



# US 25, Corbin to London Connector Study (Item No. 11-8515.00)

In Partnership with:  
HMB Professional Engineers, Inc.  
Kentucky Transportation Cabinet

*May 2021*



## US 25, Corbin to London Connector Study Executive Summary (Item No. 11-8515.00)

May 2021



# Executive Summary

The US 25 Corbin to London Connector Study was initiated by the Kentucky Transportation Cabinet (KYTC) to evaluate potential improvement options to address safety and operational performance on US 25 between Corbin and London. The objective of the planning study was to identify the short-term and long-term transportation needs of US 25 from Corbin to London.

While Phase I design was completed in 2013 (Item No. 11-8515.00), KYTC were concerned that other improvements to the surrounding transportation system (i.e. I-75, US 25E/W) negated the need for improvements to US 25. Therefore, the study was initiated in September 2018 through a contract modification between Municipal Engineering Company (later HMB Professional Engineers) and KYTC.

Illustrated in **Figure ES 1**, the study area included US 25 from US 25E (MP 0.000) in Corbin to KY 192 (MP 10.505) in London. At major intersections, the approaches were evaluated to determine potential improvement options. The mainline US 25 was evaluated to identify specific locations at which lower cost and less impactful improvements can be implemented and to assess the viability of major widening throughout the corridor.

The study focused on identifying locations where improvements may potentially help improve safety and operational issues. Specific tasks included:



**Existing Conditions Analysis:** This encompasses collecting and analyzing data including geometrics, structures, existing traffic volumes and operations, and safety analysis.



**Environmental Overview:** A summary of the natural and human impacts within the study area.



**Initial Coordination Efforts:** A summary of initial coordination efforts which includes coordination between the Project Team concerning safety and operational analysis of the study area



**Improvement Concept Development and Analysis:** A summary of the process for which locations and potential improvement options were developed. It also includes a discussion on analysis procedures and improvement option refinement.

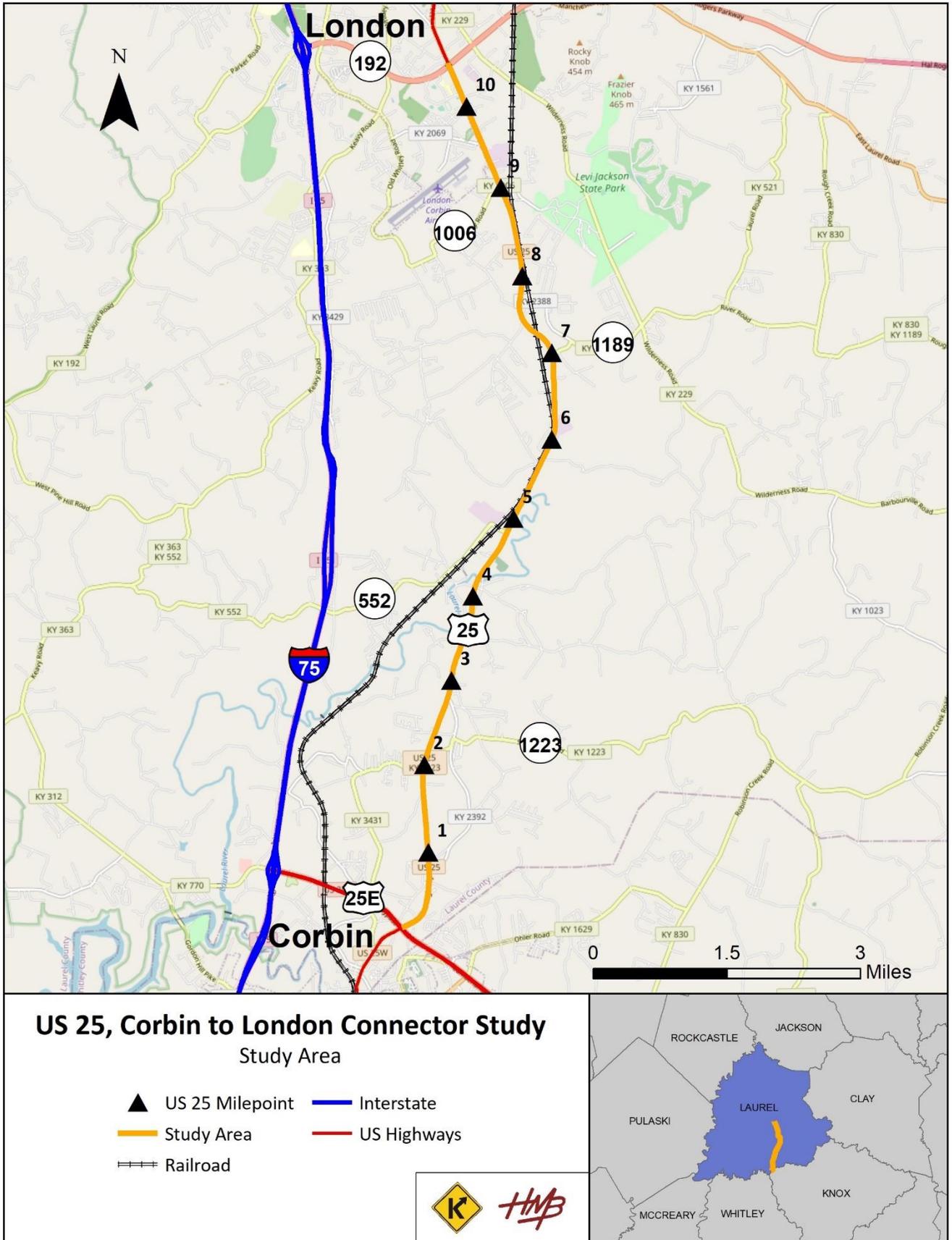


**Additional Engagement Efforts:** A summary of outreach efforts which includes a meeting with local officials / stakeholders, a public outreach effort to engage those within the communities near the study area, and coordination between the Project Team concerning improvement option prioritization.



**Study Outcomes:** Outcomes of the study as a prioritized list of locations and improvement options.

Figure ES 1. Study Area



During the course of the study, multiple collaborative meetings were held. These included two traffic model update meetings, three Project Team meetings, and one local officials / stakeholders (LO/S) meeting to gather input on potential improvements to US 25. The LO/S meeting was followed by a virtual public outreach effort to gather input from the community surrounding the study area.

Initial coordination efforts included the two model update meetings and the first of three Project Team meetings. The modifications to the Laurel Pulaski Travel Demand Model, which was used for the traffic forecast that is a part of this study, were discussed during each of the model update meetings. The first Project Team meeting provided an opportunity to review the project background and purpose of the study, present and discuss the existing conditions information, and review the traffic model to be utilized in the study.

Improvement options developed in this study were divided into two categories: 1) Spot and Safety and 2) Full Reconstruction. Spot and Safety options were considered potential short-term and medium-term improvements, while the Full Reconstruction options were considered long-term improvements and included new construction and major widening. Improvements were only considered along US 25 from US 25E (MP 0.000) to KY 1006 (MP 9.028). An existing Highway Plan project addressing the safety and operation of US 25 from KY 1006 (MP 9.028) to KY 192 (MP 10.505) is currently in the right-of-way phase (Item No. 11-147.00).

Spot and Safety improvement options were identified through a detailed crash analysis. Each high crash location (Critical Crash Rate Factor (CRF) greater than 1.0) was examined to determine if spot improvements were appropriate, and crashes within those high CRF “spots” were analyzed to determine trends and potentially attribute crashes to a particular roadway characteristic.

Full Reconstruction options, including any new construction or major widening, were identified through previous design efforts (Item No. 11-8515.00) and planning studies (Item No. 11-190.00). The feasibility of these long-term improvements was evaluated through traffic and crash analysis. The traffic analysis was used to gauge congestion on US 25 in a future year of 2040, while the crash analysis was used to determine the overall safety of US 25 from Corbin to London. Patterns in the crash analysis indicate that access point density negatively affect the safety of US 25 from Corbin to London, and access point density also affects the traffic analysis negatively impacting a roadway segment’s LOS. AASHTO’s *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)* provides guidance on how access point density may increase the rate at which crashes occur. This section of US 25 has 34 access points per mile, which has historically caused causes eight crashes per million vehicle miles on undivided roadways and between six and seven crashes per million vehicle miles for roadways with a TWLTL. Additional information about the traffic and crash analysis can be found in **Appendix D** and **Appendix B**.

Existing Information was compiled for each improvement option location including:

- 2019 AADT
- Speed Limit
- Number of Lanes
- Lane Width
- Shoulder Width
- Crash Rate (CRF)
- Excess Expected Crashes (EEC)
- Crash Severity (K and A)
- Total Crashes
- Any Geometric Issues Present

With a comprehensive initial list of possible improvement locations, the next step was to refine the list of locations. To do so, additional information was determined beneficial to help with decision making including additional crash analysis, segment traffic forecast and operational analysis, and planning level cost estimates.

A second Project Team meeting was held virtually in July 2020 to present and collect input on the refined set of project locations and improvement options. Following the presentation of the initial list of improvements, valuable input was provided on each improvement option and suggestions for additional improvement locations were made. It was emphasized that any short-term improvements should consider future widening throughout the US 25 corridor. Modifications were made to the initial improvement options based on this suggestion so that each improvement would be compatible with any major widening or new construction along US 25.

Utilizing the gathered information, a final list of 14 individual spot and safety improvements and five full reconstruction improvements were developed as shown in **Table ES 1**. These improvements were then presented to the Project Team for further review and additional analysis prior to any public engagement efforts.

**Table ES 1. Summary of Revised Improvement Options**

Improvement Option	Description	Milepoints	Cost (DRUC*)
<b>SPOT AND SAFETY</b>			
A	Access Management	0.000 - 9.028	\$ 1,260,000
B	Reflective Pavement Striping	0.000 - 9.028	\$ 170,000
C	Hopewell Rd. Improvement	1.965	\$ 270,000
D	KY 1223 Intersection Improvement	2.098	\$ 965,000
E-1	KY 2392 Intersection Improvement	2.787	\$ 935,000
E-2	Laurel Whitley Rd. Intersection Improvement	3.111	\$ 580,000
F	US 25 Widening (TWLTL)	2.800 - 3.500	\$ 8,180,000
G	Robinson Creek Rd./Echo Valley Rd./Lily School Rd. Intersection Improvements	3.480/3.606	\$ 1,440,000
H	Close Approach Roads and Force Traffic to Lily School Rd./Slate Ridge Rd. Intersection	4.105	\$ 255,000
I-1	Eliminate Fariston Rd.; Potential Traffic Signal at KY 552	5.146	\$ 105,000
I-2	Widen US 25 for Left Turn Lane, Fariston Rd.	5.146	\$ 525,000
J	Fariston Rd./Old Hwy 25 Intersection Improvement	7.511/8.126	\$ 625,000
K-1	Widen US 25	8.520 - 9.028	\$ 3,705,000
K-2	Re-align US 25	8.520 - 9.028	\$ 3,600,000
<b>FULL RECONSTRUCTION</b>			
A	Major Widening Off Alignment	0.000 - 9.028	\$ 132,500,000
B	Major Widening On Alignment	0.000 - 9.028	\$ 130,700,000
C	US 25 / US 25E Grade Separated Interchange	0.000 - 0.660	\$ 29,600,000
D-1	I-75 Connector and Grade Separated Interchange (US 25 MP 4.700)	N/A	\$ 42,600,000
D-2	I-75 Connector and Grade Separated Interchange (US 25 MP 5.800)	N/A	\$ 46,300,000

\*DRUC – Design, Right-of-Way, Utilities, Construction

Additional engagement efforts included a virtual LO/S meeting (October 2020), the subsequent public outreach effort (online survey that was available October – November 2020), and the final Project Team Meeting (December 2020). The meeting with LO/S was an opportunity to share study information and gather input from various perspectives on identifying areas of concern, refining potential improvements, and providing input on prioritization. The information presented during this meeting was provided to the community during the public outreach effort to gather further input in refining improvements and improvement option prioritization. The final Project Team meeting was an opportunity to review all public feedback and finalize improvement option prioritization.

The prioritization was broken down into the following categories:

- **Short-Term** projects included those that were either relatively low-cost or could be implemented relatively quickly using dedicated KYTC resources such as maintenance activities. These projects would not need to go through the Strategic Highway Investment Formula for Tomorrow (SHIFT) process to be constructed. There was one Short-Term project, which included implementing reflective pavement striping to improve roadway visibility in wet and dark conditions.
- **High Priority** projects included those that were overall in a higher tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were five total High-Priority projects.
- **Medium Priority** projects included those that were overall in the middle tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were six total Medium-Priority projects.
- **Low Priority** projects included those that were overall in the lowest tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were two total Low-Priority projects.
- **Long-Term** projects included high-cost, major widening and new construction, and could address the future transportation needs of the US 25 corridor in terms of operation and safety. There were five total Long-Term projects that moved forward into the public outreach phase of this study. However, reviewing planning level cost estimates and traffic forecast results led the Project Team to eliminate three projects. The US 25 / US25E grade separated interchange (Option C in **Table ES 1**) and the I-75 connector and grade separated interchange (Options D-1 and D-2 in **Table ES 1**) are not recommended at this time. The remaining Long-Term projects included major widening and new construction of US 25 from US 25E to KY 1006.

**Table ES 2** lists the improvement options and their priority. The Full Reconstruction improvement options labeled as Long-Term projects (Options A and B in **Table ES 1**) were both developed as part of Item No. 11-8515.00 in the *Kentucky's FY 2020 – 2026 Highway Plan*. This project has already gone through the SHIFT process, scoring 88.6 out of 100, and was the highest ranked project in the South Region (comprising Districts 4, 8, and 11). The Project Team felt it was necessary to divide each option being considered for this project into priority construction segments based on the analysis completed through this study. **Table ES 3** provides planning level cost estimates for design, right-of-way, utilities, and construction for those priority construction segments, and **Figure ES 2** illustrates the location of each priority construction segment.

**Table ES 2. Summary of Improvement Option Priority**

Improvement Option	Description	Milepoints	Cost (DRUC*)	Priority
<b>SPOT AND SAFETY</b>				
B	Reflective Pavement Striping	0.000 - 9.028	\$ 170,000	Short-Term
A	Access Management	0.000 - 9.028	\$ 1,260,000	High
C	Hopewell Rd. Improvement	1.965	\$ 270,000	High
D	KY 1223 Intersection Improvement (Hunter Hills Elementary)	2.098	\$ 965,000	High
I-1	Eliminate Fariston Rd.; Potential Traffic Signal at KY 552	5.146	\$ 105,000	High
I-2	Widen US 25 for Left Turn Lane, Fariston Rd.	5.146	\$ 525,000	High
E-1	KY 2392 Intersection Improvement	2.787	\$ 935,000	Medium
E-2	Laurel Whitley Rd. Intersection Improvement	3.111	\$ 580,000	Medium
G	Robinson Creek Rd./Echo Valley Rd./Lily School Rd. Intersection Improvements	3.480/3.606	\$ 1,440,000	Medium
J	Fariston Rd./Old Hwy 25 Intersection Improvement	7.511/8.126	\$ 625,000	Medium
K-1	Widen US 25	8.520 - 9.028	\$ 3,705,000	Medium
K-2	Re-align US 25	8.520 - 9.028	\$ 3,600,000	Medium
F	US 25 Widening (TWLTL)	2.800 - 3.500	\$ 8,180,000	Low
H**	Close Approach Roads and Force Traffic to Lily School Rd./Slate Ridge Rd. Intersection	4.105	\$ 255,000	Low
<b>FULL RECONSTRUCTION</b>				
A	Major Widening Off Alignment	0.000 - 9.028	\$ 132,500,000	Long-Term
B	Major Widening On Alignment	0.000 - 9.028	\$ 130,700,000	Long-Term
C	US 25 / US 25E Grade Separated Interchange	0.000 - 0.660	\$ 29,600,000	Not Recommended
D-1	I-75 Connector and Grade Separated Interchange (US 25 MP 4.700)	N/A	\$ 42,600,000	Not Recommended
D-2	I-75 Connector and Grade Separated Interchange (US 25 MP 5.800)	N/A	\$ 46,300,000	Not Recommended

\*DRUC – Design, Right-of-Way, Utilities, Construction

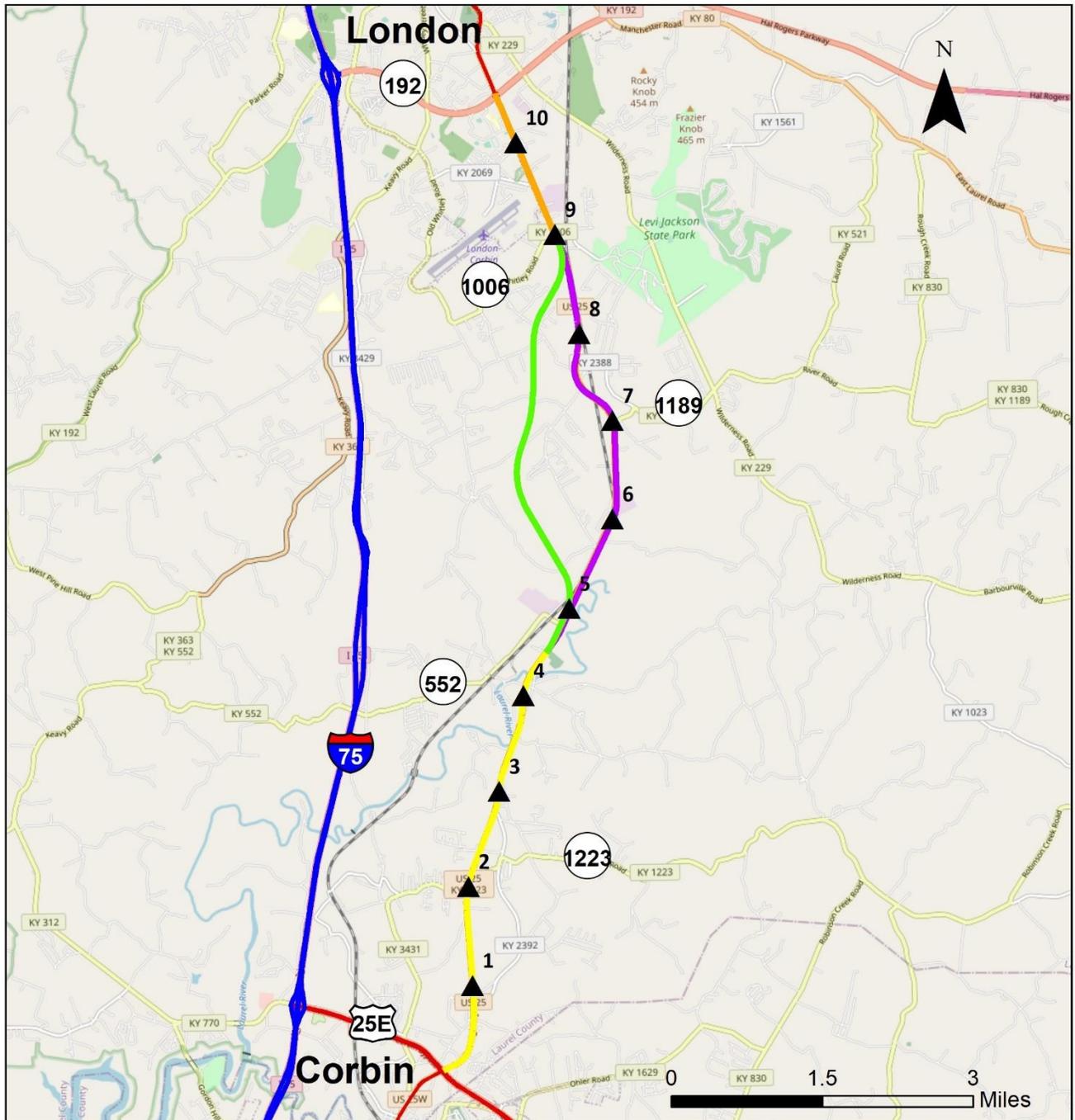
\*\*The most significant safety concern of the intersections included in Option H occurs at Lily School Rd. / Echo Valley Rd. This intersection is also included in Option G.

**Table ES 3. Long-Term Projects Priority Construction Segments**

Priority Segment ID	Description	Milepoints	Design Cost*	Right-of-Way Cost	Utility Cost	Construction Cost	Total Cost	Priority
A-1	Northern Segment Off Alignment	4.497 - 9.028	\$ 8,000,000	\$ 16,500,000	\$ 1,000,000	\$ 39,900,000	\$ 65,400,000	Long-Term
A-2	Northern Segment On Alignment	4.497 - 9.028	\$ 6,700,000	\$ 20,900,000	\$ 2,300,000	\$ 33,700,000	\$ 63,600,000	Long-Term
B	Southern Segment	0.000 - 4.497	\$ 7,700,000	\$ 18,900,000	\$ 2,300,000	\$ 38,200,000	\$ 67,100,000	Long-Term

\*The Design Cost was estimated at 20% of the Construction Cost.

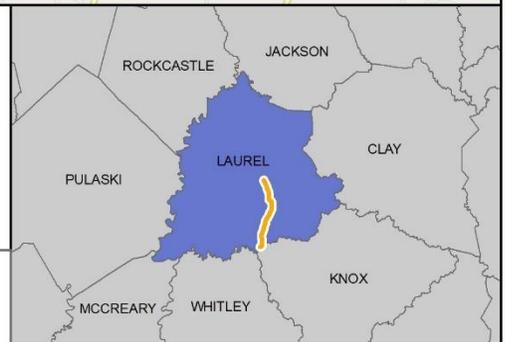
Figure ES 2. Long-Term Projects Priority Construction Segments



**US 25, Corbin to London Connector Study**  
 Long-Term Projects Priority Construction Segments

- Study Area
- Interstate
- US Highways
- Option A-1, Northern Segment Off Alignment (\$39,900,000)
- Option A-2, Northern Segment On Alignment (\$33,700,000)
- Option B, Southern Segment (\$38,200,000)

Cost estimates for construction only



The next phase in the project development process is Phase I Preliminary Engineering and Environmental Analysis for all High, Medium, and Low priority projects and an update of the Phase I Preliminary Engineering efforts previously completed for the Long-Term projects (Item No. 11-8515.00). Based on the findings of this study, Option A-1 or Option A-2 as shown in **Figure ES 2** should be implemented prior to Option B if Item No. 11-8515.00 is to be divided into priority segments.

If federal funds are used or permits will be required, additional environmental analyses will be required to satisfy the National Environmental Policy Act (NEPA). All identified high, medium, and low priority projects would need to be integrated into Kentucky's Prioritization Program, Kentucky's Strategic Highway Investment Formula for Tomorrow (SHIFT). Through this mechanism they can be funded in the Highway Plan. Short-Term projects may be initiated through KYTC D11 routine maintenance and traffic programs or become part of systematic programs such as Pavement Rehabilitation or Highway Safety Improvement Program (HSIP). City and county governments, along with Area Development Districts, should collaborate with KYTC on project funding and implementation.

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# Chapter 1 – Introduction

The US 25 Corbin to London Connector Study was initiated by the Kentucky Transportation Cabinet (KYTC) in 2018 to evaluate potential improvement options to address safety and operational performance on US 25 between Corbin and London. The study area included US 25 from US 25E in Corbin to KY 192 in London.

This area surrounding US 25 has been evaluated four times previously for potential improvements:

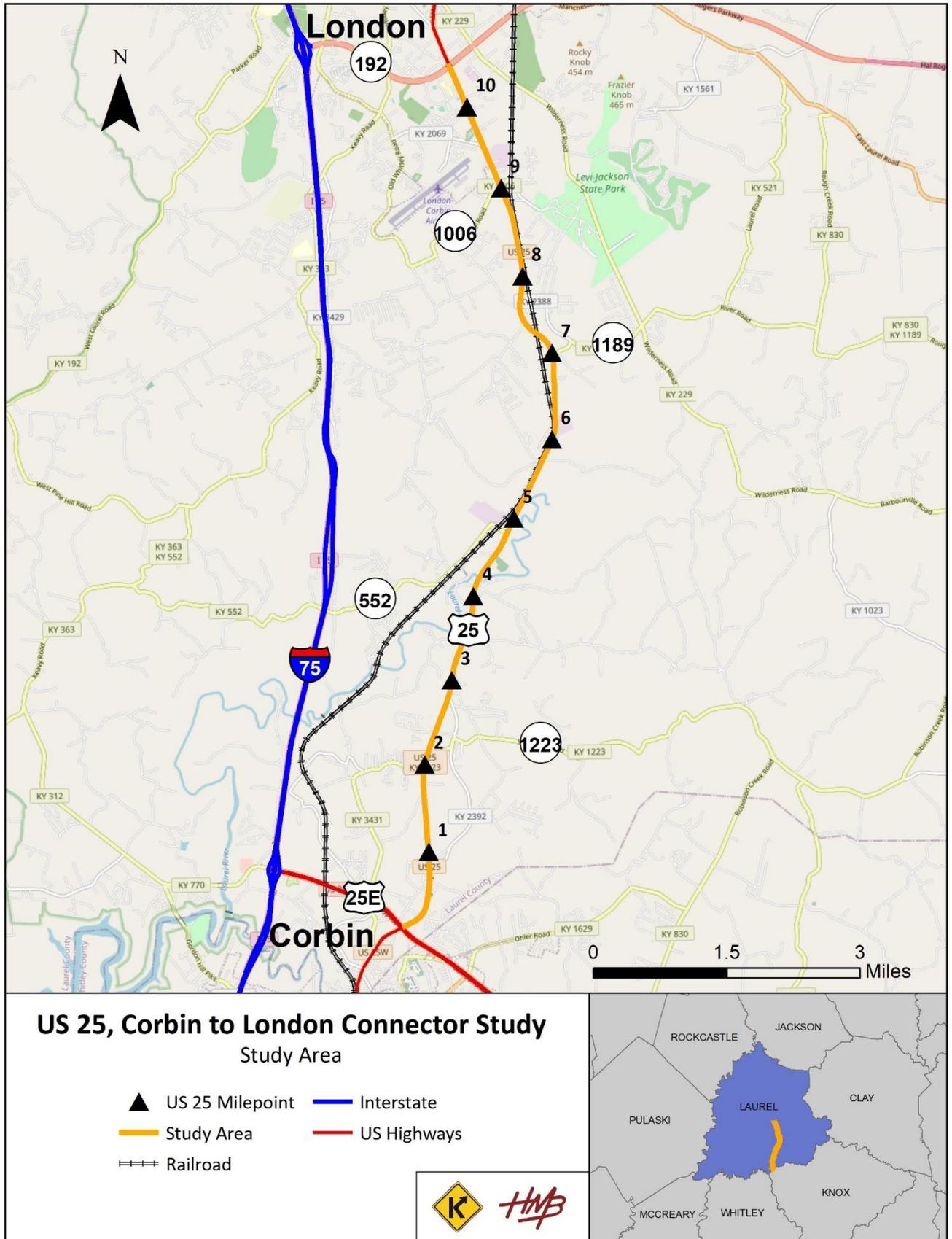
- 2006 Scoping Study (Item No. 11-8201.00) – Evaluated US 25 from US 25E to KY 192 for Potential Improvements
- 2013 Phase I Preliminary Engineering (Item No. 11-147.00) – Major Widening on US 25 from KY 1006 to KY 192
- 2013 Phase I Preliminary Engineering (Item No. 11-8515.00) – Major Widening and New Construction on US 25 from US 25E to KY 1006
- 2015 Corbin Bypass (KY 3041) Extension Study (Item No. 11-190.00) – Extension of KY 3041 and New Construction of Connection Between US 25 and I-75

While Phase I design was completed in 2013 (Item No. 11-8515.00), KYTC were concerned that other improvements to the surrounding transportation system (i.e. I-75, US 25E/W) negated the need for improvements to US 25. Therefore, the study was initiated in September 2018 through a contract modification between Municipal Engineering Company (later HMB Professional Engineers) and KYTC. The objective of the planning study was to provide an updated safety and operational analysis of the US 25 corridor and evaluate the short-term and long-term transportation needs of US 25 from Corbin to London.

## 1.1 Study Area

Illustrated in **Figure 1**, the study area included US 25 from US 25E (MP 0.000) in Corbin to KY 192 (MP 10.505) in London. At major intersections, the approaches were evaluated to determine potential improvement options. The mainline US 25 was evaluated to identify specific locations at which lower cost and less impactful improvements can be implemented and to assess the viability of major widening throughout the corridor.

Figure 1. Study Area



## 1.2 Study Process

The process of this study is described in detail in the following seven chapters. Additional resource / reference materials are included in the appendices.



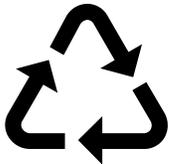
### **Chapter 1 - Introduction**

The first chapter provides background introductory information about the study and provides the framework for the remainder of the report.



### **Chapter 2 - Existing Conditions**

The second chapter encompasses collected data including geometrics, structures, existing traffic volumes and operations, and safety analysis.



### **Chapter 3 - Environmental Overview**

This chapter is devoted to a summary of the natural and human impacts within the study area.



### **Chapter 4 - Initial Coordination Efforts**

This chapter is devoted to a summary of initial coordination efforts which includes coordination between the Project Team concerning safety and operational analysis of the study area.



### **Chapter 5 - Improvement Option Development and Analysis**

Chapter five presents the process for which locations and potential improvement options were developed. It also includes a discussion on analysis procedures and improvement option refinement.



### **Chapter 6 - Additional Engagement Efforts**

This chapter is devoted to a summary of outreach efforts which includes a meeting with local officials / stakeholders, a public outreach effort to engage those within the communities near the study area, and coordination between the Project Team concerning improvement option prioritization.



### **Chapter 7 - Study Outcomes**

The final chapter presents the outcomes of the study as a prioritized list of locations and improvement options.

### 1.3 Study Objective and Goals

The objective of the US 25, Corbin to London Connector Study was to evaluate transportation needs related to safety and congestion of US 25 from US 25E in Corbin to KY 192 in London and to identify and prioritize any proposed improvement options. To accomplish this objective, study goals included the following:

- Identify Locations for Possible Projects Through Safety and Traffic Analysis
- Develop / Evaluate Improvement Options
- Prepare Prioritized List of Improvement Options

### 1.4 Previous Studies and Current Highway Plan Projects

Previously completed studies and current highway plan transportation improvements were identified in the study area that could impact US 25 in the future. During this study, *Kentucky's FY 2020 – 2026 Highway Plan* was proposed and enacted. In the enacted plan there is funding for design under Item No. 11-8515.00 allocated for 2023.

#### Previous Studies

In 2006, a study was completed in which US 25 between Corbin and London was evaluated to determine potential alternatives to improve safety and traffic flow that could be used for future programming documents (Item No. 11-8201.00). The Project Team recommendations were as follows:

- Develop access management plan and a Memorandum of Understanding (MOU) between KYTC, the City of London, and Laurel County that will legally establish the access management plan as a policy rather than guidance.
- The design speed of US 25 should be 45 mph in the urban areas and 55 mph in the rural areas.
- US 25 from US 25E to KY 1006 should be widened to a 4-lane rural highway that meets current design standards.
- Bikeways/Pedways should be provided in urban areas and in the vicinity of schools. Shoulders that meet current design standards can be used as bikeways for rural sections of US 25.
- The functional classification of US 25 should be a minor arterial throughout. The section of US 25 between KY 1006 and KY 192 should be classified as an urban minor arterial and the remainder should be classified as a rural minor arterial.
- Reconstruct/reroute US 25 from KY 1006 to KY 192.
- Construct a back entrance to the South Laurel High School complex connecting the school to either the KY 192 Bypass or to KY 363.
- Provide a new connection between the South Laurel High School and old US 25 by using part of Hurley Ln. and an undeveloped plot of land adjacent to US 25.

The 11-8201.00 study prioritized viable improvement concepts as follows:

1. Construct back entrance to the South Laurel High School complex connecting to KY 192 or KY 363 (Complete).
2. Reconstruct/reroute US 25 from KY 1006 to KY 192 (Currently in right-of-way phase; Construction Year – 2024).
3. Provide a new connection between the South Laurel High School and old US 25 by using part of Hurley Ln. and an undeveloped plot of land adjacent to US 25 (Idea abandoned).
4. Widen US 25 between KY 1189 and KY 1006 to a 4-lane rural highway.
5. Widen US 25 between US 25E and KY 1189 to a 4-lane rural highway.

As noted above, some improvements evaluated in the 2006 study have since been implemented or are in the process of being implemented. For the current study, the issues and improvement concepts from the 2006 study (11-8201.00) were considered as part of the improvement option development and evaluation process.

In 2013, Palmer Engineering completed the design effort for major widening on US 25 from KY 1006 to KY 192 (Item No. 11-147.00). This project is currently in the right-of-way phase and is included in Kentucky's *FY 2020 – 2026 Highway Plan* with the construction phase programmed to start in 2024.

In 2013, Municipal Engineering Company and HMB Professional Engineers, Inc. completed preliminary design and a draft Environmental Assessment (EA) on US 25 for two major widening alternatives from US 25E to KY 1006 (Item No. 11-8515.00). The draft EA was never finalized because funding for the next phase of work was not authorized. Both major widening options taken through preliminary design in 2013 were evaluated in the current study.

In 2015, a study known as the Corbin Bypass Extension Study (Item No. 11-190.00) was completed to evaluate the need to extend the Corbin Bypass (KY 3041) to improve local and regional mobility and provide a safer, more efficient connection between I-75 and much of southeastern Kentucky, including southern Laurel County, Knox County, and Bell County.

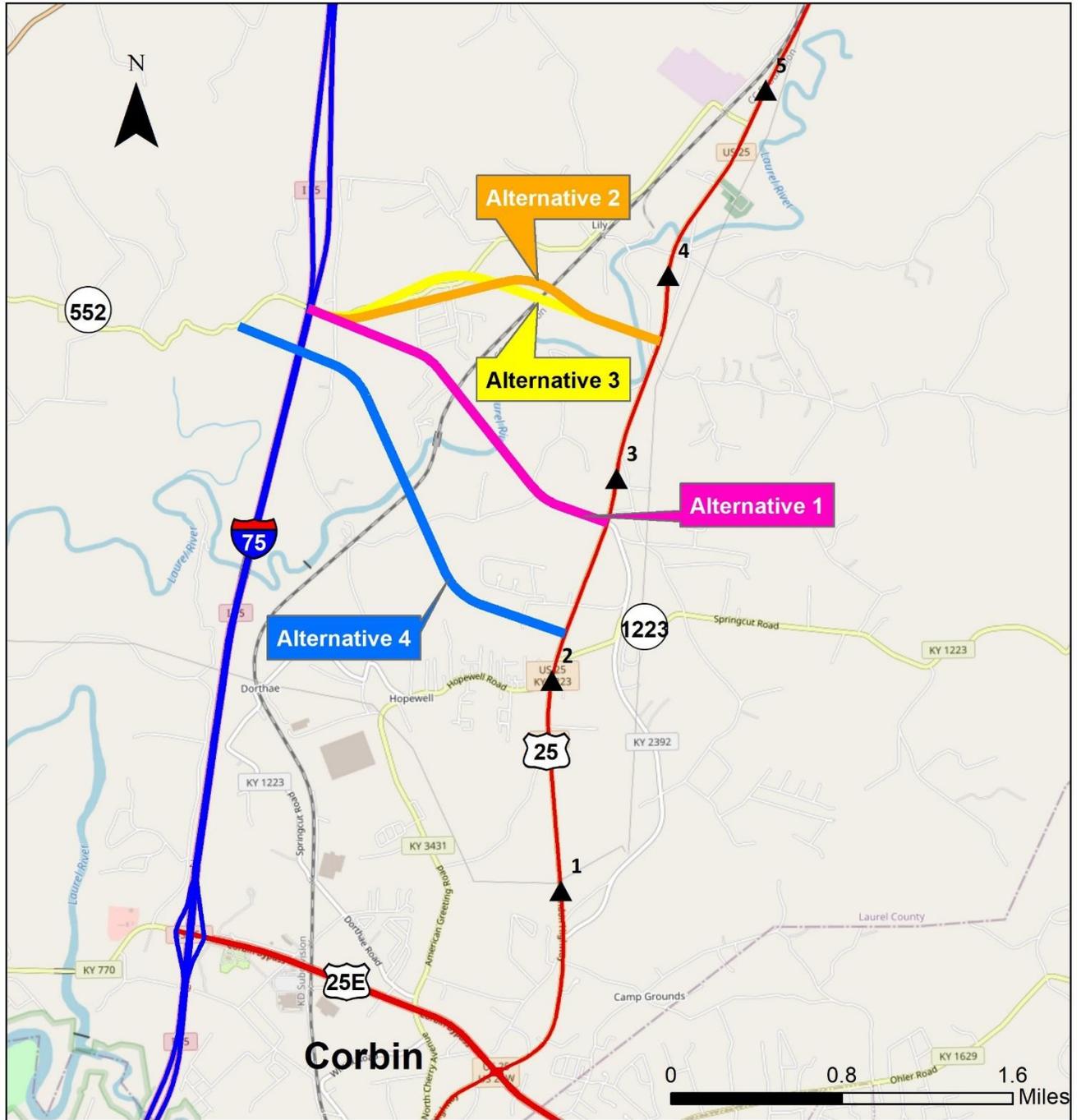
Following public involvement efforts and considering the surrounding residential areas, the Project Team determined that the extension of KY 3041 between US 25E in Knox County and US 25 in Laurel County was no longer a viable option. A no build and four partial build scenarios were evaluated as a part of the 2015 study:

1. New connector from US 25 to I-75, starting at US 25 near KY 2392 and providing a new interchange at I-75 at KY 552
2. New connector from US 25 to I-75, starting at US 25 near old US 25 (north of Lily School Rd.) and providing a new interchange at I-75 at KY 552. The connector crosses the railroad to the north and runs south of existing KY 552 before tying to this existing roadway near I-75.
3. New connector from US 25 to I-75, starting at US 25 near old US 25 (north of Lily School Rd.) and providing a new interchange at I-75 at KY 552. The connector crosses the railroad to the south and runs along existing KY 522 from the railroad crossing to I-75.
4. New connector from US 25 to I-75, starting at US 25 north of Hunter Hills Elementary School and providing a new interchange on I-75 approximately 2.25 miles north of US 25E

**Figure 2** is a map recreated from the 2015 Corbin Bypass Extension Study that illustrates each of these potential improvements. These partial build alternatives were recommended by the Project Team for consideration in future project development phases. A connection between US 25 and I-75 with an interchange at or near KY 552 was evaluated in the current study.

Further information regarding any of the previous studies discussed in the above section can be found on the Kentucky Transportation Cabinet's website.

Figure 2. 2015 Corbin Bypass (KY 3041) Extension Study (11-190.00)- Recommended Alternatives



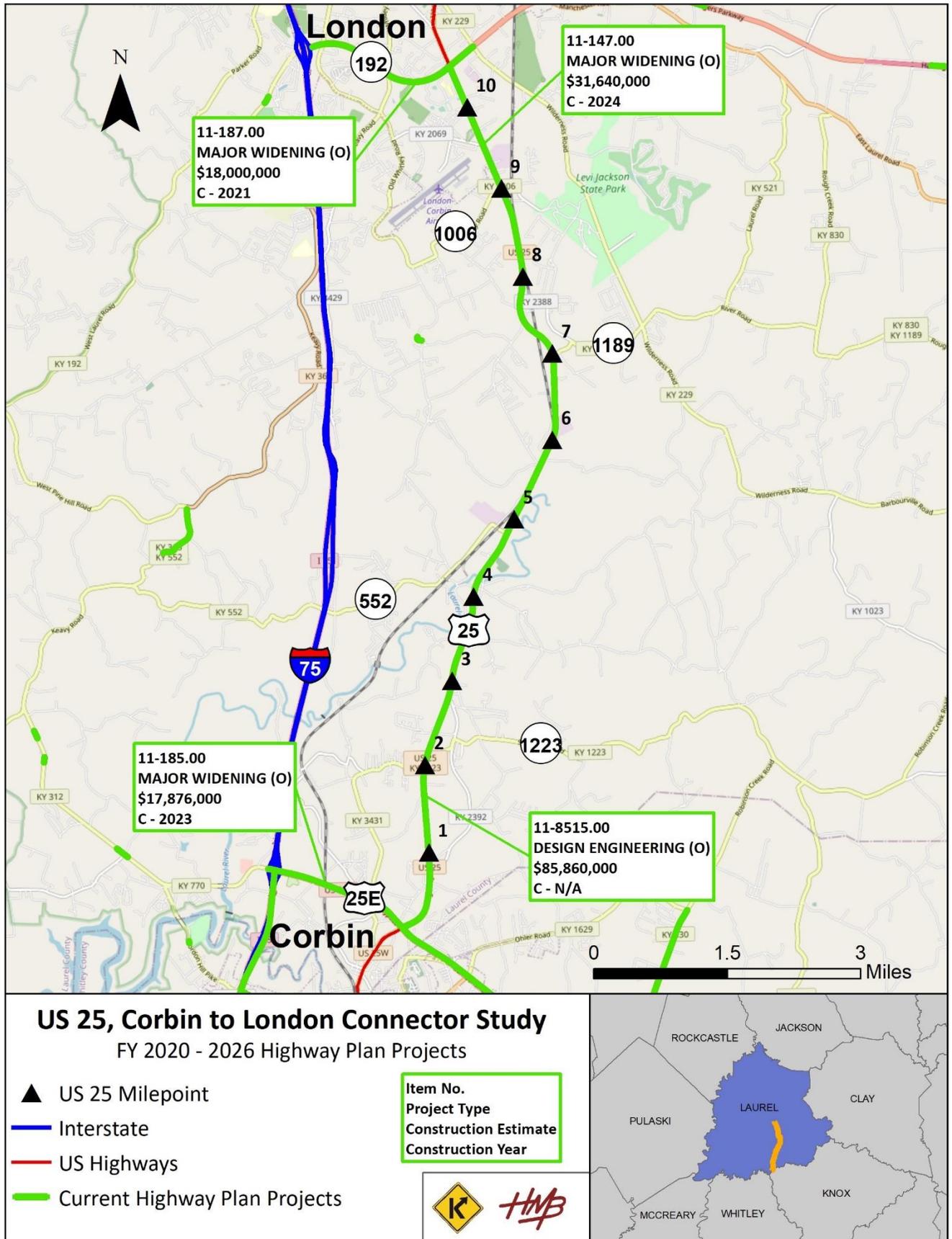
**Kentucky's FY 2020 – 2026 Highway Plan Projects**

Current highway plan projects are those that have been prioritized through Strategic highway Investment Formula for Tomorrow (SHIFT) and have been included in *Kentucky's FY 2020 – 2026 Highway Plan*. **Table 1** contains additional information about current highway plan projects near the study area, and they are illustrated in **Figure 3**.

**Table 1. Kentucky's FY 2020 – 2026 Highway Plan Projects in Study Area**

Item No.	Route	Begin Milepoint	End Milepoint	Project Type	Description	Construction Year	Construction Estimate
11-147.00	US 25	9.028	10.505	Major Widening	Reduce congestion on US 25 from KY 1006 to KY 2069; Improve connectivity from US 25 near KY 2069 to KY 229; Improve KY 229 from the new connector north to KY 192; Improve access to the school from KY 192	2024	\$ 31,640,000
11-185.00	US 25E	0.000	2.024	Major Widening	Improve safety, improve access management, and reduce congestion on US 25E from the Knox/Laurel County line to KY 770	2023	\$ 17,876,000
11-187.00	KY 192	18.316	20.425	Major Widening	Improve safety, access management, and freight mobility; Reduce congestion on KY 192 near KY 1006 to US 25 in London	2021	\$ 18,000,000
11-8515.00	US 25	0.000	9.028	Design Engineering	Improve connectivity between Corbin and London from KY 1006 to US 25E	N/A	\$ 85,860,000

Figure 3. Kentucky's FY 2020 – 2026 Highway Plan Projects in Study Area



# Chapter 2 – Existing Conditions

In this chapter, the existing transportation network conditions are presented. This includes information on the roadway facility type and geometrics, structures, traffic volumes and operations, and crash history and analysis. Data for this chapter was collected from KYTC's Highway Information System (HIS) database, bridge inspection reports, National Bridge Inventory (NBI) forms, the KYTC Traffic Count Reporting System, site visits, and existing archive project plans.

Per the Federal Highway Administration's (FHWA) 2019 Bicycle and Pedestrian Planning, Program, and Project Development, guidance states that pedestrian and bicycle needs must be given "due consideration" under Federal transportation law. US 25 does not have designated pedestrian or bicycle facilities nor is it currently part of a designated touring route. As specific improvement concepts were developed, opportunities for pedestrian and bicycle accommodations were considered.

Transit systems and opportunities is another area of consideration for corridor studies. US 25 does not have designated or fixed transit routes currently. Rural Transit Enterprises Coordinated, Inc. serves the area near the study corridor for demand based local and intercity travel.

## 2.1 Functional Class and Roadway Systems

### Functional Class

Functional classification is the process of grouping streets and highways by character of travel service and access to adjacent land uses. According to the HIS database, this portion of US 25 is classified as a Minor Arterial. A Minor Arterial is a roadway that provides service for trips of moderate length, serves geographic areas that are smaller than their higher Principal Arterial counterparts, and offer connectivity to the higher Arterial system. An urban designation applies for the entirety of the study area.

### National Highway System

The National Highway System (NHS) is a network of strategic highways within the United States. US 25 is not listed as a route in the NHS. As such, it does not fall under the monitoring and performance for the Federal Highway Administration (FHWA) Practices for Performance-Based Planning and Programming. Improvement options that are identified as part of this study will not affect Kentucky's performance measures that are reported to FHWA.

### Truck Routes

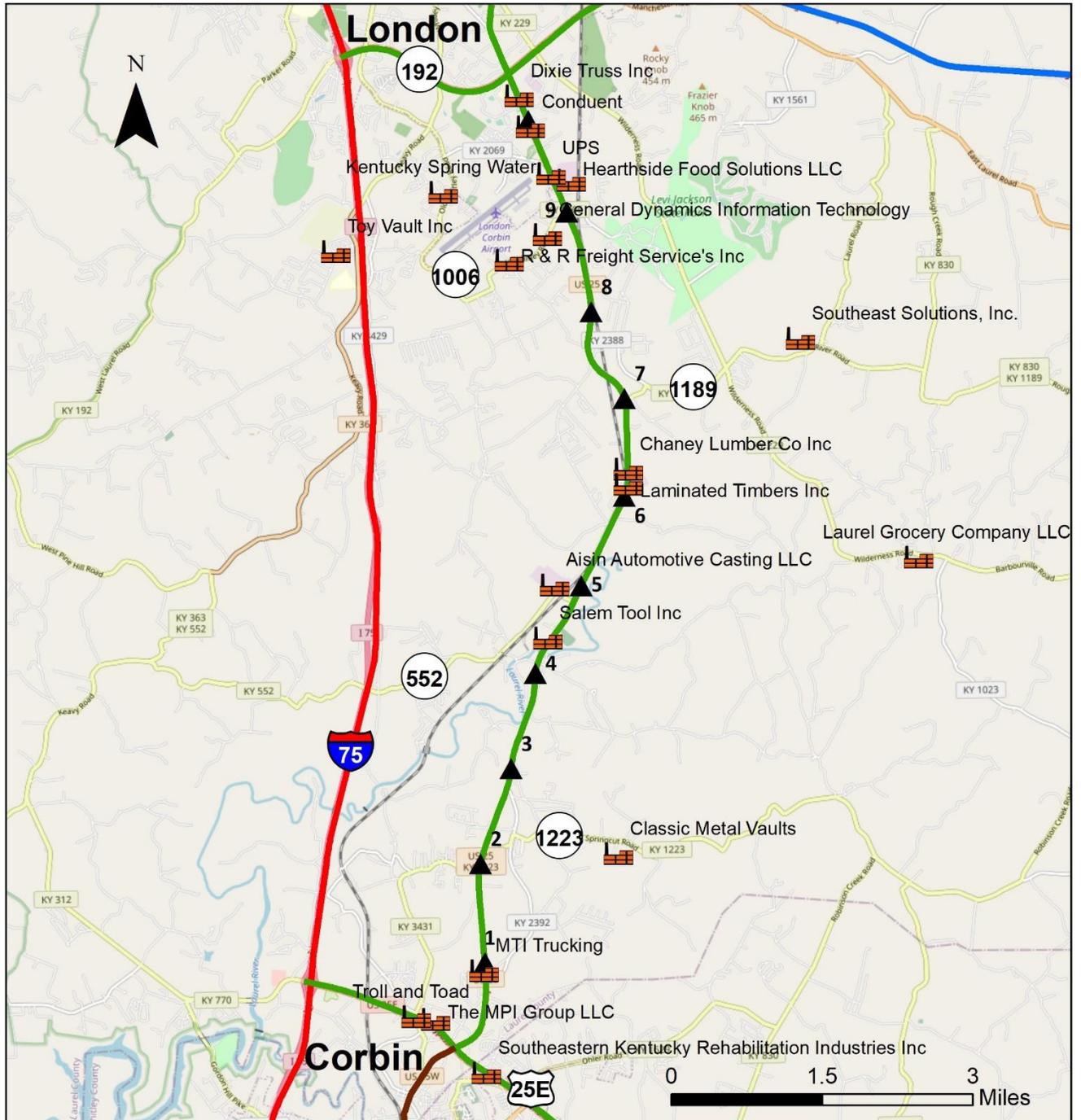
US 25 is an important link in Kentucky's freight network (as shown in **Figure 4**), carrying just over 14 percent trucks in the study area. While US 25 is not a part of the National Truck Network (NTN), it connects two routes within the NTN in US 25E and KY 192. The locations of major employers (those with over 100 employees) were identified since they may contribute to this truck traffic. These are displayed along with the freight network on **Figure 4**.

## 2.2 Roadway Geometric Characteristics

Current geometric characteristics of US 25 were identified through HIS queries and existing archive plans and compared with roadway design standards and common practices as set forth in AASHTO's *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)*, commonly referred to as the *Green Book*. Highway data assembled from HIS used in this study includes:

- Typical Sections
- Speed Limits
- Horizontal and Vertical Curves

Figure 4. Freight Network and Major Employers



**US 25, Corbin to London Connector Study**  
Freight Network and Major Employers

- Tier 1 - AADTT > 7,000
- Tier 2 - AADTT 4,000 - 7,000
- Tier 3 - AADTT 500 - 4,000
- Tier 4 - AADTT < 500
- ▲ US 25 Milepoint
- Industries with Employment >= 100

AADTT - Average Annual Daily Truck Traffic



### Typical Sections

The typical section of US 25 varies throughout the study area. Predominantly it is two lanes (93 percent of the corridor or 10.162 miles) with one travel lane in each direction. Two-way left turn lanes (TWLTL) are interspersed throughout the study area accounting for 34 percent of the corridor or 3.600 miles. There are two short segments of three-lane highway (MP 2.368 to MP 2.711 and MP 10.162 to MP 10.314) and a short segment of four-lane highway (MP 10.314 to MP 10.505). The lane width throughout 77 percent of the corridor is 11 feet (8.064 miles), but there are stretches near US 25E and KY 192 that have a lane width of 12 feet (23 percent or 2.441 miles). The shoulder widths vary between 0 and 14 feet, and there is a short section from MP 9.106 to MP 10.300 with curb and gutter. **Figure 5** and **Figure 6** illustrate the typical sections for US 25 most prevalent through the study area. **Figure 7** displays the locations where typical section variations occur on US 25.

### Speed Limits

The posted speed limit is 55 mph throughout the study corridor with the exception of two segments near US 25E (MP 0.000 – 0.244) and KY 192 (MP 8.900 – MP 10.505) where the posted speed limit is decreased to 45 mph. Speed data, obtained from HERE Traffic Analytics, was provided by KYTC for US 25 by milepoint for the years 2018 – 2019. The data is per 24-hour time periods during weekdays and includes minimum speed, maximum speed, and the 85<sup>th</sup> percentile speed. The 85<sup>th</sup> percentile speed is the speed at or below which 85 percent of all vehicles are observed to travel under free-flowing conditions past a monitored point. Typically, the speed limit should be within five miles per hour (mph) plus or minus the 85<sup>th</sup> percentile speed. The following observations were made from the plotted data:

- Throughout the study area, the maximum speed and 85<sup>th</sup> percentile speed were approximately the same value.
- The 85<sup>th</sup> percentile speed and maximum speed between US 25E and Prestige Ln were at or below the posted speed limit of 45 mph and steadily decreased approaching the signalized intersection at US 25E.
- The 85<sup>th</sup> percentile speed and maximum speed between Prestige Ln and KY 1006 were at or below the posted speed limit of 55 mph. Through this portion of the corridor these speeds ranged from 50 to 55 mph.
- The 85<sup>th</sup> percentile speed and maximum speed between KY 1006 and KY 192 were at or below the posted speed limit of 45 mph and steadily decreased approaching the signalized intersection at KY 192.

For additional detail on speed data, the plotted data is included in **Appendix A**.

### Horizontal and Vertical Curves

Information from the existing archive plans and the survey data collected as a part of the preliminary design effort in 2013 was used to evaluate the horizontal and vertical curves on US 25. All existing geometrics were compared to current design standards found in AASHTO's *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)*.

Vertical alignment elements are based on grade and curvature. The maximum grade on US 25 is 4.15 percent, which meets the design criteria for 55 mph urban arterials through rolling terrain of 6 percent. All crest vertical curves meet stopping sight distance design criteria for 55 mph and all sag vertical curves meet headlight sight distance needed for 55 mph of 495 feet.

Figure 5. Two Lane Typical Section

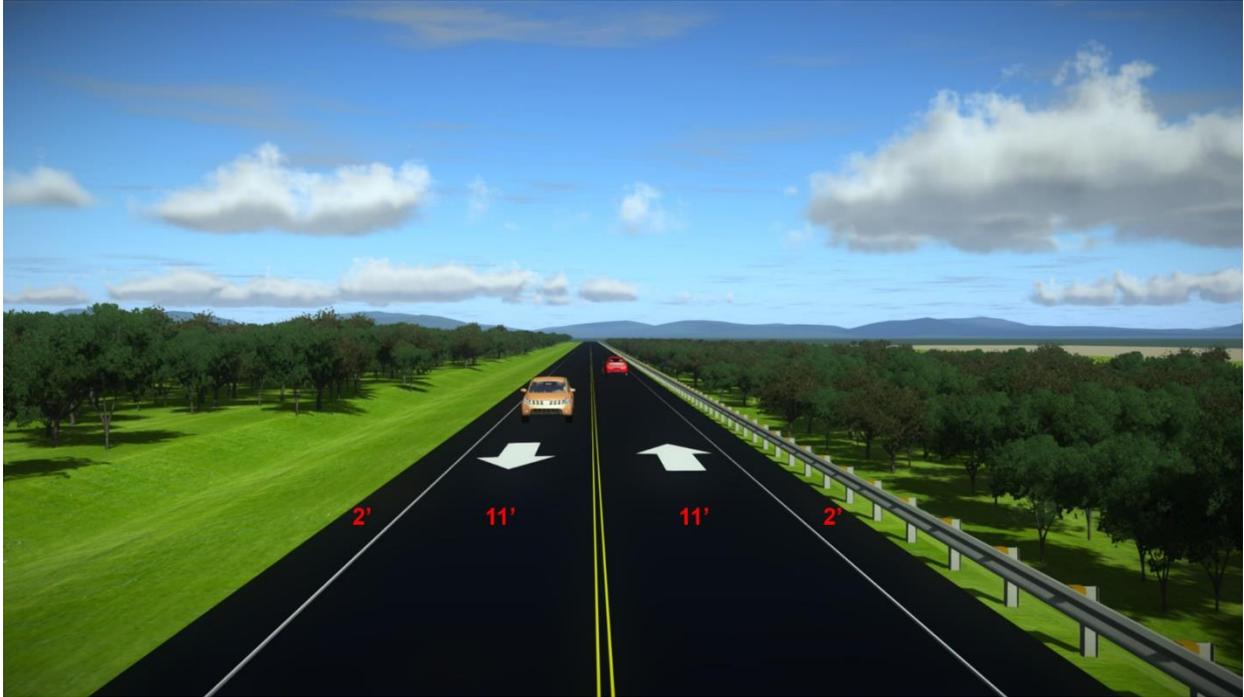


Figure 6. Two Lane, TWLTL Typical Section

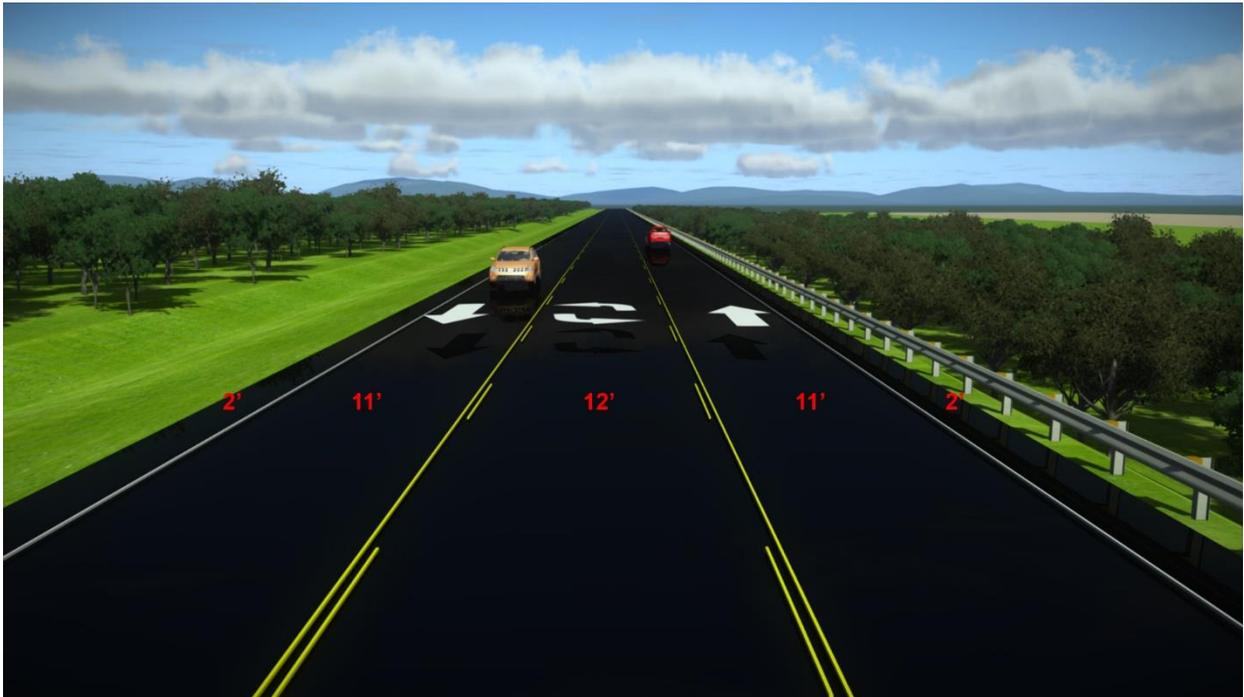
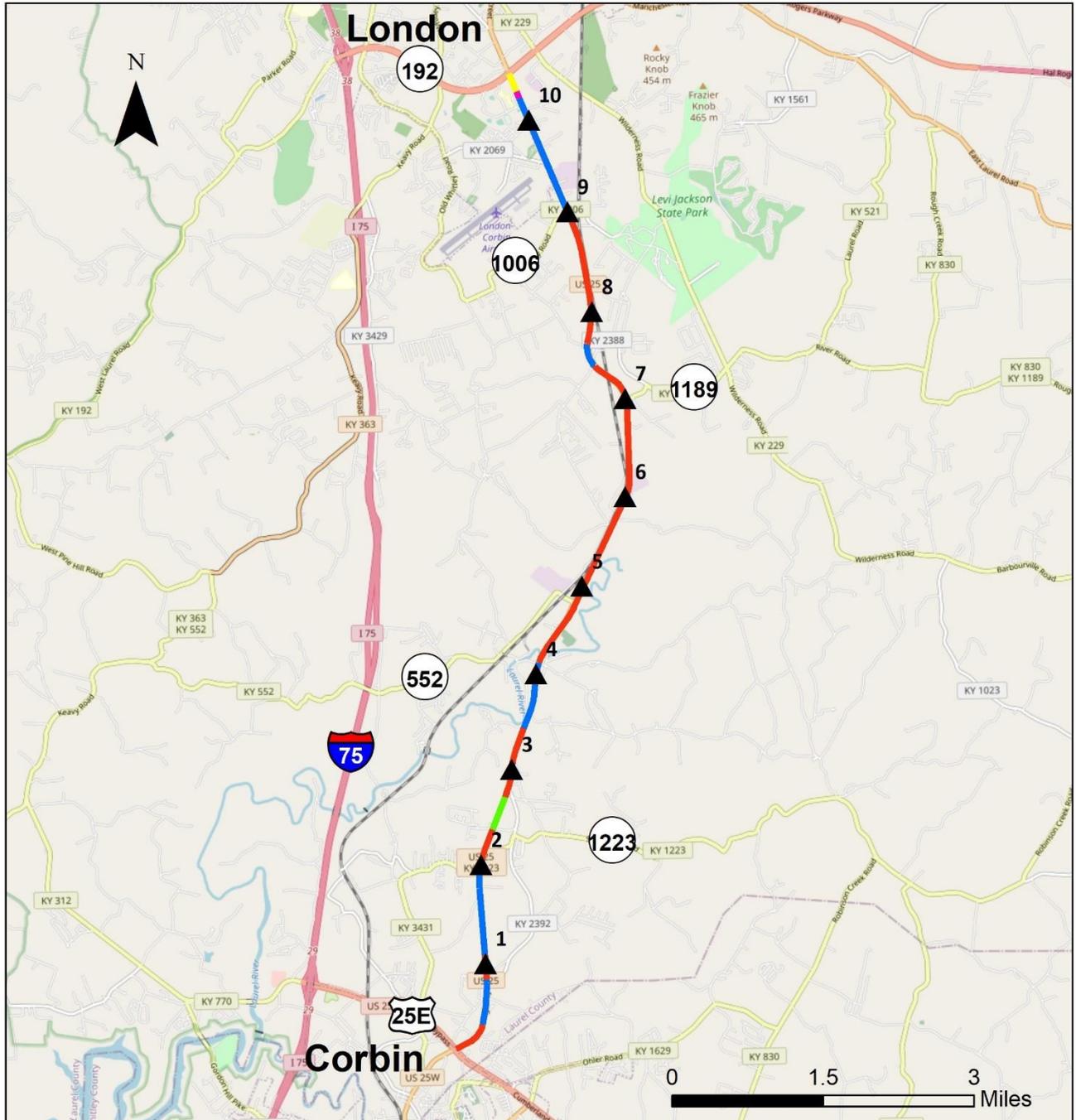


Figure 7. Typical Section Changes



**US 25, Corbin to London Connector Study**  
Typical Section Changes

- ▲ US 25 Milepoint
- Two Lanes
- Two Lanes, TWLTL
- Three Lanes
- Three Lanes, TWLTL
- Four Lanes



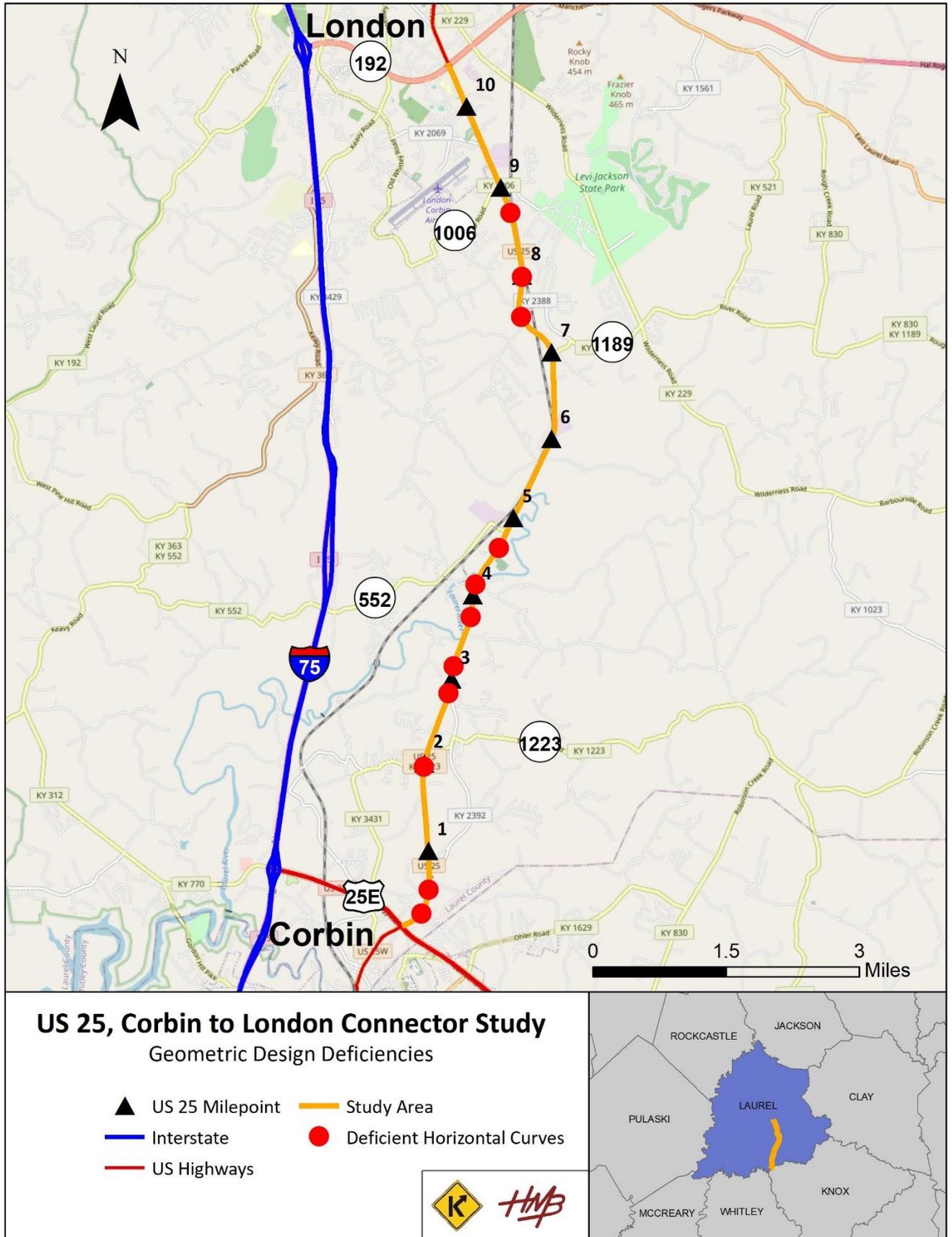
All radii of horizontal curves meet minimum design criteria for a 55 mph design speed according to AASHTO's *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)*. When coupling the horizontal curve radius with the corresponding superelevation, there were 11 curves that do not meet a design speed equivalent to the posted speed limit. However, the calculated side friction factor, based on Equation 3-7 and Figure 3-3 in AASHTO's *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)*, for each of these curves does not exceed the maximum recommended side friction factor for a 55 mph and 45 mph design speed. Crash history was analyzed at each of these curves. Four curves had one roadway departure related crash that could potentially be attributed to roadway geometrics. The locations of the curves identified as having potential design deficiencies are shown in **Table 2** and **Figure 8**.

**Table 2. Geometrically Deficient Horizontal Curves**

Begin Milepoint	End Milepoint	Radius (ft)	Super-elevation	8% Table Design Speed	Posted Speed Limit	Calculated Friction Factor*	Crashes Within 0.1 Miles of Curve	Roadway Departure Related Crashes
0.148	0.402	1450	4.00%	35	45-55	0.10	8	0
0.456	0.653	8500	NC	50	55	0.04	6	0
1.708	2.184	5700	2.00%	45	55	0.02	28	1
2.702	2.941	5500	2.00%	45	55	0.02	8	1
3.004	3.254	5900	2.00%	45	55	0.01	17	1
3.636	3.801	2950	3.00%	40	55	0.04	23	0
3.938	4.247	2900	3.00%	40	55	0.04	10	0
4.519	4.646	3500	3.00%	45	55	0.03	9	0
7.252	7.673	1910	4.00%	40	55	0.07	10	0
7.721	8.120	5600	2.00%	40	55	0.02	16	0
8.527	8.778	6050	2.00%	40	55	0.01	16	1

\*Maximum friction factor for 45 mph is 0.19; Maximum friction factor for 55 mph is 0.13 per AASHTO *Green Book (2018)*

Figure 8. Geometric Design Deficiencies



## 2.3 Structures

Structures identified through KYTC's Bridge Data Miner service can be seen in **Figure 9**. A bridge is classified as structurally deficient if the deck, superstructure, substructure, or culvert is rated in "Poor" or worse condition (any with condition rating of four or less on the FHWA National Bridge Inventory (NBI) condition rating scale in accordance with the Pavement and Bridge Condition Performance Measures final rule). The Robinson Creek Bridge located at milepoint 3.310 is in "Poor" condition due to its NBI substructure rating of four.

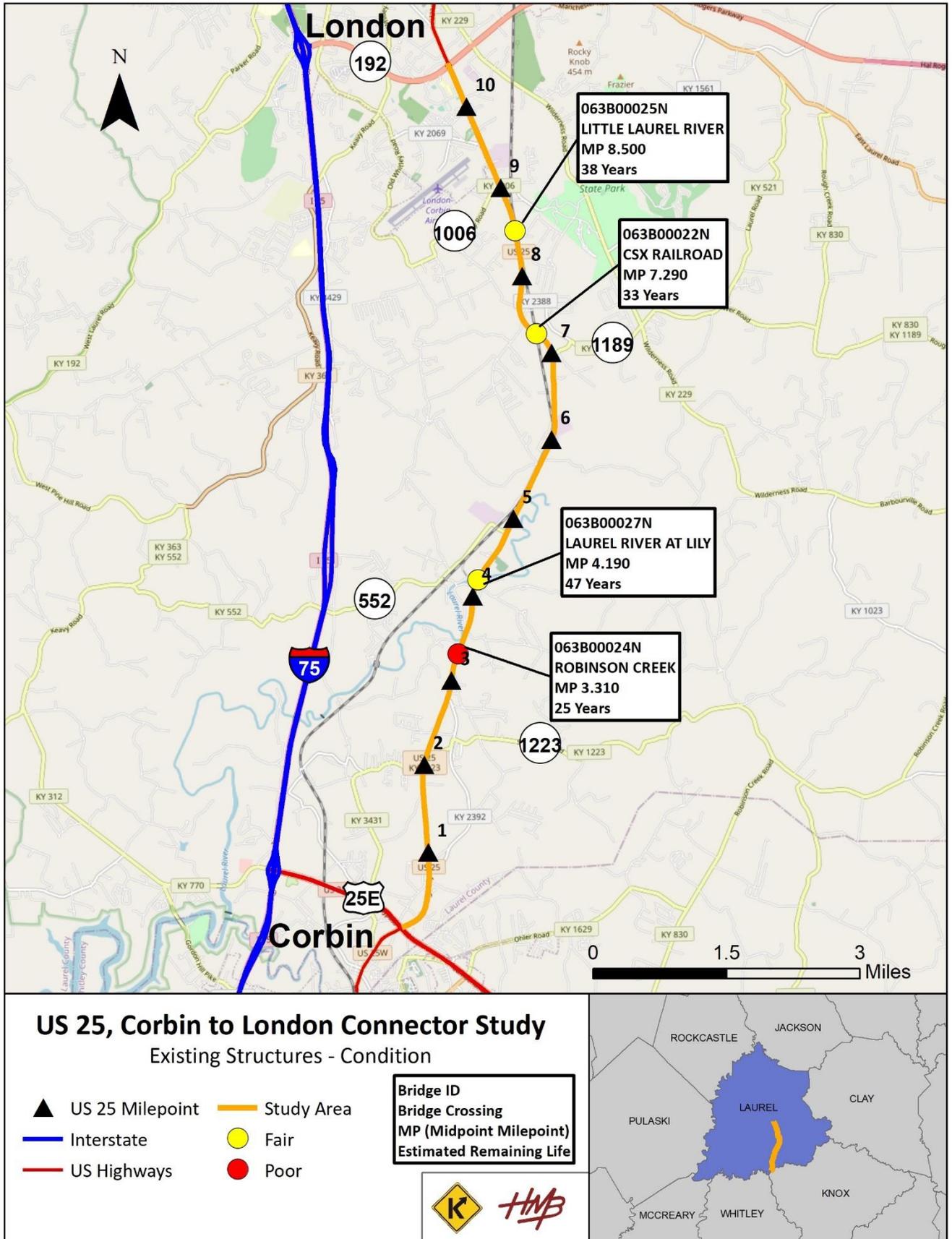
The *Kentucky Transportation Cabinet Transportation Asset Management Plan (KYTC TAMP)* published in 2019 outlines a method to calculate the estimated remaining life of a bridge that can be used for asset management purposes. The estimated remaining life is based on an assumed life of 75 years for a new bridge and is determined using three bridge components: deck, superstructure, and substructure. Each component is weighted and combined with the NBI rating per KYTC Bridge Inspection Reports to determine how much the bridge asset has depreciated. The estimated remaining life for each bridge in the study area can be found in **Table 3**.

**Table 3. Existing Structures**

Bridge Crossing	Milepoint	Bridge ID	NBI Deck Rating	NBI Super-structure Rating	NBI Sub-structure Rating	Condition	Estimated Remaining Life* (Yrs)
ROBINSON CREEK	3.310	063B00024N	6	5	4	Poor	25
LAUREL RIVER AT LILY	4.190	063B00027N	7	6	6	Fair	47
CSX RAILROAD	7.290	063B00022N	6	6	5	Fair	33
LITTLE LAUREL RIVER	8.500	063B00025N	6	6	6	Fair	38

\*Estimated using formula outlined in *KYTC TAMP*.

Figure 9. Existing Structures - Condition

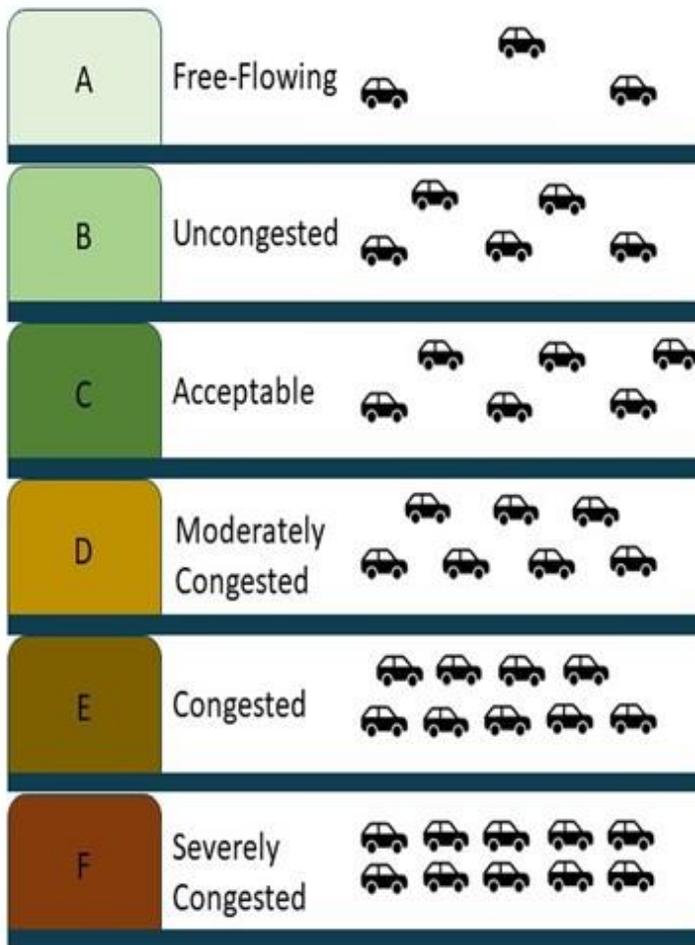


## 2.4 Existing Traffic Volumes and Operational Analysis

Existing year (2019) traffic volumes for US 25 are based on the most recent KYTC count stations. The count years range from 2017 – 2019. Year 2019 volumes were calculated from these counts and calibrated using traffic volumes from the Laurel Pulaski Travel Demand Model that was updated through a separate contract, applying a growth factor when necessary based on historic trends. The 2019 traffic volumes were forecasted to years 2025 and 2040. For the No build scenario, the annual average daily traffic (AADT), annual average daily truck traffic (AADTT), and design hourly volume (DHV) for each segment of US 25 is shown in **Figure 11** on **Page 21**.

A level of service (LOS) analysis was performed for mainline US 25 segments using *Highway Capacity Software (HCS7)*. LOS is a qualitative measure of determining the operational characteristics of a roadway facility. It is used to define the quality of traffic operations based on measures such as vehicle speed, travel time, comfort and convenience, maneuverability, congestion, and delay. There are six levels of service for each type of facility. The levels are designated by letters, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Acceptable operations for roadways in urban areas are LOS D or better. **Figure 10** presents a graphical depiction of LOS for reference.

**Figure 10. Level of Service (LOS) Designations**



In addition to providing the range of traffic flow according to letter grade, other reported performance measures are Volume to Capacity (V/C) ratio and density. The V/C ratio represents the proportion of traffic demand using the roadway for a designated time period in relation to its theoretical capacity to serve the demand. Density represents the number of vehicles occupying a unit length of roadway. A V/C ratio equal to or greater than 1.0 in urban areas indicates the road is operating at or above its theoretical design capacity. When the density reaches 45 passenger cars per mile per lane (pc/mi/ln) it is an indicator that a road has reached capacity.

The levels of service, density and V/C ratios were determined for existing (2019) conditions, 2025, and 2040 for a No Build scenario in which no major widening or new construction would occur on US 25. All segments operate at an acceptable LOS (LOS D or better) with the exception of Segment 1 – US 25E to KY 1223 in 2040 (LOS E) and Segment 5 – KY 1006 to KY 192 in all years analyzed (LOS E). The V/C ratios are all 0.67 or

less while the density ranges from 6.5 to 24.7 indicating mainline capacity is not an issue. The density and V/C ratio are shown in **Table 4** and LOS results are shown on **Figure 11** for the No Build scenario.

**Table 4. US 25 Density and V/C - No Build**

US 25 Segment	2019 Density (pc/mi/ln)*	2019 Volume to Capacity Ratio (V/C)	2025 Density (pc/mi/ln)*	2025 Volume to Capacity Ratio (V/C)	2040 Density (pc/mi/ln)*	2040 Volume to Capacity Ratio (V/C)
1	11.3	0.39	11.8	0.41	13.3	0.44
2	7.5	0.52	7.7	0.52	8.9	0.57
3	8.4	0.41	8.8	0.43	9.8	0.46
4	6.5	0.36	6.8	0.38	7.7	0.41
5	21.3	0.60	22.2	0.62	24.7	0.67

\*pc/mi/ln – passenger cars per mile per lane

## 2.5 Crash Analysis

As part of this study, historical crash data was analyzed to identify locations along the portion of US 25 in the study area that could be considered high crash locations. Historical crash records were extracted from the Kentucky State Police’s (KSP) *Collision Database* for a three-year period (July 2016 – June 2019).

### Crash Analysis Methods

The statistical crash analysis was performed based on methods that compare existing crash rates with crash rates of similar types of facilities. These methods included the Critical Crash Rate method and the Excess Expected Crashes (EEC) method. Statewide crash rates and methodologies were provided by the Kentucky Transportation Center (KTC) and found in the *2018 Analysis of Traffic Crash Data in Kentucky (2014-2018 data)*. Detailed crash reports were analyzed for specific locations as needed.

1. Excess Expected Crashes - KYTC crash analysis methodology has been evolving, transitioning from the Critical Crash Rate method and progressing toward the EEC methodology based on the *AASHTO Highway Safety Manual (HSM)* procedures. HSM methods allow for the ability to estimate potential crash frequency on roadways, and the potential effects that differences in roadway characteristics have on crashes (e.g. a 3-foot shoulder versus a 10-foot shoulder). If the EEC is negative, it indicates that there are fewer crashes than expected. KTC provided the EEC along with the factors and formulas used for each segment of the study corridor. KTC uses a tool called CDAT (Crash Data Access Tool) which accesses crash data from 2013 to 2017.

EEC analysis uses historical observed crash data for a specified time period and segment length. The segments are based on KYTC’s traffic count segments, and those typically change when there is a change in roadway characteristic or breakpoint such as an intersecting road. The number of crashes for each segment was broken down based on severity as well and is shown alongside the EEC. These severities are classified based on the FHWA KABCO Injury Classification Scale. Each state may have slight variances in the definitions of these classifications. Kentucky defines KABCO as follows:

- K – Fatal: indicates the person was killed as a result of the collision and died within 90 days of the collision.
- A – Incapacitating: any non-fatal injury which prevents the person from walking, driving, or normally continuing the activities he / she could perform prior to the

collision and does require medical attention. Includes severe lacerations, broken limbs, skull fracture, internal injuries, unconsciousness when leaving the scene, or inability to leave scene without assistance.

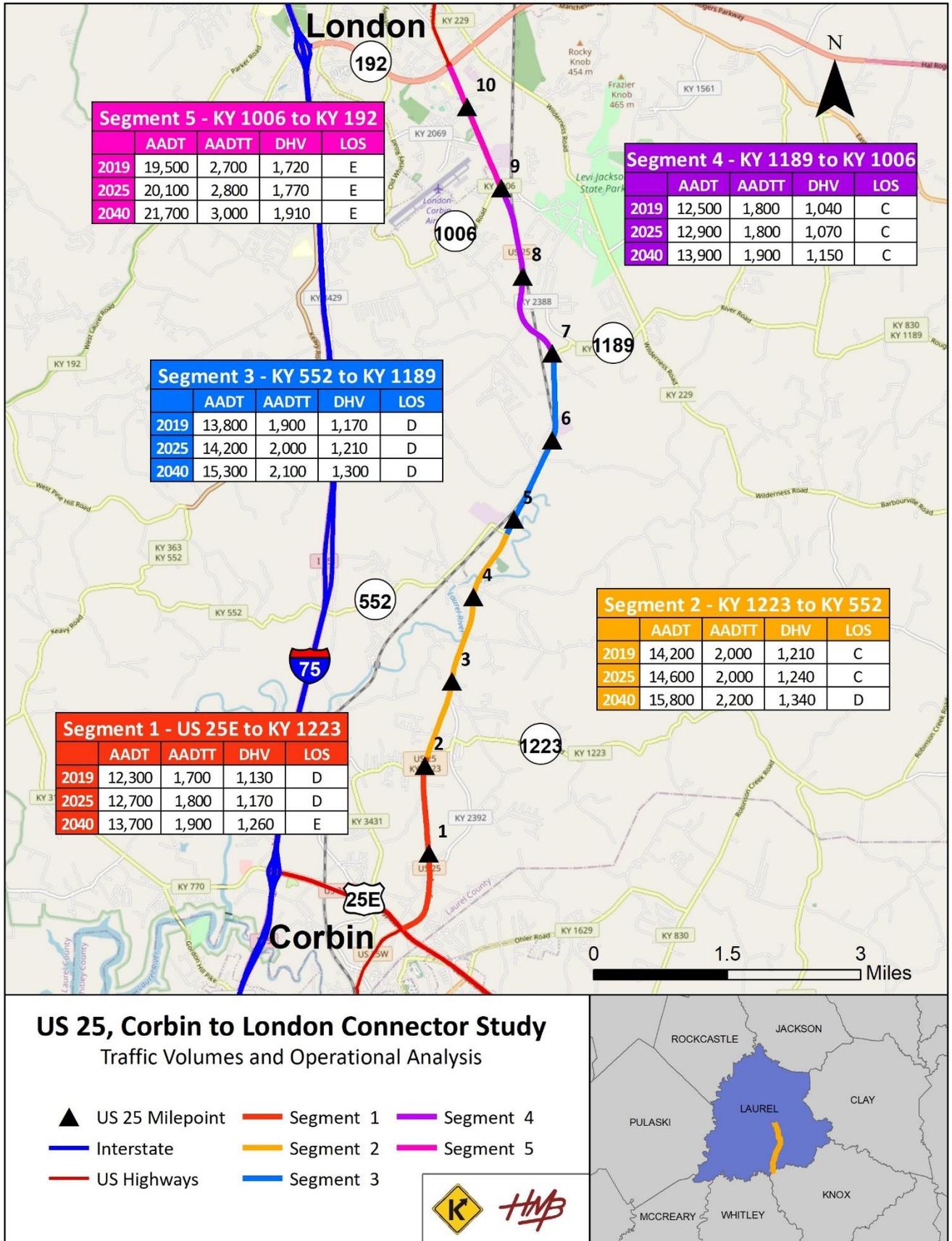
- **B – Non-incapacitating:** evident to observers at the collision scene such as minor lacerations, bruises, and abrasions.
- **C – Possible Injury:** claim of injury and / or pain that is not evident to the eye. Includes momentary unconsciousness, limping, nausea, and hysteria.
- **O – No Injury detected (property damage only).**

Between 2016 and 2019, the EEC for each segment of the US 25 study corridor was negative except for Segment 5, which had an adjusted EEC of 129 and includes US 25 from KY 1006 to KY 192. An overview of the EEC by segment is presented in Table 5.

**Table 5. CDAT Excess Expected Crashes by Segment (2016 - 2019)**

Segment	Begin Milepoint	End Milepoint	AADT (2017)	Crashes					Total	Adjusted EEC
				K	A	B	C	O		
1	0.000	2.098	13,353	1	2	7	10	58	78	-12
2	2.098	4.822	14,040	0	6	10	12	61	89	-32
3	4.822	6.953	13,706	2	3	5	8	33	51	-41
4	6.953	9.028	12,373	3	1	5	6	58	73	-11
5	9.028	10.505	21,273	2	1	6	12	202	223	129

Figure 11. Traffic Volumes and Operational Analysis



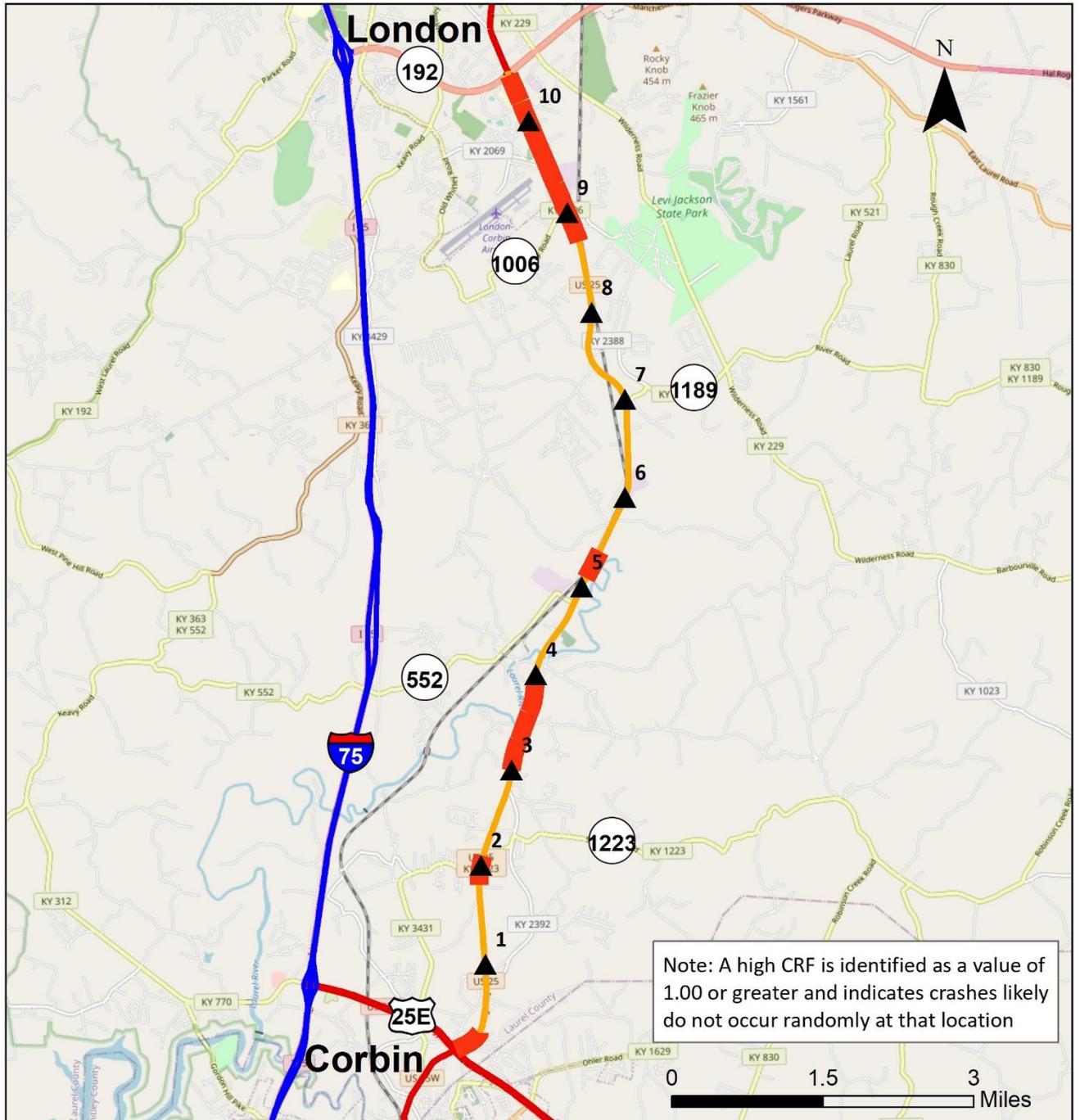
2. **Critical Crash Rate** - KYTC uses a systematic procedure to identify locations having high crash rates. The actual number of crashes, as obtained from the KSP Collision Database, occurring within a roadway segment is used to calculate the Actual Crash Rate using the number of crashes, roadway length, AADT, and the number of years for which crash data is being examined. All segments analyzed are based on KYTC's traffic count segments. These typically change when there is a change in roadway characteristic or breakpoint such as an intersecting road. Using an analysis procedure from KTC and referenced in *The Analysis of Traffic Crash Data in Kentucky (2014-2018)*, Actual Crash Rates are compared to the Critical Crash Rates for similar types of Kentucky roadways. The Critical Crash Rate is the rate which is statistically greater than the Average Crash Rate for similar roadways, and it represents a rate which crashes may be occurring in a non-random fashion. This ratio of Actual Crash Rate to the Critical Crash Rate is the Critical Crash Rate Factor (CRF). Thus, a CRF greater than 1.0 indicates crashes may be occurring more often than can be attributed to random occurrence. This procedure is used as a screening technique indicating locations where further analysis may be needed. It is not a definitive statement of a crash problem, nor a measurement of a crash problem.

Crashes were analyzed in 0.3-mile "spots" over the entire length of the study corridor. Based on this analysis, there were 12 high crash spots with a CRF greater than 1.0. Along with analyzing the CRF in these spots, a corresponding EEC analysis was performed for each based on the method described above in **Section 2.5.1**. An overview of these high crash spot locations is presented in **Figure 12**, and additional information, including the calculated CRF and EEC, for each spot analyzed is presented in **Table 6**. CRFs highlighted in red in the table are values that are above the 1.0 threshold.

During the Improvement Option development phase of this study, which will be discussed later in the report, the Project Team felt it was necessary to perform a CRF and EEC analysis for major intersections on US 25 between US 25E and KY 1006. Crashes were analyzed in 0.1-mile sites along US 25, with each intersection being the midpoint of every 0.1-mile site. In a scenario where an intersection is the break point between two traffic segments with varying AADT's, the traffic volumes of the two segments was averaged in order to calculate both the CRF and EEC. However, an exception was made at the intersection of US 25 and KY 1006 due to the drastic difference in AADT of adjacent segments (approximately 9,000 vehicles). A 0.1-mile site to the north and south of KY 1006 was analyzed. Of the 17 sites analyzed, there were 13 high crash sites with a CRF greater than 1.0. An overview of these high crash intersection-site locations is presented in **Figure 13**, and additional information, including the calculated CRF and EEC, for each site analyzed is presented in **Table 7**. CRFs highlighted in red in the table are values that are above the 1.0 threshold.

3. **CRF and EEC Comparison** - To further analyze the crash data, a comparison between the CRF and EEC methodologies was performed. Higher CRFs generally correlated to higher EEC and vice-versa, however the two cannot be directly compared. As AADT goes up, CRF goes down, however, the opposite is true with EEC; as AADT goes up, the EEC goes up. The EEC value for each 0.3-mile spot and 0.1-mile site is presented alongside the CRFs in **Tables 6 and 7**.

Figure 12. High CRF Spots (0.3 Mile)



**US 25, Corbin to London Connector Study**  
High CRF Spots (0.3 Mile)

- ▲ US 25 Milepoint
- Interstate
- US Highways
- Study Area
- High CRF (> 1.00)



**Table 6. High CRF Spots (0.3 Mile) with Corresponding EECs**

Begin Milepoint	End Milepoint	AADT (2017)	Crashes				Critical Rate Factor (CRF)	Adjusted EEC
			Fatal	Injury	PDO	Total		
0.001	0.301	13,353	0	3	29	32	2.40	19
0.301	0.601	13,353	0	0	1	1	0.07	-12
0.601	0.901	13,353	0	2	7	9	0.67	-4
0.901	1.201	13,353	0	2	3	5	0.37	-8
1.201	1.501	13,353	0	1	3	4	0.30	-9
1.501	1.801	13,353	0	3	4	7	0.52	-6
1.801	2.101	13,353	1	8	11	20	1.50	7
2.101	2.401	14,040	0	0	5	5	0.36	-8
2.401	2.701	14,040	0	2	2	4	0.29	-9
2.701	3.001	14,040	0	2	3	5	0.36	-8
3.001	3.301	14,040	0	5	9	14	1.01	1
3.301	3.601	14,040	0	5	14	19	1.37	5
3.601	3.901	14,040	0	9	10	19	1.37	5
3.901	4.201	14,040	0	2	7	9	0.65	-4
4.201	4.501	14,040	0	2	3	5	0.36	-8
4.501	4.801	14,040	0	0	7	7	0.51	-6
4.801	5.101	13,706	0	5	3	8	0.59	-5
5.101	5.401	13,706	1	5	15	21	1.54	8
5.401	5.701	13,706	1	1	1	3	0.22	-10
5.701	6.001	13,706	0	1	4	5	0.37	-8
6.001	6.301	13,706	0	2	1	3	0.22	-10
6.301	6.601	13,706	0	1	4	5	0.37	-8
6.601	6.901	13,706	0	1	5	6	0.44	-7
6.901	7.201	12,373	0	5	2	7	0.55	-5
7.201	7.501	12,373	0	0	4	4	0.32	-8
7.501	7.801	12,373	0	1	6	7	0.55	-5
7.801	8.101	12,373	0	0	6	6	0.47	-6
8.101	8.401	12,373	2	3	5	10	0.79	-2
8.401	8.701	12,373	0	1	6	7	0.55	-5
8.701	9.001	12,373	1	2	16	19	1.50	7
9.001	9.301	21,273	0	4	53	57	3.03	38
9.301	9.601	21,273	0	6	48	54	2.87	35
9.601	9.901	21,273	1	7	30	38	2.02	19
9.901	10.201	21,273	1	1	37	39	2.07	20
10.201	10.501	21,273	0	2	48	50	2.65	31

\*US 25 Critical Rate Factors and Excess Expected Crashes by Roadway Spot (0.3 miles) (3 year, July 2016 - June 2019)



**Table 7. High CRF Intersections (0.1 Mile) and Corresponding EECs**

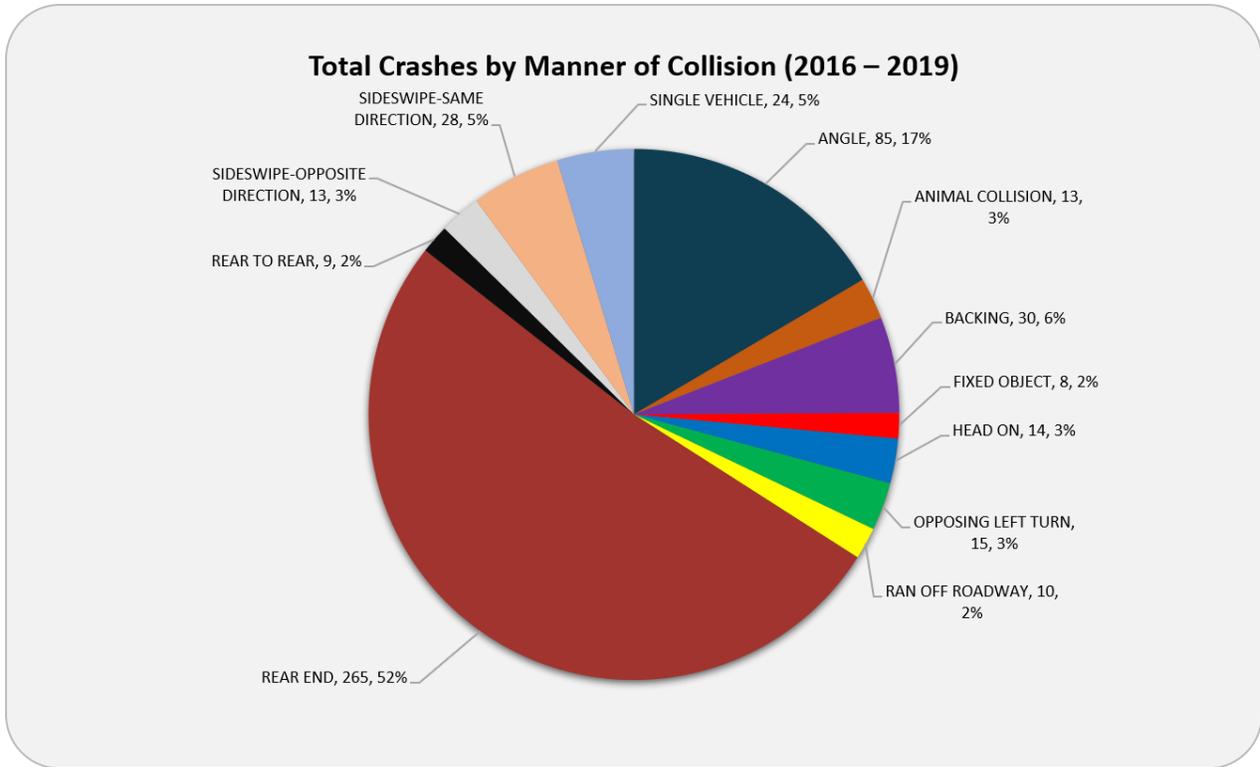
Intersection ID	Intersecting Route	Milepoint	Begin Milepoint	End Milepoint	AADT (2017)	Crashes				Critical Rate Factor (CRF)	Adjusted EEC
						Fatal	Injury	PDO	Total		
1	KY 2392	0.774	0.724	0.824	13,353	0	1	3	4	1.19	0
2	Hopewell Rd (KY 3431)	1.965	1.915	2.015	13,353	1	6	8	15	4.46	10
3	KY 1223	2.098	2.048	2.148	13,697	0	2	6	8	2.35	4
4	KY 2392	2.787	2.737	2.837	14,040	0	2	0	2	0.58	-2
5	Laurel Whitley Rd	3.111	3.061	3.161	14,040	0	2	3	5	1.45	1
6	Robinson Creek Rd	3.48	3.43	3.53	14,040	0	1	6	7	2.03	2
7	Lily School Rd/ Echo Valley Rd	3.606	3.556	3.656	14,040	0	6	8	14	4.06	9
8	Old Highway 25	3.784	3.734	3.834	14,040	0	2	0	2	0.58	-2
9	Lily School Rd / Slate Ridge Rd	4.105	4.055	4.155	14,040	0	2	5	7	2.03	2
10	Old Highway 25	4.311	4.261	4.361	14,040	0	0	1	1	0.29	-3
11	KY 552	4.822	4.772	4.872	13,873	0	1	1	2	0.58	-2
12	Fariston Rd	5.146	5.096	5.196	13,706	0	5	12	17	4.99	12
13	KY 1189	6.953	6.903	7.003	13,040	0	4	2	6	1.81	2
14	Fariston Rd / Old Highway 25	7.511	7.461	7.561	12,373	0	1	4	5	1.55	1
15	Fariston Rd	8.126	8.076	8.176	12,373	2	3	4	9	2.79	5
16	KY 1006	8.928 - 9.028	8.928	9.028	12,373	0	3	18	21	6.51	16
17	KY 1006	9.028 - 9.128	9.028	9.128	21,273	0	1	19	20	4.61	14

**High-Level Crash Analysis**

Aside from these two crash analysis methods, a high-level crash analysis was performed by analyzing the historical crash information provided by the KSP Collision Database and plotting all crashes along the corridor during the 3-year time period by their geographic coordinates. This involved analyzing statistics such as manner of collision, collision severity, daylight versus dark conditions, weather conditions, directional analysis, and others in order to find trends or help determine what could be contributing to crashes along the corridor.

Overall, there were 514 crashes within the 3-year timeframe in the study area. Summary statistics are provided in **Figure 14**. An overview map of the crash distribution density is presented in **Figure 15**. A more in-depth list of all crashes can be found in **Appendix B**.

Figure 14. Crash Statistics Infographic



#### Total Crashes by Severity (2016-2019):



**8 Fatal Crashes (2%)**  
– 8 Fatalities



**94 Injury Crashes (18%)**  
– 177 Injuries  
– A - 13  
– B - 33  
– C - 48



**412 Property Damage Only Crashes (80%)**

#### Other Statistics to Note:

**116 Non-Dry Condition Crashes (23%)**

Wet – 114 (22%)  
Snow/Slush – 1 (0.5%)  
Water – Standing or Moving – 1 (0.5%)



**115 Crashes due to Access Point Density (22%)**

Vehicle Leaving Entrance – 52 (10%)  
Collision with Turning Vehicle – 27 (5%)  
Other Intersection Collisions – 36 (7%)



**98 Non-Daylight Condition Crashes (19%)**  
**82 Dark & Not Lighted or Lights Off (16%)**

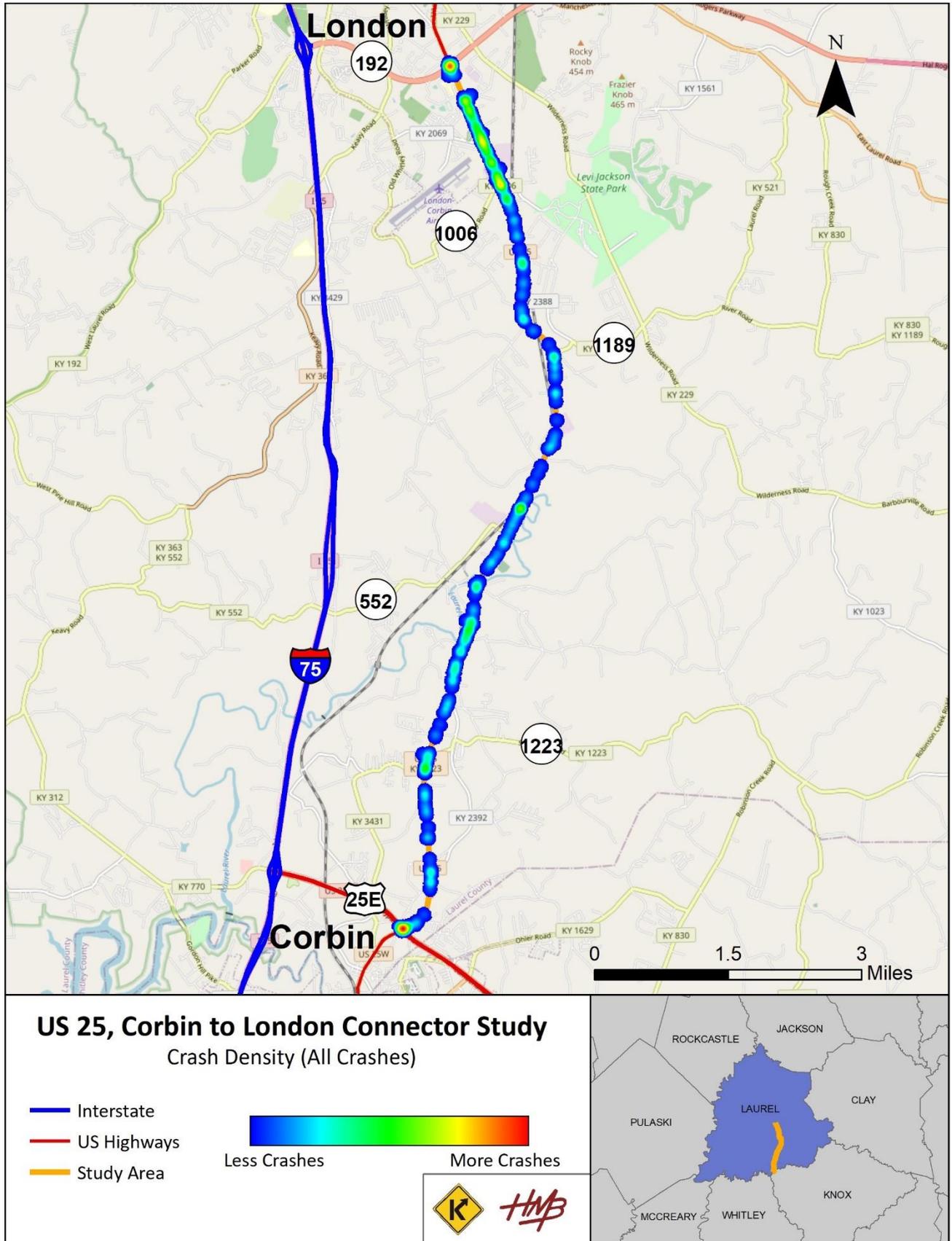


**193 Non-Clear Weather Condition Crashes (38%)**

Cloudy – 119 (23%)  
Raining – 70 (14%)  
Snowing – 2 (0.5%)  
Other – 2 (0.5%)



Figure 15. Crash Density (All Crashes)



# Chapter 3 – Environmental Overview

During the development of improvement concepts, an Environmental Overview was conducted to identify natural environmental resources, human resources, and potential issues. The overview evaluated a study area encompassing a 250-foot buffer surrounding existing US 25 and the proposed full reconstruction alignments. The portion of the buffer following existing US 25 was used to explore the potential environmental impacts of any spot improvement options.

Natural and human environmental resources were identified from a literature/database review. This included reviewing the technical baselines and draft Environmental Assessment completed from 2012-2015 during the preliminary design of potential US 25 widening alternatives from US 25E in Corbin to KY 1006 in London (KYTC Item No. 11-8515.00). Environmental resources within the study area are summarized in the following sections.

## 3.1 Natural Environment

The natural environment typically refers to all living and non-living things found to occur in nature. It includes aquatic ecology such as rivers, streams, and wetlands; threatened and endangered species; prime and unique farmland; and geotechnical resources.

### Rivers and Streams

The study area is within the Laurel River and Lynn Camp Creek watersheds. The most notable water resources identified are Laurel River and Robinson Creek, which cross the study area before joining together to the west and then draining into Laurel River Lake. Other streams in the study area included Little Laurel River, Horse Creek, and numerous unnamed tributaries. No streams in the study area are designated by the Kentucky Division of Water as a Special Use Water, however, the Laurel River Lake is designated as a Special Use Water for Cold Water Habitat.

### Wetlands and Ponds

A database search of the U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI) identified over 20 wetlands in the study area. All NWI wetlands are palustrine wetlands, with the majority being freshwater ponds. In addition to the NWI database, field investigations performed for the technical baseline (2012-2013) encountered numerous other wetlands, including numerous wetlands created within the roadside ditch. Further investigation would be required to field verify the wetland locations and delineate their size.

### Groundwater

Approximately twenty water wells are known to exist inside the study area. The majority are monitoring wells, along with a couple single-family domestic use wells.

### Floodplain/Floodway

The Federal Emergency Management Agency's (FEMA)'s National Flood Hazard data was used to identify regulatory floodplains and floodways within the study area. This data shows significant floodplain areas adjacent to Horse Creek, Robinson Creek, Laurel River, and Little Laurel River, all of which cross the study area. There are no regulatory floodways within the Study Area.

### Prime Farmland

Potential for prime farmland and farmland of statewide importance was determined by reviewing the Natural Resources Conservation Service's (NRCS) Web Soil Survey maps. Considering the majority of the study area was along existing US 25 and the developed areas adjacent to it, there was limited acreage of farmland identified as prime farmland or farmland of prime farmland identified. These farmland areas are typically in the undeveloped, off-alignment areas.

### **Endangered Species**

Within the study area, the USFWS lists 3 bats, 2 mussels and 2 plant species as threatened or endangered. In addition, most of area is designated as "Known Summer 1" habitat for the northern long-eared bat. No critical habitats were identified through the study area.

## **3.2 Human Environment**

The human environment typically refers to the built environment or the communities where we live. It includes elements such as land use, community features, historic districts and properties, and hazardous materials considerations.

### **Land Use / Community Features**

The land use within the study area is mostly commercial and residential areas with a small amount of agricultural use. Businesses are located throughout the existing US 25 corridor, including mechanic shops, factories, retail stores, and others. There are also few churches within the study area and several others just outside the boundary. In the technical baseline it was determined that a full reconstruction of US 25 could result in relocation of numerous businesses, ranging from 30 to 70 depending on the alignment, and multiple churches, ranging from two to four.

One school, Hunter Hills Elementary School, and one medical facility was identified within the study area. However, their buildings are located outside of the study area and only the entrances and parking areas are within the boundary.

No post office, government service centers, medical offices or similar community resources or community institutions were located within the study area. Several resources, such as the South Laurel High School, are located just beyond the study area.

### **Parks and Recreational Lands**

Levi Jackson Wilderness Road Park is the only park located near the study area; however, it is beyond the study area's 250-foot boundary from the existing US 25.

### **Historic Districts and Properties**

There are no known properties or historic districts listed on the National Register of Historic Places (NRHP) within the study area. However, a Cultural Historic technical baseline survey completed in 2012-2013 did determine three sites were potentially eligible. This study was part of the environmental studies performed during the preliminary design of potential US 25 widening alternatives (11-8515.00). A total of 293 properties were assessed during this study. The three sites were determined potentially eligible sites following coordination with the Kentucky Heritage Council (KHC) and the State Historic Preservation Office (SHPO). Two of the sites were residential properties and one was a truss bridge. Due to the amount of time that has passed since that evaluation, each of the 293 sites would have to be reconsidered should any of the improvement options from the current study be carried forward.

### **Noise / Air**

A preliminary straight-line analysis of the proposed traffic indicates that noise receptors (homes, parks, etc.) within approximately 90 feet to 140 feet of US 25 have the potential to exceed the criteria for sound levels. Further investigations will be required to verify noise levels at these locations and to analyze the potential for structural noise barrier mitigation where impacts occur depending on the improvement option chosen to be carried forward. For air quality, Knox and Laurel County are in attainment for all areas of potential air pollutants.

### **Hazardous Materials**

Two resources were reviewed to identify potential sites containing hazardous materials. First, a database from the US Environmental Protection Agency (EPA) was reviewed and identified 23

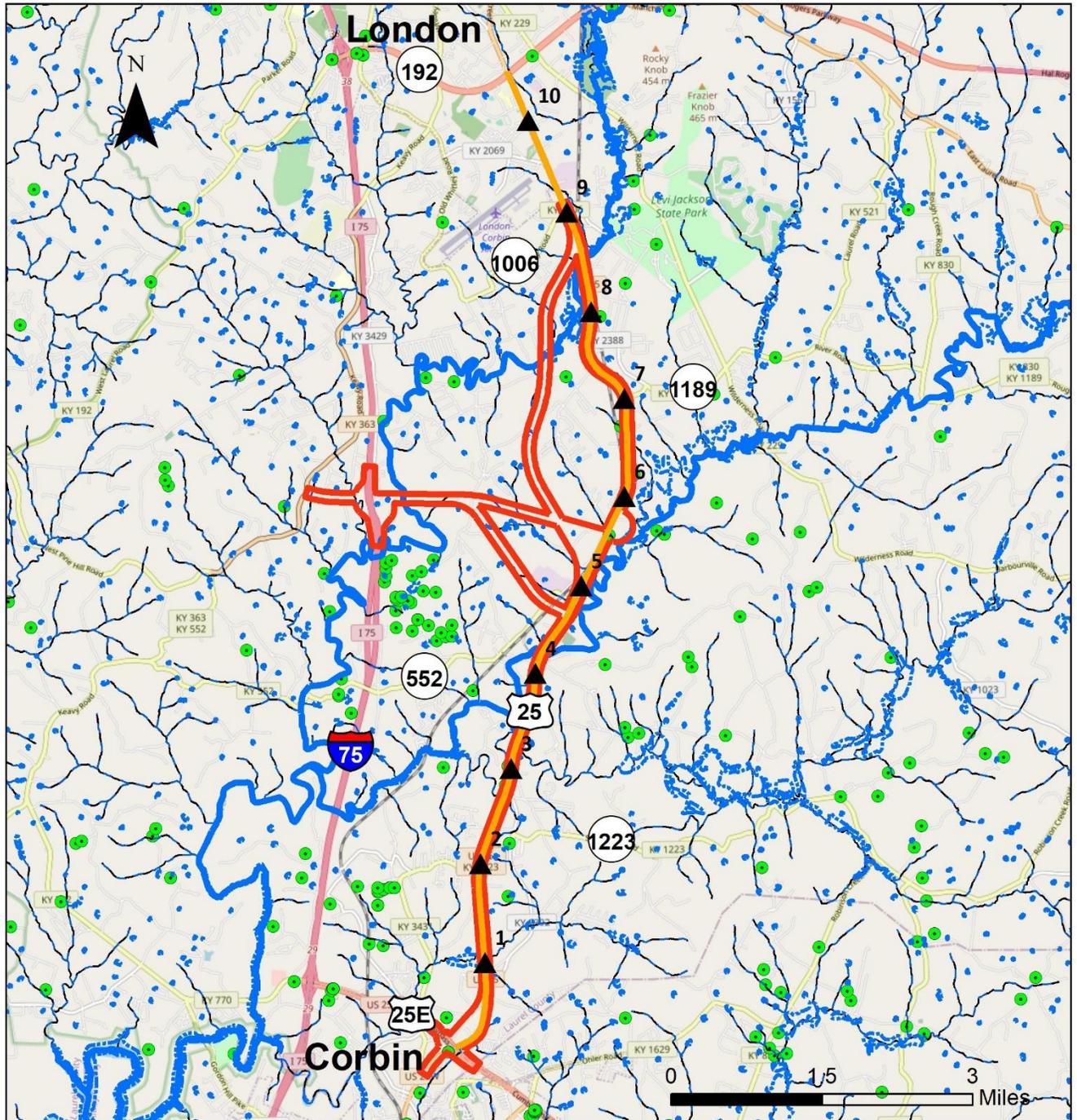
hazardous waste sites within the study area. Second, the hazardous materials baseline survey completed in 2013 (as a part of 11-8515.00) was reviewed. The baseline survey reviewed nearly 80 potential hazmat sites within and outside the proposed study area. Further investigations into each of these locations would be required to determine the level of impact and whether Phase II Investigations would be required for cleanup activities depending on the improvement option chosen to be carried forward.

**Socioeconomics**

The study area is highly populated with conventional and mobile homes. It's anticipated that any significant alterations to the existing US 25 roadway would require a large number of residential relocations.

The US Census Bureau's American Community Survey (ASC) results were consulted for a comparative review of the potential for impacts to low-income and minority residents. The project area covers several census tracts and numerous block groups. Within the study area, the percent of minority residents is lower in comparison to all of Laurel County. A similar comparison was done for low-income populations and showed that the project area is slightly higher than that of Laurel County.

Figure 16. Natural Environment

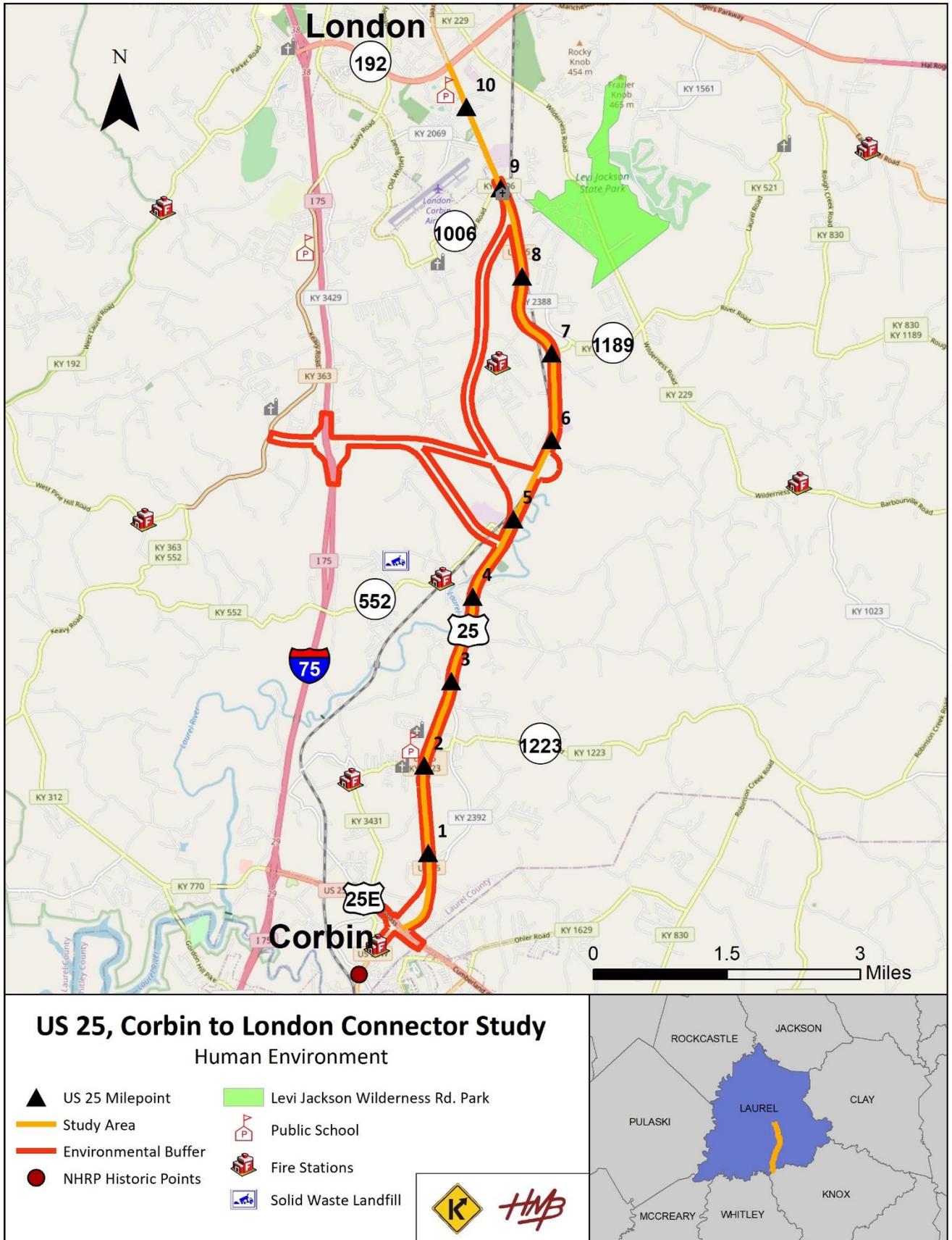


**US 25, Corbin to London Connector Study**  
Natural Environment

- ▲ US 25 Milepoint
- Study Area
- Environmental Buffer
- Water Wells
- ▭ Wetlands
- Streams
- Rivers



Figure 17. Human Environment



## Chapter 4 – Initial Coordination Efforts

During the course of the study, multiple collaborative meetings were held. These included two traffic model update meetings, three Project Team meetings, and one local officials / stakeholders (LO/S) meeting to gather input on potential improvements to US 25. The LO/S meeting was followed by a virtual public outreach effort to gather input from the community surrounding the study area.

Initial coordination efforts included the two model update meetings and the first of three Project Team meetings. The modifications to the Laurel Pulaski Travel Demand Model, which was used for the traffic forecast that is a part of this study, were discussed during each of the model update meetings. This traffic model was updated as a part of a separate contract. The first Project Team meeting provided an opportunity to review the project background and purpose of the study, present and discuss the existing conditions information, and review the traffic model to be utilized in the study. These meetings included KYTC Central Office, KYTC District 11, and consultant personnel.

The initial meetings are discussed below, while the subsequent meetings with the Project Team and LO/S were conducted after the development of potential improvement options and are discussed in **Section 5.3 and Chapter 6**.

### 4.1 Model Update Meeting No. 1

The first Model Update meeting was held on Thursday, December 19, 2019 at KYTC Central Office. Representatives included KYTC Division of Planning staff, KYTC District 11 staff, and the consultant teams. The Phase I Preliminary Engineering effort consisting of major widening of US 25 from US 25E to KY 1006 (11-8515.00) was discussed. KYTC's desire was to revisit this project to determine if the widening of US 25 was still justified and analyze a potential I-75 interchange and connection to US 25. Another consultant, who attended this coordination meeting, was assigned a traffic modeling task through a separate contract to update the Laurel Pulaski Travel Demand Model. The updated model provided traffic volumes in No Build and Build scenarios that were used by the Project Team to complete the traffic forecasting effort. Key action items were what would be included and excluded in the updated model, the Build scenarios that would be evaluated, and the next steps of the US 25, Corbin to London Connector Study. For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

### 4.2 Project Team Meeting No.1

The first Project Team meeting was held on Tuesday, February 25, 2020 at KYTC Central Office. Representatives included KYTC Division of Planning staff, KYTC District 11 staff, and the consultant teams. Study background information including the project history, study area, objective and goals, tasks, and schedule were shared with the attendees. The meeting also included a review of collected existing conditions information such as typical sections, traffic conditions, and preliminary crash analysis. Key action items included discussion of the ideas for improvement options and preliminary traffic model results to be used as a part of this study. For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

### 4.3 Model Update Meeting No. 2

The second Model Update meeting was held on Friday, March 27, 2020 and was conducted virtually due to health and safety concerns resulting from the COVID-19 pandemic. Representatives included KYTC Division of Planning staff, KYTC District 11 staff, and the consultant teams. KYTC reviewed the updated Laurel Pulaski Travel Demand Model results prior to the meeting and the results were presented to the Project Team. Several improvements made to the model since Model Update Meeting No. 1 included fixing an I-75 ramp issue in Corbin, revisiting the 2040 socioeconomic data, accounting for the widening of I-75 south of the weigh station, and confirming US 25 was widened in all build scenarios. The following nine scenarios were modeled:

- 2017 Base Year
- 2025/2040 No Build
- 2025/2040 US 25 On Alignment Widening with New Interchange
- 2025/2040 US 25 Off Alignment Widening with New Interchange
- 2025/2040 US 25 On Alignment Widening with No New Interchange

KYTC noted that if an interchange was not added to the model, an estimated 800-900 trips were added to US 25. The Project Team discussed the fact that the numbers obtained from the analysis indicated that traffic volumes did not change significantly between scenarios, despite accounting for new development that was included in the socioeconomic data. Other key action items discussed during this meeting included:

- Review the count stations the respective growth rate at each count station.
- Review the updated model results that will be used to develop the traffic forecast.
- Request updated traffic counts near the study area.
- Finalize the updated Laurel Pulaski Travel Demand Model.

For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

# Chapter 5 – Improvement Concept Development and Analysis

In this chapter, the process is summarized for the identification of where improvements may be beneficial along with the development of improvement options for the identified locations. The existing conditions analysis and coordination with KYTC personnel informed and guided the development and evaluation of locations and concepts. Improvements were only considered along US 25 from US 25E (MP 0.000) to KY 1006 (MP 9.028). As noted previously, an existing KYTC project addressing the safety and operation of US 25 from KY 1006 (MP 9.028) to KY 192 (MP 10.505) is currently in the right-of-way phase (Item No. 11-147.00).

The improvements were divided into two categories: 1) Spot and Safety and 2) Full Reconstruction. Spot and Safety options were considered potential short-term and medium-term improvements, while the Full Reconstruction options were considered long-term improvements and included new construction and major widening.

## 5.1 Identification of Initial Improvement Options

Spot and Safety improvement options were identified through the detailed crash analysis discussed previously in this report. Improvements in this category include less invasive ways to improve the safety and operation of the corridor without major modifications to US 25. A few examples of these improvements are reducing access point density, restriping US 25 with reflective pavement markings, intersection improvements, and widening short segments of US 25. Each high crash location (CRF greater than 1.0) was examined to determine if spot improvements are appropriate, and crashes within those high CRF “spots” were analyzed to determine trends and potentially attribute crashes to a particular roadway characteristic.

Full Reconstruction options, including any new construction or major widening, were identified through previous design efforts (Item No. 11-8515.00) and planning studies (Item No. 11-190.00). The feasibility of these long-term improvements was evaluated through traffic and crash analysis. The traffic analysis was used to gauge congestion on US 25 in a future year of 2040, while the crash analysis was used to determine the overall safety of US 25 from Corbin to London. Patterns in the crash analysis indicate that access point density negatively affect the safety of US 25 from Corbin to London, and access point density also affects the traffic analysis negatively impacting a roadway segment’s LOS. AASHTO’s *A Policy on Geometric Design of Highways and Streets, 7<sup>th</sup> Edition (2018)* provides guidance on how access point density may increase the rate at which crashes occur. This section of US 25 has 34 access points per mile, which has historically caused eight crashes per million vehicle miles on undivided roadways and between six and seven crashes per million vehicle miles for roadways with a TWLTL. Additional information about the traffic and crash analysis can be found in **Appendix D** and **Appendix B**.

Existing Information was compiled for each improvement option location including:

- 2019 AADT
- Speed Limit
- Number of Lanes
- Lane Width
- Shoulder Width
- Crash Rate (CRF)
- Excess Expected Crashes (EEC)
- Crash Severity (K and A)

- Total Crashes
- Any Geometric Issues Present

**Table 8** on **Pages 39–40** provides a summary of improvement locations and descriptions initially identified through this process.

## 5.2 Analysis of Initial Improvement Options

With a comprehensive initial list of possible improvement locations, the next step was to refine the list through further analysis and feedback from KYTC. To do so, additional information was determined beneficial to help with decision making. This included the following:

### Additional Crash Analysis

Identifying the improvement options included in the initial list presented to the Project Team relied heavily on the 0.3-mile spot analysis of the entire study corridor and the severity of the crashes that occurred in those segments from 2016 to 2019 discussed in **Section 2.5**. Several improvement options consisted of modifying intersections between approach roads and US 25 to enhance safety. Consequently, the Project Team felt it was necessary to perform a CRF and EEC analysis for major intersections on US 25 between US 25E and KY 1006 with each intersection being the midpoint of a 0.1-mile site. The following intersections were included as a part of this analysis:

- KY 2392 (MP 0.724)
- Hopewell Rd. (MP 1.965)
- KY 1223 (MP 2.098)
- KY 2392 (MP 2.787)
- Laurel Whitley Rd. (3.111)
- Robinson Creek Rd. (MP 3.480)
- Lily School Rd. / Echo Valley Rd. (MP 3.606)
- Old Highway 25 (MP 3.784)
- Lily School Rd. / Slate Ridge Rd. (MP 4.105)
- Old Highway 25 (MP 4.311)
- KY 552 (MP 4.822)
- Fariston Rd. (MP 5.146)
- KY 1189 (MP 6.953)
- Fariston Rd. / Old Highway 25 (MP 7.511)
- Fariston Rd. (MP 8.126)
- KY 1006 (MP 9.028)

This 0.1-mile intersection crash analysis provided valuable information that aided in differentiating the initial improvement option locations from a safety standpoint. The intersection focused CRFs and EECs helped drive improvement option modification and prioritization. Information on this additional crash analysis can be found in **Section 2.5**.

### Segment Forecasts and Operations

Year 2025 and 2040 traffic forecasts for US 25, I-75 (US 25E to KY 192), US 25E (I-75 to US 25), and KY 192 (I-75 to US 25) were generated based on evaluation of historical traffic growth analysis and consultation with the Laurel Pulaski Travel Demand Model that was updated through a separate contract. The analysis utilized traffic counts obtained from KYTC's Traffic Database which included counts from 2000 to 2020. In the Build scenario, widening US 25 both on alignment and off alignment were explored. These options were evaluated with and without a new connection between KY 363 and US 25 (MP 4.700 or MP 5.800) including a grade separated interchange near

I-75 MP 33.500. The traffic forecast volume results (AADT) are included in **Table 9** on **Page 41**, and a map of the traffic forecast segments is illustrated in **Figure 18** on **Page 42**.

One of the goals of this study was to determine if the future widening of I-75 between Corbin and London (Item No. 11-9.01) would attract a significant amount of traffic that traveled on US 25 prior to the project's completion. Information from the updated Laurel Pulaski Travel Demand Model indicated that there were no significant changes on US 25 in traffic volumes when comparing the No Build and Build scenarios. For Segments 3 and 4 (**Table 9**) in the Build – Off Alignment scenario, traffic volumes on newly constructed US 25 decreased (29 percent – 38 percent) with those vehicles remaining on old US 25. Traffic volumes on I-75 increased (7 percent – 18 percent) when comparing the No Build and Build scenarios. For additional details regarding the traffic forecasting process, refer to **Appendix D**.

### **Planning Level Cost Estimates**

Planning-level (high-level) cost estimates were produced for each of the improvement options by estimating the 2020 costs of Design, Right-of-way acquisition, Utilities, and Construction. No surveying or detailed design was performed. Construction quantities such as pavement, earthwork, traffic items, etc. were estimated for each item determined to be necessary to construct the proposed improvements. Factors were applied to increase this amount to account for contingencies, miscellaneous items not estimated, and small-project inflation. This cost was then multiplied by a factor to estimate the design cost. KYTC D11 evaluated each improvement option location to determine right of way and utility impacts. High-level cost estimates were provided to the consultant team and included in the overall cost estimate for each improvement option.

**Table 8. Summary List of Initial Improvement Options**

Improvement Option ID	Route	Milepoint	Intersecting Route	AADT (2019)	Speed Limit	No. Lanes	Lane Width (ft)	Shoulder Width (ft)	CRF	EEC	Crashes (K)	Crashes (A)	Total Crashes	Geometric Issues	Description
<b>SPOT AND SAFETY</b>															
1	US 25	0.000 - 9.028	N/A	14,200	55 (MP 0.24 to MP 8.90) 45 (MP 0.0 to MP 0.24, MP 8.90 to MP 9.028)	Varies	12 (MP 0.0 to MP 2.098) 11 (MP 2.098 to MP 9.028)	2 to 14	7 Spots	-96	6	12	291	Access Point Density	Improve access management on US 25 from the intersection with US 25E to KY 1006. Several parking lots along this corridor are flush with the shoulder. The amount of access points will be reduced and entrances will be consolidated and more clearly defined.
2	US 25	0.000 - 9.028	N/A	14,200	55 (MP 0.24 to MP 8.90) 45 (MP 0.0 to MP 0.24, MP 8.90 to MP 9.028)	Varies	12 (MP 0.0 to MP 2.098) 11 (MP 2.098 to MP 9.028)	2 to 14	7 Spots	-96	6	12	291	N/A	Speed limit will be reduced through areas that have a high frequency of access points. Countermeasures will be implemented to encourage vehicles to transition to a slower speed. Ex. Speed Limit: 55 mph Prop. Reduction: 45 mph
3	US 25	0.000 - 9.028	N/A	14,200	55 (MP 0.24 to MP 8.90) 45 (MP 0.0 to MP 0.24, MP 8.90 to MP 9.028)	Varies	12 (MP 0.0 to MP 2.098) 11 (MP 2.098 to MP 9.028)	2 to 14	7 Spots	-96	6	12	291	N/A	Increase how frequently this corridor is patrolled by law enforcement to enforce the posted speed limit. Radar speed signs will be installed strategically throughout the corridor as a traffic calming measure. The posted speed limit will be displayed on each radar speed sign.
4	US 25	0.000 - 9.028	N/A	14,200	55 (MP 0.24 to MP 8.90) 45 (MP 0.0 to MP 0.24, MP 8.90 to MP 9.028)	Varies	12 (MP 0.0 to MP 2.098) 11 (MP 2.098 to MP 9.028)	2 to 14	7 Spots	-96	6	12	291	N/A	Restripe US 25 from US 25E to KY 1006 using 6" thermo pavement markings. This will improve the visibility of the pavement striping and enhance the safety of the corridor.
5	US 25	0.000 - 9.028	N/A	14,200	55 (MP 0.24 to MP 8.90) 45 (MP 0.0 to MP 0.24, MP 8.90 to MP 9.028)	Varies	12 (MP 0.0 to MP 2.098) 11 (MP 2.098 to MP 9.028)	2 to 14	7 Spots	-96	6	12	291	N/A	Install advanced warning signs at the following approach roads alerting drivers of oncoming traffic or traffic entering US 25: Hopewell Rd., Laurel Whitley Rd., Robinson Creek Rd., Lily School/Echo Valley Rd., Lily School/Slate Ridge Rd., Parkside Rd., KY 1189, Fariston Rd./Old US 25
6	US 25	3.606	Lily School Rd	14,200	55	2 (TWLTL)	11	4	1.37	5	0	3	18	N/A	Remove vegetation in NW corner of intersection in order to improve sight distance.
7	US 25	1.965	Hopewell Rd	12,300	55	2 (TWLTL)	12	14 NB 4 SB	1.50	7	0	1	16	N/A	Improve intersection by widening Hopewell Road to separate left and right turn lanes. Move entrance from US 25 to Hopewell Road and install lighting along US 25.
8	US 25	3.111	Laurel Whitley Rd	14,200	55	2	11	4	1.01	1	0	1	13	Intersection Skew	Improve intersection sight distance by moving the tie point of Laurel Whitley Road to US 25 from MP 3.11 to MP 3.06, which will reduce the skew of the approach road.
9	US 25	2.800 - 3.500	N/A	14,200	55	2	11	4	1.37	5	0	1	16	N/A	Widen the existing two lane section of US 25 to accommodate a two way left turn lane. This pulls left-turning traffic out of the traveled way. The bridge over Robinson Creek will be replaced, and the initial construction of this section mirrors the preferred alternative selected for the ultimate reconstruction of US 25.
10	US 25	3.480	Robinson Creek Rd	14,200	55	2 (TWLTL)	11	4	1.37	5	0	0	16	Intersection Skew	Move the intersection of Robinson Creek Rd and US 25 to the south in order to eliminate the skew and improve sight distance.
11	US 25	3.784	Old Hwy 25	14,200	55	2 (TWLTL)	11	4	1.37	5	0	0	18	Intersection Skew	Improve intersection skew by moving the tie point of Old Hwy 25 to US 25 to approximately MP 3.79.
12	US 25	5.146	Fariston Rd	13,800	55	2	11	4	1.54	8	0	0	19	N/A	Remove access to US 25 from Fariston Road at MP 5.15. Construct a more desirable thru movement to connect Fariston Road to Greta Lane and extend box culvert. Vehicles that currently gain access to or leave US 25 at Fariston Rd will travel to KY 552. Evaluate warrants for traffic signal at the intersection of KY 552 and US 25.
13	US 25	8.126	Fariston Rd	12,500	55	2	11	4	0.79	-2	2	1	12	Intersection Skew	Eliminate Fariston Road access point to US 25 at MP 8.12. Vehicles that currently access US 25 through this intersection will do so through Old Hwy 25 at approximately MP 7.5. Construct new connection for Old Hwy 25/US 25 to improve intersection skew.
14	US 25	8.400 - 9.028	N/A	12,500	55	2	11	4	1.50	7	1	0	14	N/A	Widen the existing two lane roadway to four lanes with a raised median. The lane configuration will match a section of US 25 to the north that was previously designed. Vehicles traveling SB will no longer be able to turn left into the access points on the east side of US 25. Those vehicles will access these properties through a J-turn at approximately MP 8.63.
15	US 25	8.400 - 9.028	N/A	12,500	55 (MP 8.40 to MP 8.90) 45 (MP 8.90 to MP 9.028)	2	11	4	1.50	7	1	0	14	N/A	Re-align US 25 from approximately MP 8.40 to 8.90. Use the existing two lane stretch of US 25 as a frontage road in order to separate through traffic and traffic entering/exiting the access points to the east.

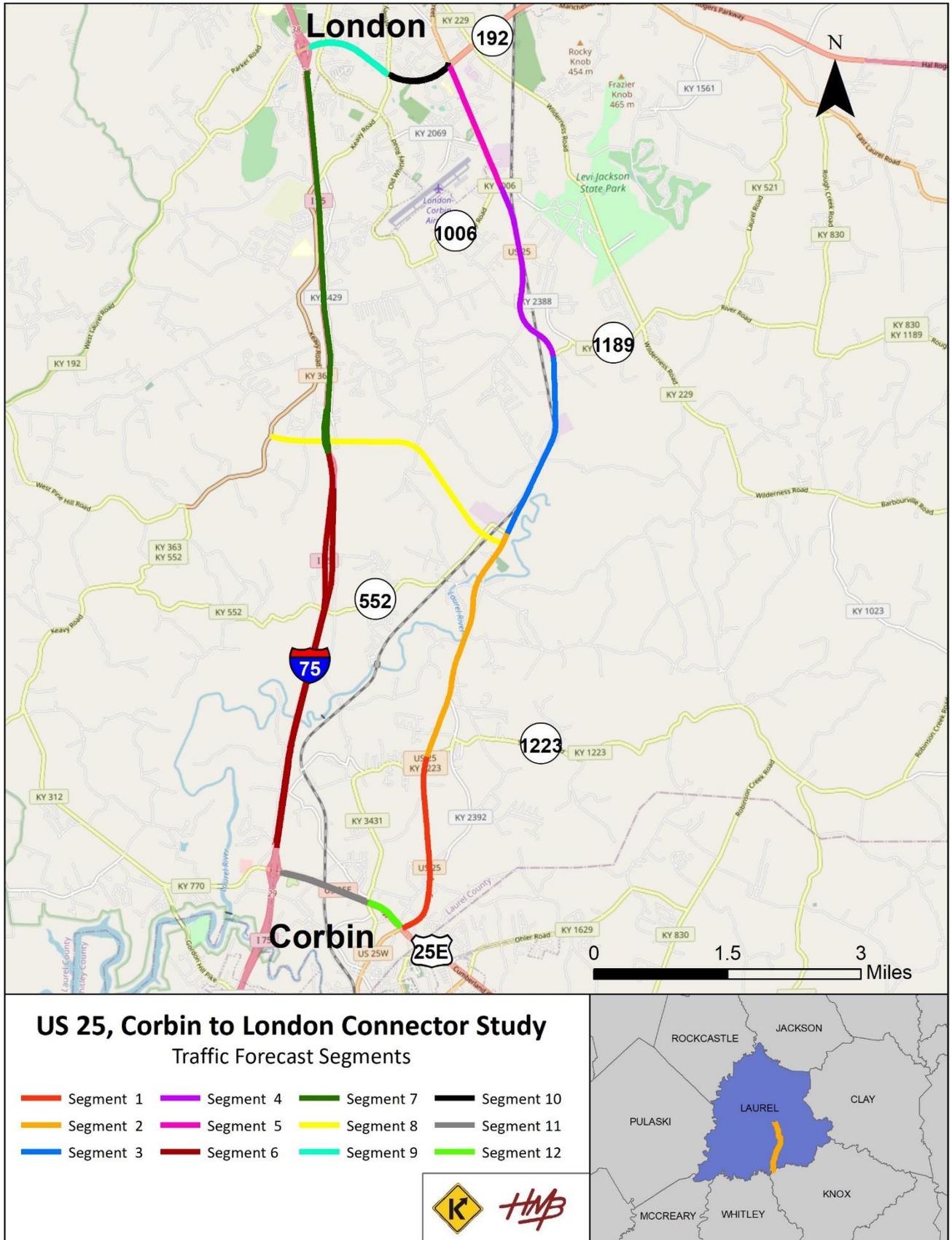
**Table 8 Cont. Summary List of Initial Improvement Options**

Improvement Option ID	Route	Milepoint	Intersecting Route	AADT (2019)	Speed Limit	No. Lanes	Lane Width (ft)	Shoulder Width (ft)	CRF	EEC	Crashes (K)	Crashes (A)	Total Crashes	Geometric Issues	Description
<b>FULL RECONSTRUCTION</b>															
16	US 25	0.000 - 9.028	N/A	14,200	55	4	12	Outside - 10 Inside - 4	7 Spots	-96	6	12	291	Deficient Horizontal Curves / Access Point Density	US 25 will be fully reconstructed along the roadway's existing alignment until MP 5.0. At that point new US 25 curves to the west of the existing alignment and travels cross country before tying back to existing US 25 at KY 1006.
17	US 25	0.000 - 9.028	N/A	14,200	55	4	12	Outside - 10 Inside - 4	7 Spots	-96	6	12	291	Deficient Horizontal Curves / Access Point Density	US 25 will be fully reconstructed along the roadway's existing alignment.
18	US 25	0.000	US 25E	N/A	N/A	N/A	N/A	N/A	N/A	36	0	0	81	N/A	Construct a grade separated interchange at US 25E and US 25. The new interchange will be to the north of the existing intersection, and US 25 will be realigned to the west of its existing alignment. The new alignment will tie into existing US 25 at MP 0.80.
19	KY 552	US 25 2.750	US 25	N/A	55	2	11	4	N/A	N/A	N/A	N/A	N/A	N/A	Construct new connection from KY 552 to US 25 south of Lily and north of Hopewell. New KY 552 will tie to US 25 at MP 2.75.
20	I-75 CONN.	US 25 4.700 (16) 5.800 (17)	KY 363 / US 25	N/A	55	2	11	4	N/A	N/A	N/A	N/A	N/A	N/A	Construct new connection from KY 363 to US 25 north of Lily. This roadway will be bridged over I-75 and a new interchange will be constructed. The I-75 Connector ties to US 25 at MP 4.70 (US 25 Option 16) and MP 5.80 (US 25 Option 17)

**Table 9. Traffic Forecast Results Summary**

Segment ID	Beginning Description	Ending Description	2019 AADT (No Build)	2025 AADT (No Build)	2040 AADT (No Build)	2025 AADT (Build - On Alignment)	2040 AADT (Build - On Alignment)	2025 AADT (Build - Off Alignment)	2040 AADT (Build - Off Alignment)	2025 AADT (Build - No Interchange)	2040 AADT (Build - No Interchange)
<b>US 25</b>											
1	US 25E	KY 1223	12,300	12,700	13,700	12,200	13,100	12,100	13,000	13,100	14,100
2	KY 1223	KY 552	14,200	14,600	15,800	13,200	14,200	13,900	15,000	14,100	15,200
3	KY 552	KY 1189	13,800	14,200	15,300	13,400	14,400	8,300	8,900	13,900	15,000
4	KY 1189	KY 1006	12,500	12,900	13,900	11,300	12,200	8,100	8,700	12,500	13,500
5	KY 1006	KY 192	19,500	20,100	21,700	18,900	20,400	18,900	20,400	20,600	22,200
<b>I-75</b>											
6	US 25E	Connector	42,900	45,500	52,900	53,600	62,200	52,700	61,200	49,100	57,000
7	Connector	KY 192	42,900	45,500	52,900	51,300	59,600	53,100	61,600	49,100	57,000
<b>I-75 CONNECTOR</b>											
8	I-75	US 25E	N/A	N/A	N/A	4,000	5,000	6,000	7,500	N/A	N/A
<b>KY 192</b>											
9	I-75	KY 363	29,900	31,700	36,800	27,300	31,700	28,400	33,000	29,400	34,100
10	KY 363	US 25	23,000	24,400	28,300	21,900	25,400	22,200	25,800	24,500	28,400
<b>US 25E</b>											
11	I-75	KY 3431	24,800	26,300	30,600	27,200	31,600	26,000	30,200	26,800	31,100
12	KY 3431	US 25	20,900	22,200	25,800	24,900	28,900	24,600	28,600	24,500	28,400

Figure 18. Traffic Forecast Segments



## 5.3 Project Team Meeting No. 2

The second Project Team meeting was held on Tuesday, July 21, 2020 at 10:00 AM (Eastern Time) and was conducted virtually due to health and safety concerns resulting from the COVID-19 pandemic. The consultant team prepared an ArcGIS StoryMap presentation to discuss information regarding additional findings on roadway existing conditions, the crash history and an updated crash analysis, the preliminary traffic forecast and analyzed speed data, and the environmental resources near the study area.

Preliminary improvement options were developed prior to the meeting as a result of a more detailed look at the study corridor and additional analysis and presented to the Project Team. KYTC provided valuable input on each of the improvement options and made suggestions for additional improvements. During the meeting, the Project Team decided to proceed with additional coordination between KYTC D11 and the consultant team to discuss the elimination and modification of several improvement options. KYTC D11 emphasized that any short-term improvements should consider future widening throughout the US 25 corridor. Modifications were made to the initial improvement options based on this suggestion so that each improvement would be compatible with any major widening or new construction along US 25.

The LO/S meeting was discussed in detail, and the importance of public involvement was emphasized by KYTC. There was concern of limited responses/involvement if the meeting and public outreach effort were virtual. The Project Team agreed to continue to think of creative ways to maximize public input and that the method for this meeting would be determined at a later date. For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

## 5.4 Revised Improvement Options

Utilizing the gathered information, the initial list of improvement options was reduced from 20 to 19. This reduction included eliminating initial improvements, modifying and consolidating initial improvements, and adding new improvements. **Table 10** provides a summary of how the initial improvement options were modified, and **Table 11** provides a summary of the revised list of improvement options.

It should be noted that the Improvement Option ID was changed from numerals to letters before compiling the revised list of improvement options. The first improvement option in each category starts with the letter "A." **Table 10** outlines how each improvement option ID changed based on the initial list and **Table 11** reflects these changes.

These improvements were then presented to the Project Team for further review and additional analysis prior to any public engagement efforts.

**Table 10. Improvement Option Modifications**

Initial Improvement Option ID	New Improvement Option ID	Modification
<b>SPOT AND SAFETY</b>		
1	A	Improvement option ID only
2	N/A	Eliminated: Upon further review of the speed data crashes cannot be attributed to vehicles traveling at high speeds. Access point density throughout the corridor is a major concern and will be addressed through other improvements
3	N/A	Eliminated: Upon further review of the speed data crashes cannot be attributed to vehicles traveling at high speeds. Access point density throughout the corridor is a major concern and will be addressed through other improvements
4	B	Improvement option ID only
5	N/A	Eliminated: After consultation with KYTC D11 it was revealed that this type of improvement has not significantly reduced crashes on routes similar to US 25 in this region
6	N/A	Eliminated: The additional intersection crash analysis revealed that this location has a CRF/EEC of 4.06/9. The Project Team decided that this intersection warranted a more robust improvement.
7	C	Improvement option ID only
N/A	D	New improvement option
N/A	E-1	New improvement option
8	E-2	Improvement option ID only
9	F	Improvement option ID only
10	G	Move Robinson Creek Rd. to the south to improve intersection skew. Reconstruct Echo Valley Rd. to tie to US 25 across from Robinson Creek Rd. at approximately MP 3.450. Construct a cul-de-sac to terminate Lily School Rd. at US 25 MP 3.606.
N/A	H	New improvement option
11	N/A	Eliminated: The additional intersection crash analysis revealed that this location has a CRF/EEC of 0.58/-2. The Project Team decided that this intersection did not warrant improvements based on this information
12	I-1	Remove access to US 25 from Fariston Rd. at MP 5.146. Vehicles that currently gain access to or leave US 25 at Fariston Rd. will travel to KY 552. Evaluate warrants for traffic signal at the intersection of KY 552 and US 25.
N/A	I-2	New improvement option
13	J	Improvement option ID only
14	K-1	Improvement option ID only
15	K-2	Improvement option ID only
<b>FULL RECONSTRUCTION</b>		
16	A	Improvement option ID only
17	B	Improvement option ID only
18	C	Improvement option ID only
19	N/A	Eliminated: Upon review of the planning level cost estimate the Project Team decided that this improvement was too costly at this time
20	D-1	Improvement option ID only
20	D-2	Improvement option ID only

**Table 11. Summary of Revised Improvement Options**

Improvement Option	Description	Milepoints	2025 AADT	2040 AADT	CRF	EEC	Cost (DRUC*)
<b>SPOT AND SAFETY</b>							
A	Access Management	0.000 - 9.028	12,700 - 14,600	13,600 - 15,800	7 Spots	-96	\$ 1,260,000
B	Reflective Pavement Striping	0.000 - 9.028	12,700 - 14,600	13,600 - 15,800	7 Spots	-96	\$ 170,000
C	Hopewell Rd. Improvement	1.965	12,700	13,600	4.46	10	\$ 270,000
D	KY 1223 Intersection Improvement	2.098	14,600	15,800	2.35	4	\$ 965,000
E-1	KY 2392 Intersection Improvement	2.787	14,600	15,800	1.45	1	\$ 935,000
E-2	Laurel Whitley Rd. Intersection Improvement	3.111	14,600	15,800	1.45	1	\$ 580,000
F	US 25 Widening (TWLTL)	2.800 - 3.500	14,600	15,800	1.37	5	\$ 8,180,000
G	Robinson Creek Rd./Echo Valley Rd./Lily School Rd. Intersection Improvements	3.480/3.606	14,600	15,800	4.06	9	\$ 1,440,000
H	Close Approach Roads and Force Traffic to Lily School Rd./Slate Ridge Rd. Intersection	4.105	14,600	15,800	4.06	9	\$ 255,000
I-1	Eliminate Fariston Rd.; Potential Traffic Signal at KY 552	5.146	14,200	15,300	4.99	12	\$ 105,000
I-2	Widen US 25 for Left Turn Lane, Fariston Rd.	5.146	14,200	15,300	4.99	12	\$ 525,000
J	Fariston Rd./Old Hwy 25 Intersection Improvement	7.511/8.126	12,900	13,900	2.79	5	\$ 625,000
K-1	Widen US 25	8.520 - 9.028	12,900	13,900	1.50	7	\$ 3,705,000
K-2	Re-align US 25	8.520 - 9.028	12,900	13,900	1.50	7	\$ 3,600,000
<b>FULL RECONSTRUCTION</b>							
A	Major Widening Off Alignment	0.000 - 9.028	12,500 - 14,100	13,500 - 15,200	7 Spots	-96	\$ 132,500,000
B	Major Widening On Alignment	0.000 - 9.028	12,500 - 14,100	13,500 - 15,200	7 Spots	-96	\$ 130,700,000
C	US 25 / US 25E Grade Separated Interchange	0.000 - 0.660	N/A	N/A	N/A	36	\$ 29,600,000
D-1	I-75 Connector and Grade Separated Interchange (US 25 MP 4.700)	N/A	4,000 - 6,000	5,000 - 7,500	N/A	N/A	\$ 42,600,000
D-2	I-75 Connector and Grade Separated Interchange (US 25 MP 5.800)	N/A	4,000 - 6,000	5,000 - 7,500	N/A	N/A	\$ 46,300,000

\*DRUC – Design, Right-of-Way, Utilities, Construction

# Chapter 6 – Additional Engagement Efforts

Additional engagement efforts included the LO/S meeting, the subsequent public outreach effort, and the final Project Team Meeting. The meeting with LO/S was an opportunity to share study information and gather input from various perspectives on identifying areas of concern, refining potential improvements, and providing input on prioritization. The information presented during this meeting was provided to the community during the public outreach effort to gather further input in refining improvements and improvement option prioritization. The final Project Team meeting was an opportunity to review all public feedback and finalize improvement option prioritization.

## 6.1 Local Officials / Stakeholder Meeting

A local officials / stakeholders (LO/S) meeting was held virtually on Wednesday, October 7, 2020 at 2:00 PM (Eastern Time) to present and collect input on the refined set of project locations and improvement concepts. The meeting was held virtually due to health and safety concerns resulting from the COVID-19 pandemic. The attendee list was prepared by the consultant team with input from KYTC. Attendees included representatives from various local jurisdictions (mayors, city council members, County Judge-Executives, etc.), local fire departments, local police departments, EMS, local schools, and the nearby former state park (Levi Jackson Wilderness Road Park). A presentation was given by the consultant through an ArcGIS StoryMap. The material included study background, roadway existing conditions, crash history, traffic overview, environmental overview, and potential improvement options. Survey polls were conducted throughout the meeting to provide opportunities for interaction along with time after each topic for discussion.

From the polling, the most important consideration/question was related to whether improvements are needed on US 25 from Corbin to London. Of those that responded, 87 percent felt that major improvements are needed on US 25 including major widening and new construction.

The meeting was concluded by demonstrating the online public outreach survey developed to collect feedback on the study. LO/S were encouraged to complete the survey once a link to the presentation and survey was emailed to them following the meeting. This link was also posted on the KYTC D11 website and Facebook page to engage the public and get input from residents near the study area.

For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

## 6.2 Public Outreach Effort

Local officials / stakeholders were encouraged to share the link to the presentation and survey with the community to maximize public feedback. The online survey was opened on Thursday, October 8, 2020 following the LO/S Meeting and closed on Friday, November 6, 2020. Hard copies were made available at the KYTC D11 office.

The survey covered topics concerning the study area ranging from traffic and safety, environmental resources, and improvement option prioritization. There were 173 responses that provided the Project Team with valuable input prior to the improvement option prioritization process. The top 10 comments provided through the public outreach effort can be found in **Figure 19**.

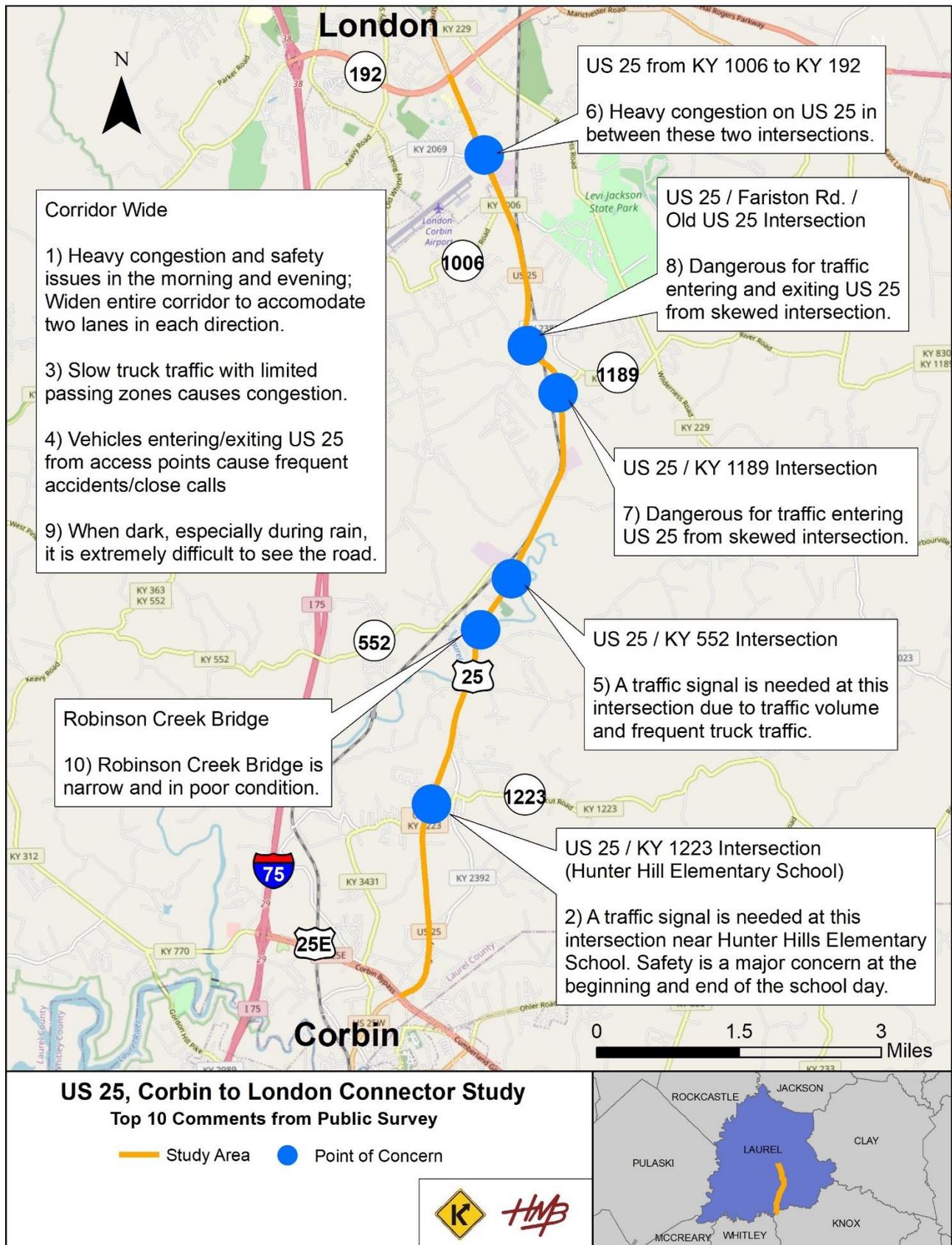
The survey prompted each participant to rank the improvement options from 0 to 5. The list of improvement options and the corresponding public outreach total and average score can be found in **Table 12**. The total score was calculated by adding the scores from each response, while the average score was calculated by dividing the total score by the number of responses. Additional information and survey results can be found in the meeting minutes in **Appendix C**.

**Table 12. Improvement Options - Public Outreach Scores**

Improvement Option	Description	Milepoints	Cost (DRUC*)	CRF	EEC	Public Outreach Average Score (Range 0-5)	Public Outreach Total Score
<b>SPOT AND SAFETY</b>							
A	Access Management	0.000 - 9.028	\$ 1,260,000	7 Spots	-96	2.93	507
B	Reflective Pavement Striping	0.000 - 9.028	\$ 170,000	7 Spots	-96	2.76	477
C	Hopewell Rd. Improvement	1.965	\$ 270,000	4.46	10	2.12	367
D	KY 1223 Intersection Improvement	2.098	\$ 965,000	2.35	4	2.83	489
E-1	KY 2392 Intersection Improvement	2.787	\$ 935,000	1.45	1	2.38	411
E-2	Laurel Whitley Rd. Intersection Improvement	3.111	\$ 580,000	1.45	1	2.63	455
F	US 25 Widening (TWLTL)	2.800 - 3.500	\$ 8,180,000	1.37	5	3.70	622
G	Robinson Creek Rd./Echo Valley Rd./Lily School Rd. Intersection Improvements	3.480/3.606	\$ 1,440,000	4.06	9	2.82	488
H	Close Approach Roads and Force Traffic to Lily School Rd./Slate Ridge Rd. Intersection	4.105	\$ 255,000	4.06	9	2.50	432
I-1	Eliminate Fariston Rd.; Potential Traffic Signal at KY 552	5.146	\$ 105,000	4.99	12	2.54	427
I-2	Widen US 25 for Left Turn Lane, Fariston Rd.	5.146	\$ 525,000	4.99	12	2.91	503
J	Fariston Rd./Old Hwy 25 Intersection Improvement	7.511/8.126	\$ 625,000	2.79	5	2.72	470
K-1	Widen US 25	8.520 - 9.028	\$ 3,705,000	1.50	7	3.36	565
K-2	Re-align US 25	8.520 - 9.028	\$ 3,600,000	1.50	7	2.92	491
<b>FULL RECONSTRUCTION</b>							
A	Major Widening Off Alignment	0.000 - 9.028	\$ 132,500,000	7 Spots	-96	2.76	478
B	Major Widening On Alignment	0.000 - 9.028	\$ 130,700,000	7 Spots	-96	2.88	498
C	US 25 / US 25E Grade Separated Interchange	0.000 - 0.660	\$ 29,600,000	N/A	36	2.40	415
D-1	I-75 Connector and Grade Separated Interchange (US 25 MP 4.700)	N/A	\$ 42,600,000	N/A	N/A	2.75	475
D-2	I-75 Connector and Grade Separated Interchange (US 25 MP 5.800)	N/A	\$ 46,300,000	N/A	N/A	2.75	475

\*DRUC – Design, Right-of-Way, Utilities, Construction

Figure 19. Top 10 Comments from Public Survey



## 6.3 Project Team Meeting No. 3

The third and final Project Team meeting was held on Thursday, December 10, 2020 at 1:30 PM (Eastern Time). The meeting was held virtually due to health and safety concerns resulting from the COVID-19 pandemic. Representatives included KYTC Division of Planning staff, KYTC District 11 staff, and the consultant team. The materials presented and discussed at the meeting included:

- Summary of Survey Results and Map
- Revised Improvement Options
- Improvement Option Prioritization Table
- Discussion on Improvement Concept Prioritization

Some considerations related to improvement concepts brought up at this meeting included:

- Improvement Option D (KY 1223 Intersection Improvement) near Hunter Hills Elementary school did not initially include exploring a traffic signal at the intersection. Due to overwhelming public feedback in favor of a traffic signal at this location, this concept would include evaluating the intersection for signal warrants moving forward.
- With the completion or near completion of multiple larger scale projects, KYTC D11 felt that US 25 would be the next corridor in the district to receive funding.
- Improvement Option F received the highest public outreach score, but it is also the most expensive Spot and Safety improvement by a wide margin. It would take longer to secure funding for this type of improvement, so it was awarded a lower priority. The Project Team decided to treat all Spot and Safety improvements with higher costs this way. The public outreach score is documented in this study and higher cost improvements will be considered if funding becomes available.
- Although the public feedback greatly assisted in the prioritization process, improvement option priority would not be based on this metric alone.

Improvement option prioritization categories chosen to be included:

- Short-Term
- Low Priority
- Medium Priority
- High Priority
- Long-Term

For additional detail regarding information presented and discussed at the meeting, refer to the meeting minutes found in **Appendix C**.

# Chapter 7 – Study Outcomes

## 7.1 Prioritized Projects

The US 25 Corbin to London Connector Study resulted in a range of conceptual improvements for future implementation. Improvement options primarily focused on areas with safety concerns identified through examination of documented crash records and alleviating traffic congestion. Utilizing additional tools including operations analysis, traffic forecasting, Project Team input, local officials / stakeholder input and public feedback, a prioritized list of recommendations for improvements has been compiled. The list includes 14 individual spot and safety options and two full reconstruction options. The prioritization is broken down by the following categories:

- **Short-Term** projects included those that are either relatively low-cost or can be implemented relatively quickly using dedicated KYTC resources such as maintenance activities. These projects would not need to go through the SHIFT process to be constructed. There was one Short-Term project, which includes implementing reflective pavement striping to improve roadway visibility in wet and dark conditions.
- **High Priority** projects included those that were overall in a higher tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were five total High-Priority projects.
- **Medium Priority** projects included those that were overall in the middle tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were six total Medium-Priority projects.
- **Low Priority** projects included those that were overall in the lowest tier of ratings based on crash history, planning level cost estimates, Project Team input, local official / stakeholder input, and public feedback. There were two total Low-Priority projects.
- **Long-Term** projects are high-cost, including major widening and new construction, and will address the future transportation needs of the US 25 corridor in terms of operation and safety. There were five total Long-Term projects that moved forward into the public outreach phase of this study, however, reviewing planning level cost estimates and traffic forecast results led the Project Team to eliminate three projects. The US 25 / US25E grade separated interchange (Option C) and the I-75 connector and grade separated interchange (Options D-1 and D-2) are not recommended at this time. The remaining Long-Term projects include major widening and new construction of US 25 from US 25E to KY 1006.

**Table 13** lists the improvement options and their priority as assigned. Additional information describing and illustrating each improvement option can be found in **Appendix E**.

The Full Reconstruction improvement options labeled as Long-Term projects (Options A and B in **Table 13**) were both developed as a part of Item No. 11-8515.00 in *Kentucky's FY 2020 – 2026 Highway Plan*. This project has already gone through the SHIFT process, scoring 88.6 out of 100, and is the highest ranked project in the South Region (comprising Districts 4, 8, and 11). The Project Team felt it was necessary to divide each option being considered for this project into priority construction segments based on the analysis completed through this study. **Table 14** provides planning level cost estimates for design, right-of-way, utilities, and construction for those priority construction segments, and **Figure 20** illustrates the location of each priority construction segment.

**Table 13. Summary of Improvement Option Priority**

Improvement Option	Description	Milepoints	Cost (DRUC*)	Priority
<b>SPOT AND SAFETY</b>				
B	Reflective Pavement Striping	0.000 - 9.028	\$ 170,000	Short-Term
A	Access Management	0.000 - 9.028	\$ 1,260,000	High
C	Hopewell Rd. Improvement	1.965	\$ 270,000	High
D	KY 1223 Intersection Improvement (Hunter Hills Elementary)	2.098	\$ 965,000	High
I-1	Eliminate Fariston Rd.; Potential Traffic Signal at KY 552	5.146	\$ 105,000	High
I-2	Widen US 25 for Left Turn Lane, Fariston Rd.	5.146	\$ 525,000	High
E-1	KY 2392 Intersection Improvement	2.787	\$ 935,000	Medium
E-2	Laurel Whitley Rd. Intersection Improvement	3.111	\$ 580,000	Medium
G	Robinson Creek Rd./Echo Valley Rd./Lily School Rd. Intersection Improvements	3.480/3.606	\$ 1,440,000	Medium
J	Fariston Rd./Old Hwy 25 Intersection Improvement	7.511/8.126	\$ 625,000	Medium
K-1	Widen US 25	8.520 - 9.028	\$ 3,705,000	Medium
K-2	Re-align US 25	8.520 - 9.028	\$ 3,600,000	Medium
F	US 25 Widening (TWLTL)	2.800 - 3.500	\$ 8,180,000	Low
H**	Close Approach Roads and Force Traffic to Lily School Rd./Slate Ridge Rd. Intersection	4.105	\$ 255,000	Low
<b>FULL RECONSTRUCTION</b>				
A	Major Widening Off Alignment	0.000 - 9.028	\$ 132,500,000	Long-Term
B	Major Widening On Alignment	0.000 - 9.028	\$ 130,700,000	Long-Term
C	US 25 / US 25E Grade Separated Interchange	0.000 - 0.660	\$ 29,600,000	Not Recommended
D-1	I-75 Connector and Grade Separated Interchange (US 25 MP 4.700)	N/A	\$ 42,600,000	Not Recommended
D-2	I-75 Connector and Grade Separated Interchange (US 25 MP 5.800)	N/A	\$ 46,300,000	Not Recommended

\*DRUC – Design, Right-of-Way, Utilities, Construction

\*\*The most significant safety concern of the intersections included in Option H occurs at Lily School Rd. / Echo Valley Rd. This intersection is also included in Option G.

**Table 14. Long-Term Projects Priority Construction Segments**

Priority Segment ID	Description	Milepoints	Design Cost*	Right-of-Way Cost	Utility Cost	Construction Cost	Total Cost	Priority
A-1	Northern Segment Off Alignment	4.497 - 9.028	\$ 8,000,000	\$ 16,500,000	\$ 1,000,000	\$ 39,900,000	\$ 65,400,000	Long-Term
A-2	Northern Segment On Alignment	4.497 - 9.028	\$ 6,700,000	\$ 20,900,000	\$ 2,300,000	\$ 33,700,000	\$ 63,600,000	Long-Term
B	Southern Segment	0.000 - 4.497	\$ 7,700,000	\$ 18,900,000	\$ 2,300,000	\$ 38,200,000	\$ 67,100,000	Long-Term

\*The Design Cost was estimated at 20 percent of the Construction Cost.

## 7.2 Next Steps

The next phase in the project development process is Phase I Preliminary Engineering and Environmental Analysis for all High, Medium, and Low priority projects and an update of the Phase I Preliminary Engineering efforts previously completed for the Long-Term projects (Item No. 11-8515.00). Based on the findings of this study, Option A-1 or Option A-2, as shown in **Figure 20**, should be designed and implemented prior Option B if Item No. 11-8515.00 is to be divided into priority segments.

If federal funds are used or permits will be required, additional environmental analyses will be required to satisfy the National Environmental Policy Act (NEPA). All identified high, medium, and low priority projects would need to be integrated into Kentucky's Prioritization Program, Kentucky's Strategic Highway Investment Formula for Tomorrow (SHIFT). Through this mechanism they can be funded in the Highway Plan. Short-Term projects may be initiated through the KYTC D11 routine maintenance and traffic programs or become part of systematic programs such as Pavement Rehabilitation or Highway Safety Improvement Program (HSIP). City and County governments, along with Area Development Districts, should collaborate with KYTC on project funding and implementation.

## 7.3 Additional Information

Written requests for additional information should be sent to Mikael Pelfrey, P. E., KYTC Division of Planning Director, 200 Mero Street, Frankfort, Kentucky 40622. Additional information regarding this study can be obtained from the District 11 Planning Section at (606) 598-2145 or by mail at 603 Railroad Ave, Manchester, Kentucky 40962.

Figure 20. Long-Term Projects Priority Construction Segments

