Owensboro Outer Loop Study


# *FINAL EXECUTIVE SUMMARY*

# Owensboro Outer Loop Feasibility Study

## Daviess County, Kentucky

**Kentucky Transportation Cabinet**

**In Partnership with:**

**Owensboro-Daviess County MPO**
**Green River Area Development District**
**HMB Professional Engineers, Inc.**
**AECOM**

*December 2021*

## Introduction and Study Area

The Owensboro Outer Loop Feasibility Study was initiated in April 2020 by the Kentucky Transportation Cabinet (KYTC) to evaluate the feasibility of an "outer loop" around Owensboro in Daviess County, Kentucky. **Figure ES-1** shows the study area which encompasses the surrounding area of Owensboro in Daviess County, Kentucky. This includes US 60 from the intersection with US 231 in the east to the intersection with KY 1554 in the west. It extends into the county south to the area where I-165 intersects with KY 142. All state-maintained routes within this boundary were included for consideration of this study. The study was conducted in coordination with KYTC, the Owensboro-Daviess County Metropolitan Planning Organization (MPO), and the Green River Area Development District (GRADD).

The initial study goals were as follows:

- Quantify Existing Needs in the Study Area
- Develop / Evaluate Feasibility of a Range of Connectivity Options
- Consider Independent Utility of Segments from a Benefit-Cost Analysis

To accomplish the objective and goals, the Project Team (consisting of organizations listed above and consultant personnel) worked collaboratively with the public, local officials, and stakeholders to accomplish the following tasks:

- Conduct a comprehensive review of the existing conditions
- Identify existing and potential new corridors / segments for "outer loop" connectivity
- Model and forecast current and future traffic for proposed segments to help with comparative analysis
- Develop a comparative analysis method for quantifying pros and cons of each segment and the corridors as a whole
- Conduct a benefit-cost analysis for identified corridors and / or segments

## Existing Conditions

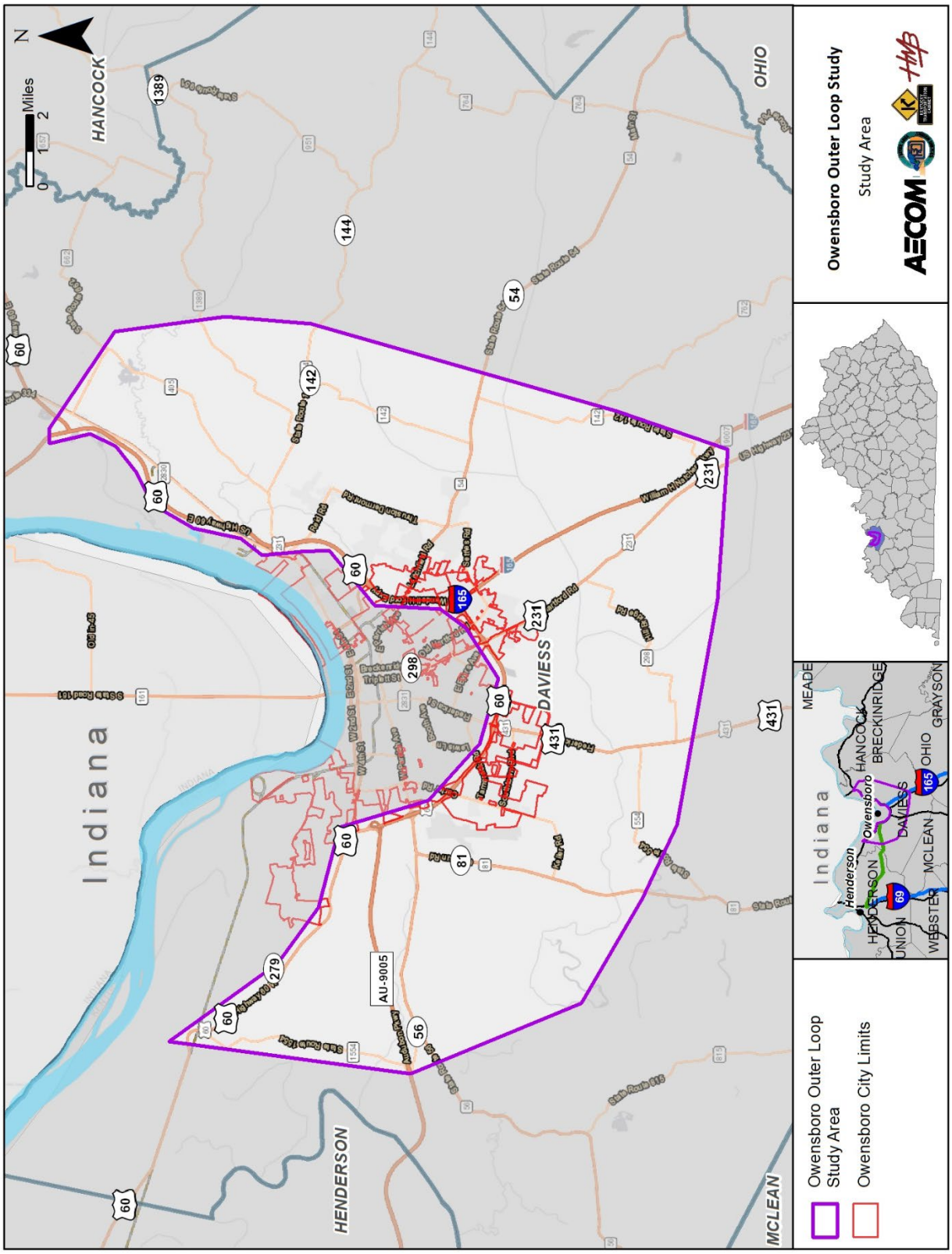
Information on elements of the existing transportation network were collected including roadway facility types and geometrics, structures, traffic volumes and operations, crash history and analysis, and bicycle and pedestrian accommodations.

*Functional Class and Roadway Systems* – The study area has a wide range of functional classifications from local roads to interstates. Portions of the Audubon Parkway and I-165 are included in the study area.

*National Highway System* – US 60, Audubon Parkway, and I-165 are included in the National Highway System (NHS) and therefore fall under the monitoring and performance for the Federal Highway Administration (FHWA) Practices for Performance-Based Planning and Programming.

*Typical Section* – The typical section of roadways varies throughout the study area, ranging from one to five lanes, with lane widths ranging from eight to fourteen feet. In the rural portions of the study area, traffic volumes tend to be lower and there is less pavement width. As traffic volumes increase in the urban areas, number of lanes and lane widths tend to increase in size.

**Figure ES-1. Study Area**



*Speed Limit* – The posted speed limit on roadways varies from 25 mph on the local routes to 70 mph on I-165.

*Horizontal and Vertical Curves* – Significant instances of higher degree horizontal curves occur on KY 298 (Old Hartford Road), KY 1456 (Thurston Dermont Road), KY 142, and KY 1554. Vertical grades are especially high on KY 1456 (Thurston Dermont Road) and KY 3143.

*Structures* – There are 125 structures in the study area identified through KYTC's Bridge Data Miner service, three of which have a Poor rating in the most recent inspection report. These include one on US 60 over Katie Meadow Slough. The other two are in the eastern portion of the study area with one on Graves Lane over Allgood Ditch and the other on South Hampton Road over Burnett Fork.

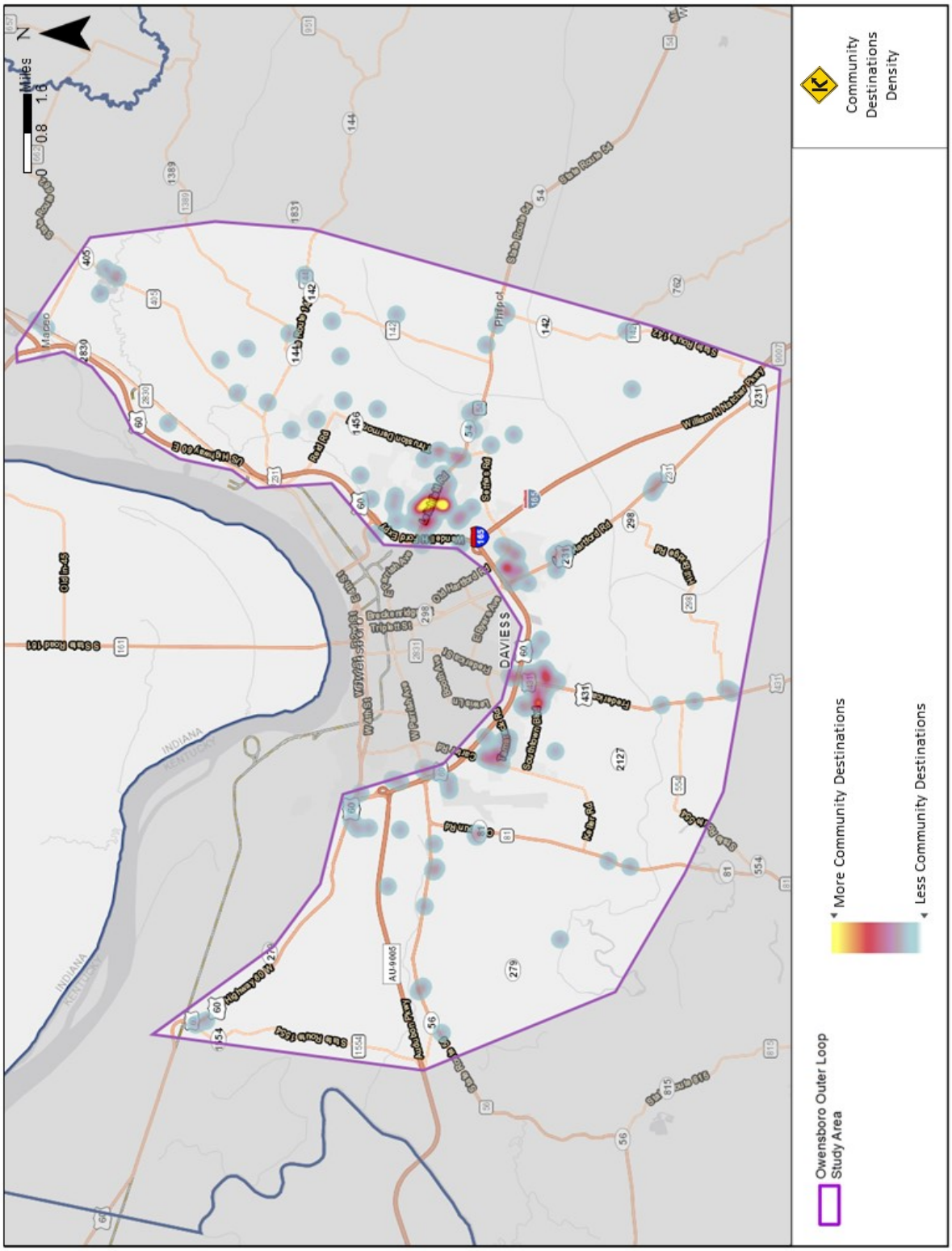
*Traffic Volumes and Operational Analysis* – Existing year (2020) average annual daily traffic (AADT) is highest along US 60 around Owensboro at 24,400 to 38,100 vehicles. These volumes are based on traffic counts from 2014 – 2020. A level of service (LOS) analysis was performed to determine a qualitative measure of operational characteristics of the roadways in the study area. LOS ranges from A (best operating conditions) to F (worst operating conditions). Two sections were identified with a LOS E or F rating. US 60 from US 431 (Frederica Street) to KY 54 (Leitchfield Road) is calculated to operate at a LOS F, with a small portion of KY 54 (Leitchfield Road) near US 60 at LOS E.

*Crash Analysis* – Historical crash data was evaluated across a three-year period from September 2017 to August 2020 to help identify locations and trends along roadways that could be considered high crash locations. Two types of statistical crash analysis were performed – evaluation of Excess Expected Crashes (EEC) and Critical Crash Rate Factor (CRF) analysis. The highest EEC values occurred on US 60, east of US 431, and ranged from 3.3 to 5.0. Typically, an EEC over 3.0 is considered a high value. For the CRF analysis, there were 31 segments that could be deemed high crash segments, with 24 between 1.0 and 2.0 and seven over 2.0. For reference, a CRF over 1.0 indicates crashes may be occurring more often than can be attributed to random occurrence.

*Pedestrian and Bicycle Facilities* – Pedestrian facilities are located primarily near the city center and major development areas. The Adkisson Greenbelt is a multi-use path and there are two US bicycle identified corridors – the Ramblin' River and the Underground Railroad tours.

*Environmental Overview* – An Environmental Overview was conducted to identify resources and potential issues for consideration during the development of potential connectivity options. This included identification of natural environment resources such as rivers and streams, wetlands and ponds, groundwater, floodplain / floodway, prime farmland, and protected species. From the overview, it was found that prime farmland comprises almost 80 percent of the study area. The human environment resources include land use, community features, historic districts, and properties. A heat map was generated of community destinations consisting of neighborhoods, businesses and industries with at least 100 employees, schools, parks, campgrounds, golf courses, medical facilities, churches, fire stations, and law enforcement, and other critical government facilities (refer to **Figure ES-2**).

**Figure ES-2. Community Destinations Density**



## Collaboration

During the study process, multiple collaborative meetings were held including three Project Team meetings, two local official / stakeholder (LO/S) meetings, and one public meeting. All meetings were held virtually due to the COVID-19 pandemic. After each LO/S meeting, an online survey was sent out to collect input on the study. The public meeting was held after the second LO/S meeting to inform the public about the study and collect feedback both at the meeting and through an online survey.

## Potential Connectivity Development and Analysis

Improving connectivity was the basis for developing initial segments which were combined to form preliminary corridors. The process for development and analysis is summarized in **Figure ES-3** and in the text below.

Segment Development

- Reviewed existing road network to determine potential segment options that connect to and utilize existing roadways to minimize right of way need.
- Reviewed existing and proposed bicycle facilities for potential connections and / or overlap.
- Reviewed community destinations to connect points of interest.
- Analyzed input from local officials and stakeholders collected early in the study process.

Segment Analysis

Segment characteristics were evaluated by the following categories:

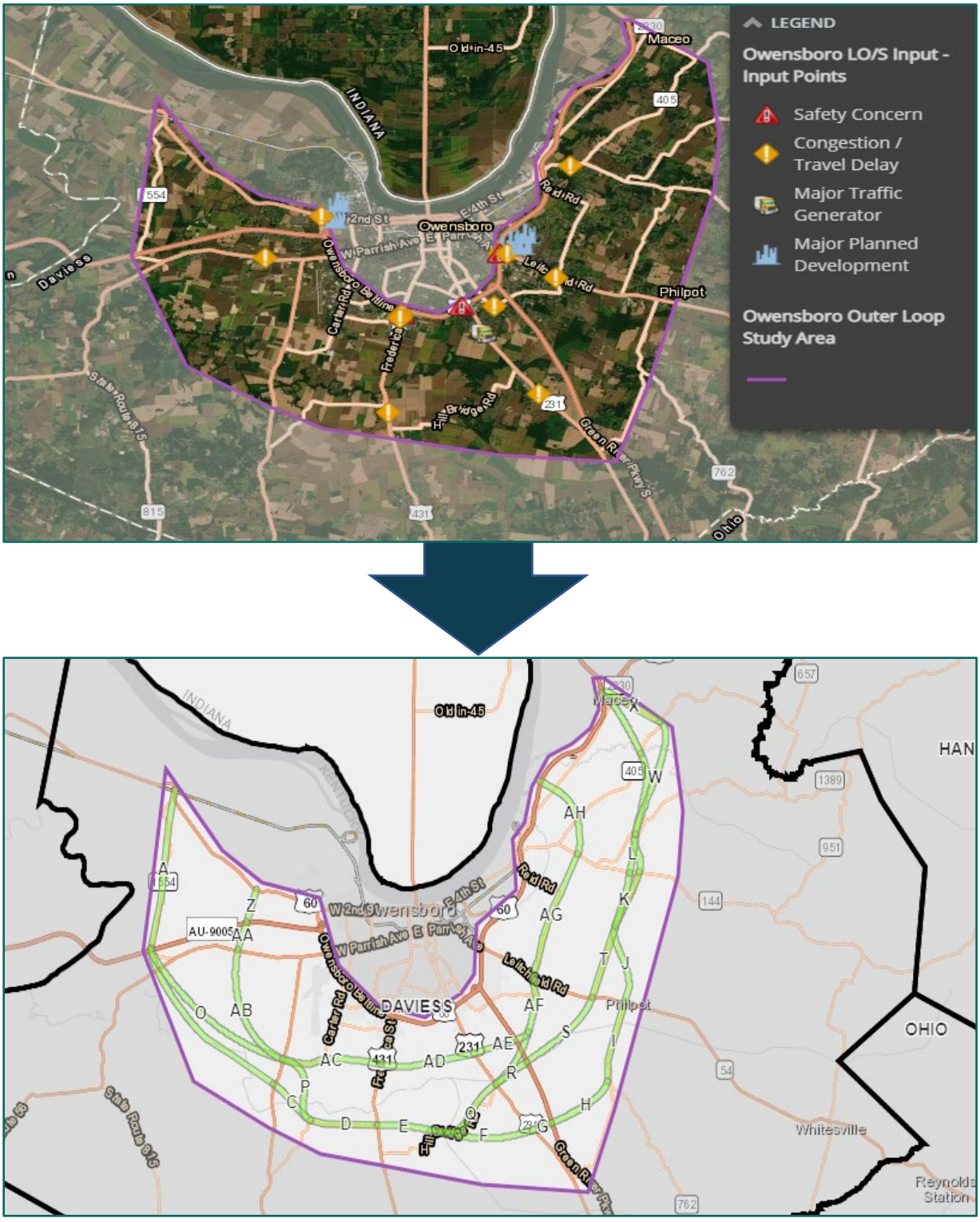
- Impacts to Natural Environment
- Impacts to Built Environment
- Effect on Safety
- Existing/Future Traffic Demand
- Utilization / Impact to Existing Roadways

## Preliminary Corridor Analysis

Individual segments were evaluated through technical assessment and combined to provide a collection of segments that had the least impacts and most benefits to connectivity. The combined segments are shown as preliminary corridors for planning purposes only and should not be used as an indication of final alignments. The following preliminary corridors were analyzed as part of this study.

- No Build – no “Outer Loop” construction; routine maintenance and rehabilitation of existing infrastructure in study area.
- Green – At an approximate length of 35 miles, this is the longest of all corridors that provides full connectivity between US 60 east and west of Owensboro. It is the farthest option from / outside the city and is comprised of Segments A, B, C, D, E, F, G, H, I, J, K, L, W, and X. From the scoring perspective, this option is the lowest ranked outer corridor based on the comparative technical analysis.
- Red – At an approximate length of 22 miles, this is the shortest of all corridors that provides full connectivity between US 60 east and west of Owensboro. It is the closest option to the city and is comprised of Segments Z, AA, AB, AC, AD, AE, AF, AG, AH.

**Figure ES-3. Segment Development and Analysis**



- Blue – This corridor is a hybrid option of the Red and Green corridors and has an approximate length of 31 miles. It is comprised of Segments Z, AA, AB, P, D, E, F, G, H, I, J, K, L, W, and X. This corridor ranked the highest meaning it would have less impacts and more benefits compared to the other routes.

**Figure ES-4** shows the preliminary corridors in the context of the study area. **Table ES-1** provides information about the corridors

**Figure ES-4. Preliminary Corridors**

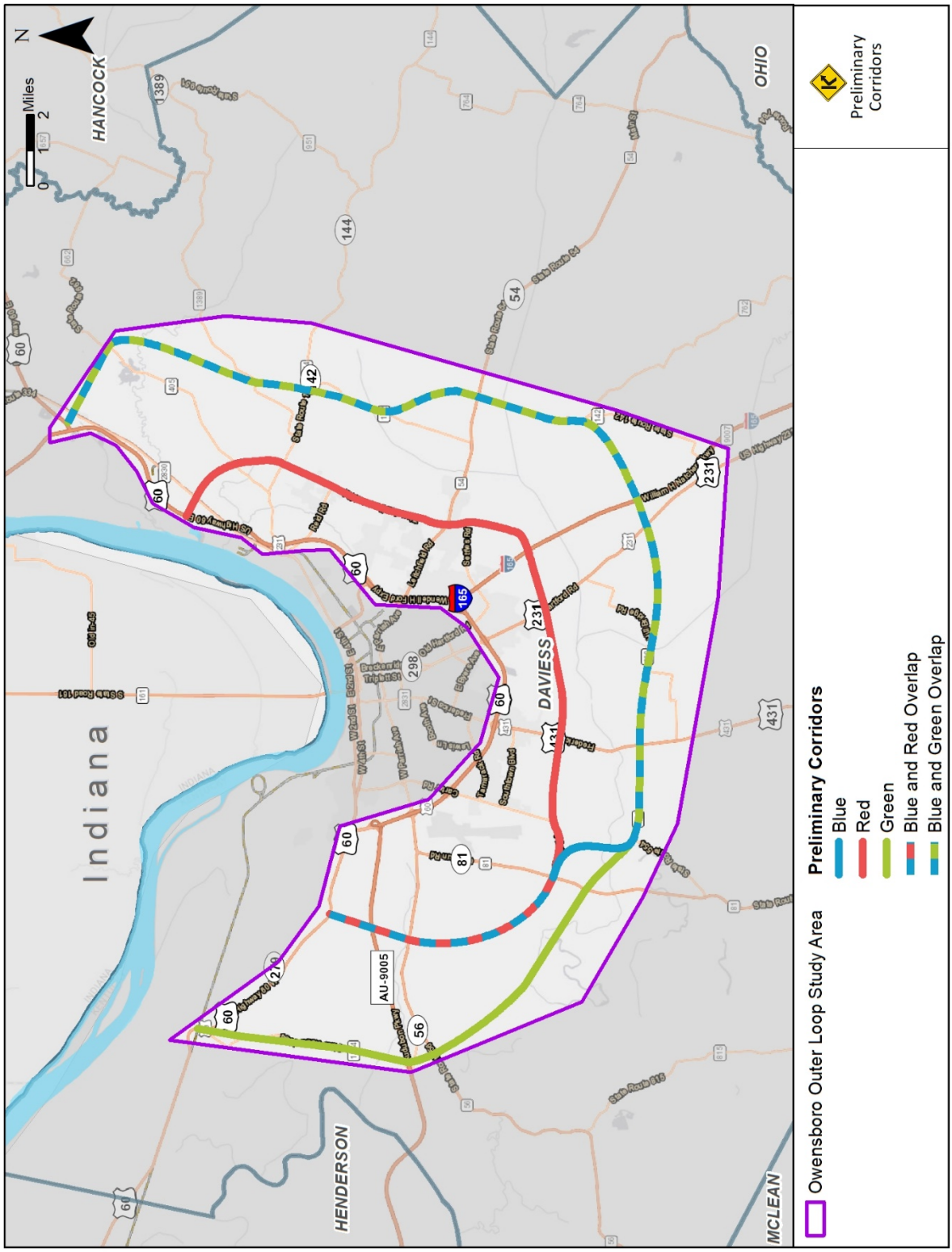


**Table ES-1. Preliminary Corridor Summary**

| Summary Categories | No-Build | Red | Blue | Green |
|---|---|---|---|---|
| Length (Miles) | N/A | 21.9 | 30.9 | 35.0 |
| Traffic Volume Average (2045 AADT) | N/A | 8,490 | 2,240 | 2,370 |
| Public Input (Survey Only)* | 1,532 | 380 | 136 | 190 |
| Cost (Design, ROW, Utilities, and Construction)** | N/A | $227,800,000 | $330,800,000 | $365,000,000 |
| Benefit-Cost Analysis*** | N/A | 0.35 | 0.09 | 0.04 |

Notes:

**These are DRAFT 2021 planning level costs subject to further review assuming an access-controlled facility with four 12' Lanes; two 10' Shoulders, 12' Ditches, 40'Median, and 34' Clear Zone. Costs will decrease as the typical section footprint decreases.

## Study Outcomes

The Project Team met on July 20, 2021, to review the input received during the public comment period that closed on July 2, 2021. The response from the public was considerable, with 2,439 surveys completed, numerous Facebook and Twitter comments, and several emails received – all of which were considered by the Project Team. The benefit-cost analysis for the preliminary corridors was found to be less than one for all potential corridors. **The Project Team concluded that based on the current conditions, traffic projections, engineering analysis, and public feedback - an outer loop connection is not feasible at this time.**

The Project Team also further evaluated three short segments and one combination of segments that could potentially be independent projects with consideration to go into the CHAF Database. The benefit-cost analysis prepared for these segments showed Segment G (US 231 to I-165) to have a significantly higher benefit-cost value (9.3) compared to the other segments (all less than or equal to one). As a result, Segment G could potentially be considered as part of a future potential interchange along I-165 and an associated new connection to US 231.