Executive Summary

The Kentucky Transportation Cabinet (KYTC) initiated the *US 68 Corridor Study*, KYTC Item No. 7-80251.00, in Jessamine and Mercer Counties to identify and evaluate potential concepts to improve safety, truck mobility, driver expectations (geometrics), and resiliency on US 68 and to determine the need for and optimal location of a replacement bridge over the Kentucky River. The study area is shown in **Figure ES- 1.**

Existing Conditions

US 68 traverses more than 370 miles in Kentucky from Paducah to Maysville. The entire route is designated as a Scenic Byway, and within the study area it is referred to as the "US 68 Heritage Corridor". Regionally, US 68 is a rural minor arterial that serves as a connection over the Kentucky River between Harrodsburg to the south and Wilmore, Nicholasville, and Lexington to the north. The study portion of US 68 spans 6.99 miles, from Milepoint (MP) 14.450 to MP 20.058 in Mercer County and from MP 0.0 to MP 1.380 in Jessamine County. At the county line, the US 68 bridge provides the only Kentucky River crossing in the area, with the nearest crossings 16 miles (US 27) and 21 miles (Bluegrass Parkway) away. The bridge was constructed in 1954 and is approaching a 75-year design lifespan. The structure has a posted weight limit of 40 tons and based on a 2024 inspection, is rated as having a poor health index due to the condition of the superstructure. The US 68 Mercer County approach to the Kentucky River crossing, which is in a 100-year floodplain, flooded in April 2025 and was closed to traffic for several days.

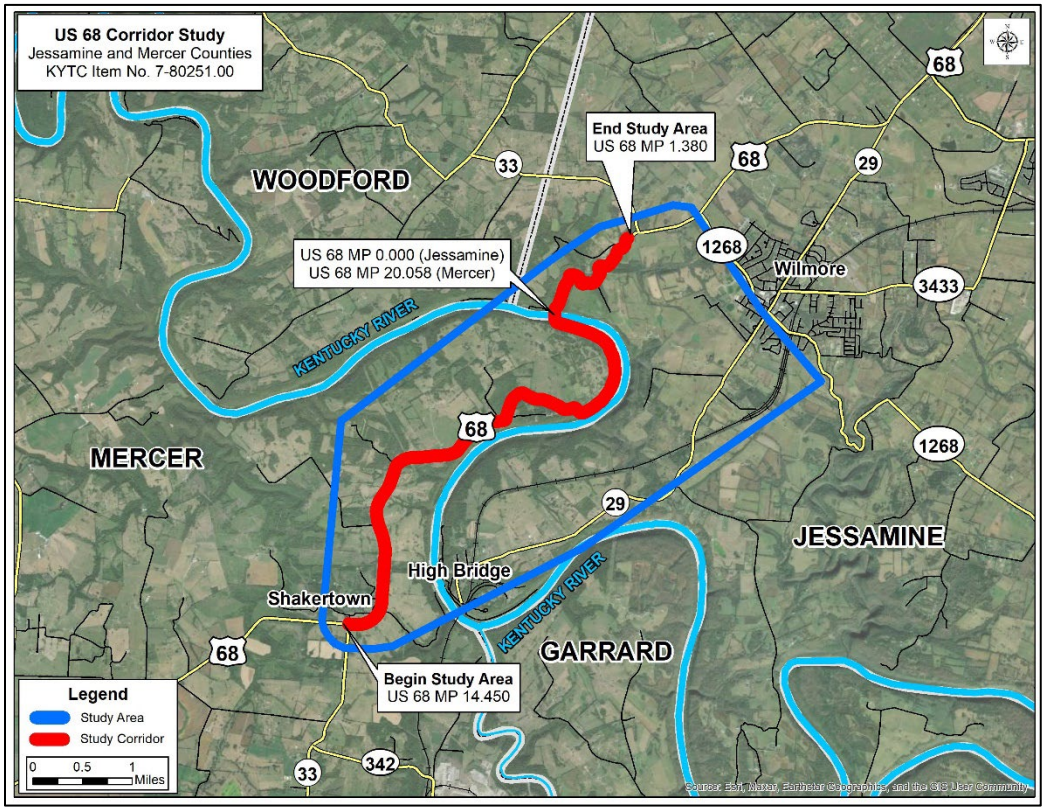

Figure ES- 1: US 68 Study Corridor

Locally, US 68 provides access to Shaker Village at Pleasant Hill (Shakertown), a National Historic Landmark located in Mercer County that once held the third largest Shaker community in the United States. The site now serves as a cultural and educational destination. US 68 also provides access to Wilmore, home to Asbury University, a private Christian liberal arts college.

US 68 is an undivided two-lane route with no passing zones throughout the study corridor. The corridor has 11-foot lanes with two-foot shoulders in Jessamine County. In Mercer County, the corridor has 10-foot travel lanes, but the shoulder width varies; a four-foot shoulder from MP 14.5 to MP 17.9, a one-foot shoulder between MP 17.9 and MP 19.7, and a two-foot shoulder from MP 19.7 to the county line. The study corridor has a posted speed limit of 55 miles per hour (mph), but operating speeds vary considerably, ranging from 30 to 55 mph. A recent Highway Safety Improvement Program (HSIP) project was completed in 2023 to improve signing, striping, guardrail, and sightlines in the Jessamine County section. An HSIP project was completed in Mercer County in 2016 to improve signing and drainage along US 68.

Current daily traffic volumes are about 3,000 vehicles per day within the study area. Results from an analysis of existing traffic volumes revealed US 68 currently operates at Level of Service (LOS) B. Traffic forecasts were developed based on population projections, historical traffic patterns, and growth rates from the Kentucky Statewide Travel Demand Model (KYSTM). The KYSTM shows an off-alignment reconstruction of US 68 that decreases travel times could increase daily traffic to 14,000 VPD by 2045. With no improvements or on-alignment safety improvements only, US 68 is expected to carry up to 4,200 VPD in 2045.

Between 2019 and 2023, a total of 109 crashes were reported on the study portion of US 68, 21 of which resulted in an injury (19 percent). Five crashes resulted in a serious injury, three of which were single vehicle motorcycle crashes. The other serious injury collisions included a head-on collision on wet pavement and a collision with an animal. The most common crash types were single vehicle (76 percent) and sideswipe crashes (nine percent).

US 68 in Jessamine County

In the eight months after the 2023 HSIP project was completed, crashes on US 68 in Jessamine County dropped from 6.7 crashes per year per mile with 15 percent injuries to 3.3 crashes per year per mile with no reported injuries.

The Crash Data Analysis Tool (CDAT) was used to perform an Excess Expected Crashes (EEC) analysis. EEC is a measure of the crash frequency for a given roadway segment compared to what is expected on a road with similar conditions (geometrics, traffic, etc.). A positive EEC indicates more crashes are occurring than would be expected. Results from this analysis revealed US 68 has a positive EEC of five crashes per year more than what is expected in Jessamine County (including pre-HSIP project crashes) and one crash per year in Mercer

County. The Level of Service of Safety (LOSS) is three on the entire study corridor, which indicates moderate to high potential for crash reduction.

Local Official / Stakeholder & Public Outreach

Over the course of the study, the project team engaged with local officials, stakeholders, and the public to share information and gather input on transportation challenges and potential improvements along the corridor. Local participants identified lack of recovery area, sharp curves, truck traffic, and steep grades as the top transportation issues on US 68. Safety was identified as more of a concern than congestion. The public and the local officials indicated support for a new alignment river crossing while maintaining the scenic nature of the corridor.

Improvement Concepts

Improvement concepts were developed based on a combination of input from the project team, local officials / stakeholders, and the public, a review of existing conditions, and results from the traffic and safety analyses. Improvement concepts include off- and on-alignment improvements, intersection improvements, and bridge rehabilitation. Descriptions of the improvement concepts are included below.

No-Build: As the bridge will eventually need to be replaced, there is no true "No-Build" option. Replacing the bridge in its current location would not improve geometrics on the approaches, including the geometrics that don't meet driver expectations for an arterial with a 55-mph posted speed limit.

Concept 1 begins at the KY 33 intersection (MP 14.5) in Mercer County and includes upgrades to existing US 68 up to MP 16.7, where it continues east on a new alignment across a new Kentucky River crossing, as shown in **Figure ES-2**. This concept ties into KY 29 in Jessamine County, where it would include upgrades to the existing route until just south of Wilmore, where a new alignment would connect north to KY 1268. The proposed typical section for the entire concept includes two 12-foot lanes, four-foot paved shoulders, a flush four-foot median, and a ten-foot shared use path, as shown in **Figure ES-3**. Modifications to the typical section, including cost-saving reductions to the total width, should be considered during the design phase.

Concept 2 begins at the KY 33 intersection (MP 14.5) in Mercer County and includes upgrades to existing US 68 up to MP 17.3, where it continues north on a new alignment across a new Kentucky River crossing west of the existing bridge, as shown in **Figure ES-2**. The alignment then continues west of existing US 68, eventually connecting back at KY 1268. The proposed typical section again includes two 12-foot lanes, six-foot paved shoulders, a flush four-foot median, and a ten-foot shared use path, as shown in **Figure ES-3.**

Concept 3 includes an option to realign Chinn's Curve in Mercer County from MP 17.5 to MP 18.7.

Concept 4 includes on-alignment corridor-wide safety improvements, rather than individual spot improvements, in Mercer County to match the recent HSIP project in Jessamine County. Potential improvements include signing, striping, replacing guardrail, repaving, edge line / centerline rumble strips, and high friction surface treatment (HSFT) at horizontal curves.

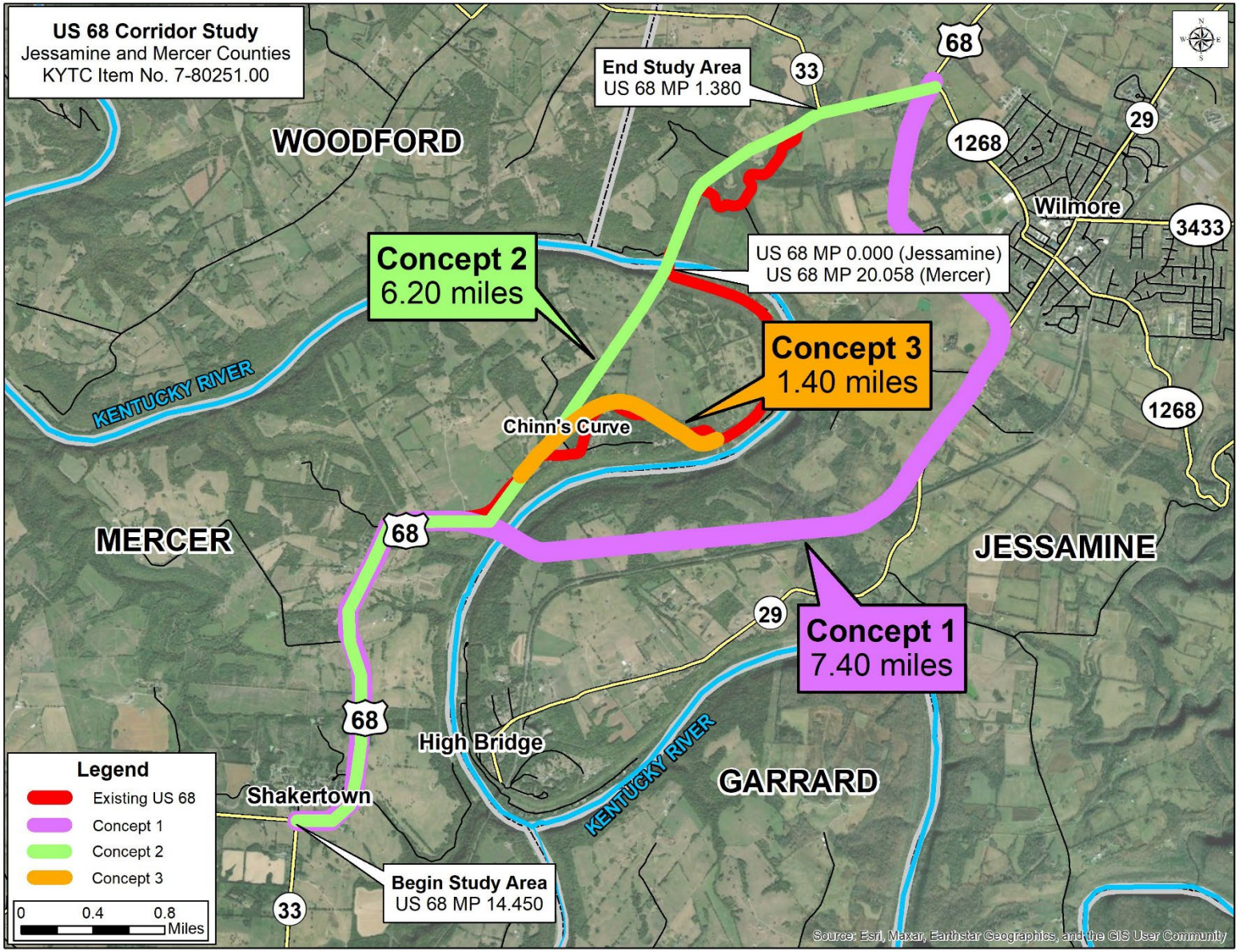

Figure ES-2: Off-Alignment Concepts

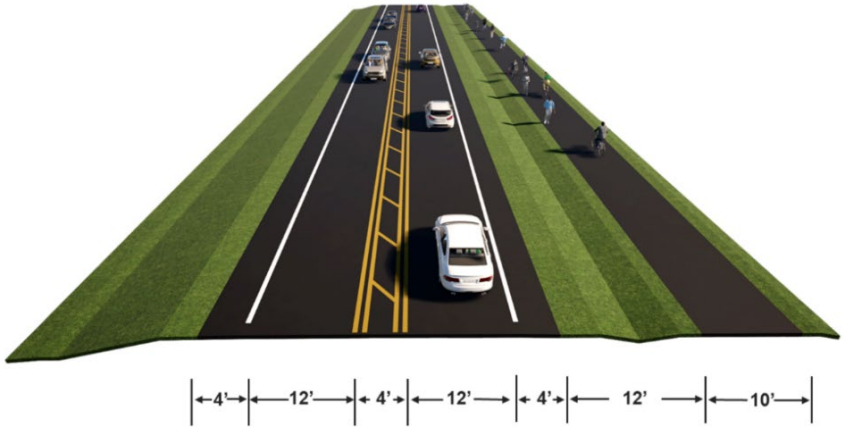

Figure ES: 3 – Typical Section for Concepts 1 & 2

Intersection Improvements include installing Intersection Conflict Warning Systems (ICSW) at the US 68 intersections with KY 33 in Jessamine and Mercer Counties. These systems use vehicle detectors under the pavement to alert drivers of approaching traffic.

Bridge Rehabilitation options aim to extend the life of the bridge 15 years or more. The following summarizes the bridge rehabilitation:

- Replacing the deteriorated steel bearings with elastomeric bearing assemblies.
- Installing and crack monitoring gauges at critical shear crack locations.
- Installation of fiber reinforced polymer (FRP) if the shear cracking continues to develop.
- Replace the existing barrier rail with standard mono-slope bridge rail.
- Blast cleaning, hydrodemolition, and partial depth patching.
- Concrete patching of spall areas.
- Galvanic anode to control the corrosion of metal surfaces.
- Cleaning and repairing expansion joints.

Conclusions

An evaluation matrix was developed to summarize the concepts, as shown in **Table ES-1**. 2025 cost estimates were developed to include design, right of way, utilities, and construction**.** These costs include a 30 percent contingency to account for unknowns. An additional 50 percent "time" or "management" contingency was applied to the long-term concepts to account for lack of future funding in the 2024 – 2030 Enacted Highway Plan. Cost estimates were developed with and without the shared use path (SUP) based on mixed feedback from the local officials. The final typical section will be determined in the Design phase.

The US 68 Corridor Study served as a pilot study to incorporate the Safe System Approach through Road Safety Assessments (RSAs) with the goal of eliminating crashes that result in death and serious injuries. A framework was developed to score how well the existing alignment or a new project aligns with the Safe Systems Approach. The framework grades roads on three

principles: exposure (the number of road users), likelihood (the probability that a crash occurs), and severity (the probability that a fatality or severe injury will occur), and resulted in an exponential scoring system.

Table ES-1 presents the Safe System scores in two ways: cost per mile per percent reduction in score and an SSA Index, which indicates how closely aligned each concept is with the Safe System Approach. The higher the SSA percentage the better aligned that concept is with the Safe System Approach, with a maximum score of 100 percent. Concepts 1 and 2 have the overall highest SSA Index percentages while Concept 4 has the lowest cost per mile per percent reduction.

Table ES-1: Evaluation Matrix

Concept	No-Build	Concept 1	Concept 2	Concept 3	Concept 4
Length (mi.)	6.988	7.4	6.2	1.4	5.6
Traffic					
Travel Time (min.)	14.2	8.7	7.0	13.4	14.2
2045 ADT (VPD)	3,600	12,800	13,700	4,200	3,600
Cost (2025$)					
Design	$0	$22,300,000	$22,200,000	$3,500,000	$800,000
Right of Way	$0	$2,100,000	$3,400,000	$400,000	$0
Utility Cost	$0	$5,500,000	$5,500,000	$400,000	$0
Construction	$0	$148,400,000	$148,100,000	$23,000,000	$5,600,000
Construction w/out Shared Use Path	$0	$122,700,000	$119,000,000	N/A	N/A
2025 Total w/out Shared Use Path	**$0**	**$152,600,000**	**$150,100,000**	N/A	N/A
2025 Total* w/Shared Use Path	**$0**	**$178,300,000**	**$179,200,000**	**$27,300,000**	**$6,400,000**
Total (50% Contingency)**	**$0**	**$267,500,000**	**$268,800,000**	**$41,000,000**	**N/A**
Safe System Framework					
Cost per mi. per 1% reduction	$0	$460,000	$610,000	$1,990,000	$70,000
SSA Index	**13%**	**32%**	**30%**	**16%**	**18%**
Benefit					
Safety Benefit	$0	$8,600,000	$8,600,000	$1,000,000	$6,600,000
Travel Time Savings	$0	$186,300,000	$246,200,000	$11,900,000	$0
Benefit-Cost Ratio w/out Shared Use Path	**0.0**	**1.3**	**1.7**	**N/A**	**N/A**
Benefit-Cost Ratio* w/Shared Use Path**	**0.0**	**1.1**	**1.4**	**0.5**	**1.0**

*Includes 30% contingency
**Includes additional 50% time contingency
***BCR calculated using total cost without 50% time contingency

A benefit-to-cost analysis (BCA) was performed to compare the improvement concept costs (without the 50 percent time contingency), including design, right-of-way, utility, and construction, to the safety and travel time benefits. A benefit-to-cost ratio (BCR) above 1.0 indicates the safety and travel time benefits outweigh the costs. Costs and BCRs are shown for Concepts 1 and 2 with and without a shared use path. The safety benefits were estimated using crash modification factors (CMFs) from the Crash Modification Clearinghouse. Concepts 1 and 2 have positive BCRs with and without the shared use path. Concept 4 has a BCR of 1.0 while the realignment of Chinn's Curve, Concept 3, has the lowest BCR of 0.5.

Based on a combination of input from the project team, a review of existing conditions, the traffic and safety analyses, local officials / stakeholder input, public input, and field reconnaissance, the following improvements are recommended to move forward.

Short-Term Recommended Concepts

- **Concept 4**: on-alignment corridor-wide safety improvements in Mercer County including signing, striping, guardrail, repaving, edge line / centerline rumble strips, and high friction surface treatment (HSFT) at horizontal curves.
- **Intersection Control Warning System (ICWS) at the intersections with KY 33:** Detectors under the pavement to alert drivers of approaching traffic.
- **Existing US 68 Kentucky River Bridge Rehabilitation**: This option may extend the life of the structure 10 to 15 or more years and is expected to cost $3.6 million.

Long-Term Recommended Concepts

The long-term recommendation includes moving Concepts 1 and 2 forward to Phase 1 Design.

Next Steps

The next step following this study for any potential improvements would be Phase 1 Design Preliminary Engineering and Environmental Analysis. Additional phases of this project are not listed in Kentucky's Highway Plan. This project must be included in the Lexington Area Metropolitan Planning Organization (LAMPO) Transportation Improvement Plan (TIP) to be eligible for federal funding.

In accordance with 23 USC 106, this potential project is expected to exceed the threshold of $100 million for FHWA financial planning requirements. Future project teams should follow the procedures outlined in KYTC *Design Memorandum No. 6-24* which detail compliance with these requirements, including enhanced coordination, a Financial Plan, and adherence to the project development checklist. Further funding will be necessary to advance the long-term project to the design phase as additional phases of this project are not funded in Kentucky's FY 2024 – FY 2030 Highway Plan.