



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.

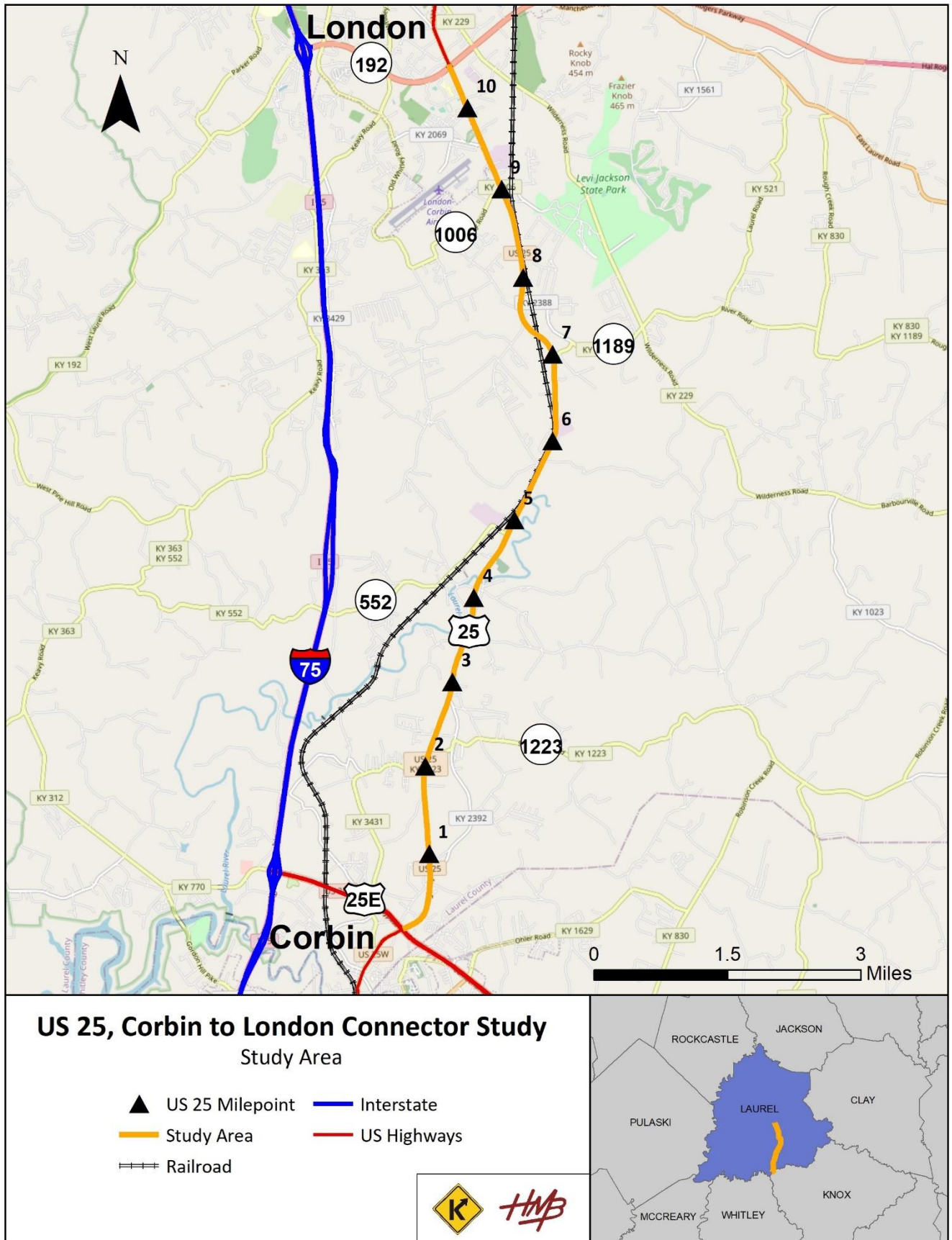


Additional Engagement Efforts: A summary of outreach efforts which includes a meeting with local officials / stakeholders, a public outreach effort to engage those within the communities near the study area, and coordination between the Project Team concerning improvement option prioritization.



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*, 7th 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*)
SPOT AND SAFETY			
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
FULL RECONSTRUCTION			
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
SPOT AND SAFETY				
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
FULL RECONSTRUCTION				
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.

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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.