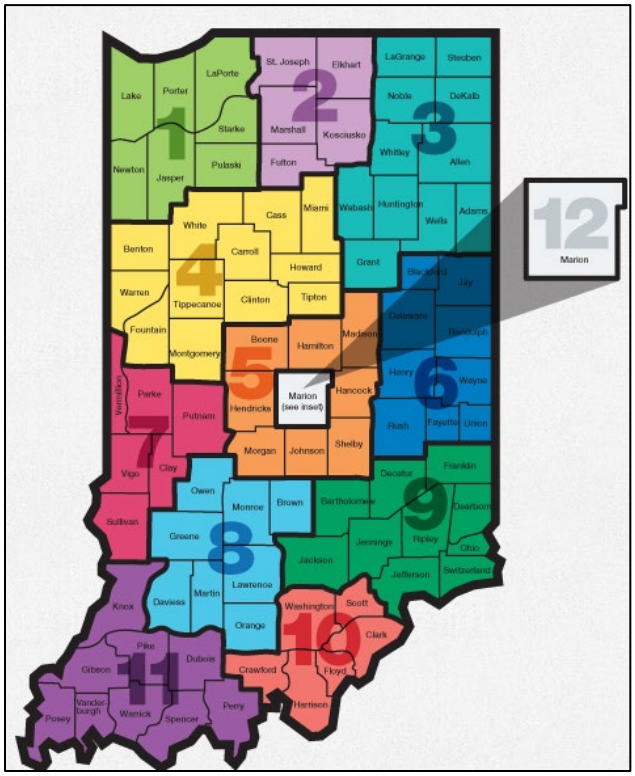

Figure 2-5: WorkOne Regions

Indiana High School Equivalency (HSE)

Indiana HSE offers an alternative to earning a high school diploma statewide. An HSE Diploma can be earned after completing a test based on five subject areas (math, reading, writing, science and social studies). Anyone 16 years of age living in Indiana for at least 30 days who do not already have a high school diploma are eligible to take the text.

Ivy Tech Community College[6]

There are three Ivy Tech Community College campuses within the Study Area (at Linton, Tell City, and Bloomington). Ivy Tech offers college courses whose credits can transfer to Indiana four-year colleges and universities. Students also may earn Associates degrees at Ivy Tech. In the region, Ivy Tech educates students in business, logistics and supply chain, public affairs and social services, information technology, arts, sciences, education, health sciences, nursing, advanced manufacturing, and engineering. Through the Workforce Ready Grant administered by Next Level Jobs Indiana, participants can receive fully funded job training for programs in EMT, HVAC, LPN, Medical Assisting, Business Administration, and IT.

North Lawrence Career Center[7]

The North Lawrence Career Center in Bedford is housed in North Lawrence High School. It serves six school districts in the area (Bedford North Lawrence, Brownstown, Medora, Mitchell, Orleans, and Shoals). These have combined to create Career Center Area 40. Students from all Area 40 schools are eligible to take advantage of any of the NLCC programs. Participating students attend the Career Center for three hours each school day and take their required academic classes at their home school. There is no charge for students to attend; however, most programs require expenditures for book rental, special clothing, and supplies. Students benefit from the quality programs offered and the chance of advanced career and technical education with dual college credits, certifications, and work-based learning opportunities. The NLCC increases workforce employability of area residents.

[6] Website Accessed October 16, 2019 via http://www.stonegateeducation.com/ivy-tech-community-college--bedford.html

[7] Website Accessed October 16, 2019 via https://www.nlcs.k12.in.us/programs/school-improvement/school-plans/31-north-lawrence-career-center/file

Oakland City University[8]

Oakland City University has two satellite campus within the Mid-States area; one in Bedford and the other in Rockport. The University is affiliated with the General Baptist Church. These two campuses focus on adult learning through accelerated degrees, usually completed within 18 months. Areas of study include business, logistics, criminal justice, and strategic management.

NSWC – Crane Division (Martin County) [9]

Through a $14 million annual program from the National Defense Authorization Act Section 219, Crane funds additional research, technology transition, and workforce development programs. Projects ranging from microelectronics to advanced countermeasures deployment were among those funded in the 2019 selection year.

In addition to funding research, technology transition, and workforce development programs, Crane has a local presence that focuses on high school students and the robotics fields. In collaboration with Bloomington High School South, Crane helped fund the BHHS robotics team that will design a mobile and remotely controlled robotic base structure to meet government detailed specifications. The final product the students create will be used by the U.S. Government for technology demonstration and evaluation.

The intention of this collaboration is to support a new generation and incoming workforce with the challenges of the ever-growing field of robotics. Students and Crane benefit from their connection as they enter the workforce and pursue a career in technology and Crane has a pool of local skilled workers to employ.

Vincennes University[10]

Vincennes University has one campus in the Mid-States area in Jasper. This campus partners with local manufacturing companies to advance workforce development through the Career Advanced Partnership (CAP). The partnership provides students a paid internship while enrolled at VUJ full-time. Students work two days a week at a manufacturing partner and attend classes three days a week at VUJ. Students completing the internship will earn an Associate's Degree from Vincennes University which can be support a four-year Bachelor's Degree in fields such as engineering, technology, or business.

Vincennes University also focuses on medical and healthcare related workforce training by offering specialized training for nurses, training to become a certified medical or nursing assistant, a phlebotomy technician program, a dental assistant training program, and others. Vincennes partners with local hospitals and medical services providers such as the Memorial Hospital and Health Care Center to combine in-class and experiential learning for its participants.

Conexus Indiana

Conexus Indiana was created in 2007. It is a statewide group of advanced manufacturing, education and public-sector representatives. Its mission is to accelerate, promote, and grow Indiana's advanced manufacturing and logistics industries. It is involved in workforce development from high school to adult job training. Conexus offers a two-year high school course called Hire Tech that provides high school students with an education in advanced manufacturing and logistics. The course offers students an opportunity to earn industry credentials while in high school, and the course credits can count towards a

[8] Website Accessed October 18, 2019 via https://www.cappex.com/colleges/oakland-city-university
[9] Website Accessed October 16, 2019 via http://www.radiusindiana.com/cranes-innovation-program-expands-research-and-opportunities-for-the-region/
[10] Website Accessed October 16, 2019 via https://www.vinu.edu/web/jasper-campus

degree in higher education. Conexus also places high school students in a six-week summer internship program.

Conexus connects college students across the Midwest with other students and Indiana employers in a "case competition" where teams solve an advanced manufacturing business case. Conexus also hosts networking events for college students to connect with employers.

Conexus's Catapult Indiana provides entry-level workforce training program for Indiana residents with the skills and competencies for careers in manufacturing. The program partners with industry leaders to identify and meet current and emerging industry needs, build a talent pipeline, expand employment participation, and increase worker wages. Statewide more than 3,000 employees have completed training through Catapult.

Conexus supports veteran workforce development through INvets which connects Indiana companies with veterans as they exit the military. Participating companies value the skills and work ethic of veterans and find employment opportunities for them within their companies.

2.6 Improving Business Access to Capital

Small Business Administration (SBA) Loans

The Small Business Administration works with lenders to provide loans to small businesses. The agency doesn't lend money directly to small business owners. Instead, it sets guidelines for loans made by its partnering lenders, community development organizations, and micro-lending institutions. The SBA reduces risk for lenders and makes it easier for them to access capital. That makes it easier for small businesses to get loans. Small businesses loans can be made for as little as $500 to as much as $5.5 million. To receive an SBA loan, the business must have exhausted all other options and not receive funding from any other financial lender. **Table 2-2** lists the number of SBA loans by county in the study area from October 1, 2018 to September 30, 2019.

Table 2-2: Number of SBA loans by County (FY 2019)

County	Number of SBA Loans
Crawford	0
Daviess	5
Dubois	1
Greene	2
Lawrence	2
Martin	0
Monroe	16
Orange	0
Perry	0
Pike	1
Spencer	1
Warrick	17

Capital Access Program–State Small Business Credit Initiative (CAP-SSBCI)[11]

The Small Business Jobs Act of 2010 created the State Small Business Credit Initiative (SSBCI) to provide direct support to states for use in programs designed to increase access to credit for small businesses. The U.S. Treasury allocated funds to the State of Indiana to provide funding for the Indiana Capital Access Program–State Small Business Credit Initiative (CAP-SSBCI). CAP-SSBCI is a small business credit enhancement program that creates a specific cash reserve fund for a lender to use as additional collateral for loans enrolled in the program by the lender. CAP-SSBCI gives businesses with access to capital by encouraging lenders who participate in the program to make loans they may not otherwise make.

[11] Website Accessed October 13, 2019 via https://www.treasury.gov/resource-center/sb-programs/Pages/ssbci.aspx

Under the Program, the borrower, the lender and the IEDC each contribute a percentage of the loan into the lender's dedicated reserve fund, which pools contributions (premiums) from all CAP-SSBCI loans enrolled by the lender. The lender determines whether a loan is made, the interest rate, the terms and conditions and the percentage contributed to the reserve fund. Borrower and lender each contribute between 1.0 to 3.5%of the loan amount enrolled. The borrower pays its designated percentage and the lender matches this amount (which the lender passes on to the borrower). The IEDC contributes a combined match of both the lender and borrower for a 1:1 premium match. To qualify a business must have 500 or fewer employees. The maximum loan amount is $5,000,000.

Indiana Community Business Credit Corporation (ICBCC)[12]

The ICBCC helps businesses that would normally be too risky for lenders to extend loans to access capital by taking a subordinate collateral position on projects that need at least $200,000 in funding. The participating lender takes a senior position guaranteeing 50% or more of the project. ICBCC has been helping financial institutions lend money to Indiana businesses since 1986. Loan amounts range from $100,000-$500,000. The Credit Corp can provide no more than 50% of the project financing. Conventional interest rates are used (usually several points above prime rate). The loan term ranges from 3 to 25 years. Eligible uses include:

- Primary working capital
- Subordinated working capital
- Long-term loans for new equipment
- First mortgages on existing properties as well as planned construction projects
- Second mortgages
- Leveraged buy-outs, and
- Subordinated debt/equity combinations

2.7 Revolving Loan Funds (RLF)[13]

A revolving loan fund (RLF) is a gap financing measure primarily used for development and expansion of small businesses. It is a self-replenishing pool of money. Interest and principal payments on old loans fund new ones. While the majority of RLFs support local businesses, some target specific areas such as healthcare, minority business development, and environmental cleanup.

Establishing a revolving loan fund provides access to a flexible source of capital that can be used in combination with more conventional sources. Often, the RLF is a bridge between the amount the borrower can obtain on the private market and the amount needed to start or sustain a business.

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[12] Website Accessed October 16, 2019 via http://www.cambridgecapitalmgmt.com/icbcc.php

[13] Indiana RLF: Website accessed December 6, 2019 via https://www.in.gov/ifa/srf/index.htm,
Monroe County Bloomington Industrial Incentive Loan Fund: Website accessed December 6, 2019 via https://bloomington.in.gov/council/legislation/Resolution/1991/91-34
Green County EDC RLF: Website accessed December 6, 2019 via https://greencountyedc.com/rsvp/incentives/
Dubois County Enterprise Loan Fund: Website accessed December 6, 2019 via https://duboisstrong.com/driving-business/expanding/
Crawford County RLF: Website accessed December 6, 2019 via https://www.crawfordcountychamber.org/revolving-loan-fund
Perry County Tell City RLF: Website accessed December 6, 2019 via https://www.pickperry.com/doing-business/incentives/

Quality RLFs issue loans at market or otherwise competitive and attractive rates. Many RLF studies have shown that access to capital and flexibility in collateral and terms is more important to borrowers than lower than market interest rates. RLFs must be able to generate enough of an interest rate return to replenish the fund for future loan allocations. With competitive rates and flexible terms, an RLF provides access to new financing sources for the borrower, while lowering overall risk for participating institutional lenders. Typical uses for RLF loans include:

- Operating capital
- Acquisition of land and buildings
- New construction
- Facade and building renovation
- Landscape and property improvements
- Machinery and equipment

Capitalizing a Revolving Loan Fund

Initial funding, or capitalization, of a revolving loan fund usually comes from a combination of public sources, such as the local, state, and federal governments, and private ones such as financial institutions and philanthropic organizations. Funding acquired for capitalization is usually the equivalent of a grant – it does not need to be paid back.

Most revolving loan funds have at least one local public source for capitalization combined with other sources. If capitalization is exclusively local, the RLF may have greater flexibility in lending, as state and federal involvement tend to include restrictions that may not fit local business needs.

State and local governments often use one or a combination of the following to capitalize an RLF: tax set-asides, general obligation bonds, direct appropriations from the state legislature, annual dues from participating counties or municipalities, and funds directed from the state lottery.

The federal government is another common source of capital. Communities may apply for funding from the United States Department of Agriculture (via the Rural Economic and Community Development Administration), Housing and Urban Development (via Community Development Block Grants), and the Department of Commerce (via the Economic Development Administration).

Standards and Results

As a public investment instrument, revolving loan funds are expected to enhance the public good – namely projects contributing to economic growth and community revitalization. Borrowers must address performance measures established by the loan administrator such as; number and type of jobs created or retained; increase in tax revenue; private funding relative to public investment; and benefits to low and moderate-income citizens, from business ownership to job opportunities. Indiana and Mid-States Study Area Revolving Loan Funds include the following:

- The State Revolving Fund (SRF) Loan Program
- Indiana Finance Authority (IFA) Small Bond Program
- Monroe County - Bloomington Industrial Incentive Loan Fund
- Green County - Green County EDC Revolving Loan Fund
- Dubois County - Enterprise Loan Fund (ELF)
- Crawford County - Crawford County Revolving Loan Fund (RLF)
- Perry County - Tell City EDC Revolving Loan Fund

2.8 Start-ups, Entrepreneurship, & Innovation

Indiana is ranked number one in the Midwest (and number eight in the nation) for entrepreneur friendliness, according to the Indiana Small Business Development Center 2018 annual report. Statewide there were over 300 new business starts in 2018. Indiana was given an "A" grade for ease of starting a business by Thumbtack.[14] This success can be attributed to the many layers of support offered from the local to the state and federal level for start-ups and entrepreneurs. Below is a brief overview of those most prevalent and relevant to the Mid-States area.

Figure 2-6: Indiana's Certified Technology Parks

The Certified Technology Parks[15]

The CTP program, enabled by Indiana Code 36-7-32, was created to attract and grow high-technology businesses and promote technology transfer opportunities in Indiana. Designation as a Certified Technology Park (CTP) allows for the local recapture of certain state and local tax revenue which can be invested in the development of the park. CTPs can capture a maximum of $5 million over the life of the park in incremental sales and income taxes. To become a CTP, the applicant must prove the CTP will attract high tech companies and jobs, the local government must participate financially in the establishment of the CTP, and an Indiana institution of higher education must make a monetary or in-kind contribution to the park. **Figure 2-6** shows the location of all CTPs in Indiana. The two certified technology parks within the Mid-States Study Area are in Bloomington and Odon, Indiana.

Bloomington Technology Park – Trades District[16]

The Bloomington Technology Park comprises 65 acres in Downtown Bloomington Encompasses the Trades District. In 2011, the City of Bloomington purchased 12 acres from Indiana University to create the Trades District, a component of the 65-acre Downtown CTP. The Trade District is seen as an innovation hub and job creation center focused on recruiting and growing technology industries. The park is a mixed-use development that offers residential, commercial, and open spaces uses.

[14] Thumbtack is a website and app for finding local professionals for any product and conducts annual surveys of 7,500 business owners nationwide on issues such as business friendliness, taxes, licensing requirements, labor regulations, and how easy it is to start, operate and grow a business. Thumbtack's survey is one of the largest surveys of small businesses nationwide.

[15] Accessed October 14, 2019 via https://iedc.in.gov/programs/certified-technology-parks/home

[16] Accessed October 15, 2019 via https://bloomington.in.gov/business/districts/ctp

The Westgate @ Crane, Odon, Indiana[17]

The WestGate @ Crane CTP is a partnership between the IEDC, several county economic development corporations, NSWC – Crane Division, I-69 Innovation Corridor, Indiana Office of Defense Development, and WorkOne. Within the Mid-States 12-county region, the Martin, Greene, and Daviess County economic development corporations are partners in this CTP. Purdue University, Indiana University, and University of Southern Indiana are also partnering in this CTP. The park provides a tech start-up and incubation space, mentorship, funding, networking, workforce training, and other business support. The training courses are sponsored by Indiana University, Purdue University, and University of Southern Indiana.

NSWC Crane Technology Transfer (T2) Program (lab to market program)[18]

The NSWC Crane Technology Transfer (T2) Program seeks to license and collaborate with local individuals, companies, and academic institutions for the purpose of transferring government protected innovations for commercialization. The intent is to spur economic development to support activities of the federal government. The Federal Laboratory Consortium[19] (FLC)'s role is to promote, educate, and facilitate lab technology transfer.

Small Business Innovation Research (SBIR) & Small Business Technology Transfer (STTR)

Indiana SBIR encourages research and development in small businesses that have the potential for commercialization. The STTR program expands funding opportunities in research and development through a public/private partnership between small businesses and nonprofit research institutions. STTR encourages collaboration between these two entities to create a product that can be commercialized. Within the Study Area, only Monroe County has participated in the SBIR-STTR programs since 2017. **Table A-4** in the Appendix details which companies received funding for SBIR-STTR in Monroe County.

Indiana Center for Biomedical Innovation (ICBI)[20]

ICBI supports research and development in biomedical and healthcare related technologies by providing access to a variety of funding sources for translational research, and technology development and commercialization in biomedical fields. Grants through the ICBI's Indiana Clinical and Translational Sciences Institute (CTSI) offers milestone-based grant support, screening and identification of potential drug molecules, development of proof of concept for drug, device, cell or gene therapy and diagnostics and further product development through the Technology Enhancement Award (TEA). ICBI provides support and guidance for SBIR/STTR applications and connections to angel and venture capital investors. Other funding and support for the biomedical and health sciences industry in Indiana include the GSK Discovery Fast Track Challenge, Johnson & Johnson Innovation Centers, Lilly Open Innovation Drug Discovery, and the Pfizer Centers for Therapeutic Innovation.

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[17] Accessed October 15, 2019 via https://westgatecrane.com/
[18] Accessed October 16, 2019 via https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Crane/Partnerships/Technology-Transfer/
[19] Website Accessed October 16, 2019 via https://www.navsea.navy.mil/Media/News/SavedNewsModule/Article/1887096/nswc-crane-employee-sees-expansion-innovation-in-technology-transfer-future/
[20] Accessed October 17, 2019 via https://www.in-bioinnovation.org/grants-funding/

Indiana Procurement Technical Assistance Center (PTAC)[21]

PTAC provides procurement technical assistance to help existing small businesses sell products or services to the appropriate government agency by offering confidential counseling services and workshops at no cost. The core of the procurement assistance program is counseling and education. PTAC holds events and connects businesses to workshops as well as offers individualized advice and customized bidding opportunities. The Procurement Technical Assistance Center is funded in part through a cooperative agreement with the Defense Logistics Agency.

Elevate Ventures[22]

Elevate Ventures is a venture capital nonprofit that nurtures and develops emerging and existing high-potential businesses into high-performing, Indiana-based companies. Elevate provides business analysis and advisory services that connect companies with resources they need to succeed and grow for the long-term. As a nonprofit organization, Elevate receives 75% of its funding from IEDC's 21st Century Research and Technology Fund. Elevate Ventures works with first-time entrepreneurs to help them start a business, from launch to exit. Some of the industries in which Elevate has expertise include semiconductors, agriculture, IT, pharmaceuticals, medical devices, aerospace, and big data. To date, Elevate Ventures has funded 326 start-ups in 81 counties in Indiana.

Incubators and Co-working Spaces

Incubators and co-working spaces are useful resources for entrepreneurs and start-up companies that cannot or would rather not acquire their own office space. Within the Mid-States area, such resources are in Monroe and Daviess counties. A list of existing resources and spaces is in **Table A-5** in the Appendix. Other resources for start-ups and entrepreneurs include;

- **B-Start**[23] – Based in Bloomington, B-Start is a pre-accelerator program of the Bloomington Economic Development Corporation (BEDC) designed for Indiana University and Ivy Tech student technology startups. B-Start participants are at the earliest stage of their business development and are coached through cohort activities and individualized mentorship. These build a foundation to accelerate the growth of their startups.
- **Gayle & Bill Cook Center for Entrepreneurship**[24] – The Center is housed at Ivy Tech Bloomington and aims to develop and implement practical tools and resources for students and the community to foster entrepreneurship in Bloomington and its surrounding areas. The Center has developed six entrepreneurship courses, in-person and online as well as business consulting services, and community programs to serve the region.

2.9 Funding for Industrial Development

Several economic development incentives and tools discussed in other sections can be used to spur industrial development. These include but are not limited to the EDGE tax credit, CAP program, tech research and development funding and assistance programs, and USDA business assistance programs. The most prominent industrial business development funding in Indiana is the Industrial Development Grant Fund (IDGF), which provides funding to municipalities for infrastructure improvements.

[21] Accessed October 17, 2019 via https://www.in.gov/indiana-ptac/781.htm
[22] Accessed October 17, 2019 via https://www.elevateventures.com/about/
[23] Accessed October 17, 2019 via http://www.b-start.org/
[24] Accessed October 16, 2019 via https://www.ivytech.edu/bloomington/entrepreneurship/

IDGF[25]

The Industrial Grant Fund (IDGF) assists municipalities and other eligible entities as defined under I.C. 5-28-25-1 with off-site infrastructure improvements needed to serve the proposed project site. Upon review and approval of the local recipient's application, project specific milestones are established for completing the improvements. IDGF reimburses a portion of the total cost of the infrastructure improvements. Financial assistance will be paid as each milestone is achieved, with final payment upon completion of the last milestone of the infrastructure project. Examples of eligible uses include lease purchase, construction or repair of real and personal public property; construction of airport facilities; construction of tourist attractions; and construction, extension, or completion of water and sewer lines, roads, sidewalks, rail spurs, and fiber cable. The infrastructure must have a role in retaining or creating full-time jobs.

2.10 Tax Credits and Exemptions

Tax credits and exemptions are important economic development tools that give qualifying businesses and activities financial relief which support job growth and industry innovation. Below is a brief overview of the tax credit and exemption initiatives statewide and within the Mid-States Study Area.

Tax Credit Programs[26]

- **Economic Development for a Growing Economy (EDGE) -** A refundable tax credit program that rewards companies creating jobs and contributing to the growth of Indiana's economy. EDGE credits are calculated as a percentage of payroll tax withholding for net new Indiana jobs. EDGE credits may be awarded for a period of up to 10 years.
- **Hoosier Business Investment Tax Credit (HBI)** - This program encourages capital investment in Indiana by providing a credit against a company's Indiana tax liability. The credit amount is based on a company's qualified capital investment with the final credit amount determined by the Indiana Economic Development Corporation, based on an analysis of the economic benefits of the proposed investment.
- **Headquarters Relocation Tax Credit -** When a business relocates its corporate headquarters (defined as the location of the principal office of the principal executives) to Indiana, it is entitled to a credit against its state tax liability equal to half of the costs incurred in relocating the headquarters. A company must have worldwide annual revenue of at least $100 million to qualify.
- **Venture Capital Investment Tax Credit** - The Venture Capital Investment Tax Credit was established to improve access to capital to fast-growing Indiana companies by providing individual and corporate investors an additional incentive to invest in early stage firms. Investors who provide qualified debt or equity capital to Indiana companies receive a credit against their Indiana income tax liability.
- **Industrial Recovery Tax Credit (IRTC)** - The Industrial Recovery Tax Credit provides an incentive for companies to invest in facilities requiring significant rehabilitation or remodeling expense. After a building has been designated as an industrial recovery site, companies may be eligible for a tax credit calculated as a percentage of qualified rehabilitation expense.

[25] Accessed October 16, 2019 via https://iedc.in.gov/incentives/industrial-development-grant-fund---idgf/home
[26] Accessed October 16, 2019 via https://blsstrategies.com/indiana

- **R&D Tax Credit** - The R&D tax credit provides a credit against state tax liability for qualified company research expenses.

Tax Exemptions

- **Patent Income Exemption -** Certain income derived and earned from qualified patents by a taxpayer are exempt from taxation. Qualified patents include utility patents and plant patents. Eligible taxpayers must be domiciled in Indiana and be an individual or corporation with not more than 500 employees.
- **R&D Sales Tax Exemption** - There is a 100%sales tax exemption for qualified research and development equipment and property purchased.
- **Tax-exempt Bonds** - These debt instruments, often called Private Activity Bonds, Industrial Revenue Bonds or Industrial Development Bonds, are issued by state or local governmental entities for the benefit of a private company, usually manufacturers. Interest on the bonds is generally exempt from federal income taxes for investors, which typically results in lower long-term interest rates to the borrower.

Table A-6 in the Appendix provides a list of all recipients of EDGE, SEF, HBI, and IRTC credits and exemptions within the Mid-States Study Area.

2.11 Urban Enterprise Zones[27]

The Urban Enterprise Zone (UEZ) program was established under Indiana Code 5-28-15 to promote investment and increased economic activity in some of the most distressed urban areas around the state. Businesses within UEZs receive tax savings by filling out an annual registration form with the local Urban Enterprise Association (UEA). Federal and state funded job training programs often target areas in enterprise zones. Bedford in Lawrence County and Bloomington in Monroe County, Indiana are the two locations for urban enterprise zones in the Mid-States Study Area.

To qualify as an enterprise zone, the area must have at least 25% of households in poverty, population between 2,000 and 10,500, and have an area between three- and four-square miles[28]. The enterprise zone is funded by registration fees and General Assembly appropriations. The fund pays administration expenses (both internally and for UEAs) and provides grants to UEAs for brownfield remediation in enterprise zones.

2.12 United States Department of Agriculture (USDA)[29]

USDA promotes rural prosperity and economic development by financing investments in rural utilities, housing, and businesses. USDA believes that when rural areas share the same level of infrastructure services as urban areas, they can make great economic contributions. USDA leverages funds, stimulates private-public partnerships, and engages in collaboration to build rural infrastructure including broadband, community facilities, safe and affordable housing, health services and facilities, and provides

[27] Accessed October 6, 2019 via https://www.iedc.in.gov/programs/urban-enterprise-zones/home
[28] Accessed October 16, 2019 via https://law.justia.com/codes/indiana/2010/title5/ar28/ch15.html. If the zone includes a parcel of property that: (A) is owned by the municipality; and (B) has an area of at least twenty-five (25) acres; the area of the zone may be increased above the four (4) square mile limitation by an amount not to exceed the area of the municipally owned parcel.
[29] Accessed October 24, 2019 via https://www.usda.gov/sites/default/files/documents/usda-strategic-plan-2018-2022.pdf

capacity building to help underserved communities become thriving communities. A matrix of the more than 30 USDA Rural development programs can be found here. https://www.rd.usda.gov/files/RD_ProgramMatrix.pdf.

Programs fall into three main categories: Rural Business, Rural Housing, and Rural Utilities Services. Funds can be used for a variety of purposes, including land and buildings, machinery and equipment, working capital, infrastructure, and technical assistance/training. Each program has specific geographic and population restrictions for where funding and resources can be used.

Current program performance metrics are dependent on estimated data provided by the applicants on long-term projections of outcomes, pending funding approval. Since community needs vary widely, the rapidity of economic improvements may vary depending on applicants' capacity, industry sectors, data sharing, and performance reporting by program and/or community. There is currently no universal performance metric to measure the success of these programs or their financial investments.

2.13 Broadband Access and Development

Reliable and affordable high-speed internet connectivity is fundamental for economic activity throughout the United States. Access to high-speed internet is vital for many industries, including agricultural production, manufacturing, mining, and forestry. It acts as a catalyst for rural prosperity by enabling efficient, modern communications between rural American households, schools, and healthcare centers as well as markets and customers around the world. The Mid-States Study Area contains mostly rural areas and has limited broadband access as compared to other parts of the state (see **Figure 2-7**). Broadband access programs therefore play an important role in bringing economic opportunity to the Mid-state's Study Area.

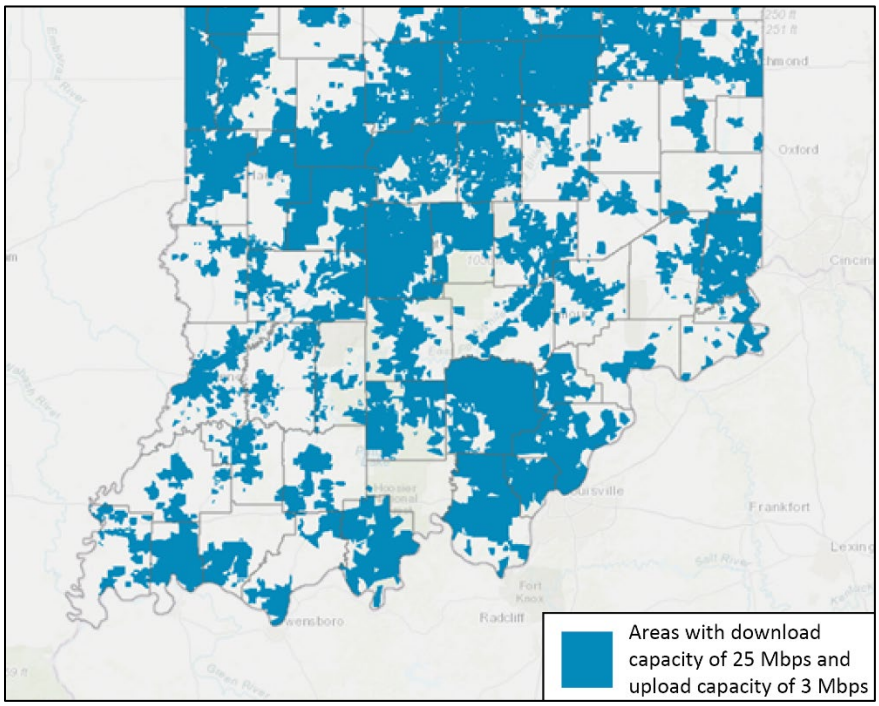

Figure 2-7: Map of Broadband Access in Study Area[30]

[30] Interactive Map Accessed October 16, 2019 via https://www.indianabroadbandmap.com/

Certified Broadband Ready Communities

The Broadband Ready Communities Development Center was created as a tool to encourage broadband development throughout Indiana by serving as an information resource and certifying local communities as being broadband ready. The Broadband Ready Communities Development Center is established by IC 5-28-28.5.[31]

The following local units of government within the Study Area have established the necessary procedures to be certified as Broadband Ready Communities.

- City of Boonville, Warrick County
- City of Cannelton, Perry County
- City of Mitchell, Lawrence County
- Town of Santa Claus, Spencer County
- City of Bedford, Lawrence County
- Crawford County
- Martin County

The Perry-Spencer Rural Telephone Cooperative is the only rural telephone cooperative within the Mid-state Study Area. Rural telephone cooperatives are eligible for several USDA grants and program assistance.

Federal Communications Commission (FCC)

The FCC funds nationwide rural broadband access. In July of 2019 $524 million was allocated to this program. The Universal Service Administrative Co. (USAC) collects and delivers this funding through four programs. These include Schools and Libraries, Rural Health Care, Lifeline, and High Cost. All four programs serve people in rural, underserved, and difficult to reach areas. The High Cost program[32], also known as the Connect America Fund, is most closely tied to economic development. It is designed to ensure that consumers in rural, insular, and high-cost areas have access to modern communications networks capable of providing voice and broadband service, both fixed and mobile, at rates that are reasonably comparable to those in urban areas. The program fulfills this universal service goal by allowing eligible carriers who serve these areas to recover some of their costs from the federal Universal Service Fund.

United States Department of Agriculture (USDA)[33]

The USDA offers the ReConnect Loan and Grant Program which provides loans and grants to fund the cost of construction, improvement, or acquisition of broadband facilities and equipment in rural areas. To be eligible for a 100% loan or 50% loan / 50% grant, the proposed service area in an application must be in a rural area where 90% of the households do not have sufficient broadband access. To be eligible for a 100% grant, the proposed funded service area in an application must be in a rural area where 100% of the households do not have sufficient broadband access. Nonprofit and for-profit entities, government, Indian tribe, and limited liability companies may apply.

[31] Accessed October 21, 2019 via https://www.in.gov/ocra/files/Broadband_Ready_Facts_2019.pdf
[32] Accessed October 21, 2019 via https://www.fcc.gov/general/universal-service-high-cost-areas-connect-america-fund
[33] Accessed October 21, 2019 via https://www.usda.gov/reconnect/program-overview

2.14 Energy Efficiency and Sustainability Initiatives

The Indiana Department of Environmental Management (IDEM) administers the Recycling Market Development Program[34] which administers grants to public and private businesses, local government, and non-profit organizations in Indiana that want to start projects that focus on reuse, reduction, and recycling methods that result in;

- An increase in recyclable material collection or consumption,
- A reduction in municipal solid waste shipped for final disposal,
- Improved partnerships with communities, including not only economic impacts, but increased public awareness of recycling opportunities through tangible outreach and education efforts.

Grants between $1,000 and $250,000 are awarded to chosen applicants with a 50% cash match by the applicant.

2.15 21st Century Talent Region

21st Century Talent Regions is a program intended to encourage regional collaboration as an economic development strategy. The goal is to create at least 12 regions over the next biennium. Talent Regions are areas that commit to using a systems approach to attract, develop, and connect Hoosier talent. Regions are self-defined with regard to their geography and are working toward building and implementing a plan to increase educational attainment, raise household income, and grow population. There is no cost to become a Talent Region. To become a Talent Region, a region must;

- Commit to working across geographic lines and across organizations to attract, develop, connect and retain talent;
- Organize itself with designated leader and regional participation including, but not limited to: local governments, business, K-12 education, economic development, higher education, non-profit(s), and workforce development;
- Connect with the Office of Career Connections and Talent to receive assistance in organizing efforts to attract, develop, connect and retain talent;
- Build a plan to grow population (attract and retain talent), increase educational attainment (develop talent), and raise household income (connect talent) in collaboration with the Office of Career Connections and Talent and the Indiana Economic Development Corporation and with technical assistance provided by CivicLab; and
- Implement the priorities identified.

Following implementation, a region will receive a 21st Century Talent Region designation. Stakeholders involved in creating and implementing a Talent Region should include members from local governments, business, K-12 education, higher education, non-profit(s), economic development and workforce development.

The need for 21st Century Talent Regions arises out of the fact that disjointed efforts to improve quality of life minimize effectiveness and informed investments. Regional collaboration has consistently been able to make transformative progress that individual communities struggle to achieve independently. Additionally, many communities have numerous efforts to grow quality of place, increase education

[34] Accessed October 24, 2019 via https://www.in.gov/idem/recycle/2358.htm

attainment, raise household income and grow population, but they are often disconnected and are not bringing together the necessary stakeholders to achieve the desired collective community outcomes. A regional dashboard supported by IEDC and CivicLab will engage and inform decision-makers on what gaps and surpluses exist in a collective effort to attract, develop, connect and retain talent.

3 NON-PERSONAL CAR ALTERNATIVES

3.1 Transit and Passenger Rail

Transit services play a role in connecting employees to their workplaces. In the Mid-States Study Area, this connectivity is limited. Most transit systems operate infrequently, and none function as a regional commuter option that could compare to the impact that a regional highway connection would have on commuter access. There are no Amtrak[35] stations within the Mid-States Study Area. Additionally, transit systems would not support regional industry logistics operations and goods movement. Transit, while it has the potential to connect employees to places of work, does not have the scale or scope of impact necessary to achieve the goals of the Mid-States highway alternative proposed. **Table 3-1** provides an overview of the transit services operating within the Mid-States Study Area.

Table 3-1: Transit services operating within the Mid-States Study Area

System Name	County/Counties	Service Area	Service Type
Transit Authority of Stone City	Lawrence County	Bedford, Indiana	Demand response route service
Area 10 Rural Transit	Monroe and Lawrence counties	Same as counties	Fixed and demand response route service
Orange County Transit	Orange County	Same as county	Fixed and non-fixed route service
Ride Solution – Southern Indiana Development Commission	Warrick County	Same as county	Demand response route service
Warrick Area Transit System	Warrick County	Same as county	Fixed route bus system
Bloomington Transit	Monroe County	Same as county	Fixed route bus system
Hoosier Ride	Monroe, Lawrence, Orange, Spencer, Daviess counties	Bloomington, Bedford, Orleans, Paoli, Dale, Washington	Fixed route bus system
Southern Indiana Transit System – Division of Blue River Services Inc	Crawford, Harrison, Scott, and Washington counties	Same as counties	Demand response route service
Huntingburg Transit System	Dubois County	Huntingburg, IN	Demand response route service

[35] Accessed October 17, 2019 via https://www.in.gov/indot/2815.htm

Figures A-1 and **A-2** in the Appendix show the extent of Hoosier Ride and Amtrak service, further illustrating their limited availability in the Mid-States Study Area.

3.2 Freight Rail[36]

Freight rail is well-used in Indiana to transport large quantities of goods. Of the 12 counties in the Mid-States Study Area, Warrick County has the highest originating and terminating rail volume.[37] Common commodities transported along rail lines in the Mid-States Study Area include coal, grain, iron, sand, clay, soybean meal, and petroleum products. The rail companies operating in the Mid-States Study Area include the following:

- Indiana Southern Railroad
- Indiana Railroad Company
- Indiana Railroad Museum Railroad
- Dubois County Railroad
- Hoosier Southern Railroad
- Norfolk Southern Railroad

Tables A-7 and **A-8** in the Appendix list the short-range and long-range investments from the 2017 Indiana State Rail Plan Appendix.[38]

Rail freight is a consistent and efficient means of moving goods, but it only serves certain industries. These industries tend to be those which transport large volume, higher-weight goods whose movement is not highly time-sensitive.

3.3 Autonomous Vehicles

While it is likely that autonomous vehicles will eventually enter the market and greatly impact how people travel, work, and commute, they have not yet made such an impact. It is important to consider the implications of autonomous vehicles from a workforce commuting and economic development standpoint, particularly for highway alternatives in this EIS. Incorporating current INDOT design standards will be important to accommodate future use by autonomous vehicles. The project designs for the highway alternative will accommodate autonomous vehicles.

[36] Accessed October 21, 2019 via https://www.in.gov/indot/2394.htm
[37] Indiana State Rail Plan. Accessed on October 17, 2019 via https://www.in.gov/indot/files/2017%20Indiana%20State%20Rail%20Plan.pdf
[38] Indiana State Rail Plan Appendix. Accessed on October 17, 2019 via https://www.in.gov/indot/files/2017%20Indiana%20State%20Rail%20Plan%20Appendix.pdf

4 CONCLUSION

The programs and policies identified in this report can individually and collectively support some, but not all, of the goals in the Mid-States Corridor Purpose and Need. None of the alternatives were able to address or improve highway accessibility, or highway connections to multi-modal centers.

Key Take-aways

- Scope and scale of non-highway alternatives are too limited, not regional, or don't exist within the geography of the Study Area
- Technology advancements are not yet widely available or reliable
- Coordination and capacity in the region are too limited to execute some alternatives at the level needed for effective implementation

Table 4-1 below summarizes the alternatives described in the overview, their prevalence and use in the Mid-States Study Area, their potential for additional use or expansion, and which Purpose and Need goals they support indicated by the blue shaded boxes.

Table 4-1: Summary of Non-Highway Alternatives

Alternative	Current Use in Study Area	Potential for added use/ availability	Regional Accessibility	Highway Safety	Economic Development	Intermodal Connectivity
Opportunity Zones	Limited	Limited				
Tax abatements	Some areas more than others	Moderate				
TIF	Some areas more than others	Moderate				
CDFIs	Limited	Moderate				
Job Training	High	High				
Access to Capital	Moderate	High				
Revolving Loan Funds	Moderate	High				
Start-up and entrepreneur support	Moderate	High				

Alternative	Current Use in Study Area	Potential for added use/ availability	Regional Accessibility	Highway Safety	Economic Development	Intermodal Connectivity
IDGF	Low	Moderate				
Tax credits / exemptions	Some areas more than others	Moderate				
Urban enterprise zones	Low	Low				
USDA rural development	Moderate	High				
Broadband	National	High				
Transit	Local / regional	Low				
Commuter Rail	State-wide	Low				
Freight Rail	National	Moderate				
Autonomous Vehicles	Limited to none	High (future)				
Mid-States Highway Alternatives	-	High				

APPENDICES

Table A-1. Opportunity Zone Census Tracts in Mid-States Corridor Study Area

Census Tract	County
18025952100	Crawford
18027954700	Daviess
18037953800	Dubois
18093950900	Lawrence
18105000100	Monroe
18105000401	Monroe
18105000501	Monroe
18105001101	Monroe
18117951500	Orange
18123952600	Perry
18125954000	Pike

Table A-2: IC 6-1.1-12.1 Deductions from Tax Exemptions, Deductions and Abatements in Millions of Dollars and % Change from 2016-2017
(Report on Property Tax Exemptions, Deductions, and Abatement (2018) accessed Oct. 17, 2019 via https://www.in.gov/dlgf/files/ExemptionsDeductionsReport-2018.pdf)

County	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2016-2017**
Crawford	-	-	-	-	-	-	0.2	-
Daviess	2	2.7	3.9	4.7	5.4	5.5	4.3	-21%
Dubois	0.1	0.1	-	1.6	4.9	7.7	12.2	58%
Greene	-	-	-	-	7	10.8	11.5	6%
Lawrence	5.9	4.2	3.2	2.1	1.7	1.5	3.2	109%
Martin	3.7	3.4	7.2	6.2	5.3	4.8	4.8	1%
Monroe	46.5	31.1	39.7	25.6	18.9	9	15.1	67%
Orange	61.9	43.3	34.9	27.9	21.2	15.4	15.7	2%
Perry	5.7	4.5	3.2	3.2	2.6	2.1	7.7	262%
Pike	-	-	-	-	-	-	-	-
Spencer	2.1	1.4	1.5	1.9	1.5	1.4	7.9	455%
Warrick	6.4	5.8	7	16	15.5	14.9	11.8	-21%

Table A-3: Number of NMTC qualifying census tracts in the Mid-States Study Area

County	Number of Census Tracts Qualifying for NMTC
Crawford	3
Daviess	2
Dubois	1
Greene	3
Lawrence	4
Monroe	15
Orange	3
Perry	1
Pike	2
Warrick	1

Table A-4: Companies awarded funds via SBIR-STTR programs in Mid-state Study Area

County	City	Start-up Company	Contract Amount	Year
Monroe	Bloomington	Victor Technologies LLC	$50,000	2017
Monroe	Bloomington	The Bee Corp.	$50,000	2018
Monroe	Bloomington	Victor Technologies LLC	$50,000	2018
Monroe	Bloomington	Graspable Inc	$50,000	2018
Monroe	Bloomington	KS and Associates LLC	$50,000	2018
Monroe	Bloomington	Megadalton Solutions LLC	$50,000	2019
Monroe	Bloomington	Cloudsdeal Inc	$50,000	2019
Monroe	Bloomington	Warrant Technologies LLC	$43,044.50	2019

Table A-5: Start-up co-working and incubation spaces within Mid-States area[39]

Name	Type	Address	City	County
Roundhouse Hub	Co-working	207 E Main St	Washington	Daviess
The Lock & Key	Co-working	WestGate @ Crane Technology Park	Odon	Daviess
Workspace by Blue Burro	Co-working	113 E 6th St @ the square	Bloomington	Monroe
Switchboard	E-Platform	Virtual Networking	Bloomington	Monroe
Showers Dimension Mill	Flex Space	334 W 11th St - Trades District	Bloomington	Monroe
WestGate Academy at NSWC Crane	Incubator	WestGate @ Crane Technology Park	Odon	Daviess
BloomingLabs	Makerspace	1609 S Rogers Street, Building 4	Bloomington	Monroe
IU MILL Makerspace	Makerspace	201 N Rose Ave, Room 2260	Bloomington	Monroe
Verge Events	Start-up Group	n/a	Bloomington	Monroe

[39] Website Accessed October 16, 2019 via Iedc.in.gov

Table A-6: Business locations and expansions in the Mid-States 12-county area that received federal or state economic development funding from 2017 to October 2019

County	Company	Fund	New Jobs (expected)	Expected Qualified Investment	Year
Crawford	SIMCO of Southern Indiana Inc	EDGE	10	$590,850	2018
Daviess	Eagle Railcar Services - Washington, Indiana LLC	EDGE/SEF/IRTC	100	$6,739,200	2017
Daviess	M&C Tech Indiana Corporation	EDGE/SEF	70	$6,009,000	2019
Dubois	Rudeck LLC	EDGE	98	$4,781,800	2018
Greene	BrightVolt Inc	EDGE/SEF	30	$6,665,000	2017
Greene	Pro-Mark Building Solutions LLC	EDGE/IDGF	17	$1,565,000	2017
Greene	Integrity Defense Services Inc	EDGE/SEF	160	$1,077,128	2018
Lawrence	McWane Inc	HBI	23	$4,578,776	2017
Lawrence	CAP Group LLC	HBI	60	$6,700,000	2017
Monroe	Hanapin Marketing LLC	SEF	14	$322,617	2017
Monroe	AB Bio Technologies Inc	EDGE/SEF	33	$5,736,564	2017
Monroe	Phoenix Closures Incorporated	EDGE/HBI/SEF	75	$22,071,000	2018
Monroe	Tasus Corporation	EDGE/SEF	18	$9,200,000	2018
Monroe	PTS Electronics Corporation	EDGE	220	$2,606,000	2019
Monroe	Catalent Indiana LLC	EDGE	200	$125,782,381	2019
Orange	Jasper Seating Company Inc	EDGE/SEF	316	$3,540,000	2018
Perry	ATTC Manufacturing Inc	HBI	26	$27,327,000	2018
Perry	Mervis Metal Recovery LLC	HBI	6	$1,887,086	2018
Warrick	Alcoa Warrick LLC	EDGE/SEF	196	$38,620,000	2018
Warrick	Powerup Inc	SEF/HBI	105	$14,889,244	2019

Source: IN.gov Transparency Portal – tax grant loan contracts search. Available at https://secure.in.gov/apps/iedc/transparencyportal/searchtaxgrantloancontracts

Figure A-1: Hoosier Ride Service Map
Source: https://hoosierride.com/services/

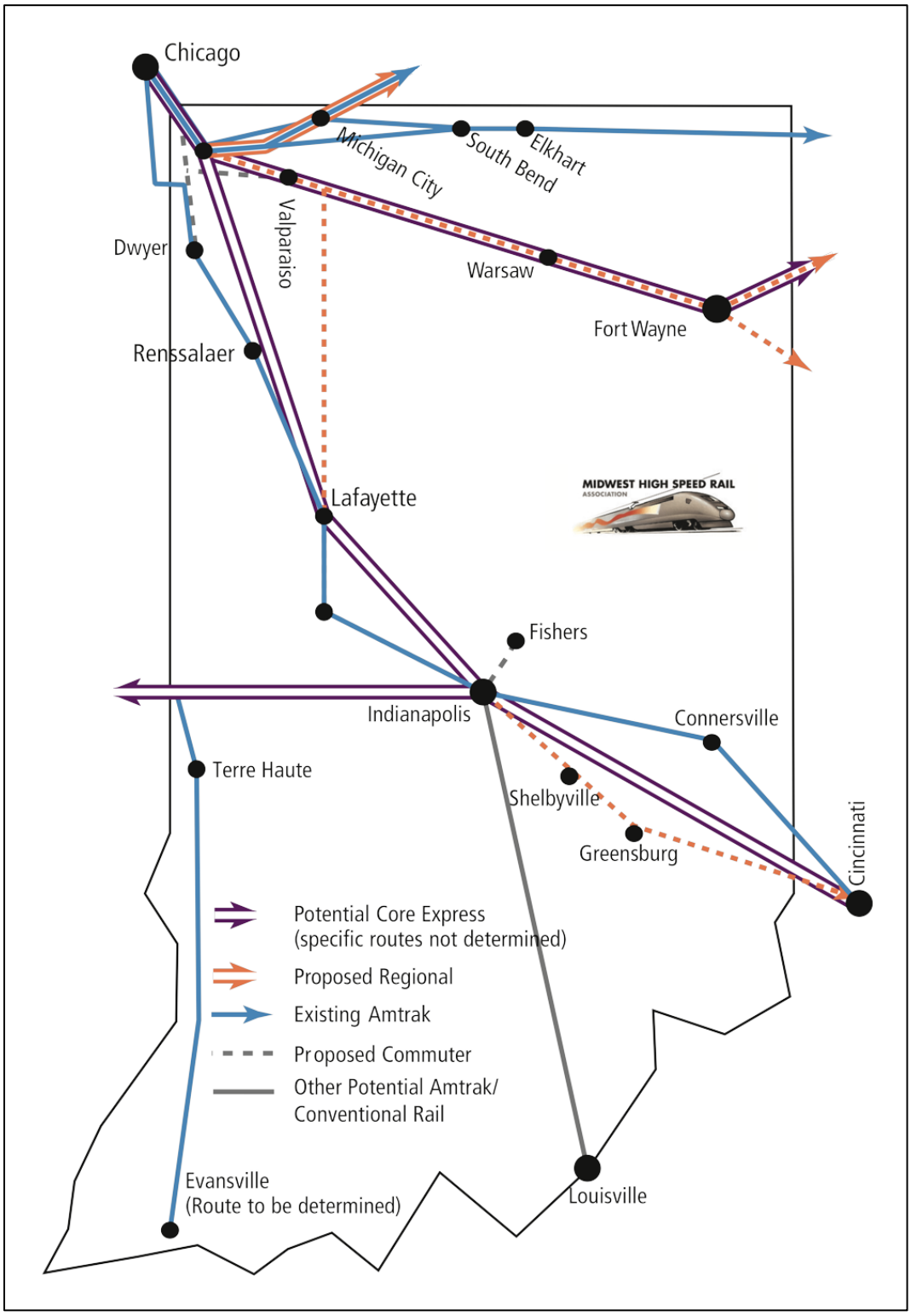

Figure A-2: Amtrak service area and stations in Indiana
Source: Indiana Midwest High Speed Rail Association

Table A-7. Short-range freight rail projects funded within Mid-States Study Area

Grantee	Funding Source	Project Type	County	Total Project cost	Grant Awarded	Project Benefit
Town of Odon	Indiana Grade Crossing Fund	Crossing Closure	Daviess	$15,000	$15,000	Crossing Safety
Warrick County	Indiana Grade Crossing Fund	Pavement Markings	Warrick	$21,014	$21,014	Crossing Safety
Pike County	Indiana Grade Crossing Fund	Crossing Closure	Pike	$10,000	$10,000	Crossing Safety
Dubois County Railroad	Indiana Grade Crossing Fund	Crossing Surface	Dubois	$18,752	$9,376	Crossing Safety
Dubois County Railroad	Indiana Grade Crossing Fund	Tie/Ballast replacement	Dubois	$348,410	$261,308	Improve Class Status

Table A-8. Long-range freight rail projects funded within Mid-States Study Area

County	Project	Cost	RR	Benefit	Source	Project Type
Warrick County	Rail to North Warrick Industrial Park from Indiana Southern RR	$1M	ISRR	Economic development, access	Conexus	Industrial Access
Daviess County	Track Infrastructure — GPC Motrin Warehouse	$2.5M	ISRR	Track build - GPC Motrin warehouse, open more markets from truck	Railroads of Indiana	Industrial Access
Spencer County	Rockport Rail to Water Connector	$500K	HOS	Economic development, access	Conexus	Multimodal
Spencer County	Intermodal yard	$2M	HOS	Intermodal transfer from truck, to rail to river	State Rail Plan Survey	Multimodal
Lawrence County	Bedford Rail Project (purchase rail property from Bedford to Mitchell from CSX) to create inland port	$1M	CSX	Economic development, access	Conexus	Multimodal, Industrial Access
Perry County	Hoosier Southern RR reconstruction from Cannelton Industrial	$500K	HOS	Economic development, access	Conexus	Rehab

	Park to Tell City river port					
Perry County	Hoosier southern RR 286 k lbs. project	$900K	HOS	State of good repair, mobility	Conexus	Rehab
Spencer County	Replace bridge at MP 11.4	$1.2M	HOS	Remove risk of failure, reduce maintenance costs and ensure 286,000 capacity	State Rail Plan Survey	Rehab
Spencer County	Replace bridge at MP 8.1	$3.5M	HOS	Remove risk of failure, reduce maintenance costs and ensure 286,000 capacity	State Rail Plan Survey	Rehab
Greene County	Install ties MP 215.0-223.5 (Indiana Railroad Company)	$1M	INRD	State of good repair, mobility, faster speeds	Conexus	Rehab
Daviess County	Install ties MP 222.3-241.5 on Chicago Subdivision	$1.8M	INRD	State of good repair, mobility, faster speeds	Conexus	Rehab
Greene County	Install ties MP 61.0-79.0 on Indianapolis Subdivision (Indiana Railroad Company)	$1.9M	INRD	State of good repair, mobility, faster speeds	Conexus	Rehab
Greene County	Install ties MP 203.5-222.3 on Chicago Subdivision (Indiana Railroad Company)	$2M	INRD	State of good repair, mobility, faster speeds	Conexus	Rehab

MID-STATES CORRIDOR

SCREENING OF ALTERNATIVES REPORT

CONSTRUCTION COST ESTIMATES APPENDIX

Mid-States Corridor
Tier 1 Environmental Impact Statement

Prepared for

Indiana Department of Transportation

Mid-States Corridor Regional Development Authority

FEBRUARY 2020

Prepared by

Mid-States Corridor Project Consultant

Construction Cost Estimates

Construction costs for each alternative are calculated on a unit cost basis that takes into account facility type and terrain. Only roadway construction costs are calculated for preliminary alternatives. For preliminary alternatives, excluded costs include right-of-way, relocations, design, construction management, utility relocation, and contingencies. The roadway construction costs were determined using previously constructed projects similar to the facility types being analyzed in this report.

Representative projects were analyzed to determine a per-mile roadway cost on a contract by contract basis. These were escalated to provide Year 2019 construction costs.

Items within each contract that were included in the per-mile roadway costs are as follows:

- **Earthwork** – Consists of all earth moving activities such as removal of existing dirt and asphalt pavement, placement of embankments and slopes, and rough grading for roadway bases and ditches.
- **Drainage** – Consists of fine grading for slopes, placement of outlet control devices, and placement of any closed conduit storm sewer structures such as inlets, manholes, and buried pipe.
- **Aggregate** – Consists of any crushed stone or aggregate used for base material under the paving material, or for backfill of utility trenches where required.
- **Paving** – Consists of either asphalt or concrete placed as the driving surface of the roadway. Both options were used on different aspects of the sampled projects.
- **Bridges** - Piling, concrete for abutments, riprap for slope stabilization, concrete for bridge decks, bridge drainage systems, reinforcing steel, epoxy coating, and any other items required specifically for the bridge construction.
- **Pavement Markings** – Consists of all lane markings, edge-lines, centerlines, and hatching required to convey information to drivers.
- **Permanent Signage** – Consists of all signs required to convey information to drivers. These signs include roadside warning signs, overhead directional signs, mile markers, wayfinding, and all other necessary signs.
- **Erosion Control** – Consists of all elements required to satisfy permitting requirements and limit site sediment runoff. These elements include silt fence, check dams, pipe protection, construction entrances, and other items deemed necessary.
- **Landscaping** – Consists of all vegetation required along the project, such as mulched seeding, sodding, tree planting, or other permanent vegetation.

Non-construction related costs are excluded in the costs of the preliminary alternatives. These costs will be included for the alternatives carried forward for detailed study. At this level of analysis, comparisons between alternatives are based solely on roadway construction costs. The non-construction items that are not estimated include:

- **Right-of-Way** – This is the property on which the roadway is constructed. It is purchased by the agency that will own and maintain the road and will be purchased, where necessary.

- **Relocations** – Relocations occur when the construction of a roadway makes a building unusable by the current occupant. Relocation costs are the costs for the current owner and/or occupant to relocate to another building.
- **Design** – This is the cost to design the proposed roadway. This also would include the cost for permitting and preparing environmental documentation (EIS, EA or CE, as appropriate).
- **Construction Management** – This is the cost of overseeing the construction of the project, ensuring that it satisfies appropriate standards, and is constructed as designed.
- **Utility Relocations** – This is the cost to relocate utilities impacted by the construction that are eligible for reimbursement per applicable state laws and federal regulations.
- **Contingencies** – These are costs added during preliminary phases of design to account for future uncertainties. These include future design modifications, cost fluctuations, and unknown future costs which arise during final design or construction.

Once the roadway-only cost for each contract was determined, a per-mile unit cost was developed by dividing the roadway only cost by the length of the project. The per-mile unit cost for each contract was then adjusted from its respective bid year to 2019 costs using an average inflation rate of 3.0%. The average inflation rate is based upon the Federal Highway Administration's National Highway Construction Cost Index from March 2011 to March 2019.[1]

Modifications to this methodology for determining a per-mile roadway cost were as follows:

- **Super 2 per-mile Roadway Costs -** Representative projects with desirable cross section elements and consistent passing lanes were not available for analysis. Per-mile roadway costs for a Super 2 facility type was developed utilizing typical quantities and pay item unit prices. Pay item unit prices are based on INDOT bid tabulations for a representative project with a similar typical section (to that of a Super-2), but lacking a passing lane and desirable width shoulders. The unit prices were applied to typical planning level quantities that could reasonably be expected for each of the Super 2 Typical Sections (i.e. rural/level, rural/rolling and urban/level). The typical planning level quantities are based on a ¼ mile section of roadway and extrapolated out to determine one-mile planning level quantities.

  The only quantity (or pay item) assumed to vary between a rural/level and a rural/rolling Super 2 Typical Section is the amount of earthwork required. In both cases, it is assumed that 75% of excavated material will be suitable for re-use and a 10% shrinkage factor will be applied to the amount of borrow required. For a rural/level typical section, an average cut and fill depth of 2 ft per ¼ mile was assumed. An average depth of 4 ft was utilized for the rural/rolling typical section. Additional factors considered in the development of earthwork quantities include the amount of private drives (2 each side per ¼ mile) and public road approaches (1 each side per ¼ mile). It should be noted that the earthwork balances are based upon the combined width of travel lanes, passing lane and shoulders. This removes the variability associated with unknown "tie-in" or "daylight" conditions. Further refinement of earthwork quantities will be completed for alternatives carried through to detailed analysis.

[1] See https://www.fhwa.dot.gov/policy/otps/nhcci/pt1.cfm. The indices for March 2011 and March 2019 are 1.4568 and 1.8477, respectively.

For the urban/level Super 2, a project on US 231 from 13th Street to 15th Street in Jasper was used as a typical ¼ mile urban roadway for determining representative quantities of street approaches, drives, traffic signals and other such elements.

Assumed percentages were applied to lump sum items such as clearing and grubbing (5.0%), signing (1.5%), storm drainage (5.0%), construction engineering (2.0%), mobilization and demobilization (5.0%), maintenance of traffic (5.0%) and erosion and sediment control (2.5%) were applied to the sum of all quantified pay items. This methodology was utilized for all Super 2 typical sections.

- **Expressway per-mile Roadway Costs for Rolling Terrain** - Representative projects used to determine expressway per-mile roadway costs were all designated as having level terrain. To develop a per-mile roadway cost for an expressway on rolling terrain, the percent increase for a rolling freeway from a level freeway was applied to the level expressway costs. Since each of these facilities have the same typical section at this stage of analysis, it is assumed that the increase in cost for the expressway facility type is proportional to that for the freeway facility type.
- **Expressway to Freeway Upgrades** - US 231 in Spencer County and SR 37 north of Mitchell currently are expressways. No construction costs are anticipated for these roadways for a Super-2 or Expressway facility type. To determine costs for upgrading the existing expressways to freeways, unit costs for access control measures were used in lieu of per-mile roadway costs. The access control measures considered were conversion of at-grade intersections to either a grade separated crossing or a full interchange. Similar to the per-mile roadway costs, access control measure unit costs were developed using representative projects. The access control unit costs may underestimate the cost to fully convert an expressway to a freeway. The density of intersections and ability to provide alternate access to remote properties could increase construction costs.

Recently completed projects were used as a basis for determining the cost estimates for these alternatives. The following briefly describes the projects that were used.

- Freeway: Rural/Level
    - **Contract IR-33040 I-69 RP 38+63 to RP 46+64** – Construction of 7.6 miles of freeway on new terrain.
    - **Contract IR-33042 I-69 RP 46+64 to RP 50+11** – Construction of 3.3 miles of freeway on new terrain.
    - **Contract IR-33045 I-69 RP 53+10 to RP 62+68** – Construction of 9.5 miles of freeway on new terrain
    - **Contract IR-33633 I-69 RP 50+01 to RP 52+86** – Construction of 2.6 miles of freeway on new terrain.

- Freeway: Rural/Rolling
    - **Contract IR-33737 I-69 RP 97+77 to RP 102+41** – Construction of 4.4 miles of freeway on new terrain.

- Expressway: Rural/Level
    - **Contract IR-30845 SR 25, Segment 2A** – Construction of 2.2 miles of expressway on new terrain.
    - **Contract IR-30846 SR 25, Segment 2D** – Upgrade of 2.7 miles of 2-lane highway to expressway.
    - **Contract IR-30849 SR 25, Segment 3A** – Upgrade of 2.9 miles of 2-lane highway to expressway with a new bypass around Rockfield, IN.
    - **Contract IR-30850 SR 25, Segment 3B** – Upgrade of 5.2 miles of 2-lane highway to expressway with a new bypass around Burrows, IN.

- Grade Separation/Overpass
    - **Contract R-35952 Styline Drive over Norfolk Railroad & 12th Street** – Construction of a new railroad overpass.

- Interchange
    - **Contract IR-35629 I-69 RP 203+70 to RP 204+30** – Conversion of an overpass to a full interchange. This contract has the minor road passing over the freeway.
    - **Contract IR-33291 I-69 at Union Chapel Road** – Conversion of an overpass to a full interchange. This contract has the minor road passing over the freeway.

On the following page are the **Unit Cost Summary Tables** (providing the per-mile roadway costs by facility type and terrain).

Unit Cost Summary
Tables
01/25/2020

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

Item	Unit Price
Grade Separation	$6,200,000
Interchange	$20,500,000

MID-STATES CORRIDOR

SCREENING OF ALTERNATIVES REPORT

IMPACT CALCULATION APPENDIX

Mid-States Corridor
Tier 1 Environmental Impact Statement

Prepared for

Indiana Department of Transportation

Mid-States Corridor Regional Development Authority

FEBRUARY 2020

Prepared by

Mid-States Corridor Project Consultant

INDIANA DEPARTMENT OF TRANSPORTATION INDOT

LOCHMUELLER GROUP
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Introduction

Potential impacts of each preliminary alternative were calculated using spatial data sets and ArcGIS (ESRI) software, which is a geographic information system (GIS). This document describes the GIS methodology used in the Mid-States Corridor Screening of Alternatives Report (Screening Report). This appendix provides a description of the development of the GIS database for the Screening Report and how the data were used to identify potential impacts of alternatives within the 12-county study area (**Figure 1).**

This study area consists of counties bounded by the area including I-69 on the west and north, SR 37 on the east, and the Ohio River on the south.

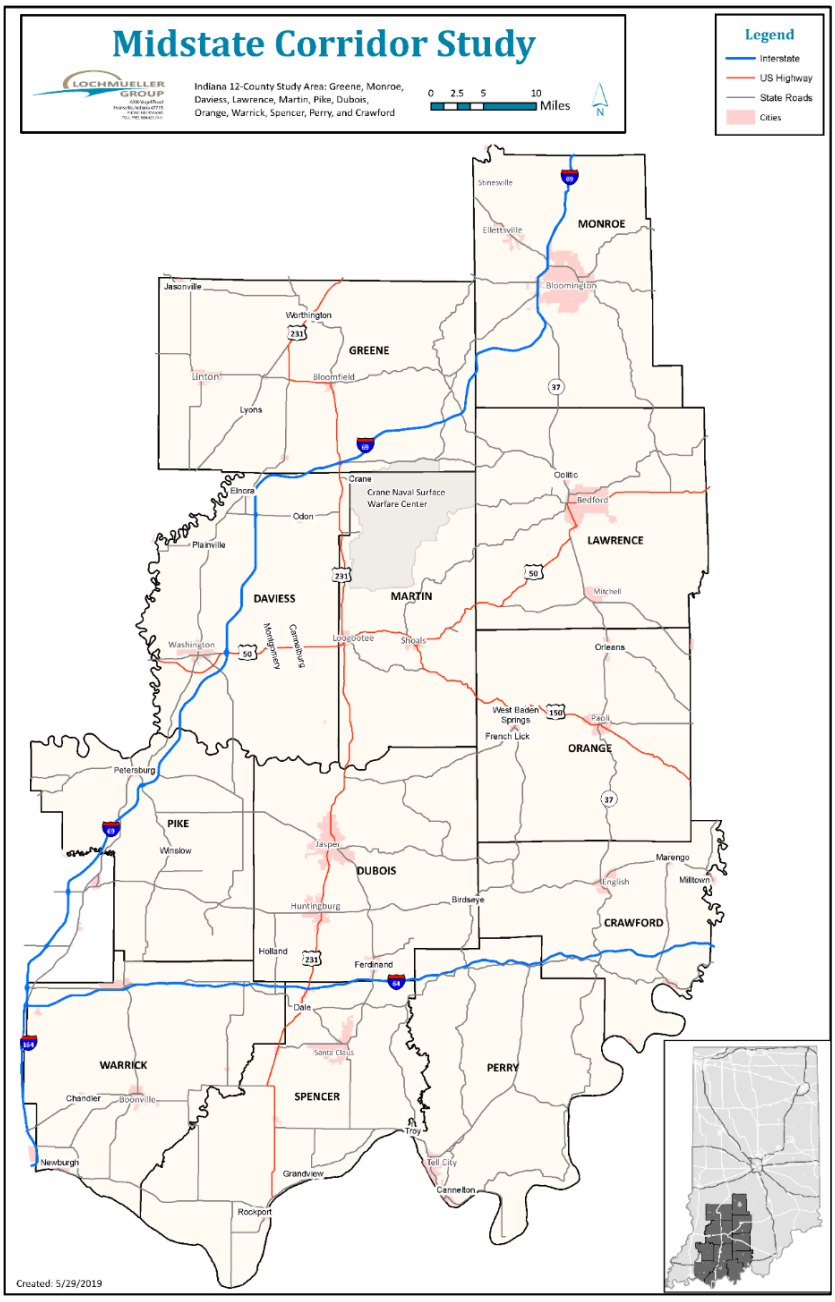

Figure 1: Mid-States Corridor Study Area

What is a Geographic Information System?

A geographic information system (GIS) is a computer-based system that allows performance of "location analytics." GIS is a method to capture, store, and display information related to specific positions on the Earth's surface. It allows for comparative analysis and represents geographic data using software and tools. GIS software allows you to overlay information and query it in terms of attributes and spatial relationships. There are two main types of GIS data: vector and raster. Vector data includes points, lines, and polygons. Examples of vector data are a residence (point); a street (line) and a neighborhood boundary (polygon). Raster data is a grid data, including images comprised of pixels. Each cell in the grid contains a value representing information, such as temperature, elevation or color value.

Database Compilation

A GIS database encompassing the entire 12-county study area of the Mid-States Corridor has been compiled. A GIS database is a collection of geographic dataset layers assigned a project coordinate system. The specified coordinate system and units for the Mid-States Corridor is Indiana State Plane East Zone, North American Datum (NAD) 1983, feet.

The GIS database organization streamlines the capabilities, quality, and consistency with respect to comparative analysis. Attribute data is contained within each dataset to provide quantitative data and qualitative descriptions in addition to the location information. Metadata is a document that includes information about the source of the GIS dataset and when and how it was created.

The GIS database was the repository for the project resource data throughout the alternatives screening process. It will continue to be used throughout the project. It simplifies the ability to prepare detailed environmental resource maps for public display exhibits and was used to avoid and minimize impacts as part of the definition of initial alternatives.

Impact Calculations

Impacts to specific resources were calculated using various geoprocessing tools. First, representative alignments created for each alternative in Computer Aided Design (CAD) software by the engineering design team were imported into the GIS database. Buffers were calculated for the representative alignment alternative linework using appropriate segmentation and buffer width for the various facility types, terrain, and land-use type within the study bands as determined by the engineering design team. (Table 1). Existing rights-of-way of US 231 and SR 37 were removed from the resulting buffers. Resource layers overlaying each buffer area were clipped to its boundaries and subsequently quantified for impacts. Clipped resources had their geometry calculated in the form of total area (acres) or total length (feet). For some resources (parcels and historic structures) total counts were used to tally impacts. Table 2 (at the end of this document) provides the results from the impact analysis of the resources data sets and is summarized by the three sections of the study bands for each of the representative alternative alignments and each facility type.

Table 1: Impact Calculation Buffer Widths

Facility Type	Design Type	Terrain Type	Buffer Width
Freeway	Urban	Level	350'
Freeway	Rural	Level	400'
Freeway	Rural	Rolling	600'
Expressway	Urban	Level	350'
Expressway	Rural	Level	400'
Expressway	Rural	Rolling	600'
Super 2	Urban	Level	125'
Super 2	Rural	Level	300'
Super 2	Rural	Rolling	500'

Screening Report Data Sets

For the initial screening of preliminary alignment alternatives, selected resource data sets were used to analyze the impacts of preliminary alternatives. These impacts (along with performance on project goals and cost) was used to identify alternatives to be carried forward for detailed study in the Environmental Impact Statement (EIS). The following paragraphs provide details about each data set used for the impact calculations.

Agricultural and Forested Lands

The evaluation of cropland and forest resource impacts used the U.S. Department of Agriculture (USDA) 2016 National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL). Agriculture impacts include all commodity types including row crops, grains, hay, seeds, pasture, tree crops, and other specialty crops such as vegetables. Impacts to forest were calculated by grouping deciduous forest, evergreen forest, and mixed forest classes.

Cultural Resources[1]

The assessment and calculation of potential impacts to cultural resources (historic sites and districts) for the screening alternatives was conducted using the State Historic Architectural and Archaeological Research Database (SHAARD) published in April 2019 which includes location and description data on historic districts, buildings, bridges, and miscellaneous objects. The data set includes features that are listed on the National Register of Historic Places, as well as sites designated as outstanding, notable and contributing historic features in the Indiana Historic Sites and Structures Survey.

[1] For reasons of confidentiality, information about archaeological sites 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.

Floodplains

Potential encroachment impacts upon floodplains within the study area were calculated using the Indiana Department of Natural Resources FIRM Floodplains and Flood Hazard Zones in Indiana dataset, published January 2019. Analysis was based on the total acreage of Zone A/AE (floodway and 100-year floodplain) encroached upon by the respective facility type buffer.

Karst Features

Calculation of potential impacts to karst geology features were based on encroachment acreage for each screening alternative using the Indiana Geological Survey Sinkhole Area and Sinking Stream Basin GIS coverage layer, published June 2019.

Managed Lands

Impacts to managed lands used the dataset from the Indiana Department of Natural Resources (IDNR), published June 2019. This dataset included public, non-profit, and privately-owned properties. These 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. With a few exceptions, direct impacts to managed lands were avoided during alignment development of the screening alternatives.

Parcels

The assessment of impacts to residential and business properties was performed using the county land parcel data set prepared by the Indiana Geographic Information Office (IGIO) as part of the Indiana Data Sharing Initiative (IDSI), published April 2018. Because estimation of potential residential and business relocations is not practical at the alternatives screening level, parcel data were used as a surrogate to assess relative impacts. All parcels 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. All parcels designated as “commercial” or “industrial” in the data set, include a large variety of classifications from heavy manufacturing, to warehouses, offices, retailers, services, recreation/entertainment, hotels, apartments, and health care facilities.

Streams

Impacts to streams were calculated using the United States Geologic Survey (USGS) National Hydrography Dataset (NHD) published April 2019. The NHD linework is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system.

Threatened and Endangered Species

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, published August 2019, that includes documented occurrences of state and federally listed species.

Points in the database representing the locations of listed species were buffered by 1,000 feet. Impacts were then calculated by a count of species buffers overlaid by alternative buffers. This ensured that species and habitats presence that might not be well represented by a single observation point would be quantified.

In order to preserve confidentiality, impacts 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** of the Screening of Alternatives Report.

Wetlands

Impacts to wetlands were calculated using the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) data set downloaded September 2019. 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 grouped into two categories: 1) wetlands including palustrine forest (PFO), shrub (PSS), and emergent (PEM); and 2) ponds (PUB, PUS).

Screening Report Resource Impacts

Table 2 provides a detailed breakdown of the impacts for 10 different alternatives alignments. Impacts within the table are segmented by different facility type alternatives (freeway, expressway, and Super-2), and by project segment (Segment 1, Segment 2, and Segment 3). The resulting combination of 10 alignments and three facility types resulted in impact calculations for twenty-eight (*N=28*) different alternatives. Alignment R was only considered for the Super-2 facility type, while all other alignments were considered for all three facility types.

In order to compare impacts across all the ten alternatives, between the three segments, and between the three facility types, data are presented in one comprehensive table. Facility types for each alternative were coded with a number.

- Freeway facility types were represented by **-1**: (*A-1; B-1; C-1 G-1; K-1; M-1; N-1; O-1; P-1*).
- Expressway facility types were represented by **-2:** (*A-2; B-2; C-2 G-2; K-2; M-2; N-2; O-2; P-2*).
- Super-2 facility types were represented by **-3:** (*A-3; B-3; C-3 G-3; K-3; M-3; N-3; O-3; P-3; R-3*).

Table 2: Resource Impact Table by Section and Facility Type

			Section 1																									
	Alternatives		A			B			C			G			K			M			N			O			P			R
SECTION 1	*Facility Type (1=Freeway; 2=Expressway; 3=Super-2)*		A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	G-1	G-2	G-3	K-1	K-2	K-3	M-1	M-2	M-3	N-1	N-2	N-3	O-1	O-2	O-3	P-1	P-2	P-3	R-3
	Total Floodplain Impacts	acres	26	0	0	26	0	0	26	0	0	26	0	0	26	0	0	26	0	0	26	0	0	26	0	0	26	0	0	0
	NWI (Pond)	acres	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0
	NWI (Emergent, Forested/Shrub)	acres	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0
	TOTAL FT Stream Impacts	feet	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	2,695	0	0	0
	Agricultural	acres	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0	0
	Forests	acres	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	0
	Industrial / Commercial	#	8	0	0	8	0	0	8	0	0	8	0	0	8	0	0	8	0	0	8	0	0	8	0	0	8	0	0	0
	Industrial / Commercial	acres	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0	5	0	0	0
	Residential	#	21	0	0	21	0	0	21	0	0	21	0	0	21	0	0	21	0	0	21	0	0	21	0	0	21	0	0	0
	Residential	acres	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0	0
	Historic Sites (Outstanding, Notable, Contributing)	#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Historic Districts	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Confidential-Managed Lands	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Confidential-Heritage Species (1000 ft Buffer)	#	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sinkhole & Sinking Stream Areas	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

			Section 2																									
	Alternatives		A			B			C			G			K			M			N			O			P			R
SECTION 2	*Facility Type (1=Freeway; 2=Expressway; 3=Super-2)*		A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	G-1	G-2	G-3	K-1	K-2	K-3	M-1	M-2	M-3	N-1	N-2	N-3	O-1	O-2	O-3	P-1	P-2	P-3	R-3
	Total Floodplain Impacts	acres	104	104	78	104	104	78	140	140	103	140	140	103	261	261	197	311	311	235	261	261	197	367	367	277	311	311	235	35
	NWI (Pond)	acres	10	10	7	10	10	7	10	10	7	10	10	7	12	12	8	2	2	2	12	12	8	2	2	1	2	2	2	1
	NWI (Emergent, Forested/Shrub)	acres	20	20	15	20	20	15	35	35	25	35	35	25	98	98	73	31	31	23	98	98	73	32	32	24	31	31	23	9
	TOTAL FT Stream Impacts	feet	28,631	28,631	21,151	28,618	28,618	21,134	33,949	33,949	24,701	33,949	33,949	24,701	42,491	42,491	32,025	34,150	34,150	27,075	42,491	42,491	32,025	39,181	39,181	30,735	34,154	34,154	27,095	8,078
	Agricultural	acres	559	559	420	560	560	421	808	808	607	808	808	607	717	717	536	658	658	494	717	717	536	706	706	530	658	658	494	59
	Forests	acres	108	108	80	107	107	80	154	154	115	154	154	115	317	317	237	266	266	197	317	317	237	306	306	226	266	266	197	27
	Industrial / Commercial	#	0	0	0	0	0	0	0	0	0	0	0	0	8	8	8	3	3	2	8	8	8	3	3	2	3	3	2	295
	Industrial / Commercial	acres	0	0	0	0	0	0	0	0	0	0	0	0	9	9	5	8	8	6	9	9	5	8	8	6	8	8	6	34
	Residential	#	72	72	62	73	73	61	105	105	91	105	105	91	62	62	53	40	40	33	62	62	53	43	43	35	40	40	33	444
	Residential	acres	62	62	47	62	62	47	90	90	69	90	90	69	68	68	52	38	38	28	68	68	52	41	41	30	38	38	28	57
	Historic Sites (Outstanding, Notable, Contributing)	#	0	0	0	0	0	0	2	2	1	2	2	1	0	0	0	2	2	1	0	0	0	2	2	1	2	2	1	29
	Historic Districts	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Confidential-Managed Lands	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Confidential-Heritage Species (1000 ft Buffer)	#	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sinkhole & Sinking Stream Areas	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2…continued: Resource Impact Table by Section and Facility Type

			Section 3																										
	Alternatives		A			B			C			G			K			M			N			O			P			R
SECTION 3	*Facility Type (1=Freeway; 2=Expressway; 3=Super-2)*		A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	G-1	G-2	G-3	K-1	K-2	K-3	M-1	M-2	M-3	N-1	N-2	N-3	O-1	O-2	O-3	P-1	P-2	P-3	R-3
	Total Floodplain Impacts	acres	49	49	38	130	130	97	77	77	57	109	109	81	188	188	140	464	457	367	283	266	211	192	175	149	188	188	140	26
	NWI (Pond)	acres	0	0	0	6	6	6	11	11	8	3	3	1	4	4	2	9	9	6	10	10	7	6	6	5	4	4	2	2
	NWI (Emergent, Forested/Shrub)	acres	16	16	12	16	16	12	2	2	1	4	4	2	7	7	4	18	17	12	20	18	15	15	14	11	7	7	4	4
	TOTAL FT Stream Impacts	feet	23,743	23,743	17,578	19,121	19,121	14,838	14,884	14,884	11,476	31,303	31,303	22,811	41,956	41,956	30,364	56,204	58,182	47,260	85,560	82,084	65,370	72,967	66,242	55,313	41,956	41,956	30,364	17,131
	Agricultural	acres	684	684	514	761	761	573	668	668	497	1039	1039	777	889	889	664	850	831	662	881	859	690	743	701	585	889	889	664	65
	Forests	acres	87	87	64	114	114	84	224	224	167	464	464	347	583	583	436	1704	1669	1357	1571	1525	1243	1422	1372	1143	583	583	436	178
	Industrial / Commercial	#	0	0	0	0	0	0	4	4	4	1	1	0	0	0	0	40	4	3	72	5	5	122	7	6	0	0	0	106
	Industrial / Commercial	acres	0	0	0	0	0	0	6	6	4	0	0	0	0	0	0	24	5	3	33	11	8	53	6	5	0	0	0	33
	Residential	#	38	38	34	48	48	42	16	16	11	38	38	29	30	30	23	194	79	69	205	69	62	302	76	67	30	30	23	418
	Residential	acres	20	20	14	32	32	24	25	25	18	44	44	32	40	40	29	141	113	91	130	99	80	178	124	103	40	40	29	222
	Historic Sites (Outstanding, Notable, Contributing)	#	1	1	1	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3	5	5	5	8	7	6	2	2	2	24
	Historic Districts	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Confidential-Managed Lands	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	252	252	210	1	0	0	0	0	0	13
	Confidential-Heritage Species (1000 ft Buffer)	#	X	X	X	X	X	X	X	X	X	XX	XX	XX	XX	XX	XX	XX	X	X	XXXXX	XXX	XX	XXX	XX	XX	XX	XX	XX	X
	Sinkhole & Sinking Stream Areas	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	183	152	706	700	584	568	482	402	0	0	0	0

			TOTALS																										
	Alternatives		A			B			C			G			K			M			N			O			P			R
TOTAL ALL SECTIONS	*Facility Type (1=Freeway; 2=Expressway; 3=Super-2)*	units	A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	G-1	G-2	G-3	K-1	K-2	K-3	M-1	M-2	M-3	N-1	N-2	N-3	O-1	O-2	O-3	P-1	P-2	P-3	R-3
	Total Floodplain Impacts	acres	179	153	116	260	234	175	243	217	161	275	249	185	475	449	337	801	769	602	570	527	408	585	542	425	525	499	375	61
	NWI (Pond)	acres	11	10	7	17	16	12	21	21	15	14	13	8	16	16	10	12	11	8	22	21	15	9	8	6	7	6	3	3
	NWI (Emergent, Forested/Shrub)	acres	37	36	26	37	36	27	37	36	26	39	39	27	105	105	78	50	48	35	118	116	88	48	46	35	38	37	27	14
	TOTAL FT Stream Impacts	feet	55,069	52,374	38,729	50,434	47,738	35,972	51,529	48,833	36,178	67,948	65,252	47,512	87,143	84,447	62,390	93,050	92,332	74,335	130,747	124,575	97,396	114,844	105,423	86,048	78,806	76,110	57,459	25,209
	Agricultural	acres	1,278	1,243	934	1,357	1,321	994	1,512	1,476	1,104	1,883	1,848	1,384	1,642	1,606	1,200	1,544	1,488	1,155	1,634	1,576	1,226	1,484	1,407	1,115	1,583	1,547	1,158	124
	Forests	acres	222	194	144	249	221	164	406	378	281	647	619	462	928	900	673	1,998	1,935	1,554	1,916	1,841	1,480	1,756	1,677	1,369	878	850	633	205
	Industrial / Commercial	#	8	0	0	8	0	0	12	4	4	9	1	0	16	8	8	51	7	5	88	13	13	133	10	8	11	3	2	401
	Industrial / Commercial	acres	5	0	0	5	0	0	11	6	4	5	0	0	14	9	5	37	13	9	47	20	13	66	14	11	13	8	6	67
	Residential	#	131	110	96	142	121	103	142	121	102	164	143	120	113	92	76	255	119	102	288	131	115	366	119	102	91	70	56	862
	Residential	acres	86	82	62	98	94	71	120	116	87	138	134	101	113	109	81	183	151	119	203	168	131	223	164	133	82	78	57	279
	Historic Sites (Outstanding, Notable, Contributing)	#	1	1	1	3	3	3	4	4	3	5	5	4	2	2	2	5	5	4	5	5	5	10	9	7	4	4	3	53
	Historic Districts	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Confidential-Managed Lands	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	252	252	210	1	0	0	0	0	0	13
	Confidential-Heritage Species (1000 ft Buffer)	#	X	X	X	XX	XX	XX	X	X	X	XXX	XX	XX	XXX	XX	XX	XXX	X	X	XXXXX	XXXX	XXX	XXXX	XX	XX	XX	XX	XX	XX
	Sinkhole & Sinking Stream Areas	acres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	183	152	706	700	584	568	482	402	0	0	0	0

MID-STATES CORRIDOR

SCREENING OF ALTERNATIVES REPORT

PURPOSE AND NEED APPENDIX

Mid-States Corridor
Tier 1 Environmental Impact Study

Prepared for

Indiana Department of Transportation

Mid-States Regional Development Authority

FEBRUARY 2020

Prepared by

Mid-States Corridor Project Consultant

February 2020

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1 INTRODUCTION

Purpose and Need performance measures are calculated by post-processing traffic assignments. These performance measures assess how well alternatives support goals in the project Purpose and Need. The Preliminary Alternatives analysis identified 28 alternatives (defined as combinations of route and facility type). it is not practical to run traffic assignments and conduct post-processing analyses for this number of alternatives.

To provide performance measures for all alternatives in a manageable manner, performance measures were calculated for some alternatives. Performance measures for other alternatives were calculated based upon their similarity to alternatives for which performance measures were calculated. This approach is based on the similarities of alternatives within geographic groups (families).

For example, in the Northwest Family of alternatives, traffic assignments were run for all expressway alternatives (Alternatives A, B and C). Assignments also were run for Alternative C for Super-2 and freeway facility types. The ratio of performance measures among alternatives for the expressway facility type were applied to estimate performance measures for Alternatives A and B for the Super-2 and freeway facility types. If, for example, the calculated performance measure for Alternative A were 75% of the performance measures for Alternative C for the expressway facility type, this same ratio is applied to estimate the Alternative A performance on this measure for the Super-2 and freeway facility types.

The following subsections describe these similarities, and how they were used to identify performance measures.

2 GEOGRAPHIC FAMILIES

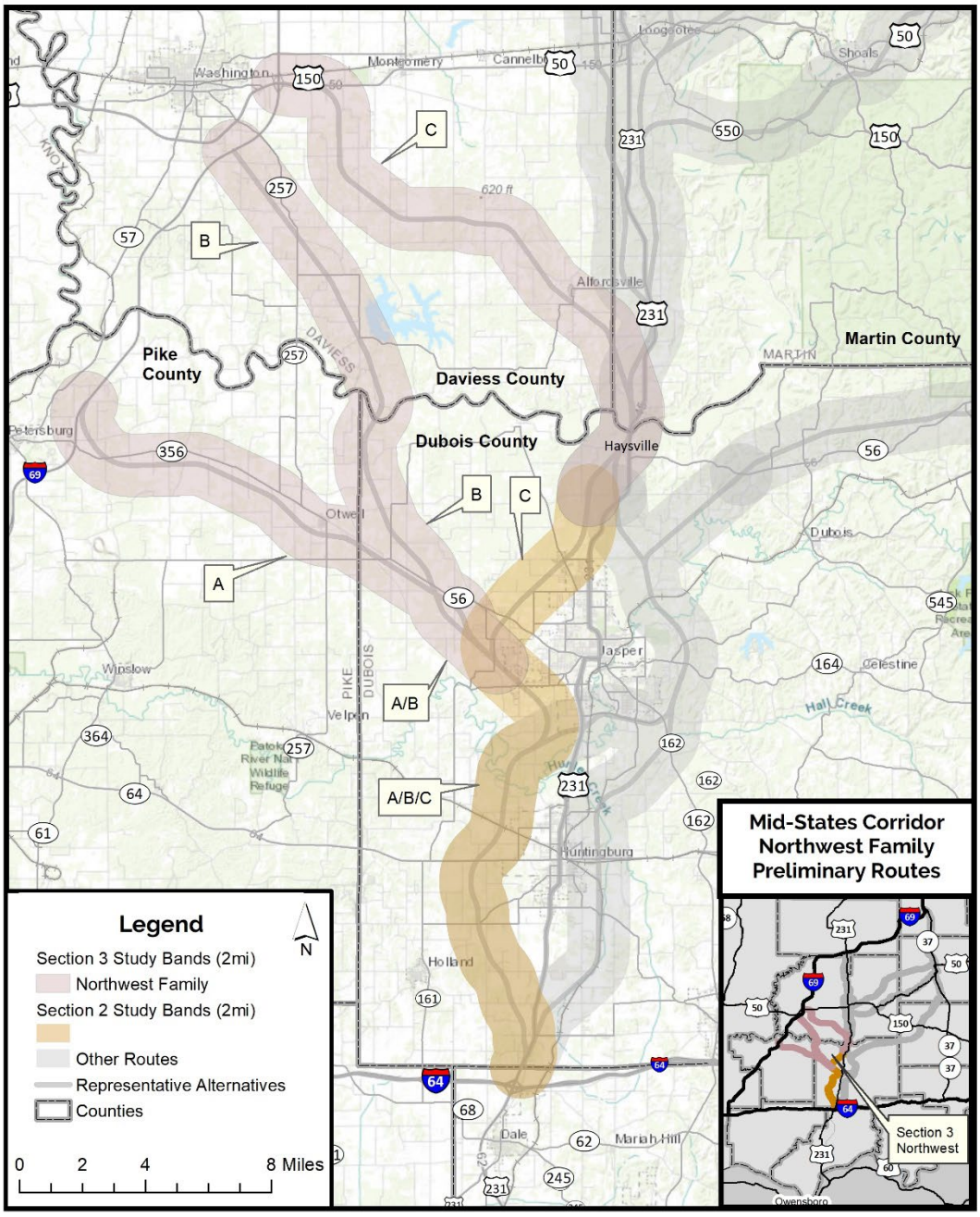
All alternatives begin at US 231 and SR 66 in southern Spencer County, near the Natcher Bridge over the Ohio River. All alternatives then follow US 231 north into Dubois County. In southern Dubois County they serve Huntingburg and Jasper before continuing in one of three geographic directions. Alternatives are grouped into three geographic families, corresponding to the direction they proceed from central Dubois County. These families are briefly described below.

2.1 Northwest Family

Alternatives in the Northwest Family proceed northwest from central Dubois County. They end at I-69 in either Pike or Daviess county. They traverse level terrain (generally agricultural) for their entire length. Between I-64 (near the Spencer-Dubois county line) and I-69, they range between 32 and 42 miles in length.[1] **Figure 1-1** shows the Northwest Family alternatives between I-64 and I-69.

[1] These mileages ranges (as well as those cited for the North Central and Northeast families) are provided in the *Construction Costs Estimates Appendix*, Overall Cost and Length Summary Table.

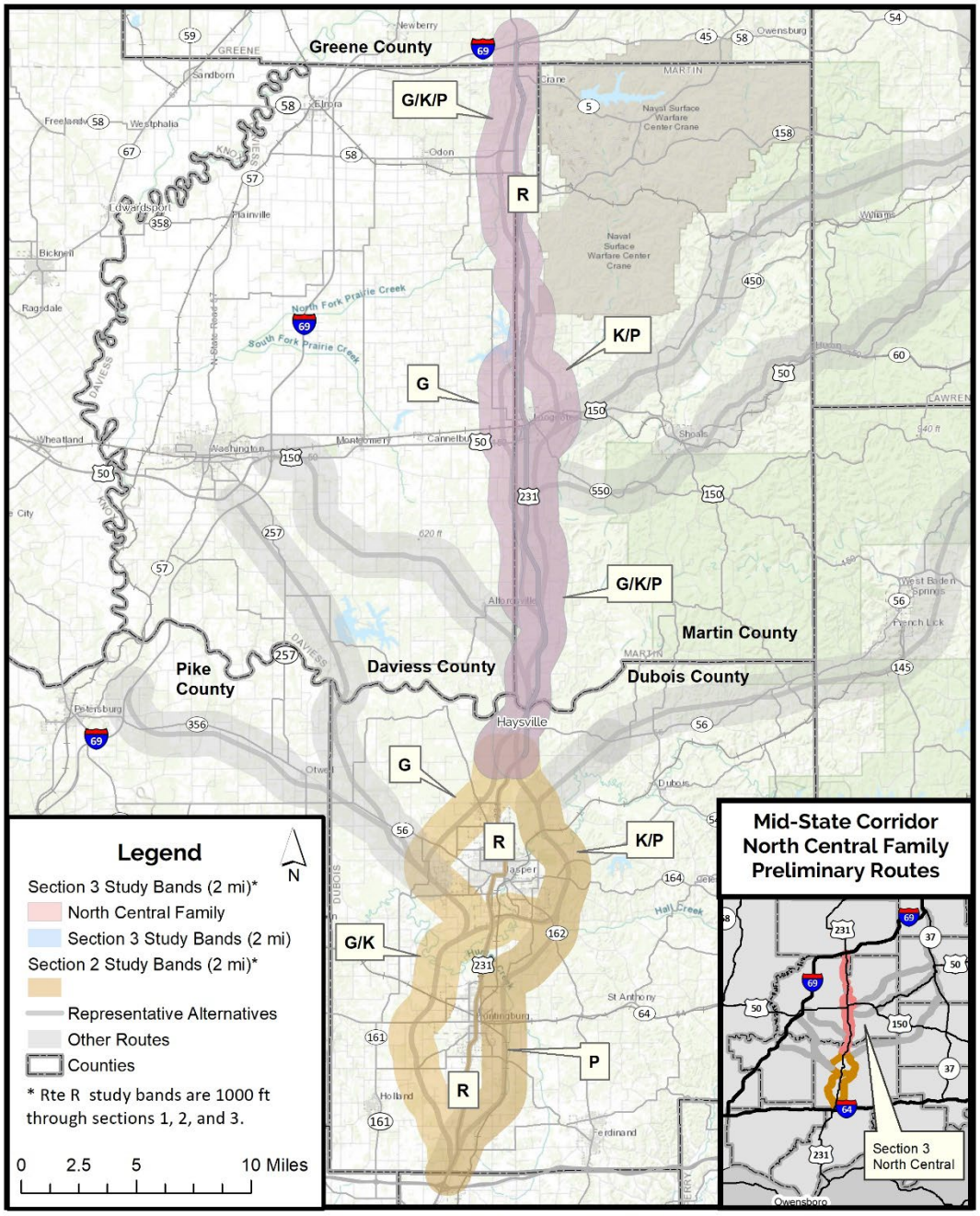
Figure 2-1 – Northwest Family Alternatives



2.2 North Central Family

Alternatives in the North Central Family proceed directly north from central Dubois County. They end at I-69 in Greene County at the existing I-69 US 231 interchange near Naval Support Activity Crane (NSA Crane). They traverse level terrain (generally agricultural) for their entire length. Between I-64 (near the Spencer-Dubois county line) and I-69, they range between 51 and 56 miles in length. **Figure 1-2** shows the North Central Family alternatives between I-64 and I-69.

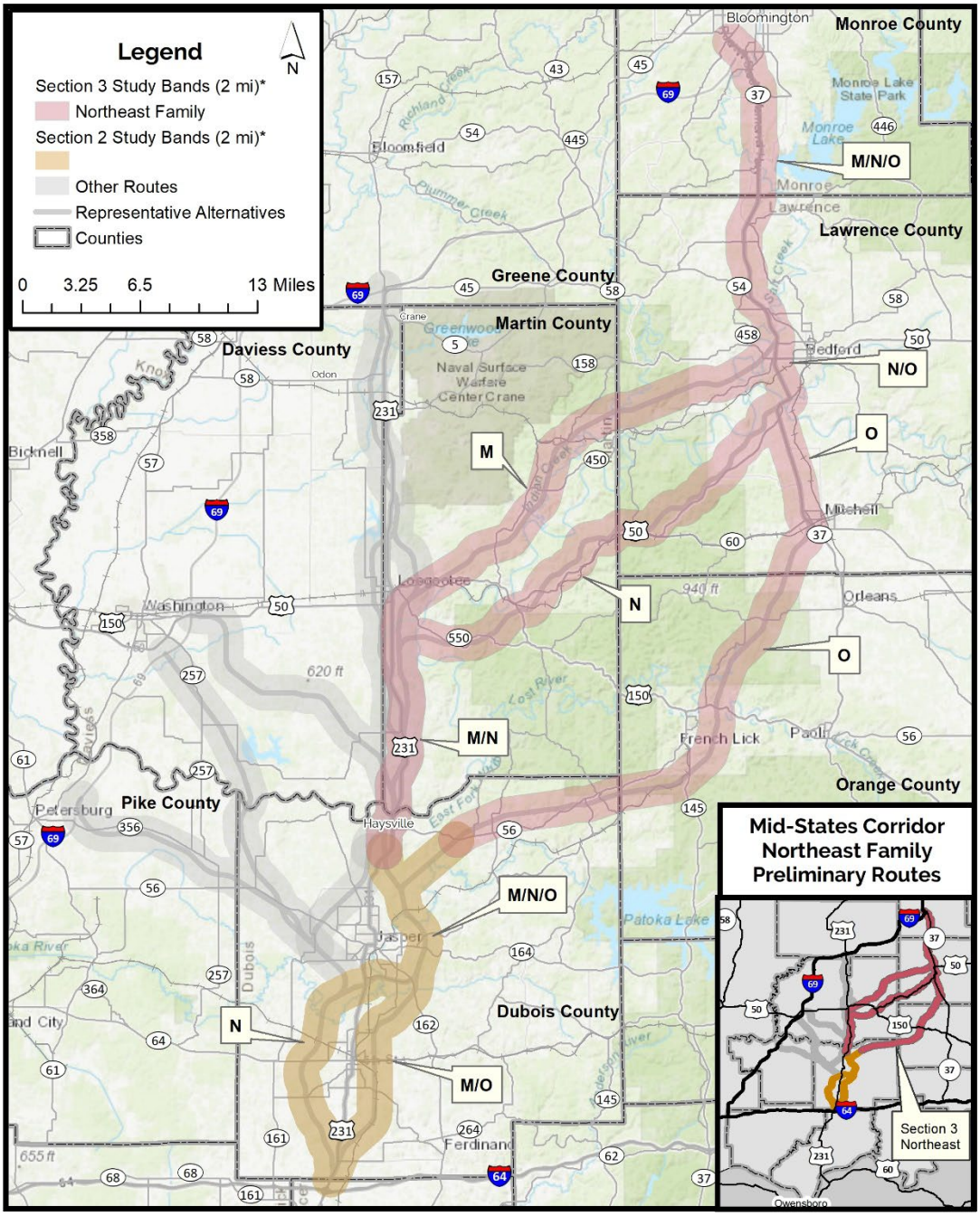
Figure 2-2 – North Central Family Alternatives



2.3 Northeast Family

Alternatives in the Northeast Family proceed directly northeast from central Dubois County. They end at SR 37 in Orange or Lawrence county, providing access to I-69 (south of Bloomington) via SR 37. They traverse level terrain (generally agricultural) through much of Dubois County. Portions of these alternatives in northeast Dubois County, as well as their routes in Martin, Orange and Lawrence counties, traverse rolling terrain. Between I-64 (near the Spencer-Dubois county line) and SR 37, they range between 52 and 63 miles in length. **Figure 1-3** shows the Northeast Family alternatives between I-64 and I-69.

Figure 2-3 – Northeast Family Alternatives



3 FACILITY TYPES

With the exception of Alternative R,[2] all alternatives were evaluated using three facility types. These include Super-2 arterial, expressway and freeway facilities. See the **Screening of Alternatives Report (Section 2.1)** for the characteristics of each facility type.

Higher classifications of facilities provide higher speeds and safer travel for each route. For the same route, the Super-2 arterial will have the lowest performance, and the freeway will have the highest performance. The expressway's performance will fall between the two facility types.

Within similar geographic regions (families), variation of alternative performance by facility type is assumed to be similar. Within the same family, alternatives (of all facility types) are similar in length, traverse similar terrain, and have similar northern termini.

4 RATIO APPROACH

For traffic assignments and performance measures, the expressway facility type provides a midrange value for costs, impacts and benefits for each route. Except for Alternative R, traffic assignments for all routes were made for the expressway facility type. Performance measures were calculated by post-processing the traffic assignments for the expressway facility types.

Within each of the three families, one route was selected to have traffic assignments and performance measures calculated for all three facility types. These routes include:

- Traffic assignments and performance measures were directly calculated for **Alternative C** for all three facility types in the **Northwest Family**. Alternative C represents the most direct connection to I-69 of the preliminary routes of the Northwest Family. It makes use of the existing I-69 interchange at US 50.
- Traffic assignments and performance measures were directly calculated for **Alternative P** for all three facility types in the **North Central Family**. Alternative P is anticipated to have fewer wetland impacts. It also is anticipated to have slightly fewer residential and farmland impacts by using an eastern bypass of Loogootee.
- Traffic assignments and performance measures were directly calculated for **Alternative M** for all three facility types in the **Northeast Family**. Alternative M provides the most direct route to I-69 of the three alternatives in this family. It also acknowledges resource agency feedback about avoiding managed land impacts, which are anticipated to be greater for routes further to the south.

[2] Alternative R is evaluated only with a Super-2 facility type. It is an upgrade of existing US 231, including the existing alignment through the cities of Huntingburg, Jasper and Loogootee. The existing alignment through these cities could not be upgraded to an expressway or freeway while maintaining appropriate design speeds.

For these three routes (Alternatives C, P and M), ratios were calculated for most performance measures. These ratios measured how performance changed by facility type for each route. These ratios were applied to the traffic assignments and performance measures to interpolate values for other alternatives in the same family.

These interpolated performance measures are provided in **Table 3-1**, **Table 3-2** and **Table 3-3** of the **Screening of Alternatives Report** for the following alternatives and facility types.

Northwest Family

- **Alternative A (Super-2 and Freeway)** based upon ratios for Alternative C
- **Alternative B (Super-2 and Freeway)** based upon ratios for Alternative C

North Central Family

- **Alternative G (Super-2 and Freeway)** based upon ratios for Alternative P
- **Alternative K (Super-2 and Freeway)** based upon ratios for Alternative P

Northeast Family

- **Alternative N (Super-2 and Freeway)** based upon ratios for Alternative M
- **Alternative O (Super-2 and Freeway)** based upon ratios for Alternative M

For two classes of measures, this ratio method was not always followed. These were measures which assessed changes in travel-time between origin-destination pairs (**Goal 1** – Accessibility to Major Business Markets and **Goal 7** – Accessibility to Intermodal Centers). These performance measures are travel time savings between travel pairs, measured in minutes. In some cases, Alternatives C, P or M showed 0 minutes of savings for expressways, but showed positive travel-time savings for expressways. In these instances, calculations of travel time savings for other alternatives in the same family were based upon professional judgment.