APRIL 2024

LINK 101

SR 101 CORRIDOR PROJECT
SOUTHEAST INDIANA

Preliminary Alternatives Screening Report

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EXECUTIVE SUMMARY

Link 101 is an Indiana Department of Transportation (INDOT) project in southeast Indiana that is evaluating alternatives for an improved State Road (SR) 101 connection between the Markland Dam Bridge and US 50. The Link 101 project will develop and evaluate alternatives in accordance with the National Environmental Policy Act (NEPA). Currently, the Link 101 project is in the preliminary environmental and design stage, which includes early coordination, development of the project's purpose and need, and development and screening of preliminary alternatives – and obtaining input on those items from agencies and the public. Since the project kicked off in late 2022, there have been two rounds of outreach with the public, key stakeholders, and agencies.

This *Preliminary Alternative Screening Report* was developed to evaluate and screen a full range of preliminary alternatives down to a smaller number that will be carried forward for more detailed analysis. All preliminary alternatives under evaluation are at a conceptual level. Key factors in the identification and development of the range of alternatives included: the project purpose and need; the project termini; areas of challenging terrain; avoidance or minimization of impacts to residences, businesses, and sensitive environmental resources, where possible; utilization of existing roadway corridors, where possible; and public and agency feedback.

Initially, 10 preliminary alternatives – Alternatives A through J – were developed in the eastern, central, and western portions of the project area. These preliminary alternatives were developed to allow for the evaluation of a wide range of alignments and destinations to a range of termini along US 50. Preliminary alternatives also varied in their use of existing roadways, including options that were completely on new alignment, completely on existing roadways, or a combination of new alignments and existing roadways. In rural areas, each of the preliminary alternatives would be a 2-lane roadway with standard 12-foot lanes and 10-foot shoulders and designed for a 55 mph speed limit. Within the incorporated/urban areas of Vevay, Versailles, and Aurora, the design of the preliminary alternatives would be limited to the existing right-of-way and based on existing posted speed limits.

The initial 10 preliminary alternatives, as well as the draft purpose and need, were presented to the public and agencies in a series of meetings in July and August 2023, and input received was incorporated into this screening report. Based on input from the public to improve and make greater use of the existing roadways in order to minimize impacts to the rural setting of the project area, two additional options – Alternatives K and L – were developed based on a lower design speed, for a total of 12 preliminary alternatives.

Multiple screening criteria were established to evaluate the proposed preliminary alternatives, including: the ability to satisfy the project's purpose and need; the potential environmental impacts; and engineering, traffic, and cost factors. Based on how well each preliminary alternative met the criteria, a recommendation was made to either dismiss or carry an alternative forward for more detailed evaluation. As shown in Figure ES-1, of the 12 preliminary alternatives, **four are recommended to be carried forward for further evaluation: Alternative B, Alternative C, Alternative G, and Alternative H**. In accordance with NEPA guidelines, the No-Build Alternative

will also be carried forward for further evaluation. Following public and agency input, a final decision will be made on the alternatives to be carried forward for further evaluation with more detailed design and environmental surveys. Based on the more detailed information, the alternatives will be evaluated, and a Preferred Alternative identified in the draft NEPA document for public and agency review and comment.

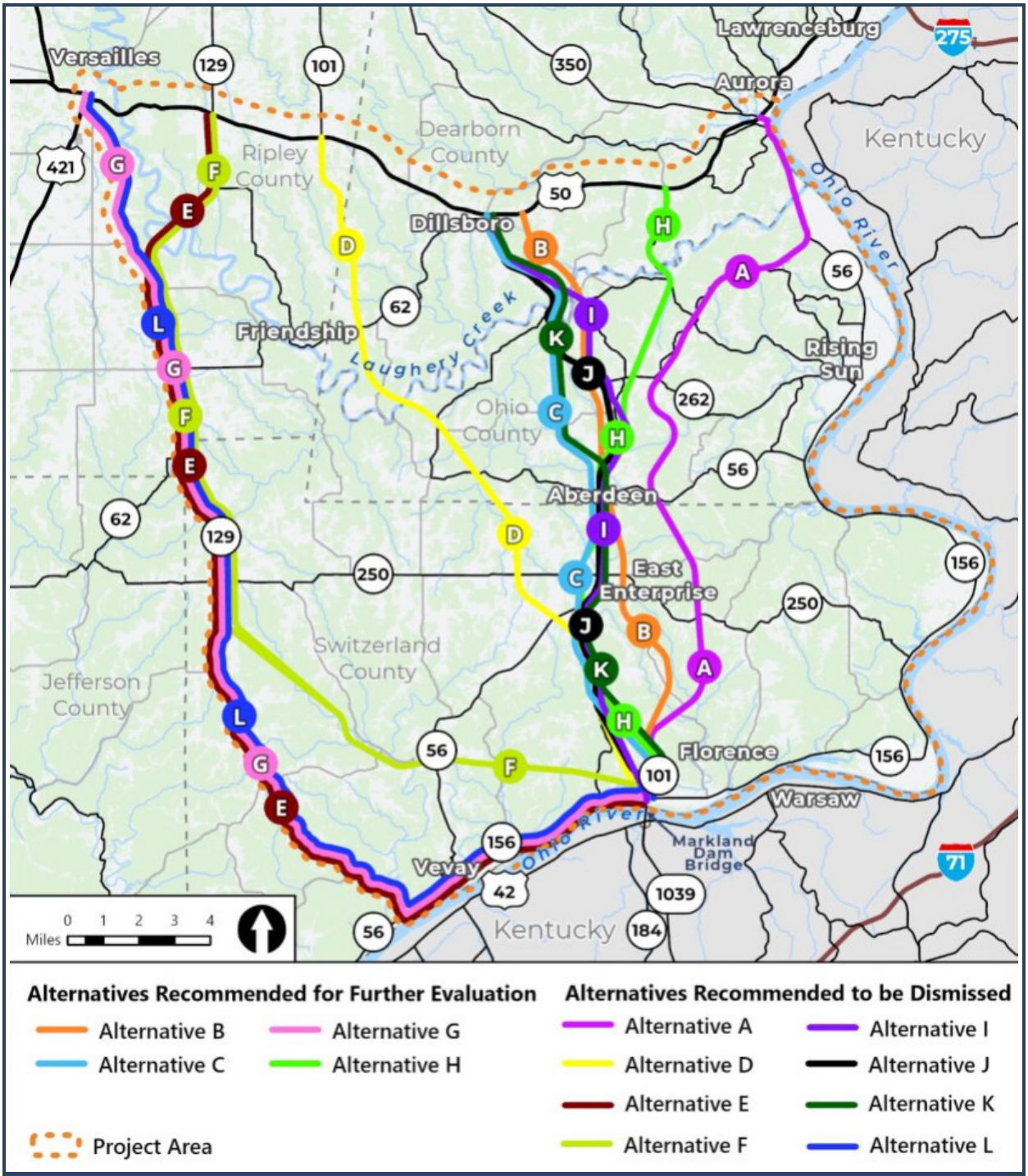

Figure ES-1. Link 101 Preliminary Alternatives Screening Results

CHAPTER 1 – INTRODUCTION

Link 101 is an Indiana Department of Transportation (INDOT) project in southeast Indiana that is evaluating alternatives for an improved State Road 101 connection between the Markland Dam Bridge and US 50. The Link 101 project is currently in the preliminary environmental and design stage, which includes early coordination, development of the Purpose and Need Statement, and development and screening of preliminary alternatives – and presenting those items to the agencies and public to obtain their input (see Section 2.2).

A screening process has been developed to evaluate and screen a full range of preliminary alternatives down to a smaller number that will be carried forward for more detailed analysis. For this process, the preliminary alternatives were developed at a conceptual level – i.e., potential routes with starting and ending points – and evaluated using screening criteria that include the ability to satisfy the project's purpose and need and a comparison of potential environmental impacts. Additional evaluation criteria included engineering, traffic, and cost factors, such as construction and right-of-way costs, construction and maintenance of traffic complexity, traffic performance, and the relative level of mobility and connectivity provided.

The purpose of this Preliminary Alternatives Screening Report is to present the project's preliminary range of alternatives to be considered, discuss the results from the screening analysis, and identify the alternatives recommended to be carried forward for further development and evaluation.

1.1 DESCRIPTION OF PROJECT AREA

SR 101 Northbound at Markland Dam Bridge

The Link 101 project was initiated to consider improvements to north-south connectivity in southeastern Indiana. The Link 101 project area is bounded by the Ohio River on the south and east, SR 129 on the west, and US 50 on the north and includes Switzerland, Ohio, Dearborn, and Ripley counties (Figure 1-1). In the southern end of the project area, SR 101 extends across the Indiana portion of the Markland Dam Bridge over the Ohio River and ends at the SR 156 intersection. In Kentucky, the Markland Dam Bridge connects to Kentucky Route 1039, which extends south to I-71. The nearest bridge crossings of the Ohio River from the Markland Dam Bridge are 39 river miles upstream at I-275 and 25 river miles downstream at US 421. As a result, the SR 101 crossing of the Ohio River at the Markland Dam Bridge is the project's southern logical terminus. At the northern end of the project area, SR 101 resumes at US 50 and continues north to I-74.

Figure 1-1. Link 101 Project Area

The entire length of US 50 within the project area has been identified as the project's northern logical terminus because it is a significant destination and change in roadway classification. In addition to SR 101, the project area includes SR 156 and SR 56, which are part of the Ohio River Scenic Byway, and SR 129, SR 250, SR 62, and SR 262, all of which are two-lane roads. US 50, which is part of the National Highway System and Indiana's Historic Pathways and is designated a National and State Scenic Byway, is the only four-lane, divided highway in the project area.

The project area has a rural setting with steep, hilly terrain, ravines, and plateaus. The dominant land uses are forest and farmland. There are numerous streams, the largest of which, Laughery Creek, extends east-west across the northern portion of the project area and features a wide floodplain and a designated floodway. There are three incorporated towns (Vevay, Versailles, and Dillsboro) and two incorporated cities (Rising Sun and Aurora) in the project area.

1.2 PROJECT HISTORY

In 2002, INDOT initiated a planning-level study, referred to as a feasibility study, for the SR 101 corridor in southeast Indiana in accordance with *Indiana's Streamlined EIS Procedures* (2001). The intent of using the streamlined procedure was to eliminate the duplication of effort by carrying out the planning process in a manner that would allow elements such as purpose and need and screening of alternatives to be carried forward into a future National Environmental Policy Act (NEPA) process. The goal of the SR 101 feasibility study was to help in the identification of potential transportation improvement projects and the level of NEPA documentation (i.e., project scope), which could then be used to obtain transportation programming and funding.

As part of the SR 101 feasibility study, INDOT prepared a *Draft Statement of Purpose and Need for the SR 101 Corridor Improvement Feasibility Study*, which was undertaken to assess the implications of limited north-south access and to identify feasible improvement alternatives. The study area limits for that analysis included I-74 to the north, US 421 to the west, and the Ohio River and Indiana state line to the south and east. In 2003, INDOT subsequently prepared the *SR 101 Corridor Improvement Feasibility/NEPA Study* (INDOT 2003), which evaluated various build alternatives and updated the 2002 purpose and need statement to include the following two project needs:

- Improve roadway safety and reduce accident frequency; and
- Improve regional accessibility and connectivity.

All the build alternatives in that study were developed with two segments, a southern and northern segment. The southern segments extended from the southern end of the study area to US 50 and were designated as "A" alternatives. The northern segments extended from US 50 to I-74 and were designated as the "B" alternatives. Alternatives were evaluated for key factors (safety/accessibility) and secondary factors (mobility/environmental/economic). The Feasibility/NEPA Study recommended constructing the project in phases and that the southern sections of the recommended alternatives (i.e., Alternatives 2A and 3A) be constructed before the northern sections. No further action was taken following the completion of the Feasibility/NEPA Study in 2003.

The project was reinitiated in 2021 by Indiana Governor Eric Holcomb, with the commitment of $200 million dollars to the development and construction of the project. The governor cited the safety and economic benefits that an improved connection would provide for southeastern Indiana. Since the announcement, the Southeast Indiana Regional Economic Acceleration and Development Initiative (SEI READI), a coalition of cities, towns, and counties in southeastern Indiana has developed the *SEI READI Regional Development Plan*, which identifies this project as a catalyst for the region and includes a number of complementary projects. Based on the 2003 Feasibility/NEPA Study's recommendations, the reinitiated project will focus on the southern section between US 50 and SR 101 at Markland Dam Bridge. The most significant modification to the project limits was reducing the western limit from US 421 to SR 129 because the 2003 Feasibility/NEPA Study did not identify any reasonable alternatives west of SR 129. These new project limits are described in Section 1.1 and represent the project area.

1.3 SUMMARY OF PURPOSE AND NEED STATEMENT

The purpose and need statement identifies specific transportation problems (needs) to be addressed and describes the specific desired outcomes (purposes). The purpose and need statement helps determine a reasonable range of alternatives and establishes performance measures that are used to determine if these alternatives meet the project's purpose and need. It is the foundation of the decision-making process and project design: any alternatives that do not meet the project purpose and need are eliminated from further consideration. For the Link 101 project purpose and need analysis, the following transportation conditions were evaluated: travel distance and time, geometric deficiencies, safety, and traffic.

The project's preliminary purpose and need was presented to the public and agencies during the first round of outreach meetings in January 2023 (see Section 2.2.1). Following those meetings and based on public and agency comments, a Draft Purpose and Need Statement was prepared and presented to the public and agencies during the second round of outreach meetings in July and August 2023 (see Section 2.2.2). Since then, additional updates and revisions were made to the Draft Purpose and Need Statement in January 2024 (see the project website for the latest version), which identifies the following project needs:

- Travel time and distance along the existing fastest and shortest route from SR 101 at the Markland Dam Bridge and the SR 262/US 50 intersection near Dillsboro is 15 minutes (79 percent) and 5.5 miles (32 percent) longer compared to a corresponding straight-line route. Due to truck restrictions on this route and many others in the project area, the routes for trucks are even longer.
- The existing fastest and shortest route has numerous geometric deficiencies such as narrow lanes, narrow or no shoulders, sharp curves, and poor sight distances that contribute to poor safety outcomes, travel times, and connectivity.
- All of the crossings of Laughery Creek within the project area have roadway approaches and/or bridges that are below the 100-year flood elevation, jeopardizing access and safety during flood events.
- Slide-prone areas within the project area and along the existing fastest and shortest route create potential access and safety issues.

- There is no direct route that provides reliable, safe, and efficient connectivity through the project area.
- Thirty-five percent and 56 percent of the roadways and intersections, respectively, along the existing fastest and shortest route have an Index of Crash Frequency (ICF) greater than 0 and are considered elevated crash locations.
- Forty-four percent of the roadways and intersections within the project area have an ICF greater than 0 and are considered elevated crash locations.

Based on the project's needs, the following primary project purposes were developed:

- Reduce travel time within the project area by improving connectivity.
- Improve safety within the project area by reducing vehicle miles traveled (VMT) on roadways with elevated crash locations.
- Provide a roadway that meets current design standards.
- Provide a roadway that is above the Laughery Creek 100-year floodplain elevation and minimizes the risk of slides.

Based on the project's purposes, performance measures were developed to evaluate whether an alternative satisfies the project's purpose and need (see Section 3.1). Note that based on initial public input, the following secondary project purposes were recommended. It is desirable, but not required, that the project satisfy these secondary project purposes:

- Accommodate pedestrian, bicycle, and horse-drawn vehicle traffic as needed.
- Provide a roadway that is compatible with the existing rural landscape.
- Provide a roadway that supports economic development in southeast Indiana.

Secondary purposes are not part of the preliminary alternatives screening process but will be taken into consideration as part of the more detailed evaluation of the alternatives that are carried forward into the draft NEPA document.

CHAPTER 2 – DEVELOPMENT OF PRELIMINARY ALTERNATIVES

The preliminary alternatives development and screening process established a wide range of alternatives for consideration for screening. Key factors in the identification and development of the preliminary alternatives for the Link 101 project included:

- Project purpose and need
- Project termini
    - All start at SR 101 at the Markland Dam Bridge
    - Considers range of destinations along US 50 between Versailles, Dillsboro, and Aurora
- Areas of challenging terrain
    - Ohio River valley
    - Steep ravines
    - Laughery Creek valley
- Avoidance or minimization of impacts to residences, businesses, and sensitive environmental resources, where possible
- Utilization of existing roadway corridors, where possible
- Public and agency feedback

Initially, 10 preliminary alternatives – Alternatives A through J – were developed. These preliminary alternatives were developed to allow for the evaluation of a wide range of alignments, destinations, and the use of existing roadways and/or new alignments. While all the alternatives are focused on improved north-south connectivity, alignments were developed in the eastern, central, and western portions of the project area and a range of termini along US 50 were included. Preliminary alternatives also varied in their use of existing roadways, including options that were completely on new alignment (i.e., Alternative B), completely on existing roadways (i.e., Alternative G), or a combination of new alignments and existing roadways.

The initial 10 preliminary alternatives were presented to the public and agencies in August 2023 to obtain feedback (see Section 2.2). Based on input from the public to improve and make greater use of the existing roadways in order to minimize impacts to the rural setting of the project area, two additional options – Alternatives K and L – were developed.

The 12 preliminary alternatives are shown in Figure 2-1 and described in greater detail in Section 2.1. In addition, the Link 101 project will include a No-Build Alternative, which is also described in more detail in Section 2.1.

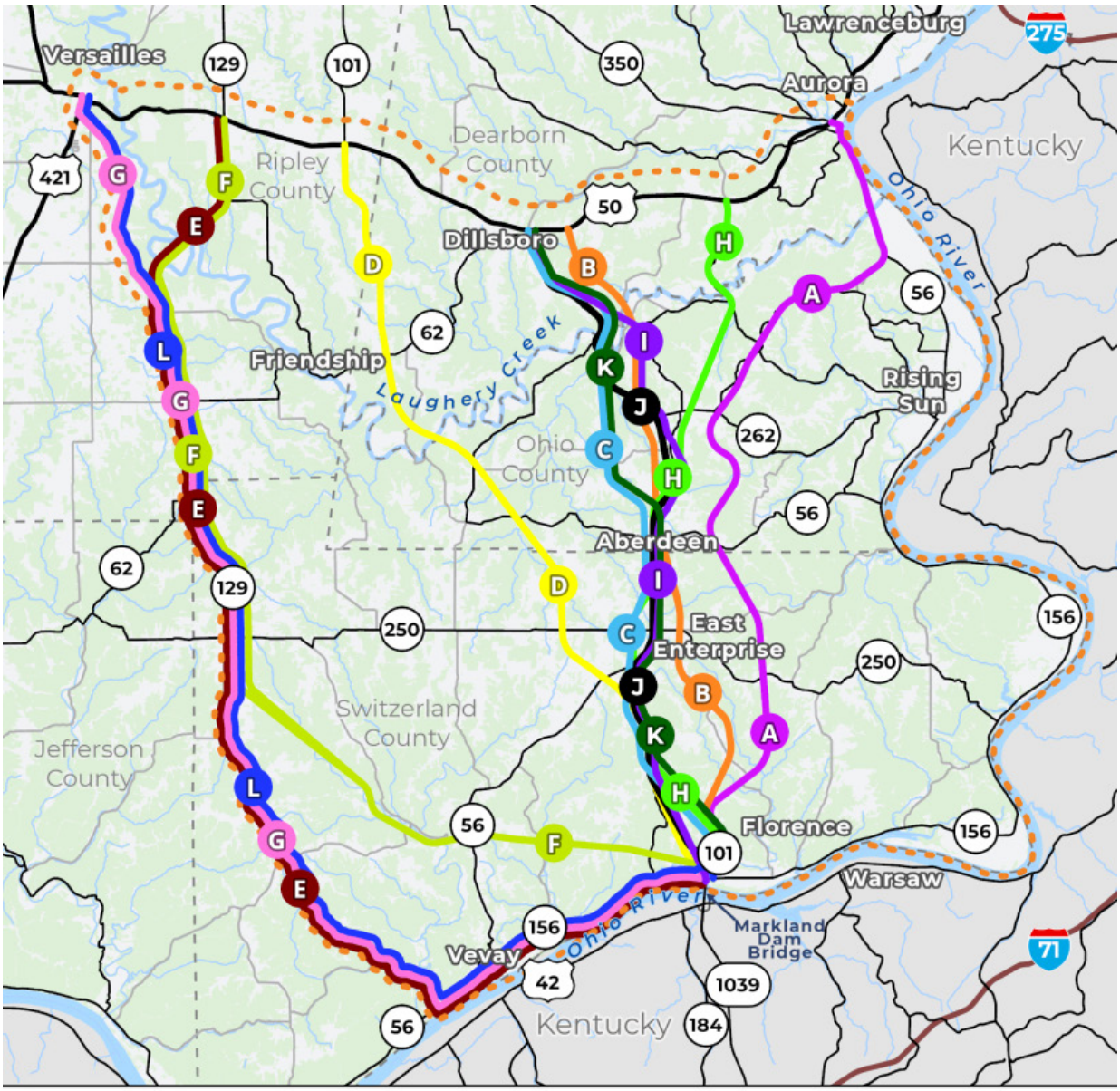

Figure 2-1. Link 101 Preliminary Alternatives

For this screening phase of the Link 101 project, the preliminary alternatives were developed at a conceptual level to define the general location, configuration, and termini required to meet the project's purpose and need while avoiding or minimizing impacts to sensitive environmental resources that were identified via secondary source data (see Section 3.2). As determined during the development of the project's purpose and need, the southern logical terminus for all the preliminary alternatives would be SR 101 at the northern end of Markland Dam Bridge and the northern logical terminus would be US 50 between Versailles and Aurora. Based on existing and 2050 projected traffic volumes, each of the preliminary alternatives would be a 2-lane roadway with standard lane widths (i.e., 12 feet).

For the initial 10 preliminary alternatives, in the rural areas for both new alignment and existing roadway sections, the preliminary alternatives were designed based on a 55 mph speed limit in accordance with the Indiana Design Manual (INDOT 2013), and would include 10-foot shoulders. Figure 2-2 shows the typical section that would be associated with this roadway design.

As previously mentioned, Alternatives K and L were developed based on public input to include alternatives that would maximize the use of existing roadways in order to reduce impacts to the rural setting of the project area. An initial assessment determined that it would not be feasible to achieve that goal and meet the design standards for a 55 mph speed limit for the full length of the project due to the terrain and the existing horizontal and vertical profile of the roadways. As a result, Alternatives K and L were developed with the flexibility to use lower design standards – rehabilitation standards with a 45 mph speed limit per the Indiana Design Manual – where required (see Sections 2.1.12 and 2.1.13).

Within the incorporated/urban areas of Vevay, Versailles, and Aurora, the design of all preliminary alternatives was limited to the existing right-of-way and based on existing posted speed limits, which range from 30 mph to 50 mph, in order to minimize property impacts.

It is anticipated that any of the proposed new roadway alternatives would be signed as a state route and that cars, trucks, and non-motorized vehicles would be permitted to use the roadway in accordance with state law.

All of the 12 preliminary alternatives would provide at-grade access to existing public roads and private driveways, but the locations and types of access are not part of the conceptual design level associated with the preliminary alternatives screening process. The details of these access points will be determined for the alternatives carried forward for further evaluation in the draft NEPA document. Note that based on design criteria, safety factors and traffic demand, access may not be provided at some locations.

Additional design development for the alternatives carried forward will include consideration of facilities for pedestrians, bicycles, and horse-drawn vehicles as well as the location of potential climbing and/or passing lanes.

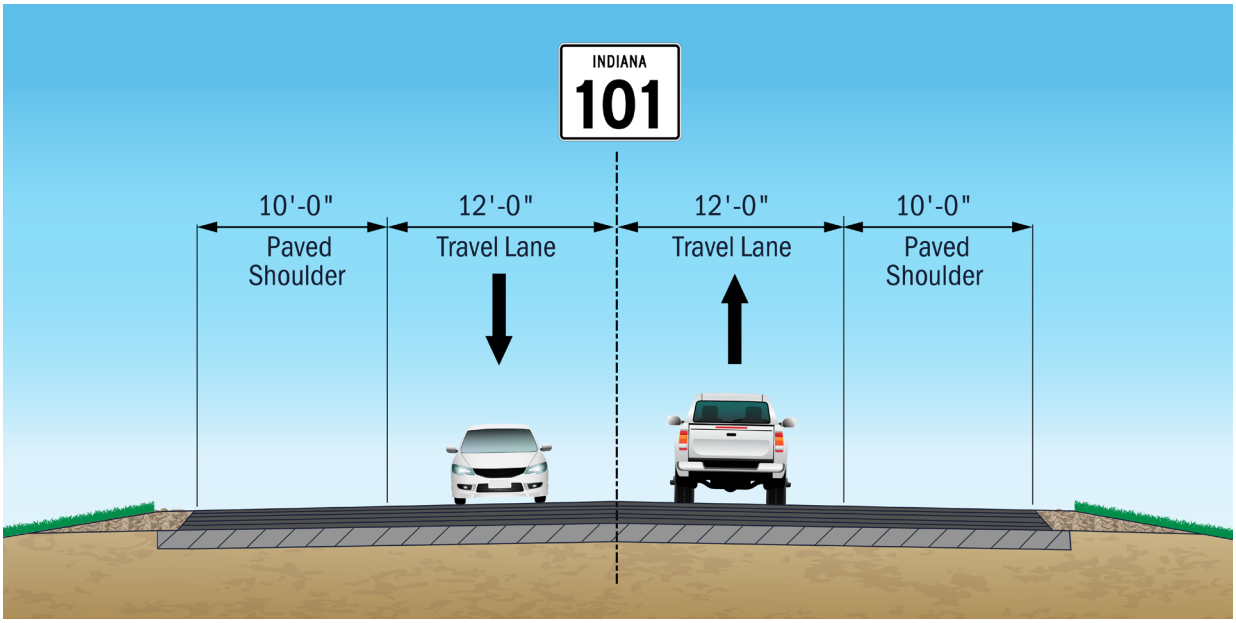

Figure 2-2. Proposed Typical Section (Rural; 55 mph)

2.1 DESCRIPTION OF PRELIMINARY ALTERNATIVES

The following sections provide a more detailed description of each preliminary alternative that was evaluated as part of this screening process. Projected daily two-way traffic volumes and associated truck volumes for the No-Build Alternative and along each preliminary alternative in 2050 are provided in Appendix A and referenced in the sections below.

2.1.1 NO-BUILD ALTERNATIVE

Although a No-Build Alternative does not meet the purpose and need for the project, it must be included in accordance with NEPA. The No-Build Alternative assumes that all the transportation projects listed in the Ohio-Kentucky-Indiana (OKI) Regional Council of Governments Transportation Improvement Program (TIP) for Fiscal Year (FY) 2024-2027 (OKI 2023) and in the INDOT Statewide Transportation Improvement Program (STIP) for FY 2024-2028 (INDOT 2023) that are located within the project area are built. The programmed projects include a variety of routine maintenance and repair or smaller reconstruction and replacement projects scattered throughout the counties, as well as an intersection improvement project with added turn lanes at US 50 in Dillsboro and a slide correction project on SR 156 east of the Markland Dam.

Currently, there are a variety of routes that are used to travel between the Markland Dam Bridge and US 50 depending on destination. Projected two-way traffic volumes in the project area for the No-Build Alternative are shown in Appendix A. For the No-Build Alternative in 2050, the shortest and fastest route has volumes ranging from 300 to 3,500 vehicles, with an average of 11% trucks, and the highest volumes on SR 56 between East Enterprise and Aberdeen.

2.1.2 ALTERNATIVE A

Based on public feedback during the initial engagement efforts for the project, Alternative A was developed to provide a route that would directly connect to Aurora. From the southern limit, Alternative A would run through the eastern portion of the project area on new alignment from SR 101 at the Markland Dam Bridge to SR 56 near Laughery Creek. From there, the route would run along existing SR 56 through Aurora to US 50. In the incorporated/urban portion of Aurora, the design of Alternative A would be limited to the existing right-of-way and based on existing posted speed limits. The route for Alternative A would be 23 miles in total length, with 5 miles being the portion along existing SR 56. Of the 5 miles along existing SR 56, 2 miles are designated as urban/incorporated within the limits of Aurora and the remaining 3 miles are designated as rural. Traffic volumes on Alternative A would range from 3,300 to 12,200 vehicles, with an average of 12% trucks and the highest volumes along SR 56 south of Aurora.

2.1.3 ALTERNATIVE B

The route for Alternative B would run through the central portion of the project area on new alignment from SR 101 at the Markland Dam Bridge, running along the east side of East Enterprise and Aberdeen and crossing Laughery Creek about 1.5 miles downstream of the existing SR 262 crossing. After crossing the creek, the route for Alternative B would continue on new alignment and end at US 50 between its intersections with SR 262 and Texas Gas Road, east of Dillsboro. The route for Alternative B would be 18 miles in total length, all traversing new terrain. Traffic volumes on Alternative B would range from 3,000 to 4,500 vehicles, with an average of 13% trucks.

2.1.4 ALTERNATIVE C

The route for Alternative C would run through the central portion of the project area as new alignment from SR 101 at the Markland Dam Bridge to Markland Pike, just north of Tapps Ridge Road. From there, the route would follow Markland Pike to SR 56, where it would travel on a new alignment around the west side of East Enterprise. North of East Enterprise, it would travel along existing SR 56 through Aberdeen and existing Cass Union Road, where it would then travel on a new alignment and cross Laughery Creek near where SR 262 currently crosses. After crossing the creek, the route would closely follow existing SR 262 and end at the US 50/SR 262 intersection in Dillsboro. The route for Alternative C would be 19 miles in total length, with approximately 4 miles being the portions along existing Markland Pike, SR 56, and Cass Union Road through Aberdeen (which are designated as rural) and less than 1 mile along SR 262 in Dillsboro (which is designated as urban/incorporated). The remaining 15 miles would be new alignment. Traffic volumes on Alternative C would range from 1,700 to 5,700 vehicles, with an average of 15% trucks.

2.1.5 ALTERNATIVE D

The route for Alternative D would run through the central and western portion of the project area as new alignment from SR 101 at the Markland Dam Bridge, running around the west side of East Enterprise, and crossing Laughery Creek near Laughery Creek Road. After crossing the creek, the route for Alternative D would continue on new alignment, intersecting SR 62 between Friendship and Farmers Retreat and ending at the US 50 and SR 101 intersection, east of Versailles. The route for Alternative D would be 22 miles in total length, with all but 1 mile along Markland Pike (which

is designated as rural) traversing new terrain. Traffic volumes on Alternative D would range from 1,500 to 4,900 vehicles, with an average of 17% trucks.

2.1.6 ALTERNATIVE E

The route for Alternative E would run through the far western portion of the project area as an option that would mostly use existing state highways. From SR 101 at the Markland Dam Bridge, the route for Alternative E would follow SR 156 and SR 56 through Vevay and then follow SR 129 to about 6 miles south of Versailles. From that point, the route would continue on new alignment to the northeast, cross Laughery Creek, and end at the existing US 50 and SR 129 intersection east of Versailles. In the incorporated/urban portion of Vevay, the design of Alternative E would be limited to the existing right-of-way and based on existing posted speed limits. The route for Alternative E would be 34 miles in total length, with 4 miles being on new alignment around Versailles and the remaining 30 miles along existing SR 156, SR 56, and SR 129. Along the existing roadways, approximately 2 miles is designated as urban in Vevay, and the remaining 28 miles is designated as rural. Traffic volumes on Alternative E would range from 400 to 6,100 vehicles, with an average of 16% trucks and the highest volumes along SR 56/SR 156 in Vevay.

2.1.7 ALTERNATIVE F

The route for Alternative F would run through the far western portion of the project area from SR 101 at the Markland Dam Bridge as new alignment westward to Mt. Sterling and then northwestward to SR 129 near Pleasant. From there, it would follow existing SR 129 to about 6 miles south of Versailles. From that point, the route for Alternative F would follow the same new alignment as Alternative G, which would cross Laughery Creek and end at the existing US 50 and SR 129 intersection east of Versailles. The route for Alternative F would be 29 miles in total length, with 19 miles primarily being the new alignment portion from SR 101 at the Markland Dam Bridge to SR 129, as well as the shorter portion to the east of Versailles. The remaining 10 miles of the alternative would be the portion along existing SR 129 (which is designated as rural). Traffic volumes on Alternative F would range from 500 to 3,000 vehicles, with an average of 19% trucks.

2.1.8 ALTERNATIVE G

The route for Alternative G would run through the far western portion of the project area as an option that would entirely use existing state highways. From SR 101 at the Markland Dam Bridge, the route would follow SR 156 and SR 56 through Vevay and then follow SR 129 and US 421 through Versailles to US 50. In the incorporated/urban portion of Vevay and Versailles, the design of Alternative G would be limited to the existing right-of-way and based on existing posted speed limits. The route for Alternative G would be 35 miles in total length with no new alignment. Approximately 3 miles are designated as urban in Vevay and Versailles and the remaining 32 miles designated as rural. Traffic volumes on Alternative G would range from 650 to 19,000 vehicles, with an average of 16% trucks and the highest volumes along SR 129/US 421 in Versailles.

2.1.9 ALTERNATIVE H

The route for Alternative H would run through the central and eastern portion of the project area on new alignment from SR 101 at the Markland Dam Bridge to Markland Pike, just north of Tapps Ridge Road. From there, the route would follow Markland Pike to SR 56, where it would travel on

a new alignment around the west side of East Enterprise. North of East Enterprise, it would travel along existing SR 56 through Aberdeen and existing Cass Union Road, where it would then travel on a new alignment and cross Laughery Creek near the existing Nelson Road crossing. After crossing the creek, the route would continue on new alignment and end at the US 50 and Cole Lane intersection, east of Dillsboro. The route for Alternative H would be 19 miles in total length, with 4 miles being the portions along existing Markland Pike, SR 56, and Cass Union Road (which are designated as rural); the remaining 15 miles would be new alignment. Traffic volumes on Alternative H would range from 3,700 to 6,700 vehicles, with an average of 14% trucks.

2.1.10 ALTERNATIVE I

The route for Alternative I would run through the central portion of the project area on new alignment from SR 101 at the Markland Dam Bridge to where Tapps Ridge Road and Markland Pike meet. From there, the route would closely follow Markland Pike to SR 56, and then would use existing SR 56 through East Enterprise and Aberdeen. After following Cass Union Road up to SR 262, the route for Alternative I would cross Laughery Creek about 1.25 miles downstream of the existing SR 262 crossing. After crossing the creek, it would closely follow SR 262 and end at the US 50 and SR 262 intersection in Dillsboro. The route for Alternative I would be 19 miles in total length, with 8 miles being the portions along existing Markland Pike, SR 56, SR 262, and Cass Union Road (most of which is designated as rural other than less than 1 mile in Dillsboro). The remaining 11 miles would be new alignment. Traffic volumes on Alternative I would range from 1,500 to 5,800 vehicles, with an average of 13% trucks.

2.1.11 ALTERNATIVE J

The route for Alternative J would run through the central portion of the project area on new alignment from SR 101 at the Markland Dam Bridge to where Tapps Ridge Road and Markland Pike meet. From there, the route would follow Markland Pike to SR 56, and then would use existing SR 56 through East Enterprise to Aberdeen, where it would follow existing Cass Union Road to approximately New Hope Road. At that point, the route would travel on a new alignment to SR 262. It would then run along SR 262 and cross Laughery Creek. The route for Alternative J would continue to closely follow SR 262 and end at the US 50 and SR 262 intersection in Dillsboro. The route for Alternative J would be 19 miles in total length, with 13 miles being the portions along existing Markland Pike, SR 56, SR 262, and Cass Union Road (most of which is designated as rural except for less than 1 mile in Dillsboro). The remaining 6 miles would be new alignment. Traffic volumes on Alternative J would range from 1,900 to 5,500 vehicles, with an average of 13% trucks.

2.1.12 ALTERNATIVE K

Alternative K was developed based on public input to include alternatives that would maximize the use of existing roadways in order to reduce impacts to the rural setting of the project area. Alternative K would follow the same alignment as Alternative C, except that it would follow existing SR 56 for a 2.2 mile section, rather than bypassing East Enterprise on new alignment. When following existing roadways, Alternative K would be designed based on a rehabilitation approach with a minimum 45 mph speed limit, which would only require 4-foot shoulders. Following rehabilitation, design exceptions would be required for approximately 28 locations where the vertical sight distance requirements could not be met. In general, design exceptions represent any

design features that do not meet current design standards and would require INDOT and FHWA approval prior to being implemented. In areas where it would not be possible to follow existing roadways and meet the 45 mph minimum speed limit, Alternative K would be designed to the 55 mph standard used for the other preliminary alternatives. In areas where the existing roadway has a speed limit above 45 mph (i.e., 50 mph or 55 mph), the higher speed limit would be maintained.

Alternative K would be 19 miles in total length, with approximately 12 miles of new alignment and approximately 7 miles being the portion along existing roadways (most of which is designated as rural except for less than 1 mile in Dillsboro). Traffic volumes on Alternative K would range from 1,300 to 4,700 vehicles, with an average of 16% trucks.

2.1.13 ALTERNATIVE L

Alternative L was developed based on public input to include alternatives that would maximize the use of existing roadways in order to reduce impacts to the rural setting of the project area. Alternative L would follow the same alignment as Alternative G (SR 156, SR 56, and SR 129/US 421) between Markland Dam Bridge and Versailles and would be designed based on a minimum 45 mph speed limit with 4-foot shoulders. As described above for Alternative K, in areas where the existing roadway has a speed limit above 45 mph, the higher speed limit would be retained. Most of this alignment already meets standards for 45 mph and most of SR 129 has 4-foot shoulders. The most substantive changes to the existing roadways would be widening of SR 156 to provide 4-foot shoulders and reconstruction of a 1-mile segment of SR 129 near Vevay where the existing alignment cannot be rehabilitated to meet the 45 mph standards.

The route for Alternative L would run through the far western portion of the project area like Alternative G and would also entirely use existing state highways with no new alignment. In the incorporated/urban portion of Vevay and Versailles, the design of Alternative L would be limited to the existing right-of-way and based on existing posted speed limits. The route for Alternative L would be 35 miles in total length, with approximately 3 miles in Vevay and Versailles designated as urban and the remaining 32 miles designated as rural. Traffic volumes on Alternative L would range from 450 to 18,700, with an average of 15% trucks and the highest volumes along US 421 in Versailles.

2.2 PUBLIC AND AGENCY REVIEW

The public outreach program for the project includes texts, emails, social media (i.e., X [formerly Twitter] and Facebook), a project phoneline, and a project office in Vevay as well as a project website (https://link101corridor.com/) that has been continually updated to reflect project updates and information. Since the project kicked off in late 2022, there have been two rounds of outreach to engage with the public, key stakeholders, and agencies and to obtain feedback on the project. Feedback from the public and agencies helped guide the development and refinement of the purpose and need and preliminary alternatives. Another round of public outreach will occur when this screening report is published.

2.2.1 OUTREACH MILESTONE #1: PROJECT KICKOFF AND SCOPING

Initial engagement efforts, starting in January 2023, introduced the project and the preliminary purpose and need.

- Public Information Meeting #1 – January 18, 2023 (in-person) and January 19. 2023 (virtual)
- Community Advisory Committee (CAC) Meeting #1 – January 9, 2023
- Environmental Justice (EJ) Working Group Meeting #1 – January 9, 2023
- Resource Agency Coordination (RAC) Meeting #1 – January 17, 2023
- Section 106 Consulting Party Meeting #1 – January 17, 2023

Prior to these meetings, early coordination letters were also sent to participating agencies, cooperating agencies, and other local and resource agencies, and invitations were sent to Section 106 Consulting Parties, on January 5, 2023.

- Participating Agencies: National Park Service (NPS), Midwest Regional Office; US Department of Housing & Urban Development (HUD); Indiana Department of Environmental Management (IDEM), Wetlands and Stormwater Programs; Indiana Department of Natural Resources (IDNR), Division of Fish and Wildlife; US Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS); OKI Regional Council of Governments; and Southeast Indiana Regional Planning Commission (SIRPC).
- Cooperating Agencies: US Fish and Wildlife Service (USFWS), Bloomington Field Office; US Environmental Protection Agency (USEPA) Region 5; US Army Corps of Engineers (USACE), Louisville District; and US Coast Guard (USCG).
- Local agencies in Ohio County, Switzerland County, Ripley County, and Dearborn County, as well as additional resource agencies: Indiana Geological and Water Survey; IDEM, Office of Land Quality and Office of Air Quality; and IDNR Division of Oil and Gas.
- Section 106 Consulting Parties: IDNR Division of Historic Preservation and Archaeology (DHPA); Indiana Landmarks Southeast Field Office; OKI Regional Council of Governments; SIRPC; Tribal Nations; and County Historical Societies, Historians, and other appropriate parties.

Input received as a result of the above coordination efforts was used in refining the project's purpose and need as well as the development of the preliminary alternatives and appropriate screening criteria as presented in this report. Specifically, after a request for an alignment to directly connect to Aurora, Alternative A was developed and included in the initial set of 10 preliminary alternatives. Also, Alternative F was developed and included to provide a western alignment that avoided Vevay. Full details regarding public and agency review and comment are provided in the *Public Information Meeting #1 Summary*, available on the project website.

2.2.2 Outreach Milestone #2: Draft Purpose and Need and Preliminary Alternatives

The initial proposed range of alternatives to be considered for the Link 101 project (i.e., the 10 Alternatives A-J), as well as the draft purpose and need, was presented to local, state, and federal agencies and the public to obtain their input in a second round of outreach.

- Public Information Meeting #2 – August 2 and 3, 2023 (in-person) and August 8, 2023 (virtual)
- CAC Meeting #2 – July 27, 2023
- EJ Working Group Meeting #2 – July 2, 2023

- RAC Meeting #2 – August 17, 2023
- Section 106 Consulting Party Meeting #2 – August 17, 2023

INDOT held an in-person public information meeting on August 2, 2023, at South Dearborn High School and on August 3, 2023, at Switzerland County Middle School/Jefferson-Craig Elementary School. An additional virtual public information meeting was held on August 8, 2023. The public meeting format consisted of an open house, a presentation by INDOT, and a listening session where attendees could provide oral comments for the record. Additional public feedback regarding the project's preliminary alternatives has been received via phone, visits to the project office, email, and mail. The strong majority of comments noted that some iteration of the "No-Build / No Need / No Action" alternative best met the needs of the project area. Full details regarding public comments are provided in the *Public Information Meeting #2 Summary*, available on the project website.

During the stakeholder and agency meetings, after the initial 10 preliminary alternatives were presented, discussions generally focused on how the range of new alignment alternatives would or would not meet the purpose and need and if additional alternatives, or hybrids of alternatives, would be considered. No specific agency comments were provided regarding changes to the range of alternatives. Additional comments regarding potential impacts to specific resources were discussed, and these comments have been considered as part of the screening evaluation. After the meeting, USFWS submitted comments regarding meeting the purpose and need and indicated that alternatives development should demonstrate improvements and benefits, compared to the current best route, and include comparisons of wetland, stream, forest, floodplain, karst, and other natural resource impacts between the proposed alternatives.

As described earlier in this chapter, based on the input received at the second round of public and agency meetings, two additional alternatives – Alternative K and L – that made greater use of rehabilitating existing roadways were developed.

2.3 OTHER ALTERNATIVES CONSIDERED BUT DISMISSED

2.3.1 TRANSPORTATION SYSTEM MANAGEMENT

A Transportation System Management (TSM) alternative would include concepts that maximize or improve traffic flow without additional or new lanes/roadways, such as improving intersections, converting existing lanes to high-occupancy vehicle (HOV) lanes, optimizing traffic signal timing, or using technology and information systems to assist travelers. According to the Federal Highway Administration (FHWA 2023), the TSM alternative is most applicable to and should be considered for proposed projects in an urbanized area (i.e., population over 200,000 persons). As result, a TSM alternative would not be an applicable and reasonable alternative for meeting the purpose and need for the Link 101 project. Additionally, many TSM concepts, such as HOV lanes, would not be reasonable or feasible for the existing roadway system, which is primarily two lanes in the project area.

However, FHWA also states that the concept of achieving maximum utilization of existing facilities is equally important in rural areas. Several of the preliminary alternatives documented within this screening utilize existing roadways to the extent practical based on design standards for a 55 mph

posted speed limit (to meet the purpose and need). Additionally, throughout the alternatives development process, INDOT will look for opportunities to maximize existing infrastructure and reduce impacts.

The previous *SR 101 Corridor Improvement Feasibility/NEPA Study* (INDOT 2003; see Section 1.2) considered a TSM alternative, but similarly determined at that time that it would not address the goal of improved regional accessibility and connectivity.

2.3.2 MASS TRANSIT

Mass transit is an alternative that would include bus or rail systems, should they be reasonable and feasible, even though they may not be within the existing FHWA funding authority. According to FHWA (FHWA 2023), mass transit should be considered on all proposed major highway projects in urbanized areas (i.e., population over 200,000 persons). Since the Link 101 project area is not an urban area with higher population densities, mass transit would not be an applicable and reasonable alternative for meeting the project's purpose and need.

CHAPTER 3 – SCREENING CRITERIA

As part of the screening process, multiple criteria were established to evaluate and screen the proposed preliminary alternatives. The criteria include the purpose and need performance measures, potential environmental impacts, and engineering, traffic, and cost factors. Each are detailed below.

Procedurally, the alternatives first must satisfy the purpose and need criteria. If an alternative satisfies the purpose and need criteria, that alternative would then be evaluated based on the environmental, engineering, traffic, and cost criteria.

3.1 PURPOSE AND NEED PERFORMANCE MEASURES

Based on the project's purposes (see Section 1.3), the following primary performance measures were established to be used in evaluating each alternative's ability to satisfy the project's purpose and need.

- Reduce travel time between SR 101 at Markland Dam and US 50.
- Reduce vehicle miles traveled (VMT) on roadway segments identified as elevated crash locations.
- Provide a roadway that meets current design standards for a 55 mph roadway except within the incorporated limits of Vevay, Versailles, and Aurora, where design standards will be based on existing posted speed limits.
- Provide a roadway that is above the Laughery Creek 100-year floodplain and minimizes the risk of slides.

These performance measures were used in the screening of the project's preliminary alternatives.

3.2 POTENTIAL ENVIRONMENTAL IMPACTS

Based on an understanding of the Link 101 project area through the review of previous studies, windshield surveys, and the scoping process, INDOT and FHWA selected the following environmental resources to be used in the preliminary screening process.

- New Right-of-way (acres)
- Relocations (number)
    - Residential
    - Business
    - Public Facilities and Service
    - Religious Facilities
- Wetlands (type/acres)
    - Emergent
    - Scrub-shrub
    - Forested
- Rivers/Streams (type/number/linear feet)
    - Perennial
    - Intermittent

- Floodway (acres)
- Floodplain (acres)
- Forested Habitat (acres)
- Potential Section 4(f) Properties (public parks/recreation areas/wildlife and waterfowl refuges) and Managed Lands (number/acres)
- Potential Historic Properties/Districts (National Register of Historic Places [NRHP] listed and outstanding) (number)
- Archaeological Sites (NRHP eligible and potentially eligible) (number)
- Section 6(f) Properties (properties that received grants from the National Park Service's Land and Water Conservation Fund) (number/acres)
- Prime Farmland Soils (acres)
- Active Farmland (acres)
- Cemeteries (number)
- Noise Sensitive Receptors (number within 500 feet of the alternative's travel lane)
- EJ Areas (linear miles and number of residential relocations in areas with minority and low-income populations)
- Potential Hazardous Material Sites (number)
- Potential Karst Sinkhole Areas (acres)

These resources were selected because they could represent differentiating factors in comparing and screening the alternatives and/or would require agency review, approval, and permitting. Potential environmental impacts were identified based on secondary source data primarily from INDOT's Red Flag Investigation (RFI) Geographic Information System (GIS) data (INDOT 2022a) and IndianaMap (IndianaMap 2023) as well as from federal, state, local, and regulatory agencies, aerial imagery, and other public data sources, as needed. More detailed descriptions of data collection methodologies and potential impacts to these resources that would be associated with each preliminary alternative are presented in Section 4.2.

For screening the environmental resources, a centerline for each alignment was established and the typical section (see Section 2) was applied to determine potential construction limits and estimate an associated environmental impact limit for each preliminary alternative. Within the rural areas, the environmental impact limit ranged from 200 feet in areas of flat terrain where the alignment is following an existing roadway, to up to 1,000 feet in areas of steep terrain where large cuts and fill would be needed to meet design standards for maximum grade. Within the urban/incorporated areas, the environmental impact limit was assumed to be the existing transportation right-of-way. The environmental impact limit was used to identify potential environmental impacts. The exception is for noise, for which a 500-foot limit was used as standard for INDOT projects.

3.3 ENGINEERING, TRAFFIC, AND COST FACTORS

Several engineering, traffic, and cost criteria were used to screen the preliminary alternatives. An explanation of each follows. Additional details for the mobility/connectivity and traffic performance evaluation are provided in the separate *Preliminary Alternatives Traffic Analysis Report*.

3.3.1 MOBILITY/CONNECTIVITY

Mobility and connectivity in the project area was assessed at a regional scale through analysis of VMT and vehicle hours traveled (VHT), and at a project area scale through estimation of travel time savings.

VMT AND VHT

The regional analysis included measurement of the incremental change in future year (2050) VMT and VHT between each preliminary alternative and the No-Build Alternative. These metrics were calculated using the Link 101 Focused Model, which is the travel demand model adapted from the Indiana Statewide Travel Demand Model (ISTDM) for the project area, used to evaluate the different alternatives and also account for any potential regional impacts.

VMT calculates the total number of miles traveled by all vehicles within a region over a period of time. VHT is a related metric that measures the total travel time for all vehicles in the region using data on speed and VMT. Throughout this report, VMT and VHT are measured on a daily basis (i.e., a 24-hour period). To analyze mobility and connectivity, the metrics are evaluated in relation to each other and to the No-Build Alternative. For example, an increase in overall VMT in the project area compared to the No-Build Alternative would indicate an increase in overall demand and travel. However, an increase in VMT and associated decrease in VHT compared to the No-Build Alternative would indicate that vehicles within the project area are using a different (longer) travel path but along a higher speed facility (represented by the preliminary alternative in the case of the Link 101 project) to save overall travel time.

In addition, the comparative level of reduction of VMTs on roadway segments identified as elevated crash locations (see Section 3.1) was also used as a screening factor for the preliminary alternatives.

TRAVEL TIME

The Link 101 Focused Model was used to estimate travel times (in minutes) for the year 2050 along each of the preliminary alternatives based on predicted travel speeds and any areas of potential congestion. These travel times were compared against the 2050 No-Build travel time to the same destination using the existing roadway network. Travel times for each preliminary alternative were generated by allowing the model to assign the trip to whatever combination roadways, whether existing or part of the preliminary alternative, resulted in the fastest trip to the destination. This analysis recognizes that a preliminary alternative may provide value (in time savings) to drivers even if their final destination is somewhere beyond the alternative's terminus at US 50. All trips start at the Markland Dam Bridge and travel time savings are provided for each of seven destinations along US 50, as well as a weighted average of all destinations. The US 50 destinations are: Versailles (SR 129 at US 50), SR 129 east of Versailles, SR 101, Dillsboro (SR 262 at US 50), 1 mile east of Dillsboro, Cole Lane, and Aurora (SR 56 at US 50).

3.3.2 TRAFFIC PERFORMANCE

Traffic performance in the project area was measured by performing a level of service (LOS) analysis on the existing roadways along the routes of each of the preliminary alternatives. A

planning-level type of LOS analysis was used, which relies on traffic volume thresholds defined for different LOSs based on prevailing roadway and traffic characteristics. The volume thresholds are sourced from the *NCHRP Report 825 Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual* (NCHRP 2016). The levels of service range from A (free-flow conditions) to F (heavy congestion). The INDOT standard for "acceptable" level of service is D or better for urban/incorporated areas and C or better for rural areas.

3.3.3 Construction/Maintenance of Traffic Complexity

A qualitative analysis was used to assess construction complexity for each preliminary alternative by assigning a low, medium, or high rating. The complexity factor reflects how difficult the construction would be due to maintenance of traffic as well as access requirements and estimated construction time or unique challenges. A low determination would indicate fewer conflicts with existing traffic, fewer number of impacts to parcels and access points, a more limited need for closures or detour routes, and potential for expedited construction. A high determination would indicate a greater number of conflicts with existing traffic during construction, a greater number of parcels and access points to be maintained, longer closures or detour routes, and an anticipated longer construction time. Another factor in complexity of construction and maintenance of traffic that was considered was topography, such as if a preliminary alternative would require a construction of a bridge and roadway approach at Laughery Creek, which could be particularly challenging due to construction access and the existing terrain. The above elements were considered for features of each preliminary alternative and an overall low, medium, or high rating was assigned.

3.3.4 Construction/Right-of-Way Cost

Costs were developed for each preliminary alternative utilizing major construction items including pavement, earthwork, bridges, and local roadway connections. These items were quantified based upon quantity take-offs directly from the preliminary alternative design. Other line-items that are more unknown at this early stage, such as pipes/culverts, maintenance of traffic, and signs, were calculated as a single lump sum or estimated as an assumed percentage of the total cost. Right-of-way costs were estimated based on the acreage of additional right-of-way based on land use type and an estimated cost for each relocation by type of use. A 25% contingency to account for additional costs associated with such items as final design changes and other unknowns due to the preliminary nature of the current design was added to the total construction cost. Costs are based on 2023 dollars.

CHAPTER 4 – EVALUATION OF PRELIMINARY ALTERNATIVES

Each preliminary alternative and the No-Build Alternative was evaluated based on the screening criteria presented in Section 3. The results of this evaluation are discussed in the following sections and are summarized in Table 4-1. Values that were evaluated as being among the best for the criterion and/or among the poorest for the criterion are highlighted, and any similarities or differences between the results are described within the appropriate sections of this chapter. The No-Build Alternative assumes the existing fastest and shortest route as documented in the Purpose and Need Statement.

4.1 PURPOSE AND NEED PERFORMANCE MEASURES

The following sections discuss each preliminary alternative's ability to satisfy the project's purpose and need performance measures. Note that the No-Build Alternative would not meet any of the project's purpose and need performance measures.

4.1.1 REDUCE TRAVEL TIME BETWEEN SR 101 AT MARKLAND DAM AND US 50

The Link 101 Focused Model was used to estimate travel times for the year 2050 along each of the preliminary alternatives based on predicted travel speeds and any areas of potential congestion. Each preliminary alternative (i.e., 2050 Build) was compared to traveling along existing routes from SR 101 at the Markland Dam Bridge to the corresponding northern terminus location along US 50 (i.e., 2050 No-Build), assuming no project improvements.

Based on this analysis of projected travel times, it was determined that each preliminary alternative would reduce travel time between SR 101 at the Markland Dam Bridge and US 50 by 4 (Alternatives E and L) to 14 (Alternative D) minutes (see Table 4-2). As a result, all the preliminary alternatives would satisfy this purpose and need performance measure.

4.1.2 REDUCE VEHICLE MILES TRAVELED (VMT) ON ROADWAY SEGMENTS IDENTIFIED AS ELEVATED CRASH LOCATIONS

As discussed in Section 1.3, 44 percent of the roadways and intersections within the project area have an ICF greater than 0 and are considered elevated crash locations. Using the Link 101 Focused Model, an evaluation of the impact each preliminary alternative may have on motorists' exposure to these elevated crash segments was conducted. This exposure is measured by aggregating the forecasted daily VMT across all elevated crash segments for each alternative.

As shown in Table 4-1, all the preliminary alternatives would result in a reduction in daily VMT in 2050 on roadway segments that were identified as having elevated crashes when compared to the No-Build Alternative. The reductions in VMT would range from -1.4 percent (Alternative K) to -13.2 percent (Alternative A). As a result, all the preliminary alternatives would satisfy this purpose and need performance measure.

Table 4-1. Preliminary Alternatives Screening Summary

	NO-BUILD[1]	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E	ALTERNATIVE F	ALTERNATIVE G	ALTERNATIVE H	ALTERNATIVE I	ALTERNATIVE J	ALTERNATIVE K	ALTERNATIVE L
ALTERNATIVE FEATURES													
Total Length (miles)	23	23	18	19	22	34	29	35	19	19	19	19	35
Existing Roads, Rural	23	3	0	4	1	28	10	32	4	8	13	7	32
Existing Roads, Urban	<1	2	0	<1	0	2	0	3	0	<1	<1	<1	3
New Alignment	N/A	18	18	15	21	4	19	0	15	11	6	12	0
Speed Limit (mph)													
Rural	30-55	55	55	55	55	55	55	55	55	55	55	45-55	45
Urban (location)	(Dillsboro) 45-55	(Aurora) 30-45	N/A	(Dillsboro) 55	N/A	(Vevay) 30-50	N/A	(Vevay) 30-55 (Versailles) 35-45	N/A	(Dillsboro) 55	(Dillsboro) 55	(Dillsboro) 55	(Vevay) 30-55 (Versailles) 35
PURPOSE AND NEED PERFORMANCE MEASURES													
Reduce Travel Time between SR 101 at Markland Dam and US 50	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reduce VMT on Roadway Segments Identified as Elevated Crash Locations	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provide a Roadway that Meets Current Design Standards, as Applicable	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Provide a Roadway that is Above the Laughery Creek 100-Year Floodplain and Minimizes Risk of Slides	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
POTENTIAL ENVIRONMENTAL IMPACTS[2]													
New Right-of-Way (acres)	0	1,070	734	718	741	870	1,235	695	672	680	779	X	X
Relocations, Total (number)	0	90	18	87	27	206	122	211	97	136	141	X	X
Residential	0	84	16	83	26	186	109	189	95	123	129	X	X
Business	0	6	2	3	0	18	11	20	2	10	9	X	X
Public Facilities & Services	0	0	0	1	0	1	1	1	0	2	2	X	X
Religious Facilities	0	0	0	0	1	1	1	1	0	1	1	X	X

	NO-BUILD[1]	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E	ALTERNATIVE F	ALTERNATIVE G	ALTERNATIVE H	ALTERNATIVE I	ALTERNATIVE J	ALTERNATIVE K	ALTERNATIVE L
Wetlands, Total (acres)	0	1.53	0.40	0.63	2.97	0.51	1.93	0.13	1.45	0.79	0.68	X	X
Emergent	0	0.07	0.34	0.58	0.56	0.25	0.16	0.10	1.26	0.26	0.58	X	X
Scrub-Shrub	0	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.05	X	X
Forested	0	1.46	0.06	0.05	2.41	0.26	1.75	0.03	0.19	0.53	0.05	X	X
Open Waters (acres)	0	12.98	6.66	5.53	5.49	2.74	5.80	1.60	3.37	7.13	8.40	X	X
River/Streams, Total (number/feet)	0	22 / 12,753	30 / 13,451	19 / 12,643	23 / 8,989	35 / 17,214	46 / 23,500	33 / 14,374	17 / 13,031	17 / 11,760	17 / 15,420	X	X
Perennial	0	7 / 3,408	6 / 1,313	4 / 711	10 / 1,866	10 / 7,073	14 / 5,799	8 / 6,870	3 / 481	4 / 1,108	5 / 1,186	X	X
Intermittent	0	15 / 9,345	24 / 12,139	15 / 11,932	13 / 7,123	25 / 10,141	32 / 17,700	25 / 7,504	14 / 12,550	13 / 10,651	12 / 14,234	X	X
Floodplains (acres)	0	53	10	29	12	115	50	106	48	11	14	X	X
Floodways (acres)	0	37	5	15	6	38	29	31	31	5	8	X	X
Forested Habitat (acres)	0	572	536	307	612	306	755	191	308	313	369	X	X
Potential Section 4(f) Properties / Managed Lands (number/acres)	0	0 / 0.00	0 / 0.00	0 / 0.00	0 / 0.00	1 / 0.53	1 / 0.53	2 / 5.56	0 / 0.00	0 / 0.00	0 / 0.00	X	X
Potential Historic Properties/Districts (number)	0	2	0	0	0	3	1	3	0	0	0	X	X
Archaeological Sites (number)	0	0	0	0	0	0	0	0	0	0	0	X	X
Section 6(f) Properties (number/acres)	0	0 / 0.00	0 / 0.00	0 / 0.00	0 / 0.00	0 / 0.00	0 / 0.00	1 / 5.03	0 / 0.00	0 / 0.00	0 / 0.00	X	X
Prime Farmland Soils (acres)	0	217	107	204	134	379	241	386	148	204	198	X	X
Active Farmland (acres)	0	460	222	353	236	318	376	224	297	253	261	X	X
Cemeteries (number)	0	0	0	2	0	1	1	1	2	4	3	X	X
Noise Sensitive Receptors (number)	0	398	71	160	74	658	140	901	142	173	169	X	X
EJ Areas (linear miles)	0	11	9	9	7	27	22	30	10	10	10	X	X
Residential Relocations in EJ Areas (number)	0	39	9	45	16	117	39	121	42	51	52	X	X
Potential Hazardous Materials Sites (number)	0	2	0	1	0	7	2	8	0	2	3	X	X
Potential Karst Sinkhole Areas (number/acres)	0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 7	1 / 7	1 / 5	0 / 0	0 / 0	0 / 0	X	X

	NO-BUILD[1]	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E	ALTERNATIVE F	ALTERNATIVE G	ALTERNATIVE H	ALTERNATIVE I	ALTERNATIVE J	ALTERNATIVE K	ALTERNATIVE L
ENGINEERING, TRAFFIC, AND COST FACTORS[2]													
Mobility/Connectivity													
Daily VMT % Change vs No-Build	157,342,500	157,348,100 0.00%	157,335,600 0.00%	157,332,700 -0.01%	157,342,100 0.00%	157,338,900 0.00%	157,339,500 0.00%	157,354,000 +0.01%	157,344,000 0.00%	157,333,800 -0.01%	157,338,800 0.00%	X	X
Daily VHT % Change vs No-Build	4,806,600	4,806,200 -0.01%	4,805,900 -0.01%	4,806,300 -0.01%	4,806,000 -0.01%	4,806,000 -0.01%	4,806,500 0.00%	4,806,400 0.00%	4,806,300 -0.01%	4,805,700 -0.02%	4,805,800 -0.02%	X	X
Weighted Average Travel Time Savings for US 50 Destinations (minutes)[3]	0	-9	-11	-10	-13	0	-8	0	-10	-10	-10	X	X
Travel Time Savings to the Alternative's Northern Terminus at US 50	0	-11	-13	-11	-14	-4	-10	-8	-13	-11	-11	X	X
Daily VMT on Elevated Crash Locations % Change vs No-Build	274,603	238,238 -13.2%	269,622 -1.8%	267,137 -2.7%	267,856 -2.5%	258,782 -5.8%	268,988 -2.0%	251,982 -8.2%	247,149 -10.0%	261,491 -4.8%	264,011 -3.9%	X	X
Traffic Performance (LOS)													
Rural Areas (LOS C or Better)	Acceptable	Below Acceptable on SR 56 south of Aurora and SR 101 at Markland Dam Bridge	Below Acceptable on SR 101 at Markland Dam Bridge	Below Acceptable on SR 101 at Markland Dam Bridge	Below Acceptable on SR 101 at Markland Dam Bridge	Acceptable	Below Acceptable on SR 101 at Markland Dam Bridge	Acceptable	Below Acceptable on SR 101 at Markland Dam Bridge	Below Acceptable on SR 101 at Markland Dam Bridge	Below Acceptable on SR 101 at Markland Dam Bridge	X	X
Urban/Incorporated Areas (LOS D or Better)	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Below Acceptable on US 421/SR 129 in Versailles	Acceptable	Acceptable	Acceptable	X	X
Construction/Maintenance of Traffic Complexity	N/A	Medium	Low	Low	Low	High	Medium	High	Low	Medium	Medium	X	X
Construction/Right-of-Way Cost (million)	$0	$933	$455	$381	$503	$498	$821	$345	$436	$481	$646	X	X

[1] The No-Build Alternative assumes the existing fastest and shortest route using posted speed limits and is therefore not intended to represent all existing travel routes within the project area in this table.
[2] Alternatives K and L were dismissed from further consideration because they did not meet the project's purpose and need (see Section 4.1.3). As a result, they were not evaluated for environmental impacts or engineering, traffic, and cost factors.
[3] The weighted average travel time savings is based on the percentage of full-length trips (e.g., vehicles starting at or near the Markland Dam Bridge and traveling to US 50) traveling to each of the seven destinations or beyond, based on the shortest travel path.

Values among the best for the criterion Values among neither the best nor poorest Values among the poorest for the criterion

Table 4-2. Summary of Travel Times

ALTERNATIVE	SOUTHERN TERMINUS	NORTHERN TERMINUS	2050 N0-BUILD[1] (MINUTES)	2050 BUILD (MINUTES)	DIFFERENCE (MINUTES/%)
Alternative A	Markland Dam Bridge	Aurora	37	26	-11 -30%
Alternative B	Markland Dam Bridge	1 mile east of Dillsboro	33	20	-13 -39%
Alternative C	Markland Dam Bridge	Dillsboro	32	21	-11 -34%
Alternative D	Markland Dam Bridge	SR 101, East of Versailles	38	24	-14 -37%
Alternative E	Markland Dam Bridge	SR 129, East of Versailles	42	38	-4 -10%
Alternative F	Markland Dam Bridge	SR 129, East of Versailles	42	32	-10 -24%
Alternative G	Markland Dam Bridge	Versailles	46	38	-8 -17%
Alternative H	Markland Dam Bridge	East of Dillsboro	34	21	-13 -38%
Alternative I	Markland Dam Bridge	Dillsboro	32	21	-11 -34%
Alternative J	Markland Dam Bridge	Dillsboro	32	21	-11 -34%
Alternative K	Markland Dam Bridge	Dillsboro	32	22	-10 -31%
Alternative L	Markland Dam Bridge	Versailles	46	42	-4 -9%

[1] The 2050 No-Build travel times were based on using existing routes that correspond to each preliminary alternative's northern terminus.

4.1.3 PROVIDE A ROADWAY THAT MEETS CURRENT DESIGN STANDARDS, AS APPLICABLE

The initial 10 preliminary alternatives would all be designed to meet current design standards for a 55 mph roadway, except within the incorporated limits of Vevay, Versailles, and Aurora, where design standards will be based on existing posted speed limits. As a result, Alternatives A through J would satisfy this purpose and need performance measure.

Alternatives K and L were developed based on input from the public to improve and make greater use of the existing roadways. As described in Chapter 2, it was determined that it would not be feasible to use existing roadways and meet the design standards for a 55 mph speed limit for the full length of the project due to the terrain and the existing horizontal and vertical profile of the roadways. Therefore, INDOT developed Alternatives K and L based on rehabilitation standards that included a minimum 45 mph speed limit and 4-foot shoulders.

For Alternative K, the more flexible design standards could only be applied to approximately 7 miles of the 19-mile long alternative. The remaining 12 miles would require full reconstruction or new alignment. Based on an initial assessment in comparison to Alternative C (the basis of its alignment), it is anticipated that Alternative K would result in minor reductions to some environmental and property impacts and a minimal reduction in cost – but would result in substantially higher impacts within East Enterprise specifically with little to no improvements to mobility throughout the project area. The anticipated impacts, costs, and limited transportation benefits associated with the lower design speed, which would not meet this purpose and need performance measure, as well as the need for numerous design exceptions, does not justify further consideration of this alternative.

For Alternative L, the more flexible design standards could be applied to the majority of the alternative – 34 of 35 miles. However, most of the existing roadway along this alignment already meets standards for 45 mph, limiting travel time and safety benefits, and most of SR 129 has 4-foot shoulders. The most substantive changes would be widening of SR 156 to provide 4-foot shoulders and reconstruction of a 1-mile segment of SR 129 near Vevay where the existing alignment cannot be modified to meet the 45 mph standards. The anticipated impacts, costs, and limited transportation benefits associated with the lower design speed, which would not meet this purpose and need performance measure, does not justify further consideration of this alternative.

Based on the evaluation above, Alternatives K and L have been dismissed because they do not meet design standards for a 55 mph roadway and will not be considered further in this preliminary screening evaluation.

4.1.4 PROVIDE A ROADWAY THAT IS ABOVE THE LAUGHERY CREEK 100-YEAR FLOODPLAIN AND MINIMIZES THE RISK OF SLIDES

All of the preliminary alternatives that cross Laughery Creek would be designed above the 100-year flood elevation. In addition, within slide prone areas, current design standards and geotechnical mitigation measures would be used to avoid or minimize the risk of slides. As a result, all of the preliminary alternatives would satisfy these purpose and need performance measures.

4.2 POTENTIAL ENVIRONMENTAL IMPACTS

The following sections discuss the environmental resources evaluated in the screening process and the potential impacts that the preliminary alternatives could have on each resource, focused on key differences such as identifying the alternative(s) with the highest or lowest impacts or other notable comparisons. Detailed impacts for each resource are shown in Table 4-1. As previously mentioned, information on these environmental resources was collected within the Link 101 project area from existing GIS data sources and other public data sources as needed. Windshield surveys have been performed throughout the project area to observe, confirm, and document various features and resources present in the project area.

For this *Preliminary Alternatives Screening Report*, potential environmental impacts are defined as those resources that are present within the defined environmental impact limit (see Section 3.2) and should be considered preliminary. For alternatives that are carried forward for further

development, efforts will be made to avoid and/or minimize these impacts to the extent practicable.

4.2.1 New Right-of-Way

The new right-of-way represents the area located within the defined environmental impact limit for each preliminary alternative that is not currently in use as existing transportation right-of-way. The amount of new right-of-way needed depends on several factors, including the type of proposed improvement (i.e., new alignment requires more right-of-way than improvements along existing routes), the total length of the proposed route, and also the terrain (i.e., steep, hilly terrain and ravines typically require wider cut and fill limits for construction than flat areas).

Property impacts from right-of-way acquisition for the construction of the preliminary alternatives vary in range by approximately 550 acres:

- Alternatives H, I, and G would require the least amount of new right-of-way to construct, 672, 680, and 695 acres, respectively.
- Alternative F, which has one of the longest total and new alignment lengths, would require 1,235 acres of new right-of-way, which is the most of any preliminary alternative.
- Alternative A, the majority of which is new alignment through steep terrain, would also require more than 1,000 acres of new right-of-way (1,070 acres).

The No-Build Alternative would not require acquisition of property for right-of-way.

4.2.2 Relocations

To determine the number of potential relocations for each preliminary alternative, the environmental impact limits were reviewed for the presence of residences, businesses, public facilities and services, and religious facilities using State of Indiana land use and parcel information (IndianaMap 2023), aerial photography, and other public data sources. For purposes of this preliminary alternatives screening, a relocation was defined as the primary building or facility on a parcel being partially or wholly located within the environmental impact limits. For residential relocations, single-family houses that appeared to be occupied and individual townhouse units and mobile homes were each considered a single relocation.

Note that since the environmental impact limits are assumed to be the existing transportation right-of-way through urban/incorporated areas, there would not be any relocations anticipated in those areas; all relocations would occur in the rural areas. No apartment buildings would be impacted by any of the preliminary alternatives.

As shown in Table 4-1, the total number of relocations from the construction of the preliminary alternatives is anticipated to vary widely:

- Alternative B would be on new alignment through the central portion of the project area and avoiding the most populated areas, would have the lowest number of relocations (18). For similar reasons, Alternative D is estimated to have a relatively low number of relocations (27).

- At the high end of the range, Alternatives G and E are both estimated to have over 200 total relocations (211 and 206, respectively). Alternatives G and E would be two of the longest routes and most of these impacts would be associated with the existing facilities along SR 129.

The No-Build Alternative would not require any relocations. Each type of potential relocation is further detailed below. Relocation impacts, as with all other resources, should be considered preliminary. During the next phase of the project, as the design is advanced and refined for the alternatives carried forward, efforts will be made to reduce these impacts.

RESIDENTIAL

The potential impacts to residences range from 16 to 189 relocations and are proportionally similar to the total relocations described above. Alternatives G and E would have the highest potential number of residential relocations (189 and 186, respectively), with most impacts to residences along SR 129 between Vevay and Versailles. Alternatives B and D would have the fewest potential number of residential relocations (16 and 26, respectively). The remaining preliminary alternatives (Alternatives A, C, F, H, I, and J) would each impact between approximately 80 to 130 residences. The No-Build Alternative would not require any residential relocations.

BUSINESS

The potential impacts to businesses range from 0 to 20 relocations and are proportionally similar to the total relocations described above. Alternatives G and E would have the highest potential number of business relocations (20 and 18, respectively), with most impacts to buildings along SR 129 between Vevay and Versailles. On the low end of the range, Alternative D would have no impacts and Alternatives B, C, and H would each impact 2 to 3 businesses. All other preliminary alternatives (Alternatives A, F, I, and J) would each impact between 6 to 11 businesses. The No-Build Alternative would not require any business relocations.

PUBLIC FACILITIES AND SERVICES

Public facilities and services located within the environmental impact limits would include a post office, a volunteer fire department, and a children's advocacy center. Alternatives C, E, F, and G would each impact 1 public facility and service building (the post office except for Alternative C, which would impact the children's advocacy center), and Alternatives I and J would each impact 2 (the post office and the volunteer fire department for Alternative I, and the post office and the children's advocacy center for Alternative J). There would be no direct impact to public facilities and services from Alternatives A, B, D, or H, nor from the No-Build Alternative.

Additionally, the preliminary alternatives would impact public utilities and associated infrastructure, including lines, towers, and/or stations. Further evaluation of potential impacts would be conducted as needed for any alternatives that are carried forward for further development for the Link 101 project.

RELIGIOUS FACILITIES

While religious facilities were avoided where possible during development of the preliminary alternatives, three churches would be located within the environmental impact limits of the various

preliminary alternative routes. Alternatives D, E, F, G, I, and J would each impact one church. There would be no direct impact to religious facilities from the remaining preliminary alternatives (Alternatives A, B, C, and H) nor from the No-Build Alternative.

4.2.3 WETLANDS

Current National Wetland Inventory (NWI) data from INDOT's RFI database (INDOT 2022a) was used to estimate the total acreage of wetlands potentially impacted within the environmental impact limits of the preliminary alternatives. Wetlands are shown in the environmental features mapping in Appendix B. Due to the steep terrain, there are not many wetland areas located within the Link 101 project area. Overall, wetlands are primarily present in the flatter plateau areas west of East Enterprise to SR 129 and within the low-lying areas associated with the Ohio River and Laughery Creek floodplains and their larger tributaries.

As shown in Table 4-1, overall, none of the preliminary alternatives would have substantial impacts on wetlands:

- Alternative G, which would utilize existing roadway alignments the most of any preliminary alternative, would have the smallest potential impact to wetlands (0.13 acre).
- Alternative D, which would run through the plateau area in the central portion of the project area, would have the greatest potential to impact wetlands (2.97 acres).
- Also on the higher end of the range, Alternatives A, F, and H would each also potentially impact between approximately 1.5 to 2 acres of wetlands.

Due to the limited presence of wetlands in the project area, the potential impacts to wetlands do not vary widely based on the location of the preliminary alternatives. The No-Build Alternative would not impact any wetlands.

4.2.4 RIVERS/STREAMS/OPEN WATERS

Current National Hydrography Datasets (NHD) from INDOT's RFI database (INDOT 2022a), supplemented with additional information from IndianaMap (IndianaMap 2023), was used to identify rivers, streams, and open waters located within the Link 101 project area. Rivers, streams, and open waters are shown in the environmental features mapping in Appendix B. While the southern and eastern boundary of the Link 101 project area (and state line with Kentucky) is the Ohio River, it is outside the environmental impact limits of all preliminary alternatives and would not be impacted by the project. Laughery Creek is the largest stream in the project area; just east of Versailles, it crosses US 50 from the north, flows through Friendship, and into the Ohio River approximately 2 miles south of Aurora. With the exception of Alternative G, which would connect to Versailles, all preliminary alternatives would cross Laughery Creek. The full length of Laughery Creek within in the project area is listed on the Nationwide River Inventory (NRI) by the NPS as providing regionally significant scenic and recreational values. Typical for the terrain and proximity to both the Ohio River and Laughery Creek, there are numerous rivers and streams dispersed throughout the project area, many of which are classified as impaired by the USEPA. There are also many small open waters (i.e., lakes or ponds) throughout the project area where water accumulates from the terrain or that are man-made ponds for agricultural purposes.

Due to dispersed nature of the numerous rivers, streams, and open waters throughout the project area, the range of potential impacts varies for the preliminary alternatives regardless of the location of the routes, though the alternatives that utilize existing alignments the most or that are shorter would typically have fewer impacts. Key results, as shown in Table 4-1, include:

- Alternative D would have the fewest overall impacts with 23 crossings and just under 9,000 linear feet of impacts.
- Also at the lower end of the range of impacts, Alternatives A, B, C, H, and I would each have approximately 12,000 to 13,000 linear feet of impacts to rivers and streams.
- Alternative F would have the greatest impacts to rivers and streams (both perennial and intermittent), with over 45 total crossings and 23,500 linear feet of impacts.

There are no substantial impacts anticipated in terms of open waters. Potential impacts would range from 1.60 acres (Alternative G) to 12.98 acres (Alternative A). Also on the lower end of the range, Alternatives E and H would each potentially impact approximately 2 to 3 acres of open waters.

The No-Build Alternative would not impact any rivers, streams, or open waters beyond existing conditions.

4.2.5 FLOODPLAINS/FLOODWAYS

Federal Emergency Management Agency (FEMA) mapping data from INDOT's RFI data (INDOT 2022a), supplemented by data from the Indiana Department of Natural Resources – Division of Water (IDNR 2022), was used to identify floodplains and floodways within the Link 101 project area. In accordance with Executive Order 11988 for floodplain management, a floodplain represents the area subject to a one percent or greater chance of flooding in any given year, i.e., the area that would be flooded during a 100-year storm event. FEMA also defines a floodway as the "channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." The 100-year floodplains and floodways are shown in the environmental features mapping in Appendix B. The major floodplains and floodways within the project area are associated with the Ohio River and Laughery Creek and their larger tributaries, and portions of existing roadways that are in proximity to these waterways lie within the floodplain. Of note, as documented in the purpose and need for the project (see Section 1.3), all of the crossings of Laughery Creek within the project area have roadway approaches and/or bridges that are below the 100-year flood elevation.

As shown in Table 4-1, impacts to floodplains would vary widely depending on the preliminary alternative:

- Alternatives B, D, I, and J – all of which would run through the central portion of the project area – would have the fewest potential impacts to floodplains (10 to 15 acres).
- Alternatives E (115 acres) and G (106 acres) would impact the largest area of floodplains. Most of these impacts are associated with the portion of these alternatives that follow existing SR 156 between the Markland Dam Bridge and Vevay. In this corridor, the existing roadway is parallel and immediately adjacent to the Ohio River floodplain.

Therefore, the environmental footprint of each of these alternatives extends into the floodplain over much of this segment. Each of these alternatives also crosses the floodplains of Log Lick Creek, Plum Creek, Indian Creek, and Long Run.

- In the middle of the range, the remaining preliminary alternatives (Alternatives A, C, F, and H) are estimated to have between approximately 30 to 50 acres of potential impacts to floodplains. Of note for Alternative A, most of the potential 50 acres of impacts to floodplains is associated with the portion that follows existing SR 56, which lies within the floodplain of the Ohio River through Aurora, though the alternative also crosses the floodplain of Log Lick Creek.

Potential impacts to floodways are overall similar as impacts to floodplains. Alternatives B, D, I, and J would potentially impact the smallest area (5 to 8 acres) and Alternatives E and A the largest area (38 and 37 acres, respectively). Also on the higher end of the range, Alternatives F, G, and H would each potentially impact approximately 30 acres of floodway.

The No-Build Alternative would not impact any floodplains or floodways beyond existing conditions.

4.2.6 Forested Habitat

US Geological Survey (USGS) land cover data from IndianaMap (IndianaMap 2023) was used to identify forested habitat within the Link 101 project area, which is shown in Appendix B. Given the rural nature of the majority of the Link 101 project area, the preliminary alternatives with the greatest amount of new right-of-way and/or new alignment typically correlate to higher impacts to forested habitat, and vice versa. Therefore, impacts to forested habitat would vary widely, as shown in Table 4-1 and summarized below:

- Alternative G, the route that would most utilize existing roadway alignments, would impact the smallest area of forested habitat (191 acres).
- Alternative F, the route that would require the largest amount of new right-of-way, would impact the largest area of forested habitat (755 acres).
- Alternatives A, B, and D, which also have higher amounts of new right-of-way, would also each impact between approximately 500 to 600 acres of forested habitat.

The No-Build Alternative would not impact any forested habitat.

4.2.7 Potential Section 4(f) Properties / Managed Lands

Section 4(f) properties include publicly owned parks, recreation areas, and wildlife and waterfowl refuges. Section 4(f) properties also include historic sites, which for the purposes of this preliminary screening, are discussed in Section 4.2.8 of this report. Potential Section 4(f) properties and managed lands were identified within the project area from INDOT's RFI data (INDOT 2022a), supplemented by aerial photography, online research for park and recreation facilities, and local park data from IndianaMap (IndianaMap 2023). For purposes of this preliminary screening, impacts to potential Section 4(f) properties were limited to the potential direct use of the property, and do not include evaluation of use associated with proximity impacts (e.g., noise and visual). A more detailed evaluation of Section 4(f) properties, impacts, and prudent and feasible avoidance measures, which may include new and/or previously dismissed alternatives, would be conducted

in the future for any alternatives that are carried forward for further development for the Link 101 Project.

Potential Section 4(f) properties and managed lands within the project area are shown in the environmental features mapping in Appendix C, and impacts are presented in Table 4-1:

- The largest potential Section 4(f) resource in the project area is Versailles State Park, which is an approximately 6,000-acre park and a state managed land that is located north and east of Versailles. A portion of the park directly abuts SR 129 just south of Versailles. As a result, Alternative G, which would utilize this existing roadway corridor, would directly impact approximately 5 acres of the park. No other preliminary alternatives would impact this resource.
- There would be more minor direct impacts to one local park: the Pleasant Township Park in Switzerland County. Due to its proximity directly along SR 129, Alternatives E, F, and G would each potentially impact the portion of its grassy field directly adjacent to the existing roadway for up to 0.5 acre.

Alternatives A, B, C, D, H, I, and J, as well as the No-Build Alternative, would have no direct impacts to any potential Section 4(f) properties or managed lands. Of the preliminary alternatives with direct impacts to Section 4(f) properties, Alternatives E and F would have the fewest impacts (less than one acre to Pleasant Township Park) and Alternative G would have the greatest impacts (over 5 acres of combined impacts to Pleasant Township Park and Versailles State Park, with the majority being to the latter resource).

4.2.8 Potential Historic Properties/Districts

Information on previously identified above-ground historic properties and historic districts that are listed in or eligible for listing in the NRHP or Indiana's State Register of Sites & Structures was collected from a review of the Indiana State Historic Architectural and Archaeological Research Database (SHAARD) (IDNR 2023). SHAARD includes data that IDNR DHPA maintains via the Indiana Historic Sites and Structures Inventory (IHSSI), which assesses the significance of each property in terms of its historical significance, architectural merit, and integrity before being given one of four ratings – Outstanding, Notable, Contributing, or Non-contributing. A rating of Outstanding means that the property has enough historic or architectural significance that it is already listed or should be considered for listing in the NRHP. A rating of Notable means that the property is above average in its architectural or historical importance and that further research or investigation may reveal that the property could be eligible for listing. Properties identified as "Outstanding" and "Notable" per the IHSSI were treated as potentially eligible for the purposes of this preliminary screening. Further consideration of cultural resources will occur, as needed, as part of the Link 101 Project and formal determinations of NRHP eligibility would occur in the future during the Section 106 process and additional properties that may be eligible could be identified at that time.

Historic properties and districts within the project area are shown in the environmental features mapping in Appendix C. Potential impacts are presented in Table 4-1, and summarized below:

- Alternative A
    - Aurora Downtown Historic District. The District encompasses over 250 buildings and is fully located within the Link 101 project area in Aurora, south of the SR 50 bridge over Hogan Creek. It was officially listed in the NRHP in 1994.
    - Historical marker in Ohio County. Located on SR 56 on the south end of the bridge over Laughery Creek, commemorating Lochry's Defeat in the American Revolutionary War. Rated as Outstanding per the IHSSI
- Alternatives E, F, and G
    - Vevay Historic Districts. The District was listed in the Indiana State Register of Sites & Structures in 1981, and a smaller area was officially listed in the NRHP in 2020. *Alternatives E and G only*.
    - Saint Paul's Lutheran Church and Cemetery on SR 129. Rated as Outstanding per the IHSSI. *Alternatives E, F, and G only*.

There are no potential impacts to previously identified historic properties/districts by Alternatives B, C, D, H, I, or J (i.e., the more central routes), nor the No-Build Alterative.

4.2.9 Archaeological Sites

Data for archaeological sites was gathered from cultural resource information available from SHAARD (IDNR 2023) and a limited walkover survey of a portion of the project area in August 2023 by Gray & Pape (Gray & Pape 2023). In accordance with 54 USC 307103 and Indiana Code 14-21-1, which provides protection for archaeological sites and burial sites, information about the location of these resources is not publicly shared. These investigations did not represent a formal Section 106 assessment of the project area, nor were they designed to collect the data sets required for formal recommendations concerning the potential eligibility of these resources for inclusion in the NRHP. Once a preferred alternative is chosen, that route would be subject to a full Phase Ia archaeological investigation adhering to both IDNR DHPA and INDOT Cultural Resources Office guidelines.

As shown in Table 4-1, no known archaeological sites would be impacted by any of the preliminary alternatives.

4.2.10 Section 6(f) Properties

Section 6(f) properties that received grants from the National Park Service's Land and Water Conservation Fund (LWCF 2022) were identified from the listing of grants provided for projects in Switzerland, Ohio, Dearborn, and Ripley counties as well as INDOT's RFI data (INDOT 2022a). Potential Section 6(f) properties within the project area are shown in Appendix C and potential impacts are shown in Table 4-1. The Markland Dam Park at SR 101 and the Riverfront Park in Vevay both received LWCF funds for park development; however, neither would be directly impacted by any of the preliminary alternatives. The Versailles State Park received LWCF funds for its campground, which appears to be located north of US 50, outside the project area. Coordination with IDNR will be required to determine if any of those funds were used to improve areas affected by the project. Until that coordination is complete, impacts to any portion of

Versailles State Park will be identified as an impact under Section 6(f). As such, it is assumed that Alternative G would impact approximately 5 acres of this Section 6(f) resource.

4.2.11 PRIME FARMLAND SOIL/ACTIVE FARMLAND

Prime farmland soils were identified from the NRCS Web Soil Survey online database (NRCS 2023). Active farmland was derived from the 2021 National Land Cover Database (NLCD 2021); areas designated as "pasture/hay" and "cultivated crops" by the NLCD were considered active farmland. Prime farmland soils and active farmland within the Link 101 project area are shown in the environmental features mapping in Appendix D. A more detailed evaluation of potential impacts to active farmlands – including landlocked parcels, uneconomic remnants (i.e., land of a shape or size that is no longer suitable for farming use), and separated or split parcels by construction of the alternative – would be conducted in the future for any alternatives that are carried forward for further development for the Link 101 project. Overall, there is more active farmland within the project area than prime farmland soil, and the presence of both is constrained by the steep terrain. Prime and/or active farmland is primarily present on the plateaus in the project area, which are generally prevalent in the central portion of the project area and in between the ravines associated with the larger streams and rivers.

Since prime and/or active farmland is one of the primary land uses throughout the project area, all preliminary alternatives would have some level of impact. Key results for each, as shown in Table 4-1, include the following:

- For prime farmland soils, Alternatives B, D, and H would have the fewest impacts (107, 134, and 148 acres, respectively). Conversely, Alternatives G and E would impact the greatest area of prime soils (379 and 386 acres, respectively).
- For active farmlands, Alternative B would impact the least amount (222 acres), though Alternatives D, G, H, I, and J would comparably impact between approximately 225 and 300 acres. At the high end of the range, Alternative A would impact 460 acres of farmlands.

The No-Build Alternative would not impact prime farmland soils and/or active farmlands.

4.2.12 CEMETERIES

Data for cemeteries was gathered from INDOT's RFI data (INDOT 2022a) and supplemented with additional information from IndianaMap (IndianaMap 2023), aerial imagery, and other public data sources. Cemeteries identified within the Link 101 project area are shown in the environmental features mapping in Appendix E. There are numerous cemeteries dispersed throughout the project area, including larger cemeteries primarily associated with religious facilities or towns as well as smaller graveyards located on private property. At some of these locations, gravestones and associated burials are located within close proximity of the existing transportation right-of-way, including the Pleasant Cemetery in Bennington within a few feet of the existing edge of travel lane along SR 129.

While cemeteries were avoided where possible, direct impacts would potentially occur at six cemeteries along the various preliminary alternatives: Alternatives E, F, and G would each impact one cemetery; Alternatives C and H would each impact two cemeteries; Alternative J would impact

three cemeteries; and Alternative I would impact four cemeteries. There would be no direct impacts to cemeteries from any of the other preliminary alternatives (Alternatives A, B, and D) nor from the No-Build Alternative. Further evaluation of potential direct and proximity impacts (e.g., noise and visual) to cemeteries would be conducted as needed for alternatives that are carried forward for further development for the Link 101 Project.

4.2.13 Noise Sensitive Receptors within 500 Feet of the Alternative's Travel Lane

An assessment was performed to compare each preliminary alternative's potential to impact noise-sensitive land uses within a 500-foot buffer from the estimated outer travel lanes of each route, using the preliminary engineering details for each. The 500-foot distance was selected based on INDOT's *Traffic Noise Analysis Procedure* (INDOT 2022b), representing the area of potential noise impacts for specific activities with noise abatement criteria.

For each preliminary alternative and its resulting noise buffer, the number of occupied residences and facilities with potentially sensitive uses – which include hospitals/medical facilities, libraries, schools/daycare centers, playgrounds, parks, recreational areas, campgrounds, cemeteries, and places of worship, among others – were calculated using INDOT RFI data (INDOT 2022a), State of Indiana land use and parcel information (IndianaMap 2023), aerial photograph, and other public data sources. For purposes of this preliminary alternatives screening, a potential impact was defined as the primary noise sensitive receptor being located within the noise buffer. For residences, single family houses, as well as individual townhome units, apartment units, and mobile homes were each estimated as a separate impact. Commercial uses were not included in the noise sensitive land uses because an approximation of their equivalent receptor totals is not feasible without extensive field investigations, and the impact threshold for these receptors is higher than the land use types discussed above.

The total number of noise sensitive receptors was calculated for each route and includes any potential noise receptors within the 500 foot noise impact limit, excluding potential relocations. These numbers are estimates based on available information and provide comparative levels of potential noise impacts for the screening process and are not intended to represent actual noise impacts for potential abatement per INDOT policies.

As shown in Table 4-1, the preliminary alternatives that follow existing roadways, particularly through the urban/incorporated areas, would have the highest potential for noise impacts since there is a greater density of established residencies and facilities with potentially sensitive uses in those areas:

- Alternatives B and D would have the least potential for noise impacts: 71 and 74, respectively. These lower impacts are associated with the routes of the alternatives being primarily on new alignment through the rural central portion of the project area.
- Alternative G would have the highest potential for noise impacts (901 noise sensitive receptors). These higher impacts are associated with the alternative having the longest route that exclusively follow existing corridors along SR 56 through Vevay and SR 129 to and through Versailles.

- Alternative E, which would follow the same alignment as Alternatives G except where it bypasses Versailles, would have the second highest potential impacts to noise sensitive receptors (658).

The No-Build Alternative would not have noise impacts beyond existing conditions.

4.2.14 ENVIRONMENTAL JUSTICE AREAS

For the preliminary screening and in accordance with INDOT guidance on the subject (INDOT 2012 and INDOT 2020), the U.S. Census Bureau 2021 American Community Survey (ACS) Five-Year Estimates (U.S. Census Bureau 2021) were used to identify the percentages of minority and low-income populations for the census tract block groups (CTBGs) within the Link 101 project area. CTBGs with minority or low-income populations greater than 50 percent were considered potential communities with EJ concerns. Within Dearborn, Ohio, Ripley, and Switzerland Counties there is 13.5 percent minority and 4.35 percent low-income. In addition, any CTBG with a minority or low-income population percentage that was 25 percent greater than the minority or low-income population percentage of the project area counties was also considered a potential community with EJ concerns. From this evaluation, of the 75 total CTBGs within the project area, approximately half – 37 CTBGs – were identified to contain one or more potential communities with EJ concerns, as shown in the environmental features mapping in Appendix F. The entire southern portion of the project area contains communities with EJ concerns, as well as in and around other towns including Versailles, Dillsboro, Aurora, Aberdeen, and Rising Sun.

As shown in Table 4-1, all preliminary alternatives would traverse through EJ areas:

- Alternative D would have the least potential impact in identified communities with EJ concerns, with approximately 7 miles (33% of the total length) in identified EJ areas.
- Approximately 50% of the length of Alternatives A, B, C, H, I, and J would run through EJ areas (9 to 11 miles).
- Almost 90% of the length of Alternative G, which would run through Vevay and Versailles, would be located in identified communities with EJ concerns (30 miles).

In terms of residential relocations in EJ areas, Alternatives B and D would have the fewest number (9 and 16 potential relocations, respectively) and Alternatives E and G would have the largest number (117 and 121 relocations, respectively). All other preliminary alternatives would have approximately 40 to 50 potential residential relocations in EJ areas. A more detailed evaluation of potential impacts to communities with EJ concerns and other disadvantaged populations, such as those with limited access to cars or internet and persons with limited English proficiency, will be conducted for any alternatives that are carried forward for further development. Impacts that have the potential to have a disproportionate and adverse effect on EJ populations include relocations, community cohesion and accessibility effects, changes in access to community facilities, changes in access for public/emergency services, visual and aesthetic effects, employment effects, traffic effects, and noise and vibration. These impacts and any associated mitigation will be documented in the draft environmental document.

4.2.15 Potential Hazardous Materials Sites

INDOT's RFI data (INDOT 2022a) was used to identify sites with potentially hazardous materials within the Link 101 project area, including landfills, abandoned oil/gas wells, brownfield sites (i.e., previously developed lands that may have at one time been contaminated), underground storage tanks or leaking underground storage tanks, and facilities with National Pollutant Discharge Elimination System (NPDES) permits. Potential hazardous materials sites within the project area are shown in the environmental features mapping in Appendix E. For the preliminary screening, if a site with potential hazardous materials was physically located within the environmental impact limit, it was counted as a potential impact. Overall, within the project area, potential hazardous materials sites are typically more present within the urban/incorporated areas as well as at existing commercial, industrial, and/or agricultural businesses along existing roadways in the area.

As shown in Table 4-1, potential impacts to hazardous materials sites from the preliminary alternatives range from no impact (Alternatives B, D, and H) up to 8 sites (Alternative G). Alternative E, which would run along most of the same route as Alternative G, would have comparable potential impacts (7 sites). All other preliminary alternatives (Alternatives A, C, F, I, and J) would each potentially impact 1 to 4 sites. The No-Build Alternative would not impact any potential hazardous materials sites.

4.2.16 Potential Karst Sinkhole Areas

INDOT's RFI data (INDOT 2022a) was used to identify the potential for karst features, such as caves and sinkholes, within the Link 101 project area. Potential karst features are shown in the environmental features mapping in Appendix B. The known karst sinkhole areas are generally located in the northwestern portion of the project area. Therefore, as shown in Table 4-1, only the preliminary alternatives in that portion of the project area would have potential impacts. Alternatives E, F, and G would each impact one karst sinkhole area, ranging from 5 acres (Alternative G) to 7 acres (Alternatives E and F).

There would be no impacts to potential karst sinkhole areas from Alternatives A, B, C, D, H, I, and J, nor the No-Build Alternative.

4.3 ENGINEERING, TRAFFIC, AND COST FACTORS

The following sections discuss the engineering, traffic, and cost factors evaluated in the screening process for each of the preliminary alternatives. Additional details for the mobility/connectivity and traffic performance evaluation are provided in the separate *Preliminary Alternatives Traffic Analysis Report*.

4.3.1 Mobility/Connectivity

VMT and VHT

As shown in Table 4-1, all preliminary alternatives would reduce daily VHT relative to the No-Build Alternative, which indicates an overall savings of travel time. However, the differences in VHT reductions between the preliminary alternatives are negligible and the overall time savings is relatively small (approximately 0.02% VHT savings throughout the project area).

Most preliminary alternatives would also reduce overall daily VMT in the region (Alternatives B, C, D, E, F, I, and J), which indicates vehicles using a shorter path for trips compared to existing options. However, some preliminary alternatives (Alternatives A, G, and H) would slightly increase VMT up to 0.01% – which, in conjunction with the VHT, suggests that some vehicles are traveling a longer distance but doing so in order to save time. Similar to the results for VHT, the relative overall change in VMT is small (increase or decrease of 0.02% or less).

Section 4.1.2 discusses changes in VMT on roadway segments that were identified as elevated crash locations per the purpose and need performance measures. Note that with regard to mobility/connectivity, all the alternatives would result in minor reductions in VHT compared the No-Build Alternative, which would represent an improvement to mobility/connectively. However, the differences in VHT between the alternatives would be negligible and, therefore, were not used as a differentiator in screening the alternatives. Similarly, all the alternatives would result in minor changes, both increases and decreases, to VMT compared to the No-Build Alternative. However, the differences in VMT between the alternatives would be negligible and, therefore, were not used as a differentiator in screening the alternatives.

TRAVEL TIME

The Link 101 model was used to estimate the travel time for each preliminary alternative and for 2050 No-Build conditions from SR 101 at the Markland Dam Bridge to a range of destinations along US 50. The results, shown in Table 4-3, indicate that travel times for most destinations would be improved, regardless of the alternative. For example, while Alternative B would reduce the travel time between the Markland Dam Bridge and its northern terminus at US 50 near Dillsboro by 13 minutes compared No-Build conditions, it would also reduce the travel time for drivers headed to Aurora (or points east of Aurora) by approximately 7 minutes and for drivers headed to Versailles (or points north or west of Versailles) by 11 minutes compared to the existing fastest route to those destinations. Note the travel time savings reflected in Table 4-3 do not require a driver to use the entirety of an alternative, or any portion of an alternative, in reaching a destination. For example, if Alternative F were constructed, a driver headed to Dillsboro would be expected to only use a small portion of the alignment of Alternative F, likely only as far as Markland Pike where they would turn northward and use existing roadways to Dillsboro; as a result, their travel time savings is minimal at approximately 1 minute. Another example, with Alternative B, drivers would use the new route to connect to US 50 near Dillsboro and then use US 50 to reach Versailles, saving 11 minutes compared to taking SR 156/SR 56/SR 129, the existing fastest route.

Based on the data in Table 4-3, key findings include:

- Travel times for most destinations would be improved, regardless of the alternative.
- Alternatives that would connect in the central portion of US 50 (from SR 101 to Cole Lane) would have the highest weighted average travel time savings (10-13 minutes). This includes Alternatives B, C, D, H, I, and J.
- Alternatives that would connect at the western end of US 50 (Versailles or SR 129) would have the lowest weighted average travel time savings. This includes Alternatives E, F, and G. The travel time savings for Alternatives E and G would be limited to only Versailles and SR 129. For all other destinations, vehicles would arrive faster using the existing roadway

network. Alternative F would provide minimal travel time savings (1-2 minutes) to destinations east of SR 101.

- Trips destined to Aurora would be fastest for the two eastern-most alternatives (Alternatives A and H). The most western alternatives (Alternatives E, F, and G) would provide very little or no benefit for drivers destined for Aurora since they would be using existing roads for all or almost all of the trip.
- Alternatives that would connect to US 50 in Dillsboro or farther east would provide a minimum travel time savings of 6 minutes to all destinations. Even Alternative A, the eastern-most preliminary alternative, would reduce travel time to Versailles by 6 minutes.
- All trips destined for Versailles would be faster, regardless of the alternative. The greatest reductions in travel time to Versailles would be provided by Alternatives B, C, D, F, I, and J (11-14 minutes). For Alternatives B, C, D, I, and J, this is because these would provide a very direct route north from the Markland Dam Bridge to US 50, which would provide a high-speed connection to Versailles. For Alternative F, the bypass of Vevay would shorten the trip to Versailles by approximately 5 miles and would also avoid the incorporated area of Vevay where speed limits are lower.

For full-length trips traveling along most alternatives (i.e., vehicles starting at or near the Markland Dam Bridge and traveling to US 50)traveling to each of the destinations or beyond, based on the shortest travel path), the most common destinations along US 50 are Aurora, SR 101, and SR 129.

Table 4-3. Travel Time Savings to US 50 Destinations

ALTERNATIVE	TRAVEL TIME SAVINGS (IN MINUTES) COMPARED TO 2050 NO-BUILD CONDITIONS FROM SR 101 AT MARKLAND DAM BRIDGE TO:							WEIGHTED AVERAGE[1]
	VERSAILLES	SR 129, EAST OF VERSAILLES	SR 101	DILLSBORO	1 MILE EAST OF DILLSBORO	COLE LANE	AURORA	
Alternative A	-6	-7	-6	-6	-6	-9	**-11**	-9
Alternative B	-11	-12	-11	-11	**-13**	-10	-7	-11
Alternative C	-11	-12	-11	**-11**	-11	-9	-6	-10
Alternative D	-14	-15	**-14**	-7	-6	-5	-3	-13
Alternative E	-6	**-4**	0	0	0	0	0	0
Alternative F	-12	**-10**	-3	-1	-1	-2	0	-8
Alternative G	**-8**	-1	0	0	0	0	0	0
Alternative H	-7	-8	-7	-7	-8	**-13**	-11	-10
Alternative I	-11	-12	-11	**-11**	-11	-8	-6	-10
Alternative J	-12	-12	-12	**-11**	-11	-8	-6	-10

Note: Values in bold indicate each preliminary alternative's terminus at US 50.

[1] The weighted average travel time savings is based on the percentage of full-length trips (i.e., vehicles starting at or near the Markland Dam Bridge and traveling to US 50) traveling to each of the destinations or beyond, based on the shortest travel path.

4.3.2 TRAFFIC PERFORMANCE (LOS)

Daily, two-way traffic volumes in 2050 along each preliminary alternative and the No-Build Alternative are provided in Appendix A and summarized in Section 2.1. As shown in Table 4-1, all segments of Alternative E would have traffic volumes that would meet the INDOT threshold for acceptable LOS (see Section 3.3.2). Each of the other preliminary alternatives (Alternatives A, B, C, D, F, H, I, and J) would have at least one segment that would exceed the threshold. Alternative A would have two such segments.

The traffic performance analysis was intended to identify any roadways along the proposed routes of the preliminary alternatives that may experience LOS issues from a planning level based on the conceptual design to date. More detailed analysis of traffic performance within the overall project area will be completed for any alternatives that are carried forward for further development.

4.3.3 CONSTRUCTION/MAINTENANCE OF TRAFFIC COMPLEXITY

Maintenance of traffic refers to the need to provide drivers the ability to reach their destination during construction. In general, segments of the preliminary alternatives that would run along new terrain require less complex maintenance of traffic plans since the existing roadways would remain open to traffic during construction or be available as detour routes if needed. On the other hand, these new terrain segments would have more complexity in terms of construction access to undisturbed areas and the challenging topography in the area; one example would be alternatives including a new bridge and approach roadways at Laughery Creek.

Maintenance of traffic for segments of the preliminary alternatives that would run overtop existing roadways, especially existing state highways, would be more complex. Construction may require closing portions of the road and implementing long detours or phasing construction by narrowing the roadway or reducing the number of lanes. Adding to this challenge is the need to maintain access to adjoining properties throughout construction; these challenges are increased in urban/incorporated areas, where the density of access points is greater.

Considering the above elements for each preliminary alternative, a low, medium, or high rating was assigned to each preliminary alternative as shown in Table 4-1. Primarily due to the length of existing roadways that the preliminary alternatives would run over, Alternatives E, and G were rated as high complexity. At the other end of the range, Alternatives B, C, D, and H were rated low complexity primarily due to the length of new terrain along the preliminary alternative. In the middle of the range, Alternatives I and J would run over more moderate amounts of existing roadways and were rated medium complexity. Alternatives A and F, which would additionally run across more challenging terrain than other alternatives with comparable lengths of existing roadways, were also rated medium complexity.

4.3.4 CONSTRUCTION/RIGHT-OF-WAY COST

Estimated costs are shown in Table 4-1 and range from $345 million to $933 million. The primary cost factors for the preliminary alternatives were earthwork, overall length, and required right-of-way. Alternatives A ($933 million) and F ($821 million) would have the highest costs and include significant lengths of new terrain roadway that cut across (rather than following) steep ridges and valleys. The amount of right-of-way required is also related to the amount of earthwork required;

cutting across ridges and valleys requires wider right-of-way in order to cut through ridge tops or add fill in valleys. Alternative J ($646 million, the third highest cost) follows, to the extent possible, the alignment of SR 262 through the Laughery Creek valley, a challenging path. Alternative G would have the lowest construction cost of all the alternatives ($345 million). While it would be 35 miles in length, it would follow existing roadways for its entire length which would reduce the need for earthwork and right-of-way. Alternative C would have the second lowest cost at $381 million. The estimated costs of the other preliminary alternatives (Alternatives B, D, E, H, I, and J) would range from approximately $436 to $503 million.

CHAPTER 5 – SUMMARY OF PRELIMINARY ALTERNATIVES SCREENING

This section provides a comparative summary of the preliminary alternative evaluation data presented in the preceding sections and in Table 4-1. Advantages and disadvantages of each preliminary alternative, focused on differentiating criteria, are highlighted in this chapter and summarized in Table 5-1. A recommendation is made for each alternative to either dismiss the alternative or carry it forward for more detailed evaluation in the draft NEPA document. While the No-Build Alternative would not meet the project's purpose and need, it is retained in accordance with NEPA.

Table 5-1. Summary of Preliminary Alternatives Screening

ALTERNATIVE	ADVANTAGES	DISADVANTAGES	RECOMMENDATION
No-Build Alternative	▪ Does not result in any construction-related impacts	▪ Does not meet purpose and need	Carry Forward
Alternative A	▪ Highest VMT reduction on elevated crash segments ▪ Moderate travel time savings	▪ Highest cost ▪ High farmland and property impacts	Dismiss
Alternative B	▪ Lowest relocations ▪ High travel time savings ▪ Low/moderate environmental impacts	▪ Lowest VMT reduction on elevated crash segments ▪ High forested habitat impacts	Carry Forward
Alternative C	▪ High travel time savings ▪ Low cost ▪ Low/moderate environmental impacts	▪ Low VMT reduction on elevated crash segments	Carry Forward
Alternative D	▪ Low relocations ▪ Low impacts to streams, floodplains, and EJ areas ▪ Highest travel time savings	▪ Low VMT reduction on elevated crash segments ▪ High wetland and forested habitat impacts ▪ Similar alignment to Alternative B, but higher impacts and cost	Dismiss
Alternative E	▪ Moderate cost ▪ Moderate reduction on elevated crash segments	▪ Lowest travel time savings ▪ High relocations ▪ High environmental impacts	Dismiss
Alternative F	▪ Moderate impacts to farmland and floodplains	▪ High right-of-way impacts ▪ High cost	Dismiss

ALTERNATIVE	ADVANTAGES	DISADVANTAGES	RECOMMENDATION
Alternative G	▪ Greatest use of existing roadways ▪ Lowest cost ▪ Low impacts to wetlands, forested habitat and active farmland	▪ Highest relocations ▪ Lowest travel time savings ▪ High impacts to floodplain/ floodway, Section 4(f)/6(f), and EJ areas	Carry Forward
Alternative H	▪ Lowest right-of-way impact ▪ High reduction in VMT on elevated crash segments ▪ High travel time savings	▪ High impacts to several environmental resources ▪ Moderate relocations	Carry Forward
Alternative I	▪ Low right-of-way impact ▪ High travel time savings	▪ Moderate to high impacts to several environmental resources ▪ Similar alignment to Alternative C, but higher impacts and cost	Dismiss
Alternative J	▪ High travel time savings ▪ Low impacts to farmland and floodway/floodplains	▪ Moderately high cost ▪ Moderate right-of-way and relocations ▪ Similar alignment to Alternative C, but higher impacts and cost	Dismiss
Alternative K	▪ N/A	▪ Does not meet purpose and need	Dismiss
Alternative L	▪ N/A	▪ Does not meet purpose and need	Dismiss

5.1 NO-BUILD ALTERNATIVE

For the No-Build Alternative, the Link 101 project would not be built and it is assumed that all of the transportation projects listed in the INDOT STIP FY 2024–2028 and the OKI Regional Council of Governments Transportation Improvement Program (TIP) FY 2024-2027 would be built (see Section 2.1.1). Although the No-Build Alternative does not meet the project's purpose and need, it must be included in the draft NEPA document to serve as a baseline for comparison in accordance with NEPA. As a result, **the No-Build Alternative will be carried forward for further evaluation**.

5.2 ALTERNATIVE A

Alternative A is recommended to be dismissed from further evaluation based on the following disadvantages:

- Highest construction and right-of-way costs ($933 million);
- Second highest right-of-way (1,070 acres);
- Highest impacts to active farmland (460 acres) and open waters (12.98 acres), and second highest floodway impacts (37 acres);
- Third highest impacts to forested habitat (572 acres) and wetlands (1.53 acres), most of which would be forested wetlands (1.46 acres);
- Potential impacts to the Aurora Downtown Historic District; and

- An approximately 2-mile section of SR 56 south of Aurora could have below acceptable levels of service for traffic.

There are some advantages for Alternative A compared to other preliminary alternatives – notably, the highest reduction in VMT on elevated crash segments, high weighted average travel time savings, and lower to moderate environmental impacts to several resources including river/streams and total relocations – but these factors did not outweigh the disadvantages noted above.

5.3 ALTERNATIVE B

Alternative B is recommended to be carried forward for further evaluation based on the following advantages:

- Second highest weighted average travel time savings (-11 minutes);
- Lowest number of relocations (18);
- Lowest impacts to floodplains (10 acres), floodways (5 acres), prime farmland soils (107 acres), active farmland (222 acres), noise sensitive receptors (71), EJ areas (9 miles), and residential relocations in EJ areas (9);
- Moderate construction and right-of-way costs ($455 million) and new right-of-way (734 acres); and
- Low construction and maintenance of traffic complexity (it is the only alternative that would be completely on new alignment).

There are some disadvantages to Alternative B compared to other preliminary alternatives – notably, the lowest reduction in VMT on elevated crash locations and higher impacts to forested habitat – but these factors did not outweigh the advantages noted above.

5.4 ALTERNATIVE C

Alternative C is recommended to be carried forward for further evaluation based on the following advantages:

- Second lowest construction and right-of-way costs ($381 million);
- Third highest weighted average travel time savings (-10 minutes);
- Moderate new right-of-way (718 acres);
- Overall low to moderate impacts to many resources including total relocations (87), wetlands (0.63 acre), rivers/streams (12,643 linear feet), floodplains (29 acres), floodway (15 acres), forested habitat (307 acres), active farmland (353 acres), and EJ areas (9 linear miles); and
- Low construction and maintenance of traffic complexity.

There are some disadvantages to Alternative C compared to other preliminary alternatives – notably, being on the lower end of reductions in VMT on elevated crash locations – but these factors did not outweigh the advantages noted above.

5.5 ALTERNATIVE D

Alternative D is recommended to be dismissed from further evaluation based on the following disadvantages:

- Second highest impact to forested habitat (612 acres);
- Third lowest reduction in VMT on elevated crash locations (-2.5%);
- Highest impact to wetlands (2.97 acres), including forested wetlands (2.41 acres);
- Moderate new right-of-way requirements (741 acres); and
- Moderate construction and right-of-way costs ($503 million).

Additionally, in comparison to Alternative B – which would also be a mostly new alignment alternative through the central portion of the project area and is recommended to be carried forward (see Section 5.3) – Alternative D would be longer than Alternative B and would result in greater impacts to most of the resource categories and greater costs.

There are some advantages for Alternative D compared to other preliminary alternatives – notably, the second lowest number of total relocations, lower impacts to waterways, floodplains, and EJ areas, and highest weighted average travel time savings – but these factors did not outweigh the disadvantages noted above.

5.6 ALTERNATIVE E

Alternative E is recommended to be dismissed from further evaluation based on the following disadvantages:

- Lowest weighted average travel time savings (0 minutes);
- Second highest number of relocations (206) and residential relocations in EJ areas (117);
- Highest impacts to many resources including: perennial streams (7,073 linear feet), floodplains (115 acres), floodways (38 acres), potential karst sinkhole areas (7 acres), and potential historic properties/districts (3), including two Vevay Historic Districts;
- Second highest impacts to prime farmland soils (379 acres), noise sensitive receptors (658), EJ areas (27 linear miles), and potential hazardous materials sites (7); and
- High constructability and maintenance of traffic complexity (it would utilized existing SR 156, SR 56, and SR 129)

There are some advantages for Alternative E compared to other preliminary alternatives – notably, acceptable levels of service, moderate cost, and moderate reduction in VMT on elevated crash locations – but these factors did not outweigh the disadvantages noted above.

5.7 ALTERNATIVE F

Alternative F is recommended to be dismissed from further evaluation based on the following disadvantages:

- Highest new right-of-way (1,235 acres);
- Second highest construction and right-of-way costs ($821 million);
- Highest impacts to streams (23,500 linear feet), forested habitat (755 acres), and potential karst sinkhole areas (7 acres);

- Second highest impacts to active farmland (376 acres) and wetlands (1.93 acres), most of which are forested wetlands (1.75 acres);
- Lower reductions of VMT on elevated crash locations (-2.0%); and
- Moderate construction and maintenance of traffic complexity (it would run across more challenging terrain than other alternatives with comparable lengths of existing roadways).

There are some advantages for Alternative F compared to other preliminary alternatives – notably, moderate impacts to a few resources such as floodplain, farmlands, and noise sensitive receptors – but these factors did not outweigh the disadvantages noted above.

5.8 ALTERNATIVE G

Alternative G is recommended to be carried forward for further evaluation based on the following advantages:

- Lowest construction and right-of-way costs ($345 million);
- Lowest impacts to wetlands (0.13 acre), open waters (1.60 acres), and forested habitat (191 acres);
- Second lowest impacts to active farmlands (224 acres);
- Third lowest new right-of-way (695 acres);
- Third highest reductions in VMT at elevated crash locations; and
- Aligns with public feedback supporting an alternative that primarily utilizes existing roadways (all 35 miles use existing roadways).

There are disadvantages to Alternative G compared to other preliminary alternatives – notably, the highest number of relocations, highest impacts to several environmental resources including potential Section 4(f)/6(f) properties, potential historic properties/districts and EJ areas/associated relocations, high construction complexity, and the lowest weighted average travel time savings – but these factors did not outweigh the advantages noted above.

5.9 ALTERNATIVE H

Alternative H is recommended to be carried forward for further evaluation based on the following advantages:

- Lowest right-of-way impacts (672 acres);
- Third lowest construction and right-of-way cost ($436 million);
- Third highest weighted average travel time savings (-10 minutes).
- One of the highest reductions in VMTs on elevated crash locations (-10%); and
- Overall low to moderate environmental impacts to many resources including open waters (3.37 acres), rivers/streams (13,031 linear feet), floodplains (48 acres), prime farmland soils (148 acres), active farmland (297 acres), and EJ areas (10 linear miles).

There are some disadvantages for Alternative H compared to other preliminary alternatives – notably, higher impacts to floodways and wetlands and more moderate impacts to total relocations – but these factors did not outweigh the disadvantages noted above.

5.10 ALTERNATIVE I

Alternative I is recommended to be dismissed from further evaluation based on the following disadvantages:

- Moderate reductions in VMT on elevated crash locations (-4.8%);
- Moderate construction and right-of-way costs ($481 million);
- Highest impacts to cemeteries (4), religious facilities (1), and public facilities and services (2);
- Moderate overall impacts to many other environmental resources including total relocations (136), open waters (7.13 acres), forested habitat (313 acres), and prime farmland soils (204 acres); and
- Medium construction and maintenance of traffic complexity.

Additionally, compared to Alternative C – which would also generally follow the existing fastest and shortest route and would use a combination of existing roadways and new alignment through the central portion of the project area, and is recommended to be carried forward (see Section 5.4) – Alternative I would result in higher impacts (particularly in East Enterprise) and costs.

There are some advantages for Alternative I compared to other preliminary alternatives – notably, lower new right-of-way, higher weighted average travel time savings, and lower impacts to a few environmental resources including active farmland – but these factors did not outweigh the disadvantages noted above.

5.11 ALTERNATIVE J

Alternative J is recommended to be dismissed from further evaluation based on the following disadvantages:

- Third highest total relocations (141 relocations);
- Third highest construction and right-of-way costs ($636 million);
- Moderate new right-of-way (779 acres);
- Moderate reductions in VMT on elevated crash locations (-3.9%);
- Second highest impacts to cemeteries (3), religious facilities (1), and public facilities and services (2);
- Overall moderate impacts to many environmental resources including open waters (8.40 acres), rivers/streams (15,420 linear feet), forested habitat (369 acres); and prime farmland soils (198 acres); and
- Medium construction and maintenance of traffic complexity.

Additionally, compared to Alternative C – which would also generally follow the existing fastest and shortest route and would use a combination of existing roadways and new alignment through the central portion of the project area, and is recommended to be carried forward (see Section 5.4) – Alternative J would result in higher impacts (particularly in East Enterprise) and costs.

There are some advantages for Alternative J compared to other preliminary alternatives – notably, higher weighted average travel time savings and lower impacts to some environmental resources

including floodplains/floodways and active farmland – but these factors did not outweigh the disadvantages noted above.

5.12 ALTERNATIVE K

As described in Section 4.1.3, Alternative K would not meet the project's purpose and need and was, therefore, dismissed from further consideration.

5.13 ALTERNATIVE L

As described in Section 4.1.3, Alternative L would not meet the project's purpose and need and was, therefore, dismissed from further consideration.

CHAPTER 6 – ALTERNATIVES RECOMMENDED FOR FURTHER DEVELOPMENT

Based on the screening evaluation, the following preliminary alternatives are recommended to be carried forward for further evaluation in the draft NEPA document (Figure 6-1):

- Alternative B
- Alternative C
- Alternative G
- Alternative H

In addition, in accordance with NEPA guidelines, the No-Build Alternative will be carried forward for further evaluation to serve as a baseline for comparison.

Following public and agency input, a final decision will be made on the alternatives to be carried forward for further evaluation. More detailed design and environmental surveys will then be conducted on these alternatives. Based on the more detailed information, the alternatives will be evaluated, and a Preferred Alternative identified in the draft NEPA document for public and agency review and comment.

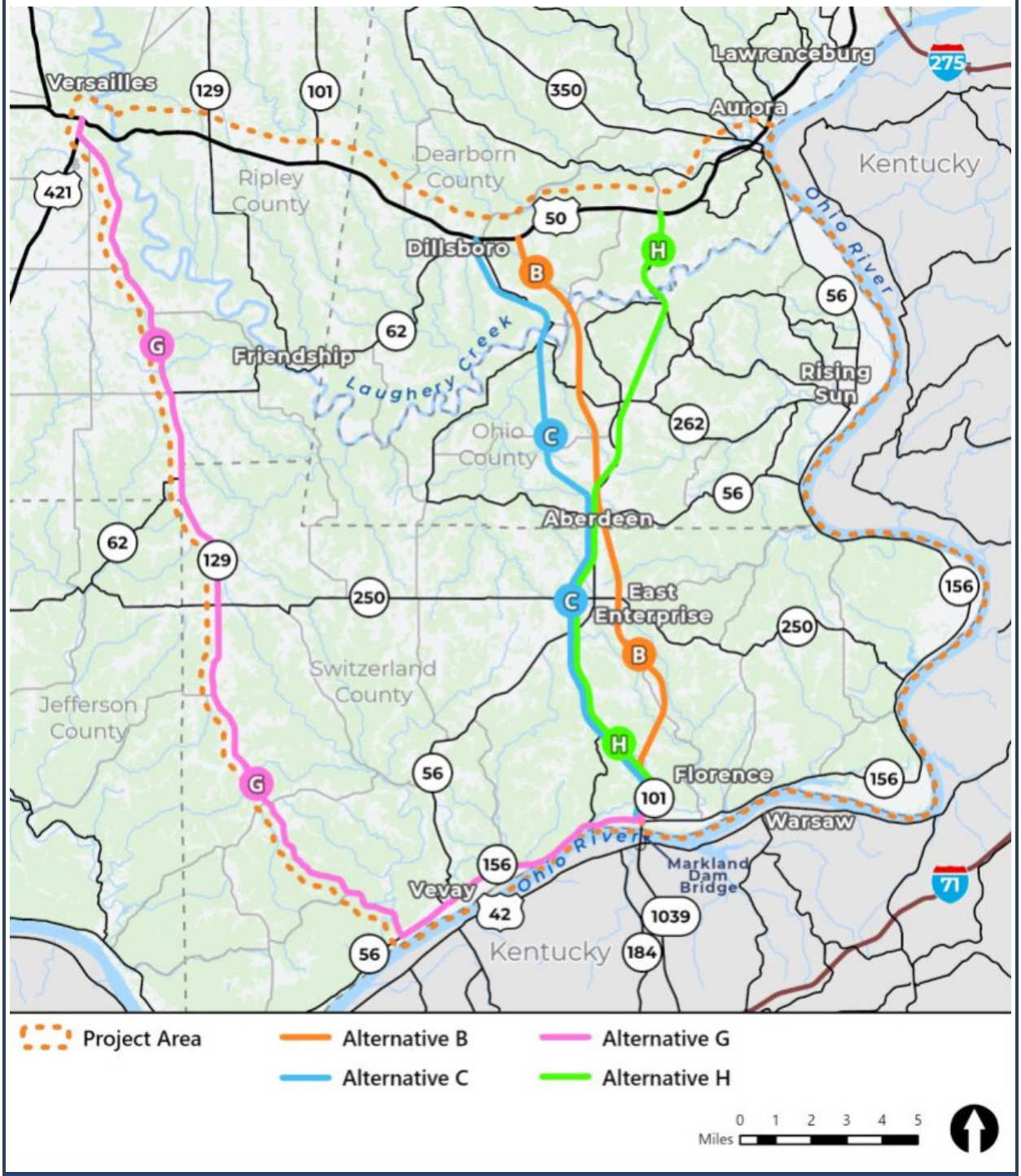

Figure 6-1. Alternatives Recommended for Further Development

CHAPTER 7 – REFERENCES

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2023 https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

APPENDIX A. DAILY TRAFFIC VOLUMES

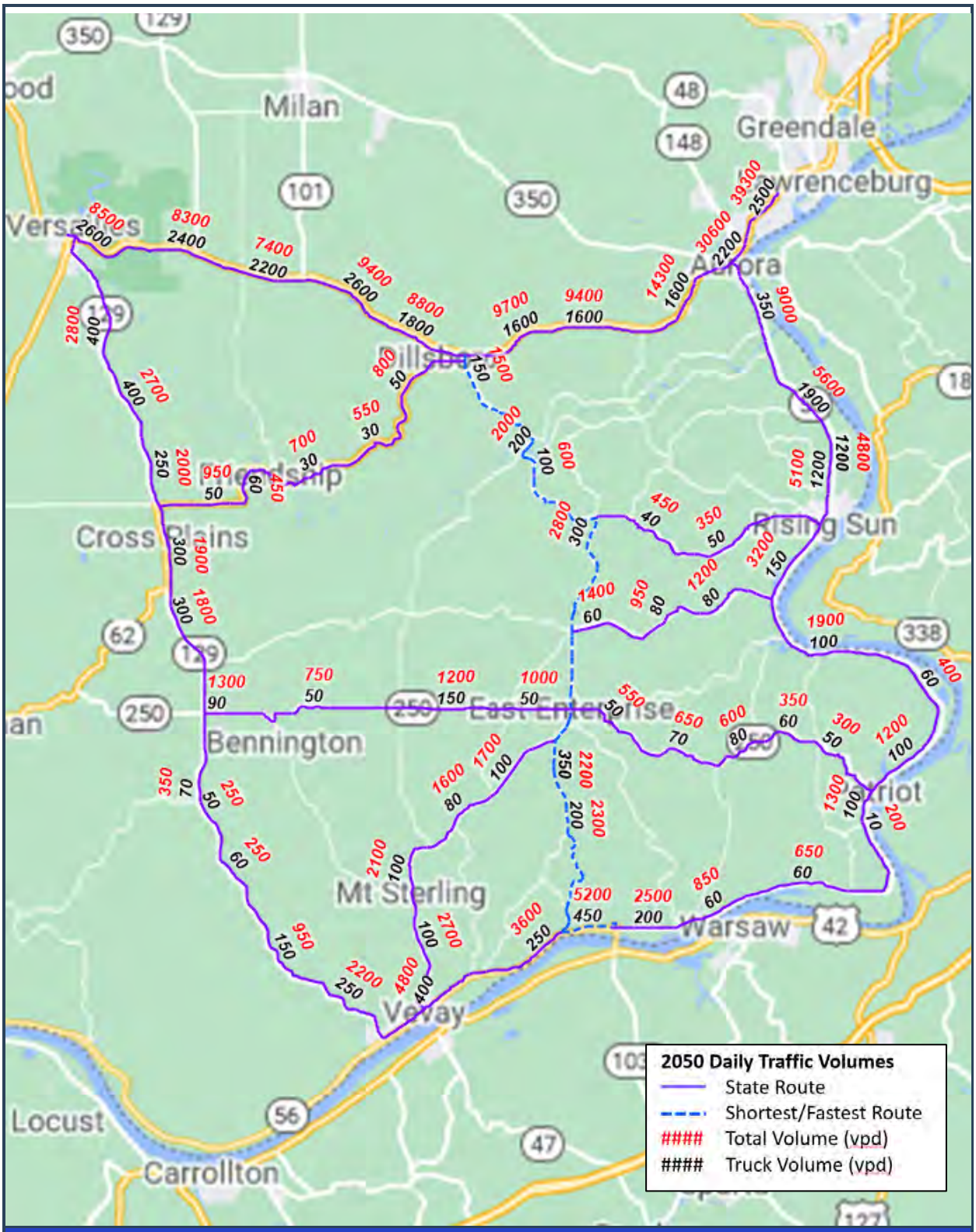


Figure A-1. Daily Traffic Volumes – No-Build Alternative

Figure A-2. Daily Traffic Volumes – Alternative A

Figure A-3. Daily Traffic Volumes – Alternative B

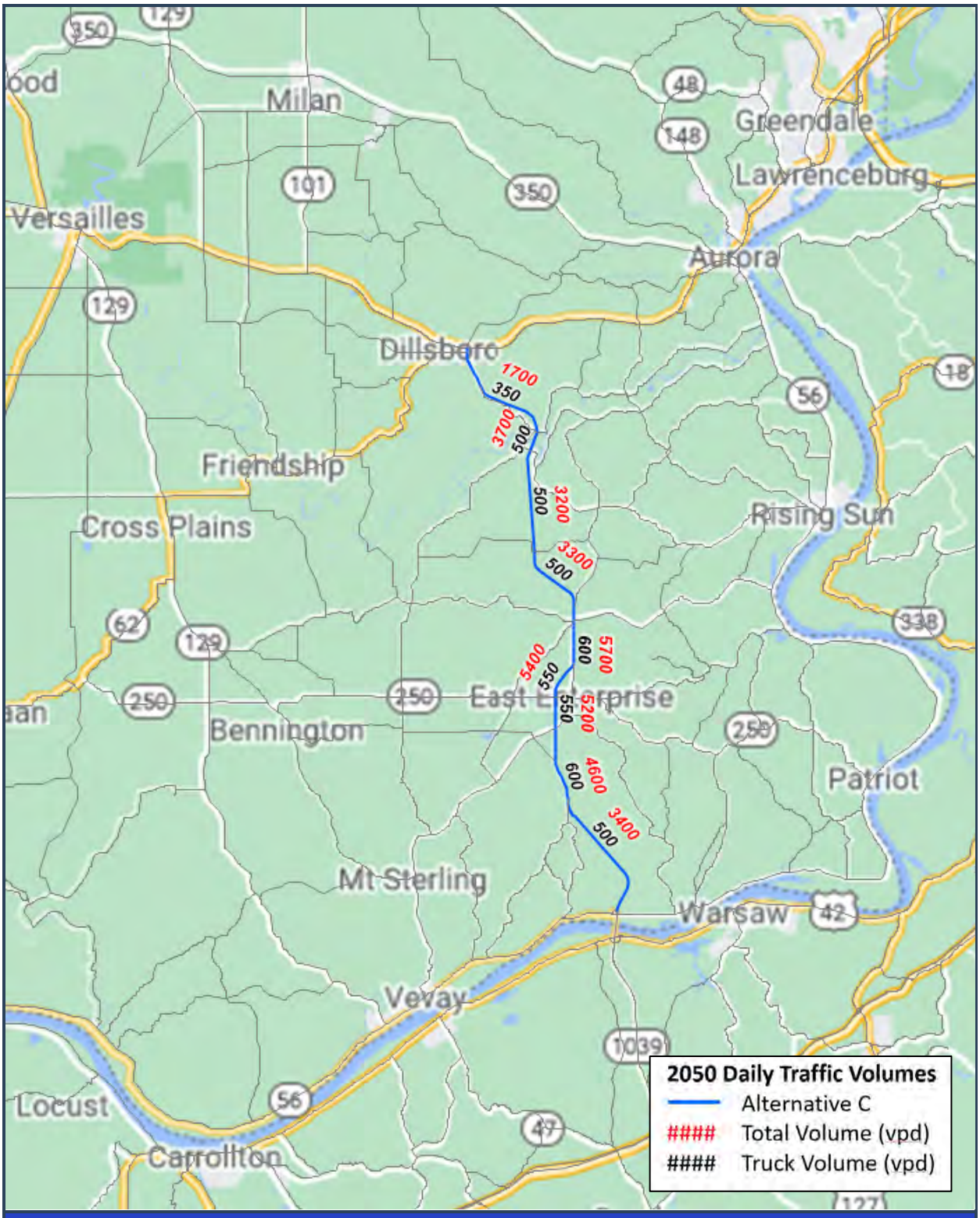


Figure A-4. Daily Traffic Volumes – Alternative C

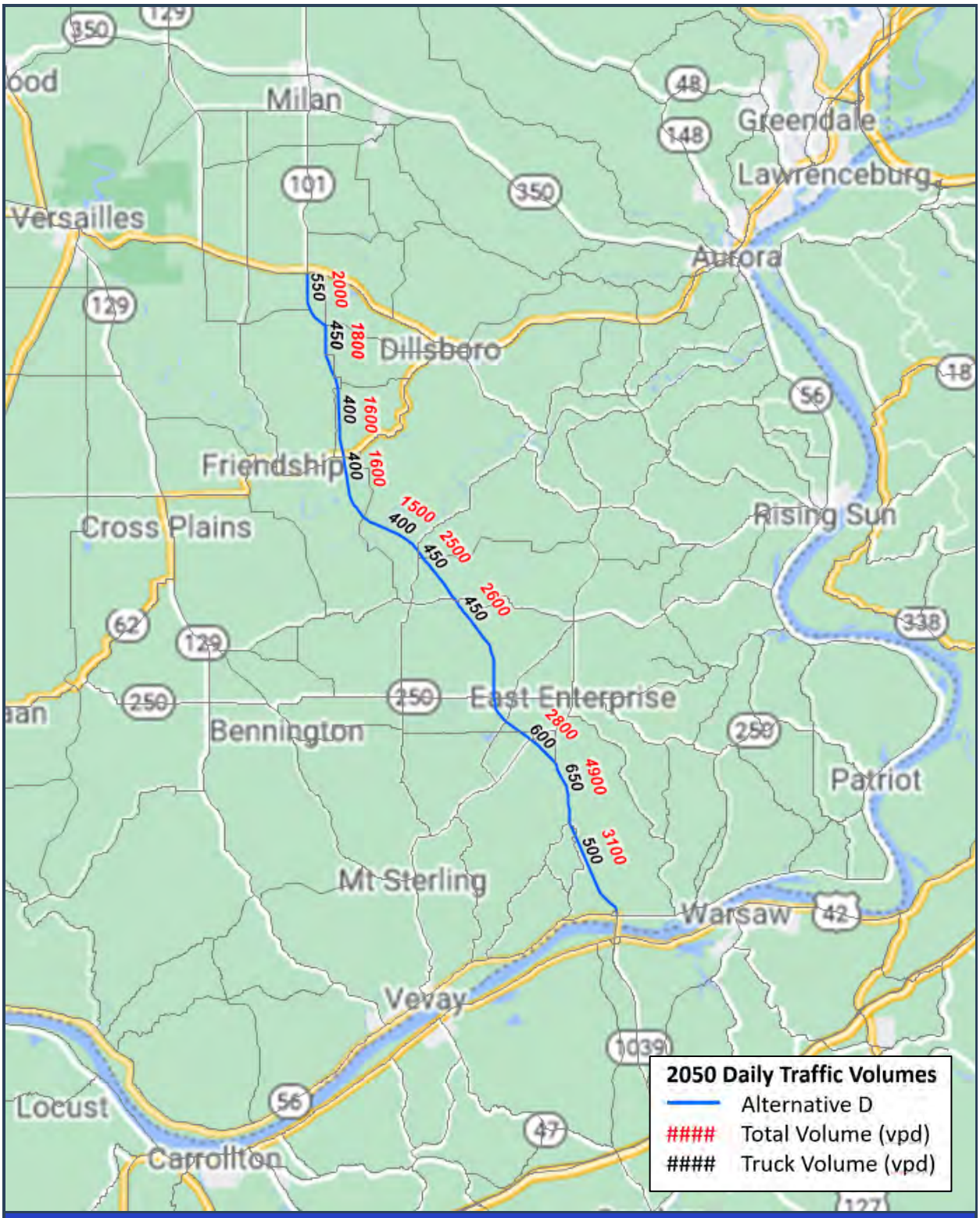


Figure A-5. Daily Traffic Volumes – Alternative D

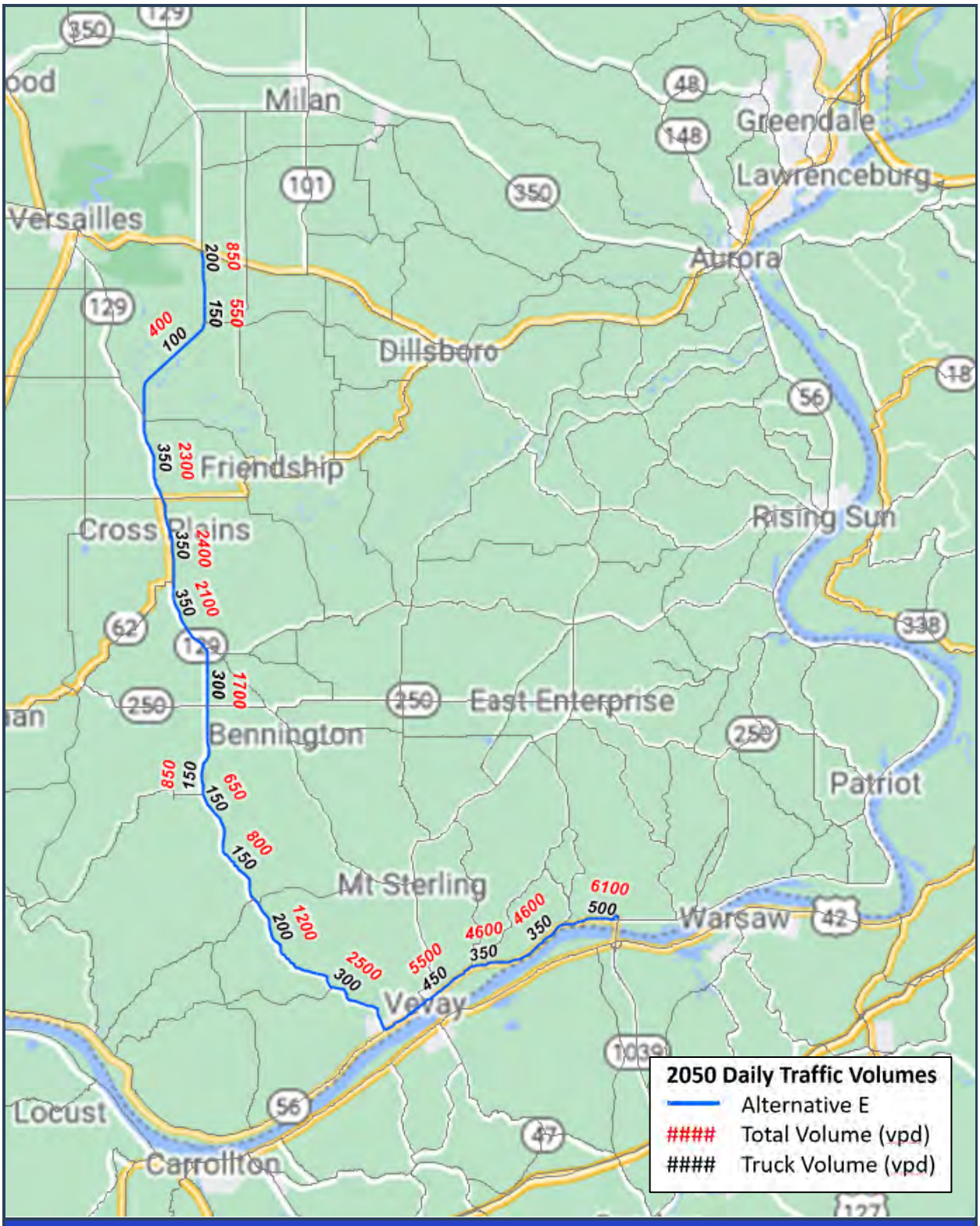


Figure A-6. Daily Traffic Volumes – Alternative E

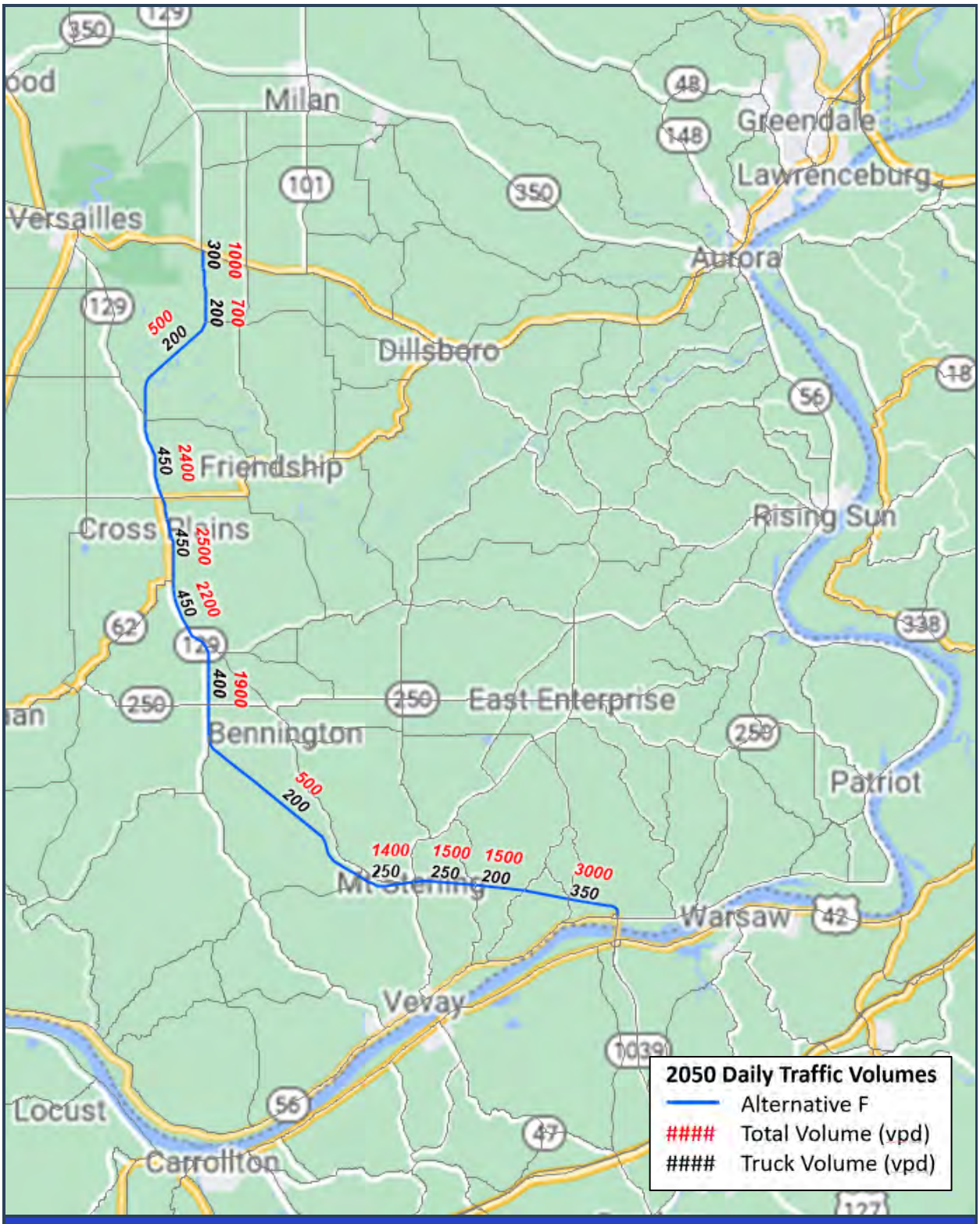


Figure A-7. Daily Traffic Volumes – Alternative F

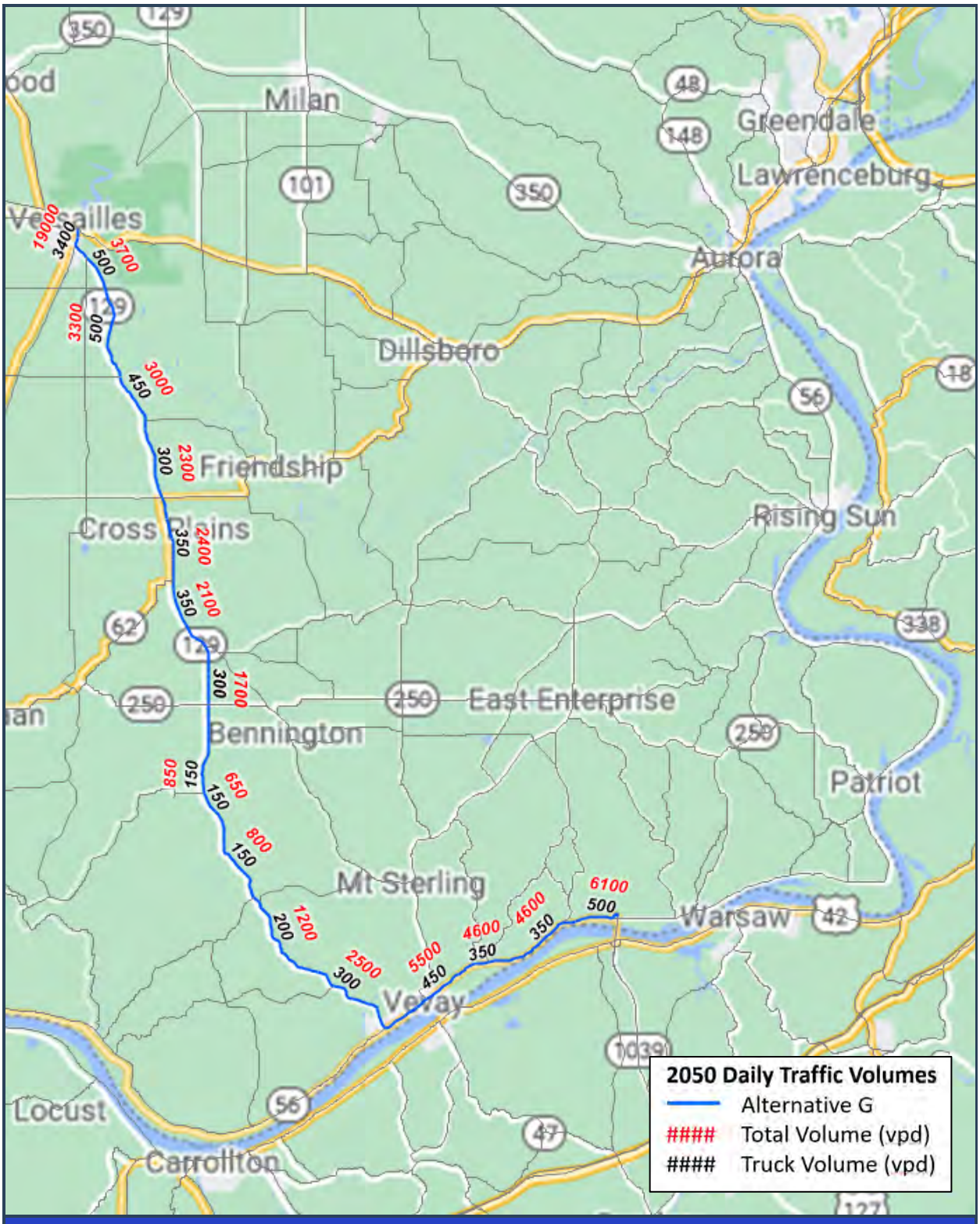


Figure A-8. Daily Traffic Volumes – Alternative G

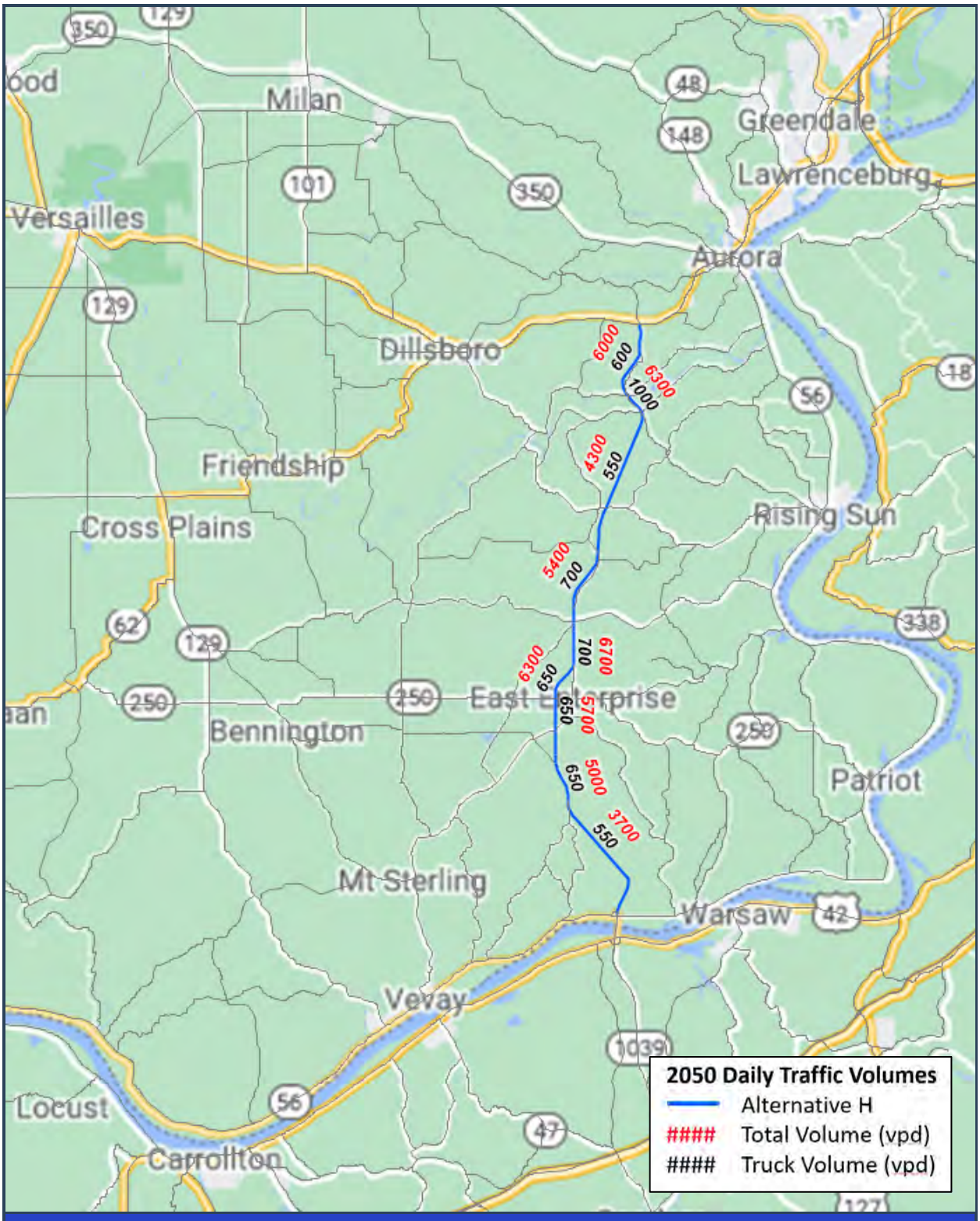


Figure A-9. Daily Traffic Volumes – Alternative H

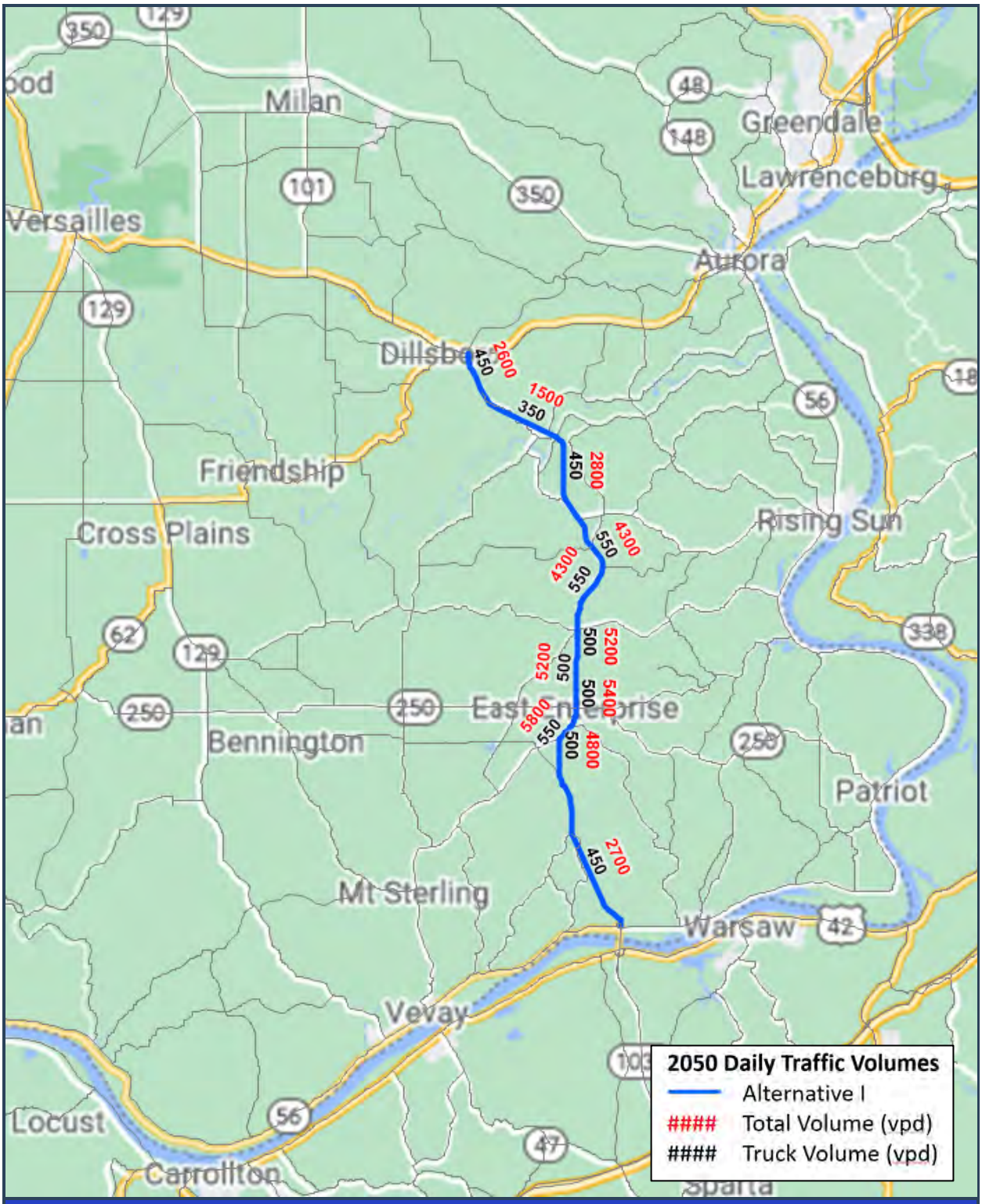


Figure A-10. Daily Traffic Volumes – Alternative I

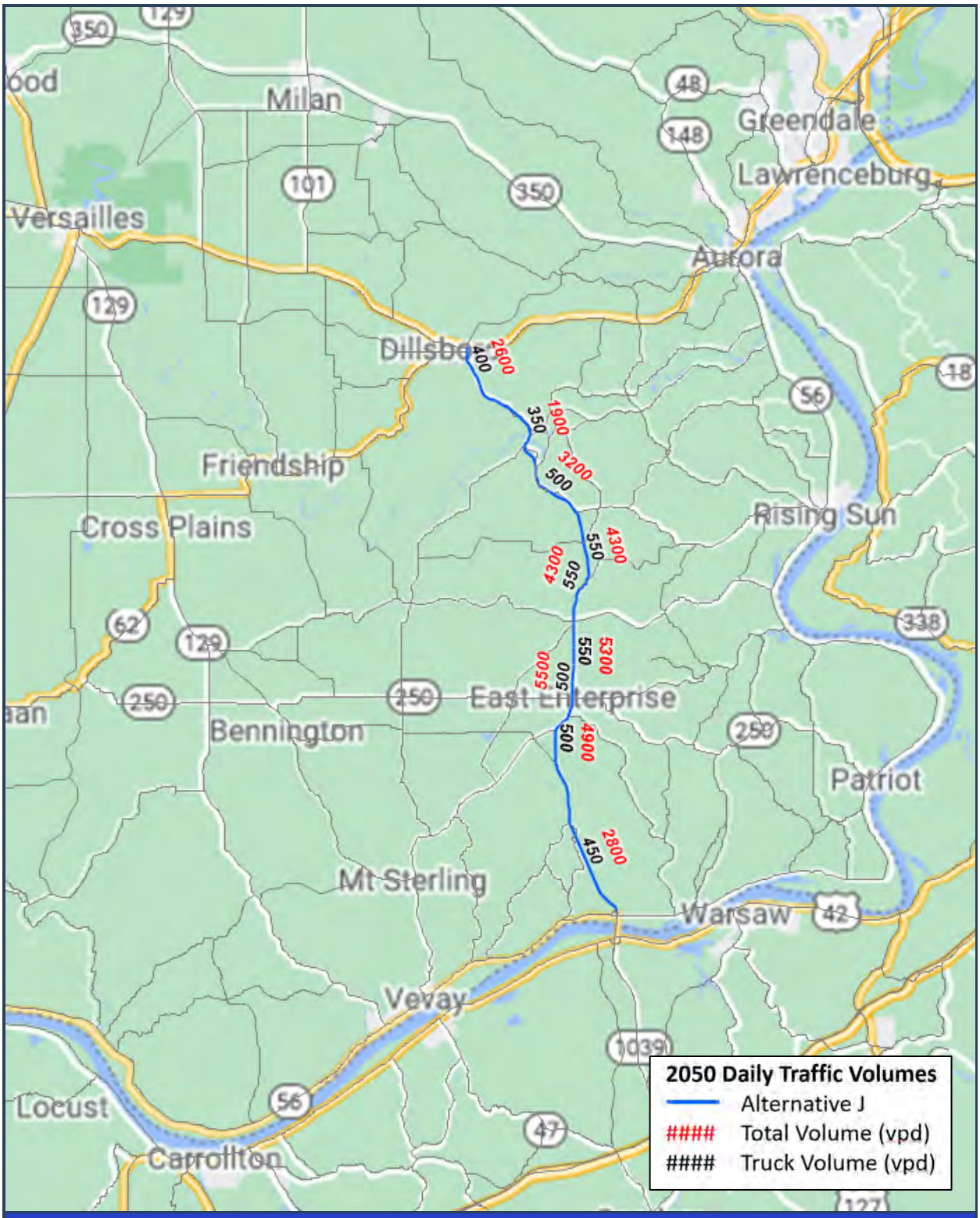


Figure A-11. Daily Traffic Volumes – Alternative J

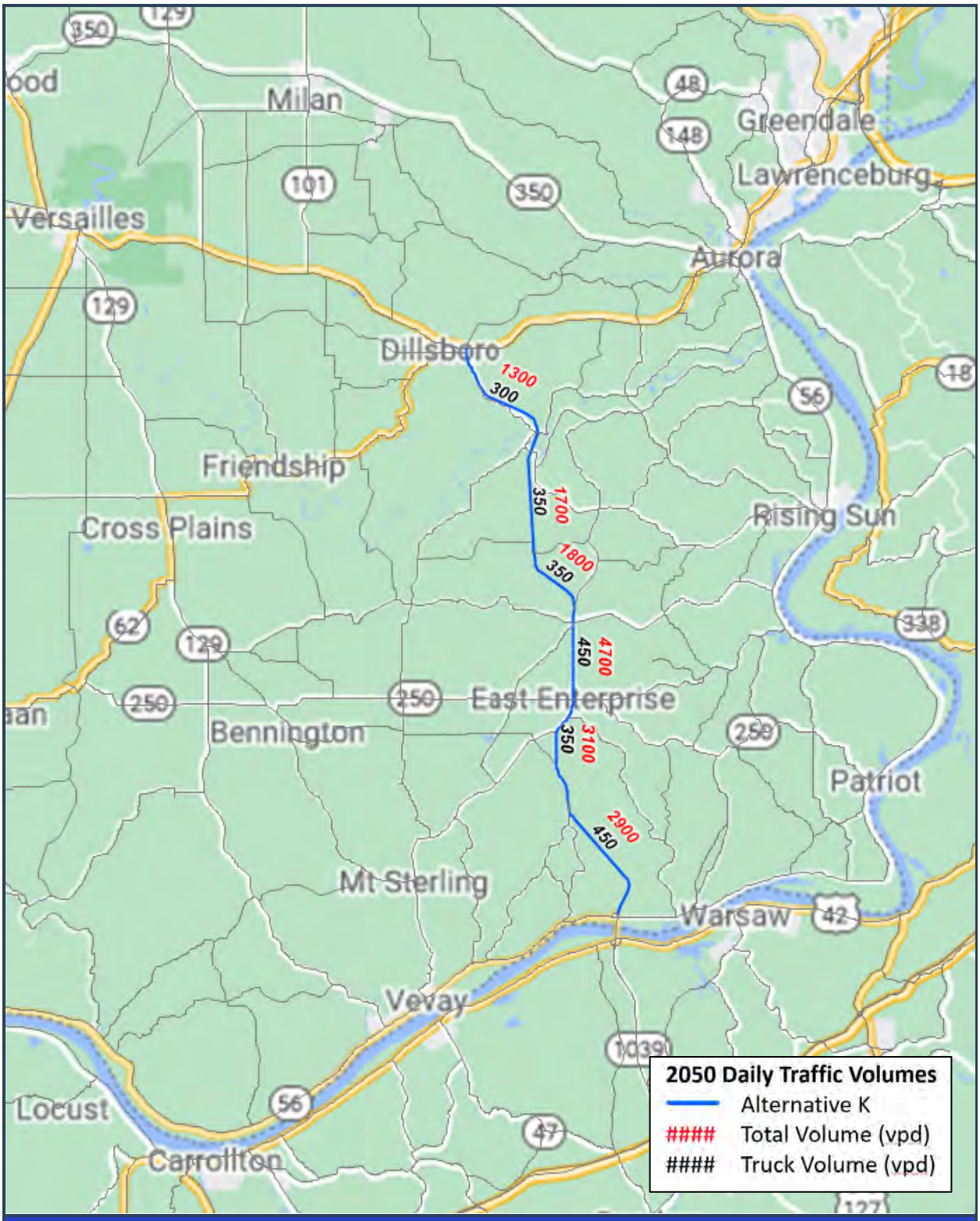


Figure A-12. Daily Traffic Volumes – Alternative K

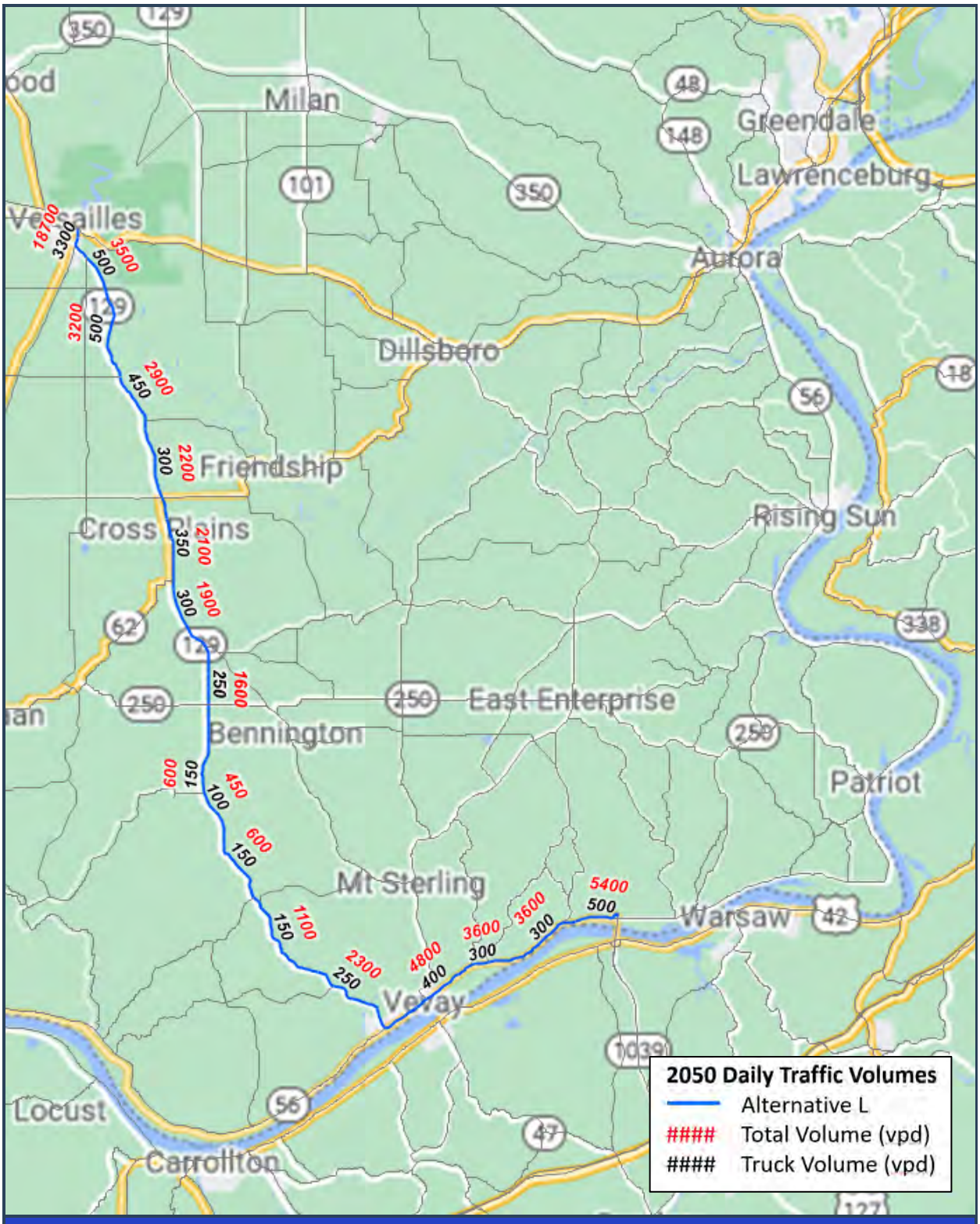
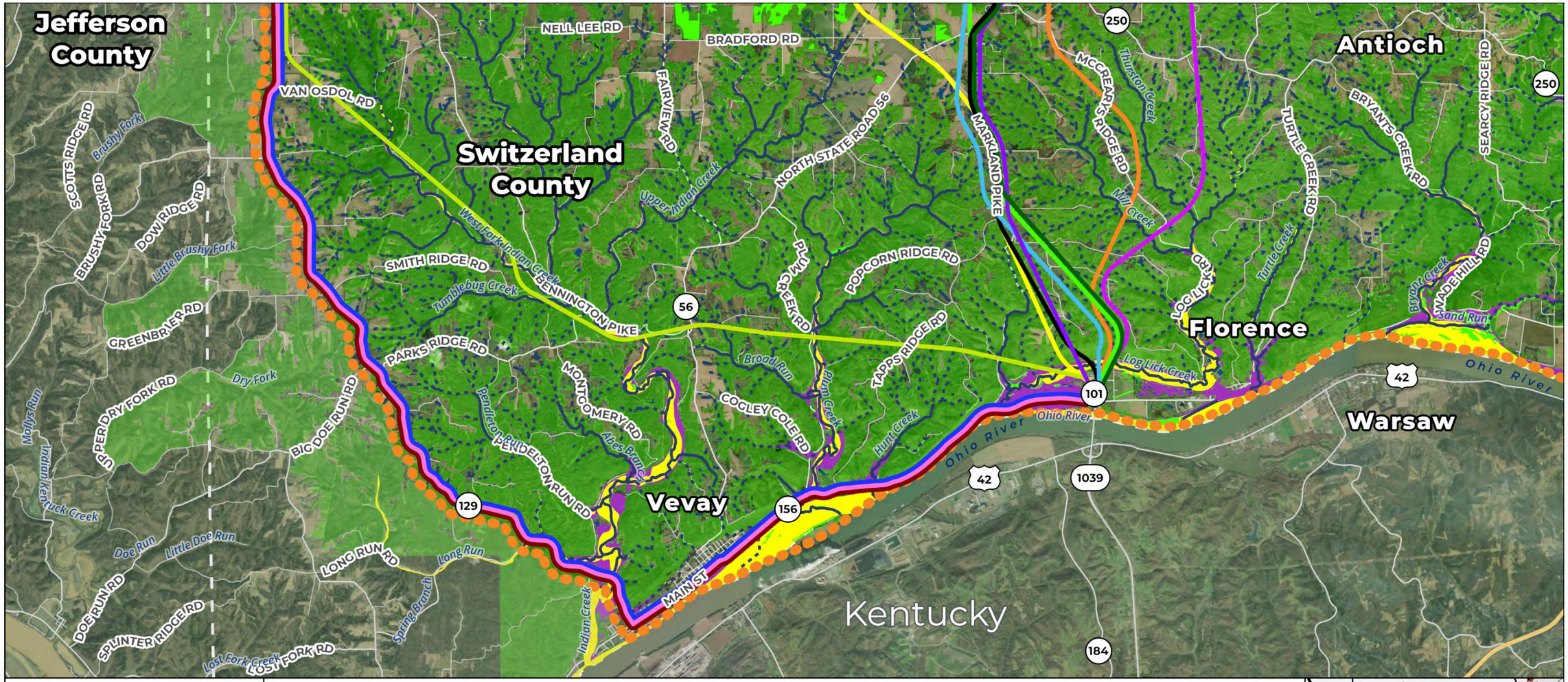


Figure A-13. Daily Traffic Volumes – Alternative L

APPENDIX B. ENVIRONMENTAL FEATURES MAP: WATER RESOURCES, KARST SINKHOLE AREAS, AND FORESTED HABITAT



LINK 101

Page 1 of 3

Source: IndianaMap,
INDOT RFI Database

Scale: 1":8,000 feet

Miles
0 1 2

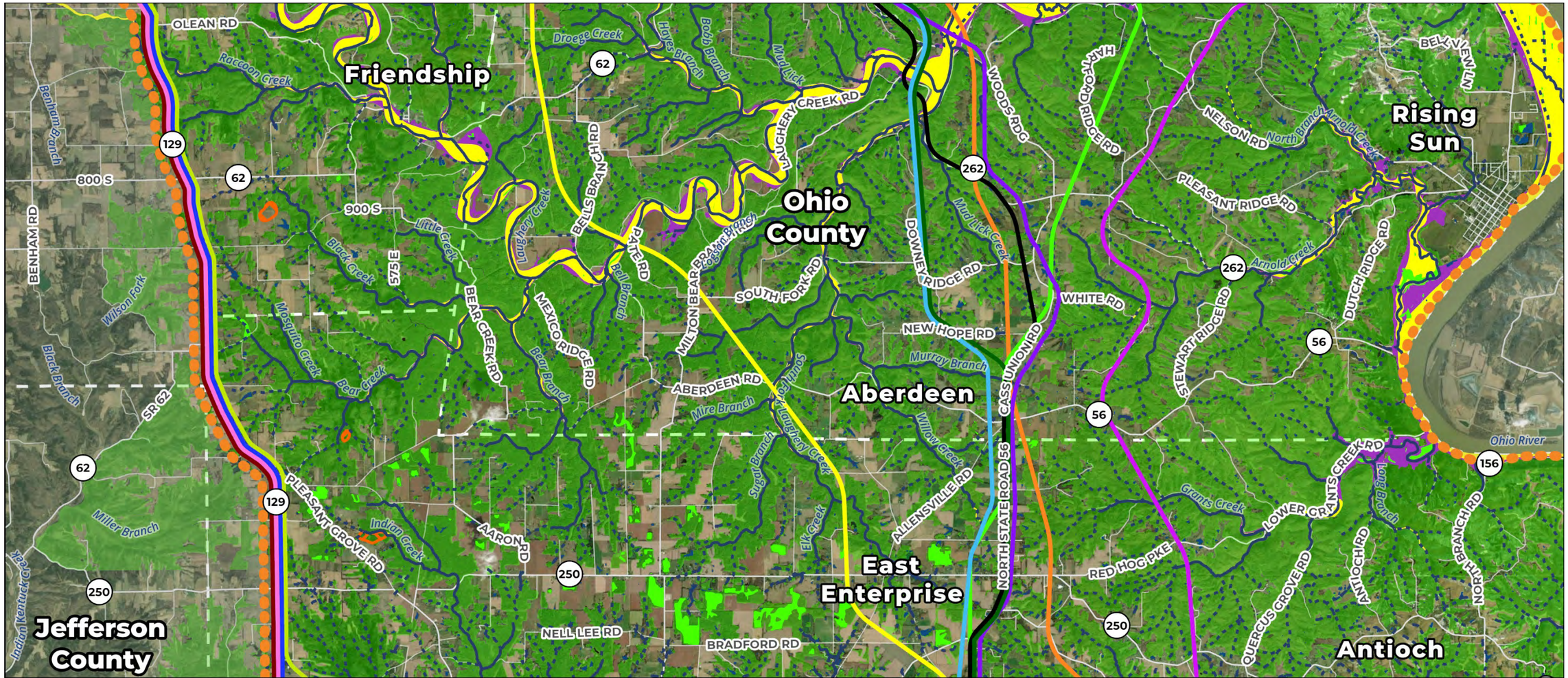
Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Alternative F
- Alternative G
- Alternative H
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Water Resources, Karst Sinkhole Areas and Forested Habitat

- River and Stream
- Intermittent Stream
- Open Water
- Wetland
- Floodway
- 100-Year Floodplain
- Karst Sinkhole Area
- Forested Habitat



LINK 101

Page 2 of 3

Source: IndianaMap,
INDOT RFI Database

Scale: 1":8,000 feet

Miles
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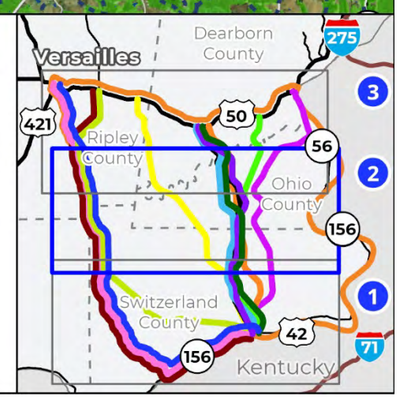
Project Area

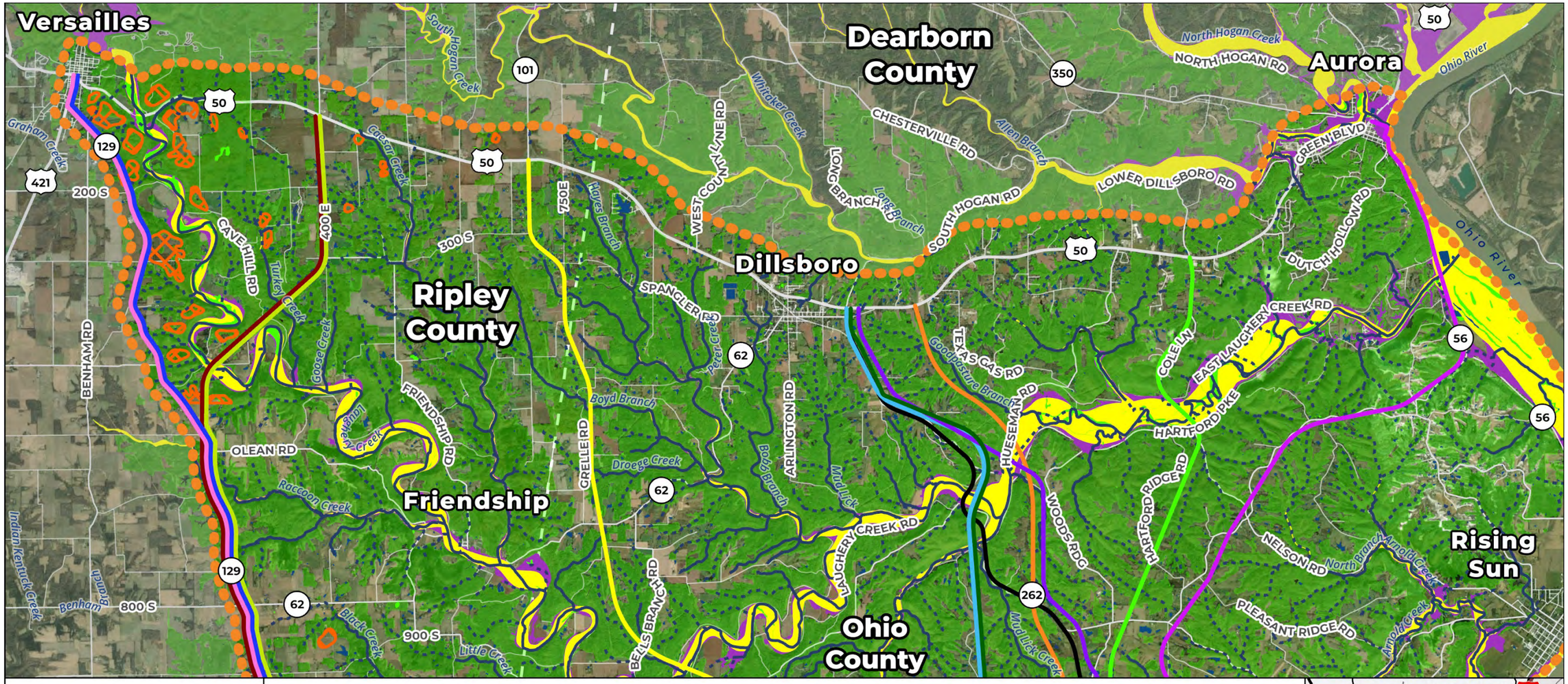
Alternatives

- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Alternative F
- Alternative G
- Alternative H
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Water Resources, Karst Sinkhole Areas and Forested Habitat

- River and Stream
- Intermittent Stream
- Open Water
- Wetland
- Floodway
- 100-Year Floodplain
- Karst Sinkhole Area
- Forested Habitat





LINK 101

Page 3 of 3

Source: IndianaMap,
INDOT RFI Database

Scale: 1":8,000 feet

Miles
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Project Area

Alternatives

- Alternative A
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- Alternative C
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- Alternative L

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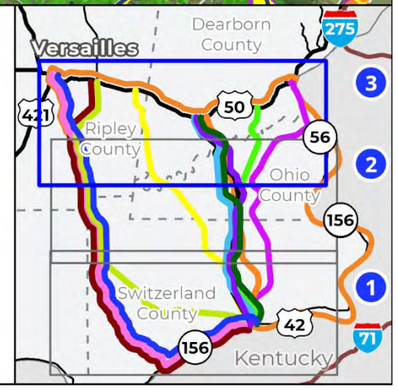
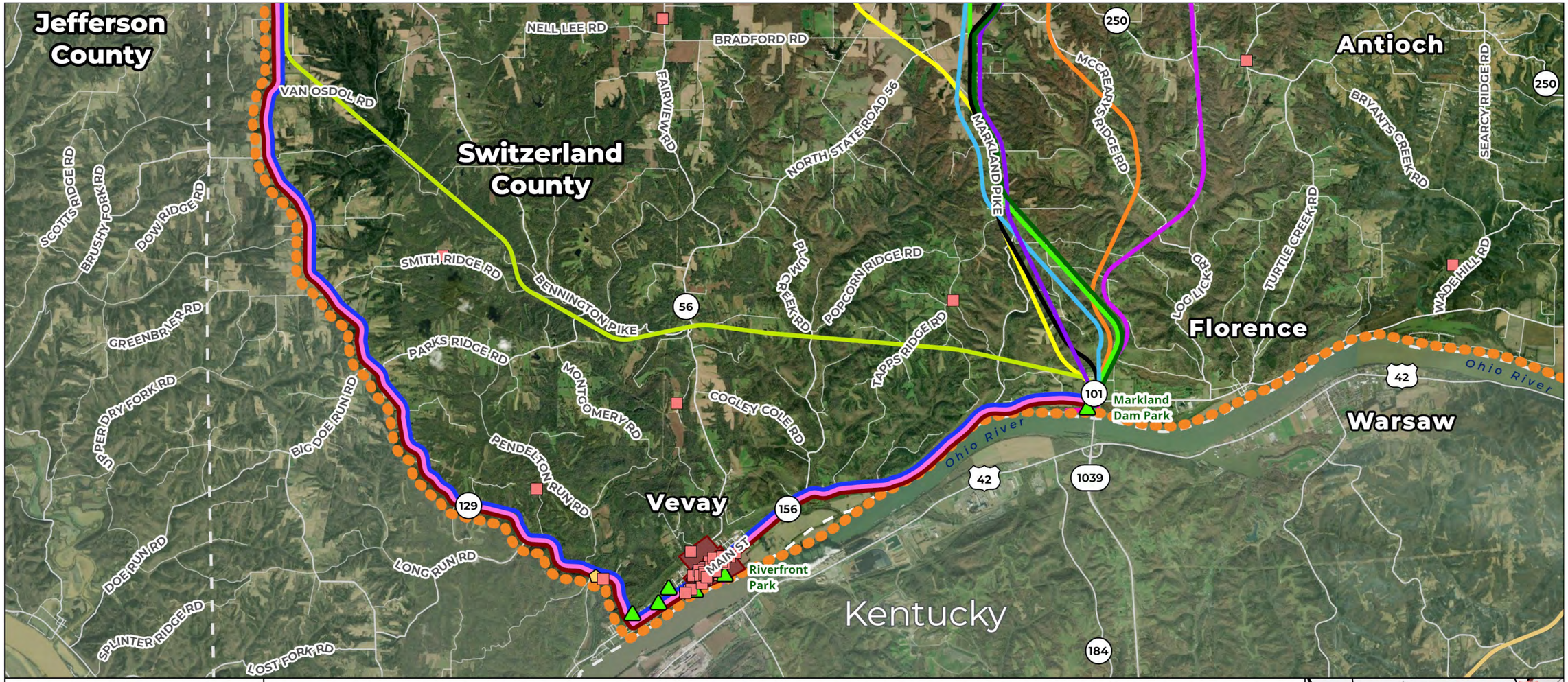
- Forested Habitat



APPENDIX C. ENVIRONMENTAL FEATURES MAP: POTENTIAL HISTORIC PROPERTIES/ DISTRICTS, SECTION 4(f)/6(f) PROPERTIES, AND MANAGED LANDS



LINK 101

Page 1 of 3

Source: IndianaMap,
INDOT RFI Database,
Indiana SHAARD
Scale: 1":8,000 feet

Miles
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Project Area

Alternatives

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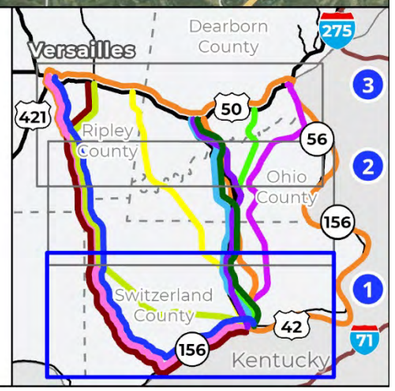
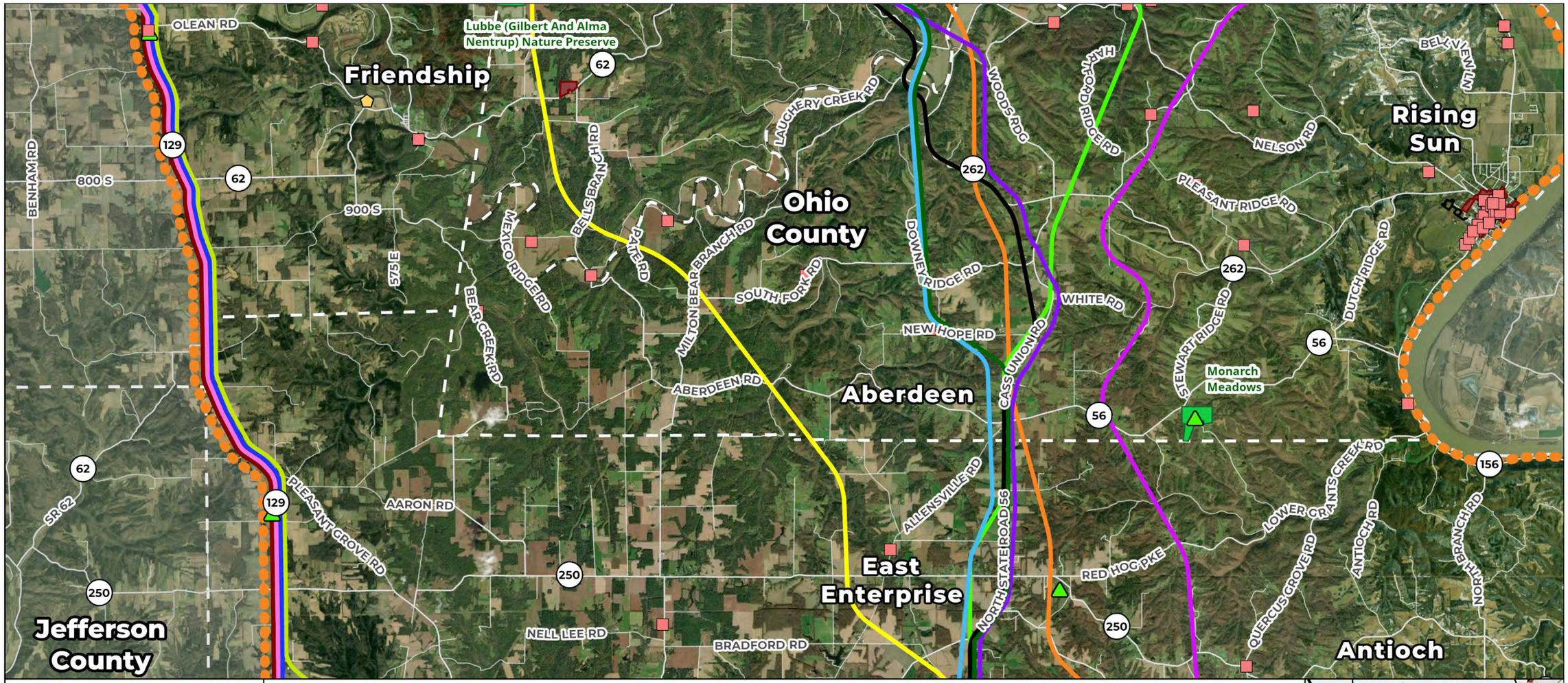
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Potential Historic Properties/Districts, Section 4(f)/6(f) Properties, and Managed Lands

- Historic Site
- NRHP Historic District
- NRHP Historic Property
- Trail
- Potential Section 4(f) Property
- Section 6(f) Property
- Managed Lands





LINK 101

Page 2 of 3

Source: IndianaMap,
INDOT RFI Database,
Indiana SHAARD
Scale: 1":8,000 feet

Miles
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Project Area

Alternatives

- Alternative A
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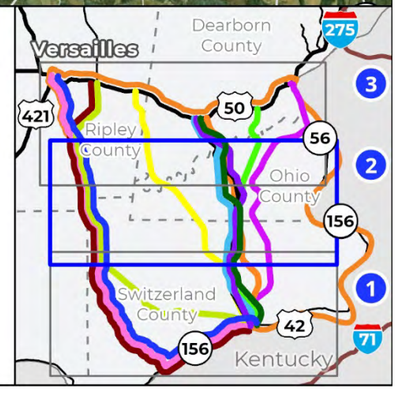
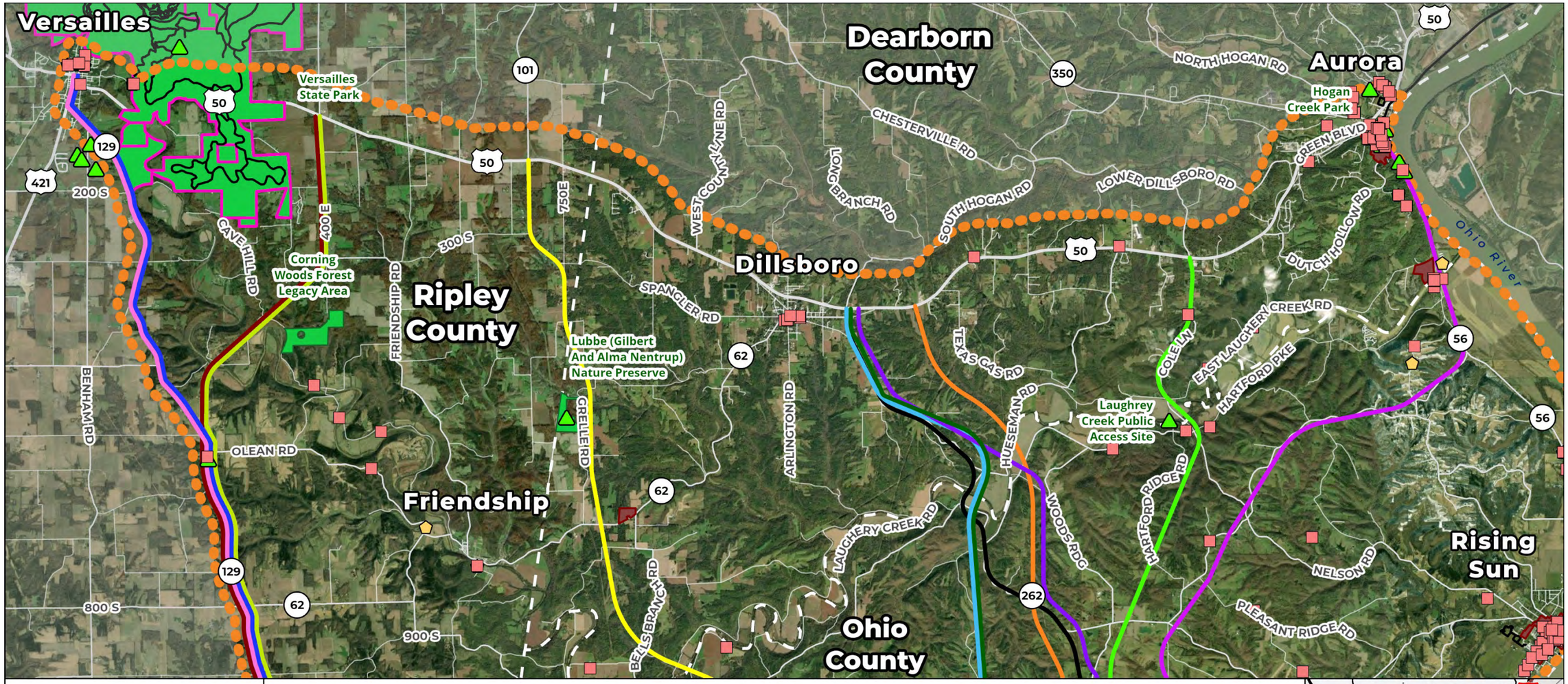
- NRHP Historic Property
- Trail
- Potential Section 4(f) Property
- Section 6(f) Property
- Managed Lands





LINK 101

Page 3 of 3

Source: IndianaMap,
INDOT RFI Database,
Indiana SHAARD
Scale: 1":8,000 feet

Miles
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Project Area

Alternatives

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Potential Historic Properties/Districts, Section 4(f)/6(f) Properties, and Managed Lands

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- NRHP Historic Property
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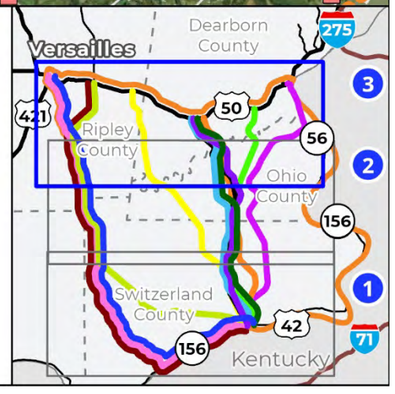
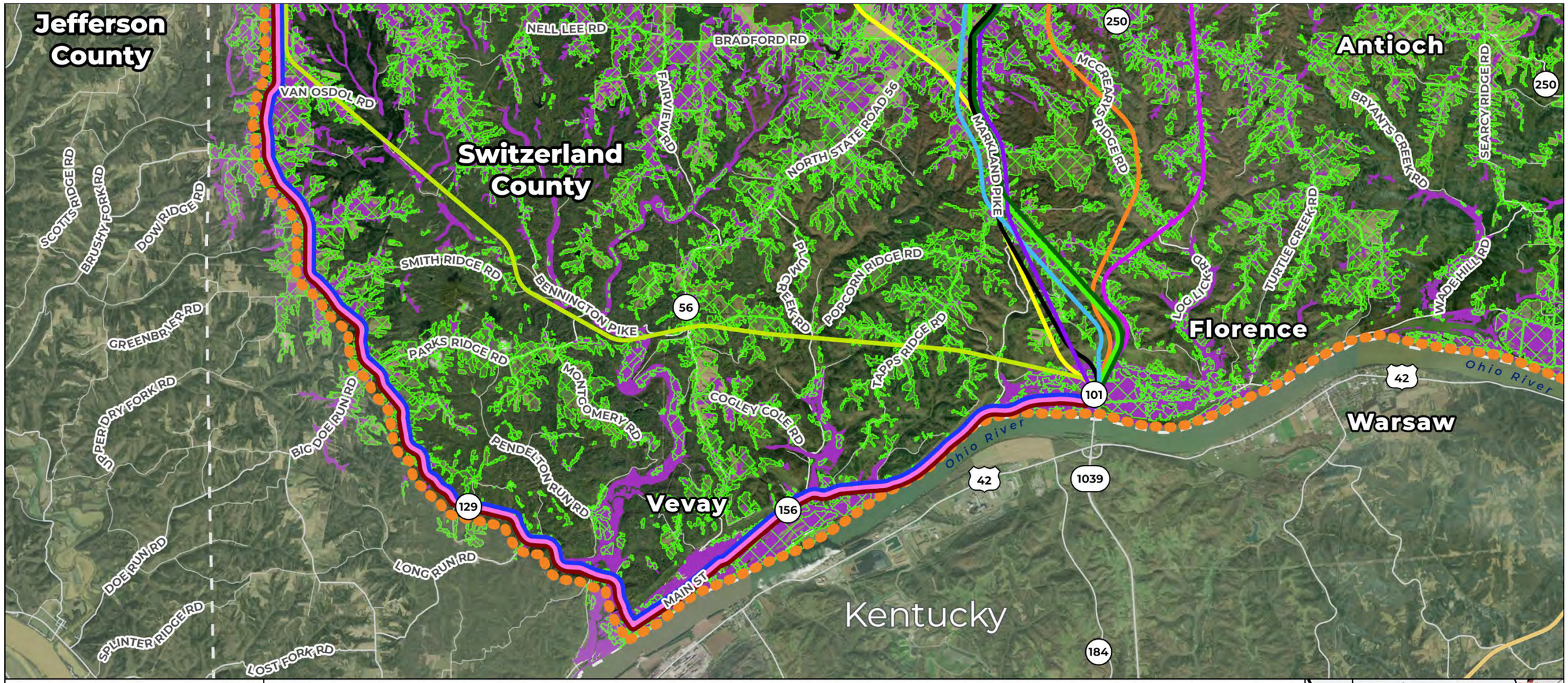
- Potential Section 4(f) Property
- Section 6(f) Property
- Managed Lands



APPENDIX D. ENVIRONMENTAL FEATURES MAP: ACTIVE FARMLANDS AND PRIME FARMLAND SOILS



LINK 101

Page 1 of 3

Source: IndianaMap, NLCD, NRCS Web Soil Survey

Scale: 1":8,000 feet

Miles 0 1 2

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
- Alternative D
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- Alternative H
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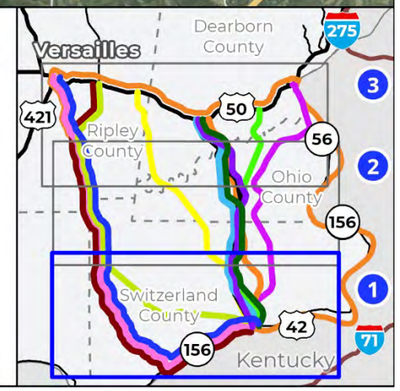
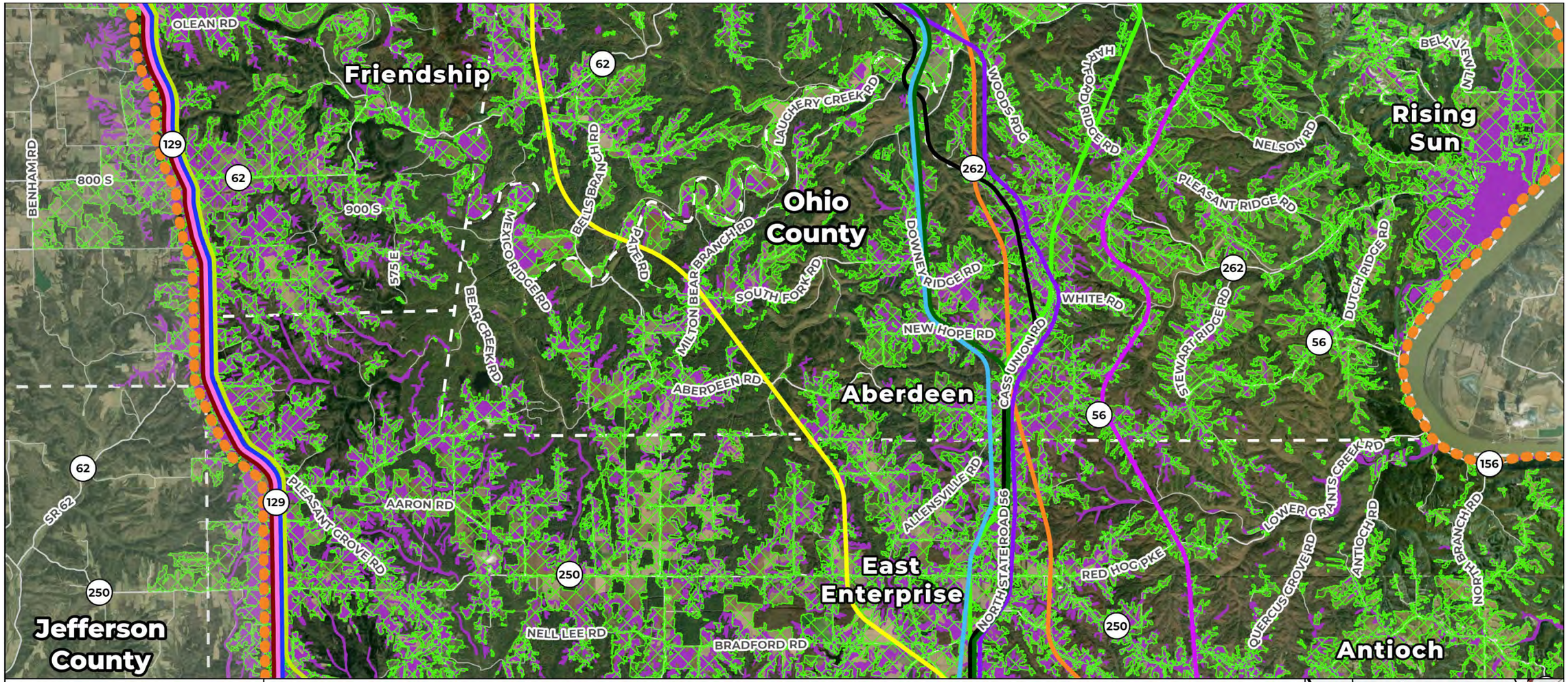
- Alternative J
- Alternative K
- Alternative L

Active Farmlands and Prime Farmland Soils

- Active Farmland
- Prime Farmland Soil





LINK 101

Page 2 of 3

Source: IndianaMap, NLCD, NRCS Web Soil Survey

Scale: 1":8,000 feet

Miles

0 1 2

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
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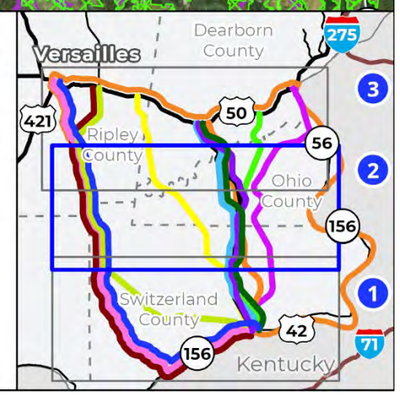
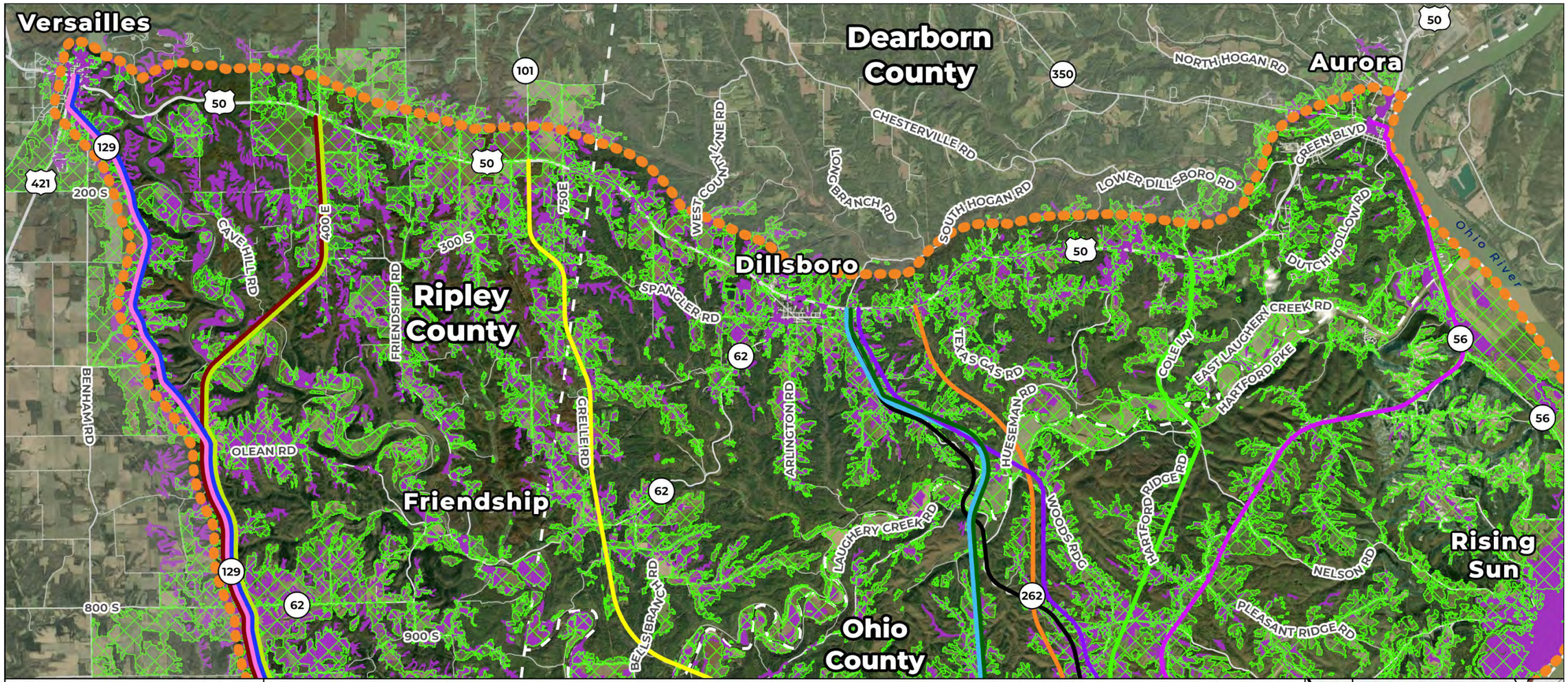
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Active Farmlands and Prime Farmland Soils

- Active Farmland
- Prime Farmland Soil





LINK 101

Page 3 of 3

Source: IndianaMap, NLCD, NRCS Web Soil Survey

Scale: 1":8,000 feet

Miles

0 1 2

Project Area

Alternatives

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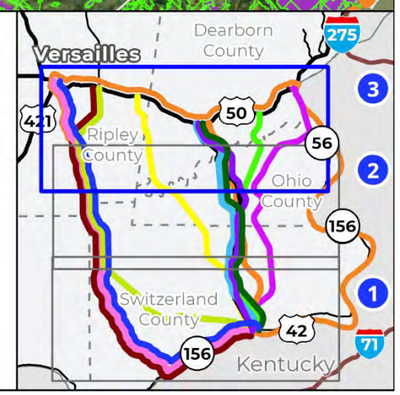
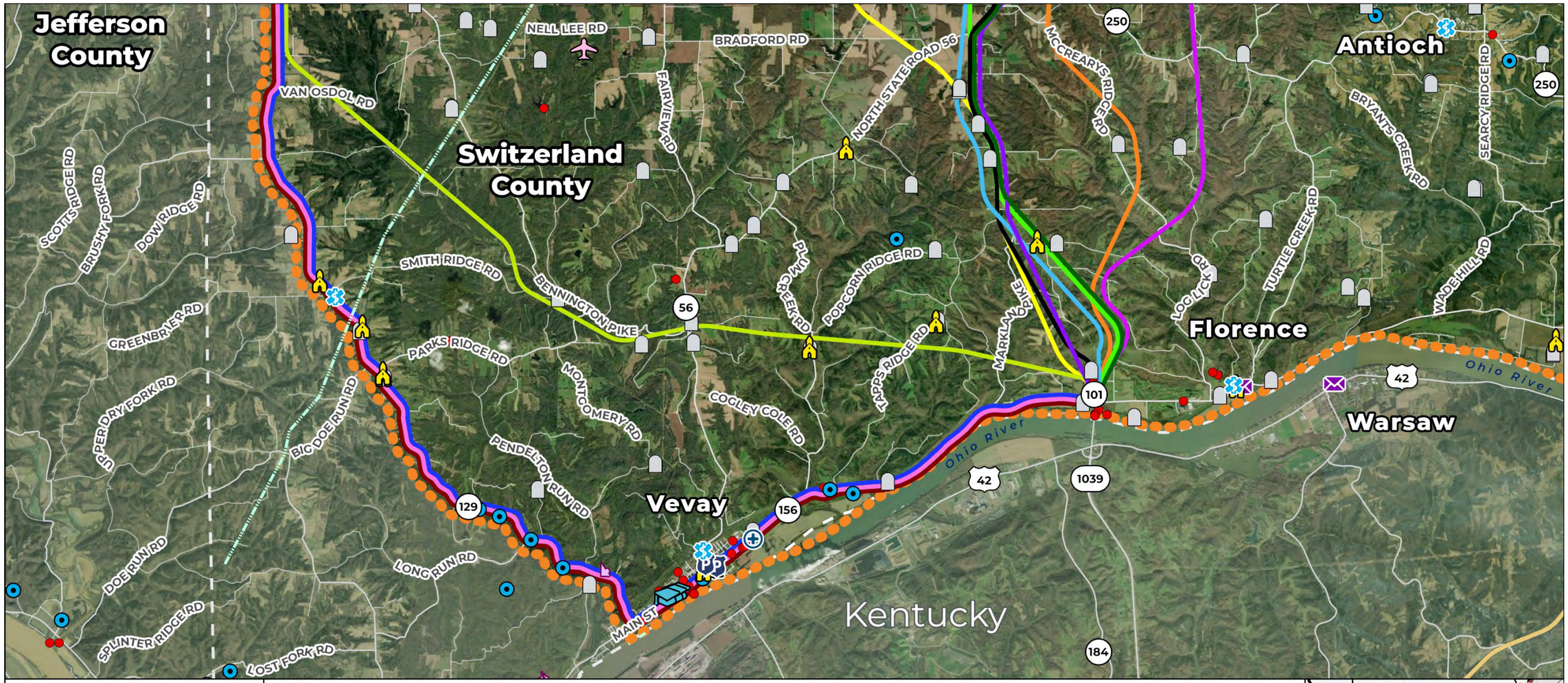
Active Farmlands and Prime Farmland Soils

- Active Farmland
- Prime Farmland Soil



APPENDIX E. ENVIRONMENTAL FEATURES MAP: HAZARDOUS MATERIALS AND PUBLIC FACILITIES AND SERVICES



LINK 101

Page 1 of 3

Source: IndianaMap,
INDOT RFI Database

Scale: 1":8,000 feet

Miles
0 1 2

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
- Alternative D
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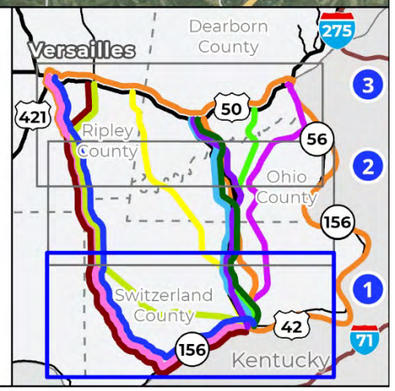
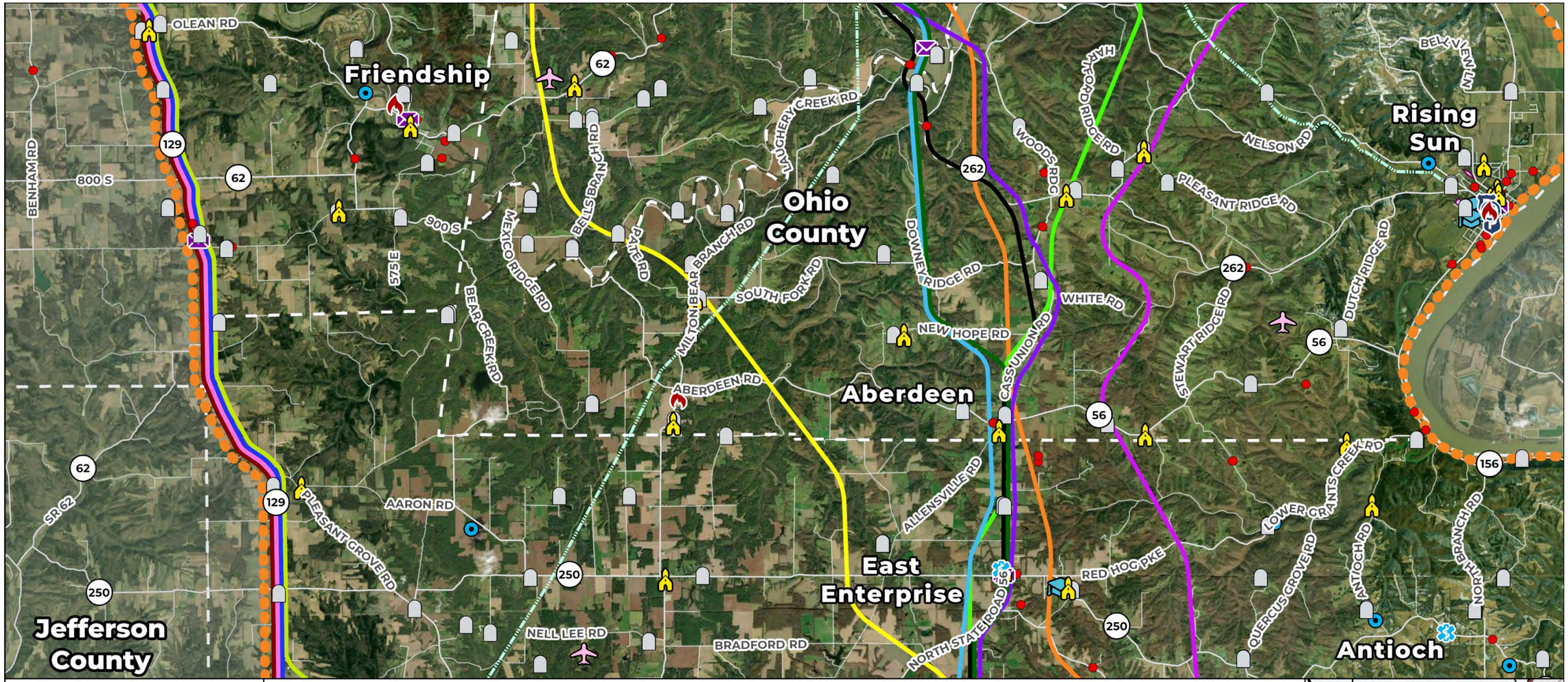
- Alternative F
- Alternative G
- Alternative H
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Hazardous Materials and Public Facilities and Services

- Hazardous Material
- Institutional Controls IDEM
- Landfill Boundaries
- Oil / Gas Well
- Mineral Resources
- Police Station
- EMS
- Fire and Rescue
- Fire Station
- Airport
- Post Office
- Library
- School
- Religious Facility
- Cemetery
- Pipeline
- Railroad





LINK 101

Page 2 of 3

Source: IndianaMap, INDOT RFI Database

Scale: 1":8,000 feet

Miles 0 1 2

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
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Hazardous Materials and Public Facilities and Services

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- Mineral Resources
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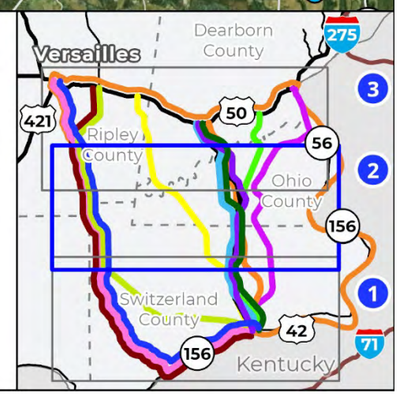
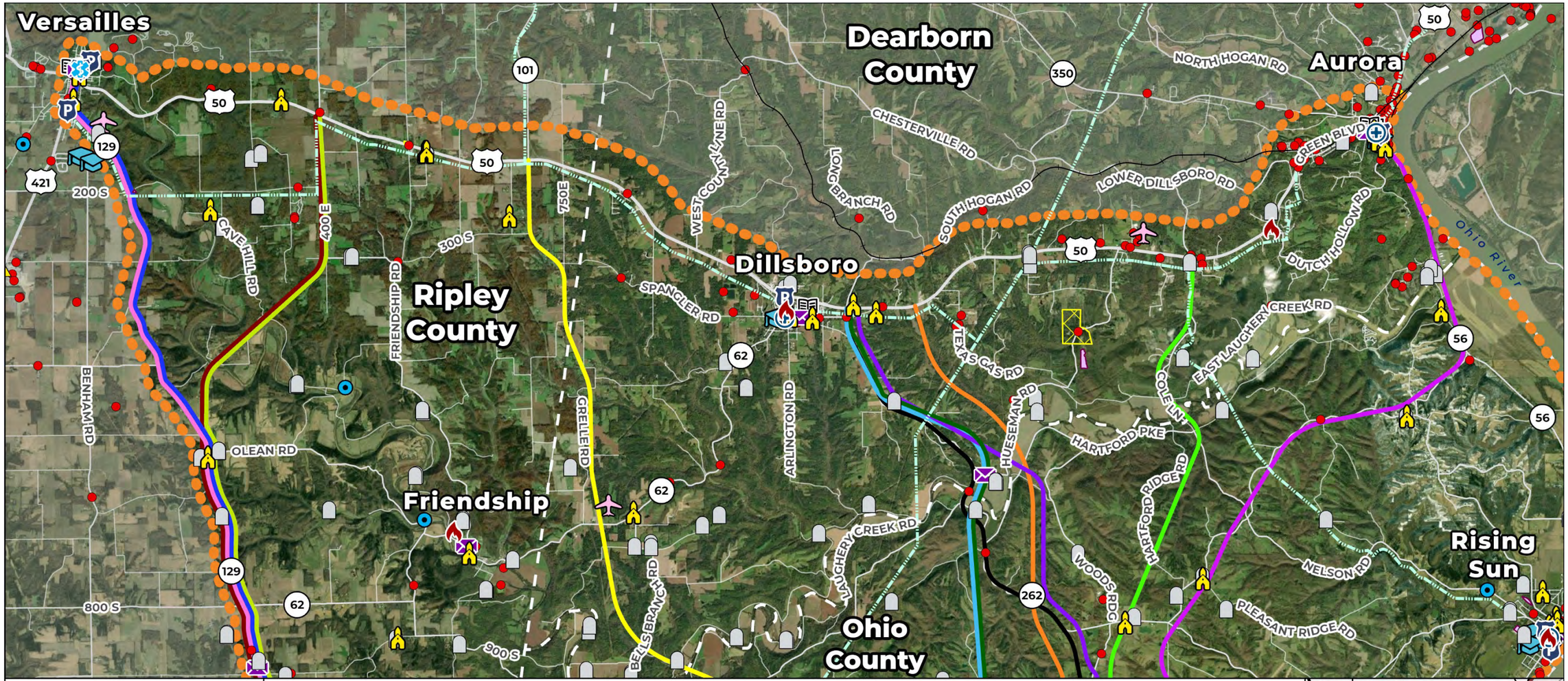
- EMS
- Fire and Rescue
- Fire Station
- Airport
- Post Office
- Library
- School
- Religious Facility
- Cemetery
- Pipeline
- Railroad





LINK 101

Page 3 of 3

Source: IndianaMap, INDOT RFI Database

Scale: 1":8,000 feet

Miles 0 1 2

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
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- Alternative F
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- Alternative J
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- Alternative L

Hazardous Materials and Public Facilities and Services

- Hazardous Material
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- Landfill Boundaries
- Oil / Gas Well
- Mineral Resources
- Police Station
- EMS
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- Fire Station
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- Cemetery
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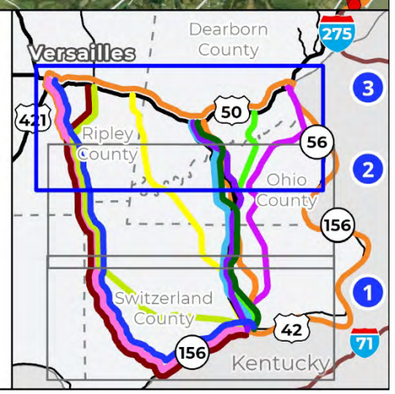
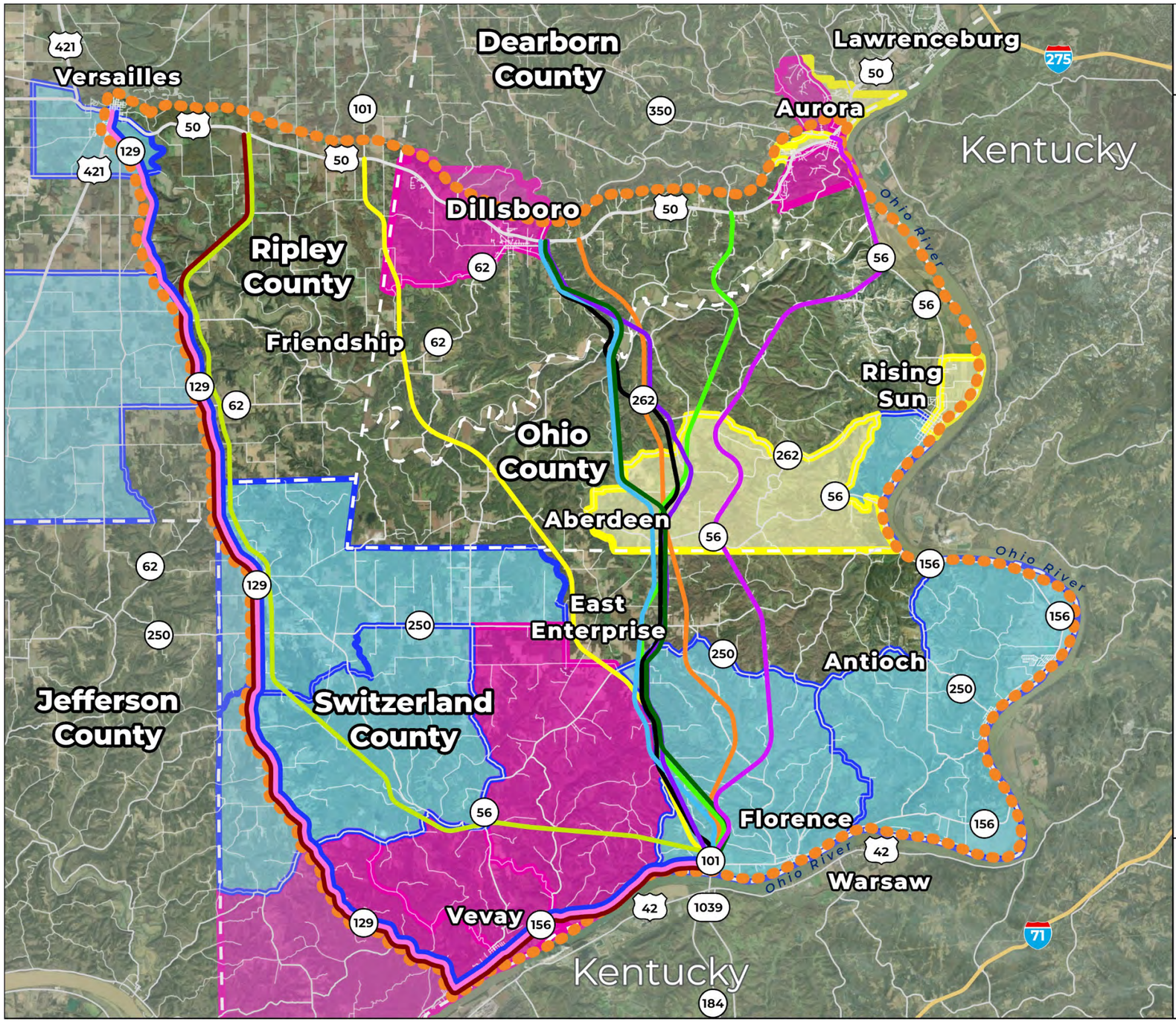


APPENDIX F. ENVIRONMENTAL FEATURES MAP: COMMUNITIES WITH ENVIRONMENTAL JUSTICE CONCERNS



LINK 101

Project Area

Alternatives

- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Alternative F
- Alternative G
- Alternative H
- Alternative I
- Alternative J
- Alternative K
- Alternative L

Communities with Environmental Justice Concerns

- Low-Income Population
- Minority Population
- Both Low-Income and Minority

Source: IndianaMap,
U.S. Census Bureau 2021
Scale: 1": 3 Miles

Miles
0 1 2 3 4 5