Stantec

US 68 Corridor Study

Item No. 7-80251.00
Jessamine and Mercer Counties, Kentucky

SEPTEMBER 2025

TEAM KENTUCKY®
TRANSPORTATION CABINET

Final Report

US 68 Corridor Study

KYTC Item No. 7-80251.00

Kentucky Transportation Cabinet
Central Office, Division of Planning &
Highway District 7

In partnership with:

Stantec

September 2025

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.

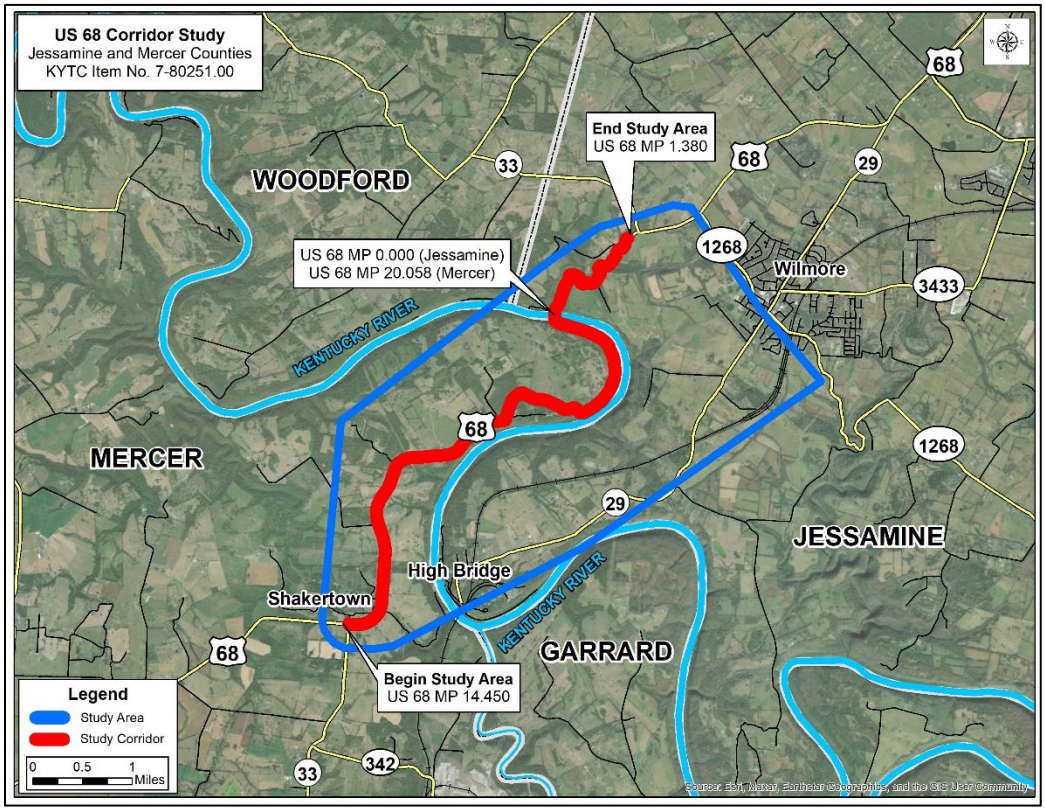

Figure ES- 1: US 68 Study Corridor

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.

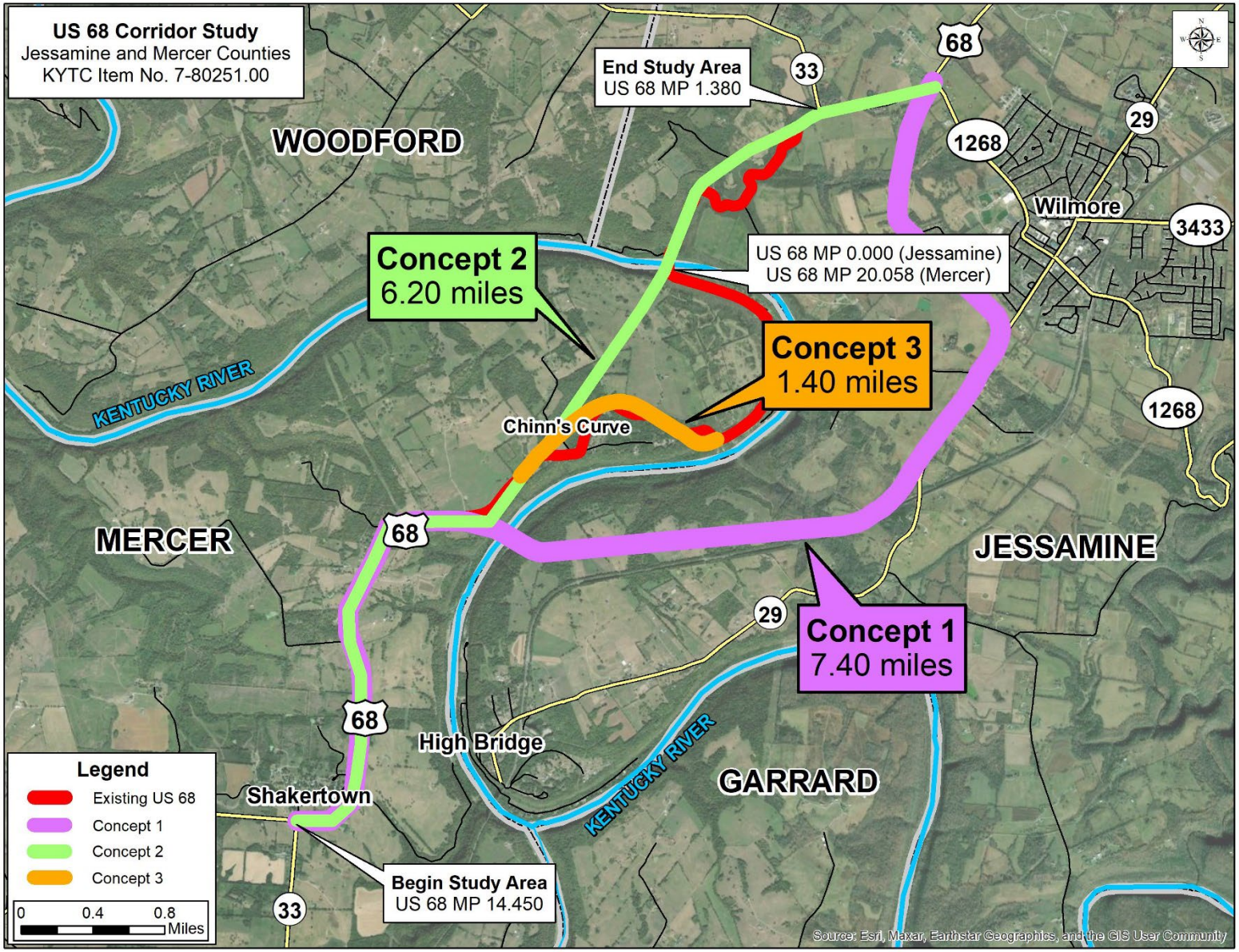

Figure ES-2: Off-Alignment Concepts

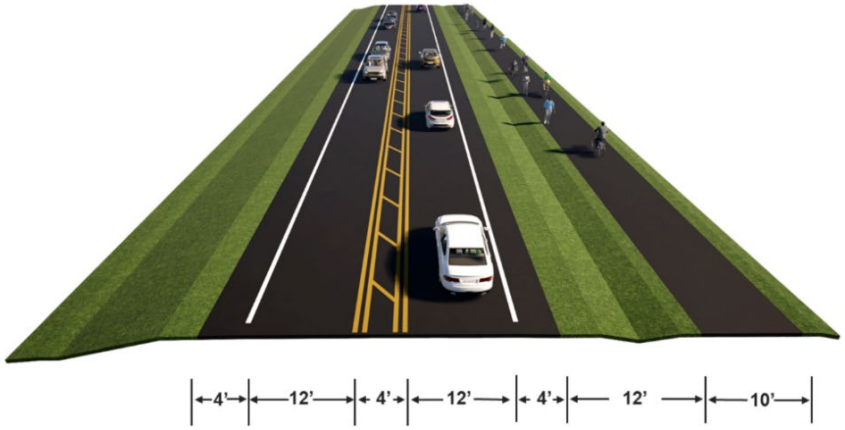

Figure ES: 3 – Typical Section for Concepts 1 & 2

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.

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1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated the *US 68 Corridor Study* 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. Mercer and Jessamine Counties are in the southwestern portion of KYTC District 7, as shown in **Figure 1.**

This study is funded with State Planning Priority (SPP) funds. This project is listed in *Kentucky's FY 2024 – 2030 Highway Plan* as Item No. 7-80251.00.

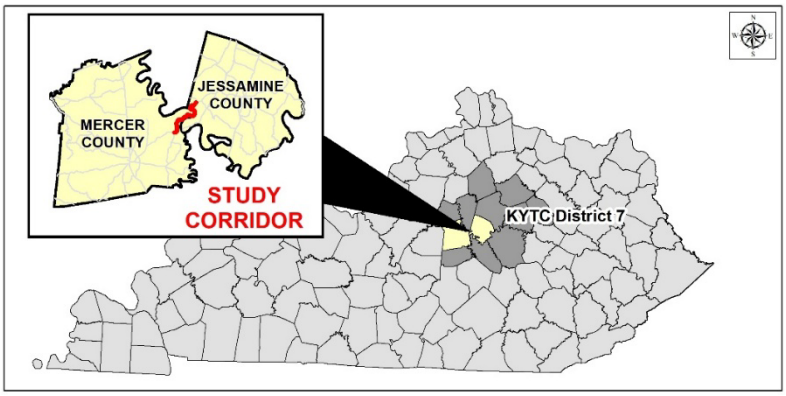

Figure 1: KYTC District 7

1.1 STUDY AREA

Figure 2 shows a general study area as well as a defined study corridor for existing US 68. The study area encompasses a stretch of the Kentucky River within which conceptual new river crossings could be considered. The study corridor is approximately seven miles long, beginning at the KY 33 intersection at milepoint (MP) 14.450 in Mercer County to the KY 33 intersection in Jessamine County at MP 1.380. The only other Kentucky River crossing between the counties is High Bridge, a historic railroad bridge known for being the first cantilever bridge built in the United States.

US 68 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 connects Mercer County and Jessamine County.

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 with a 2023 student enrollment of 1,942[1].

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. **Figure 3** presents a map of the adjacent Kentucky River crossings and the associated detour travel times if the US 68 bridge were closed, according to Google Maps.

[1] https://www.univstats/com/colleges/asbury-university/student-population/

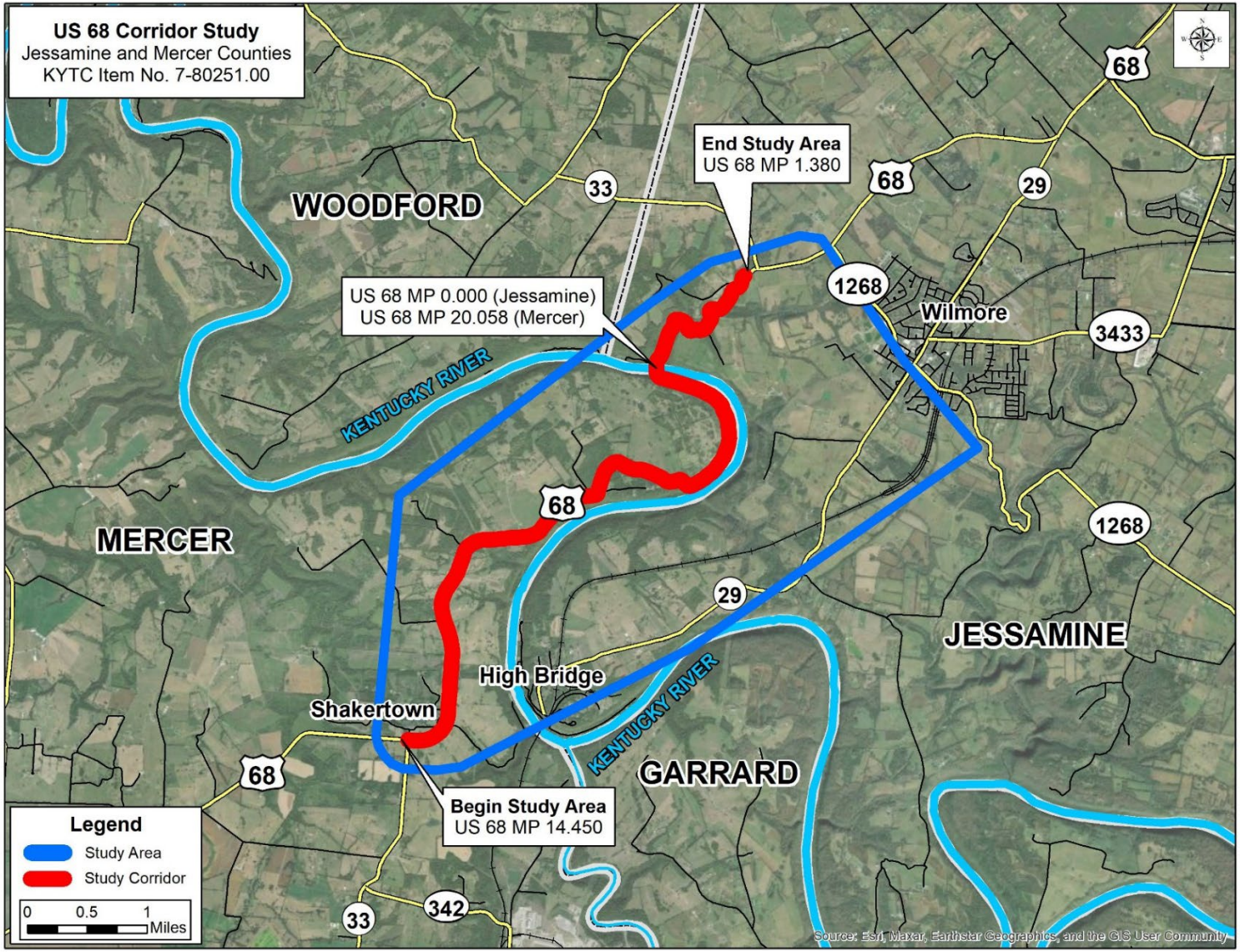

Figure 2: Study Area

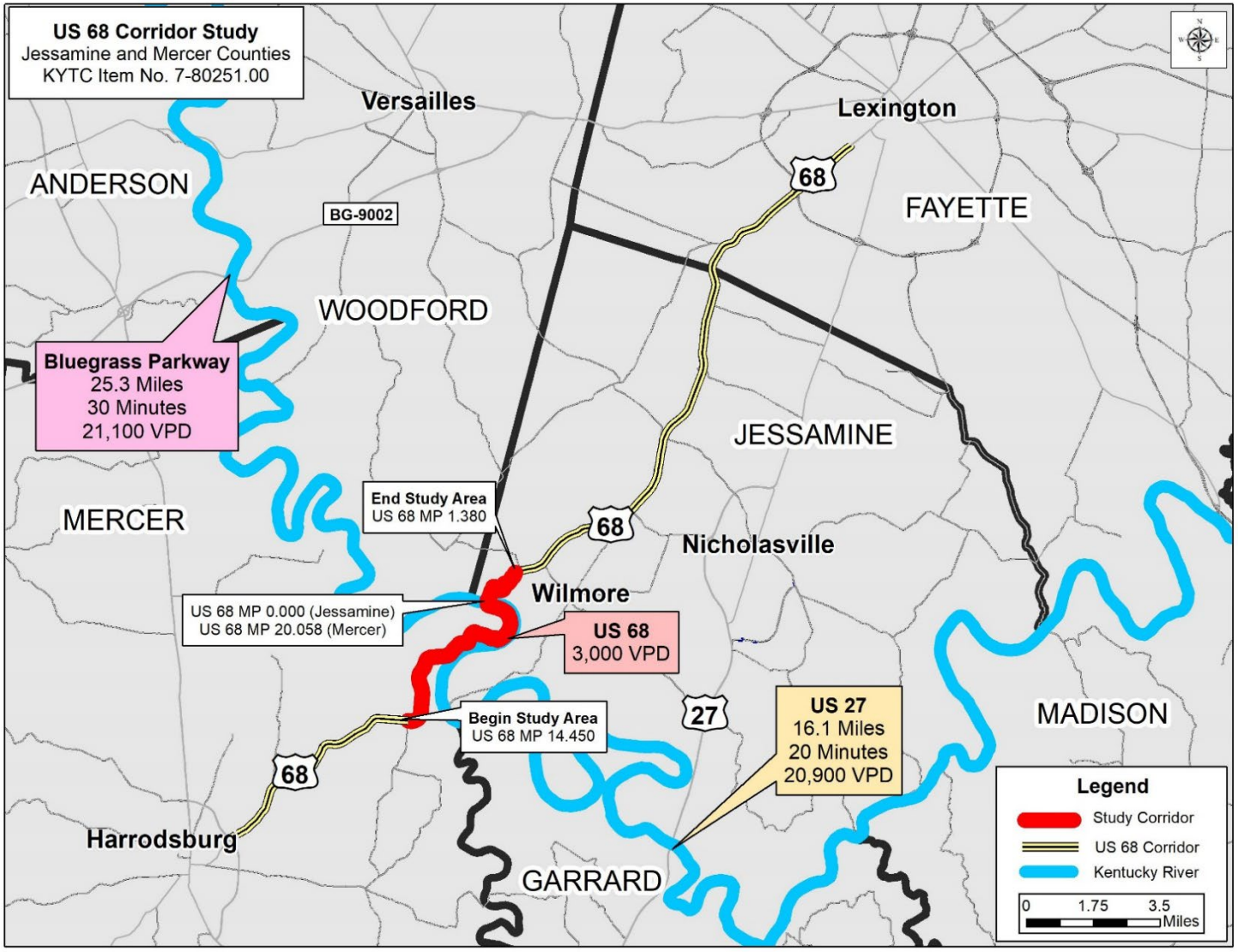

Figure 3: Kentucky River Crossings
(Source: Google Maps)

1.2 PLANNED AND COMMITTED PROJECTS

The *US 68 Corridor Study* is listed in Kentucky's FY 2024 – 2030 Highway Plan as follows:

- KYTC Item No. 7-80251.00: Feasibility study to improve the safety and driver expectation on US 68 in Mercer and Jessamine Counties near the Kentucky River (MP 14.45 in Mercer County to MP 1.38 in Jessamine County). (P = $250,000 (2024)).

There was a recent Highway Safety Improvement Program (HSIP) project to improve signing, striping, guardrail, and sightlines on US 68 in Jessamine County. This project was listed as KYTC Item No. 7-9009.00 and was completed in 2023 at a cost of approximately $4.5 million. The Jessamine County section of the study corridor was closed for 36 days during construction.

2.0 EXISTING CONDITIONS

Conditions of the existing transportation network were examined and are discussed in the following sections. The information compiled includes roadway facilities and geometrics, crash history, and traffic volumes within the study area. Data for this section were collected from KYTC's Highway Information System (HIS) database, KYTC's Traffic Count Reporting System, aerial photography, and field inspection.

2.1 FUNCTIONAL CLASSIFICATION

Functional classification is the process of grouping streets and highways according to the character of travel service they provide. The functional classification of the study corridor and adjacent routes are shown in **Figure 4.** US 68 is classified as a rural minor arterial, a route that connects smaller cities and towns to each other or to a principal arterial. KY 33 south of the study is categorized as a rural major collector, a type of road that carries traffic primarily to and from large cities. KY 33 north of the study area is categorized as a rural minor collector, which carries trips between local roads and higher-class facilities.

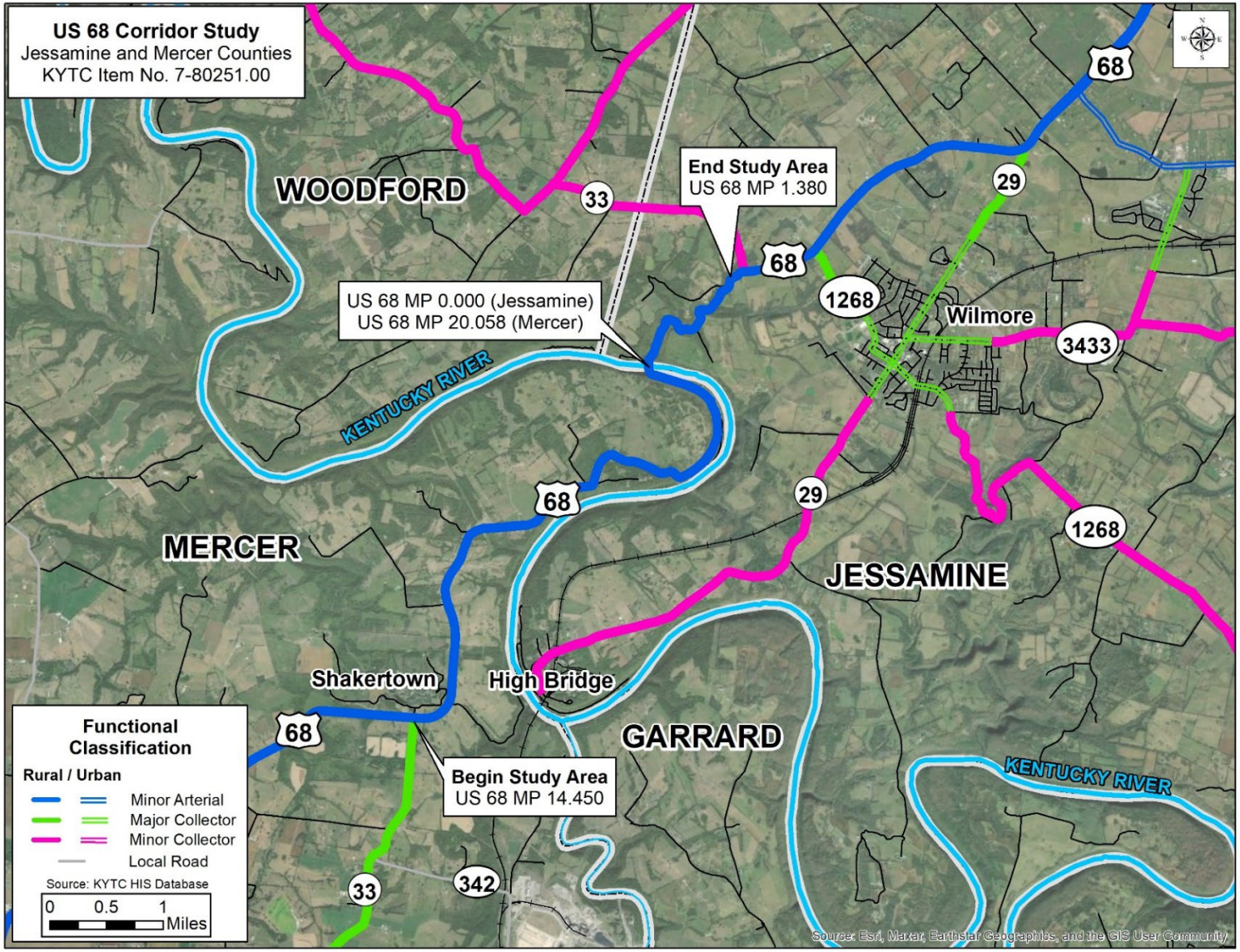

Figure 4: Functional Classification

2.2 ROADWAY GEOMETRY

KYTC's HIS database was used to identify roadway geometry. The width of the roadway, number of lanes, curvature, grade, and superelevation were examined.

2.2.1 Typical Section

The US 68 study corridor currently has two 11-foot lanes in Jessamine County and two 10-foot lanes in Mercer County, as shown in **Figure 5.** The corridor is undivided with no passing zones throughout the study corridor. The KYTC Highway Design Guidance Manual recommends lane widths of 12 feet for rural arterials with posted speed limits of 55 mph and daily traffic volumes over 2,000 vehicles per day (VPD). KY 29 and KY 33 in Jessamine County have 10-foot lanes while KY 33 in Mercer County has 11-foot lanes.

US 68 Typical Section (Mercer County)

Shoulder widths on US 68 and adjacent routes were also analyzed. US 68 has a two-foot shoulder in Jessamine County with one-foot paved. The shoulder along US 68 varies in Mercer County, with a four-foot shoulder (one-foot paved) from MP 14.5 to MP 17.9, a one-foot paved shoulder with a drain between MP 17.9 and MP 19.7, and a two-foot shoulder (one-foot paved) from MP 19.7 to the county line. KYTC guidance recommends eight-foot usable shoulders on rural arterials with daily traffic volumes exceeding 2,000 VPD.

2.2.2 Horizontal Curvature

Horizontal curves on US 68 in Mercer County are classified as A or B, with curvature less than 5.4 degrees, from MP 14.45 to MP 17.3, as shown in **Figure 6**. Between MP 17.3 and the Kentucky River, several horizontal curves are classified as E, with curvature up to 27.9 degrees. In Jessamine County, the study corridor has severe horizontal curvature, with several class F curves. Based on common geometric practices from the KYTC Highway Design Guidance Manual[2], the recommended minimum radius for 55 mph rural arterials with a maximum superelevation rate of eight percent is 960 feet (approximately six degrees).

2.2.3 Grades

Several US 68 segments have grades exceeding 8.5 percent and are classified as F , as shown in **Figure 7**. The steepest grades are located on either side of the Kentucky River crossing. Based on common geometric practices from the KYTC Highway Design Guidance Manual, the recommended maximum grade for rural arterials in mountainous terrain is six percent.

[2] https://transportation.ky.gov/Organizational-Resources/Policy%20Manuals%20Library/Highway%20Design.pdf

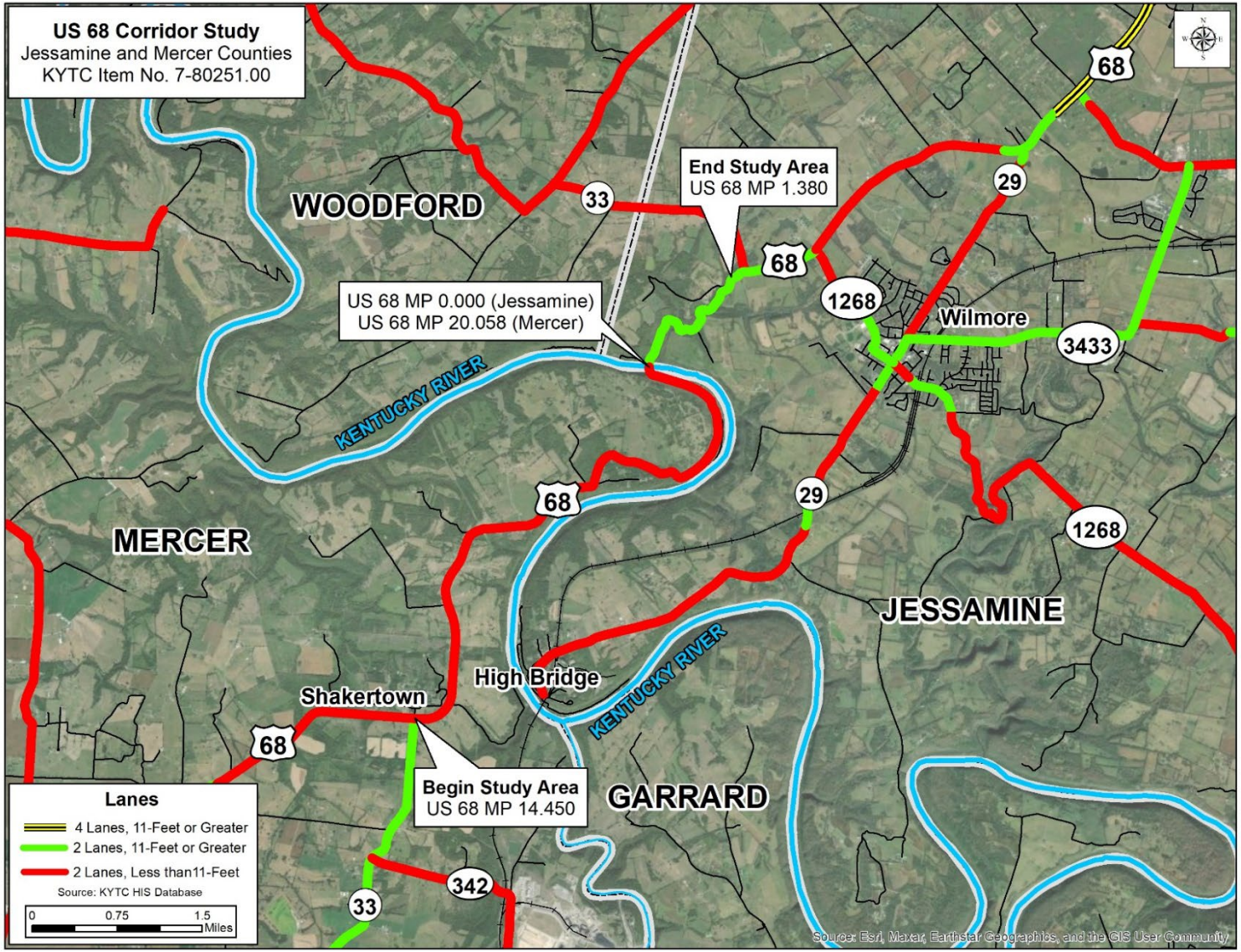

Figure 5: Lane Widths

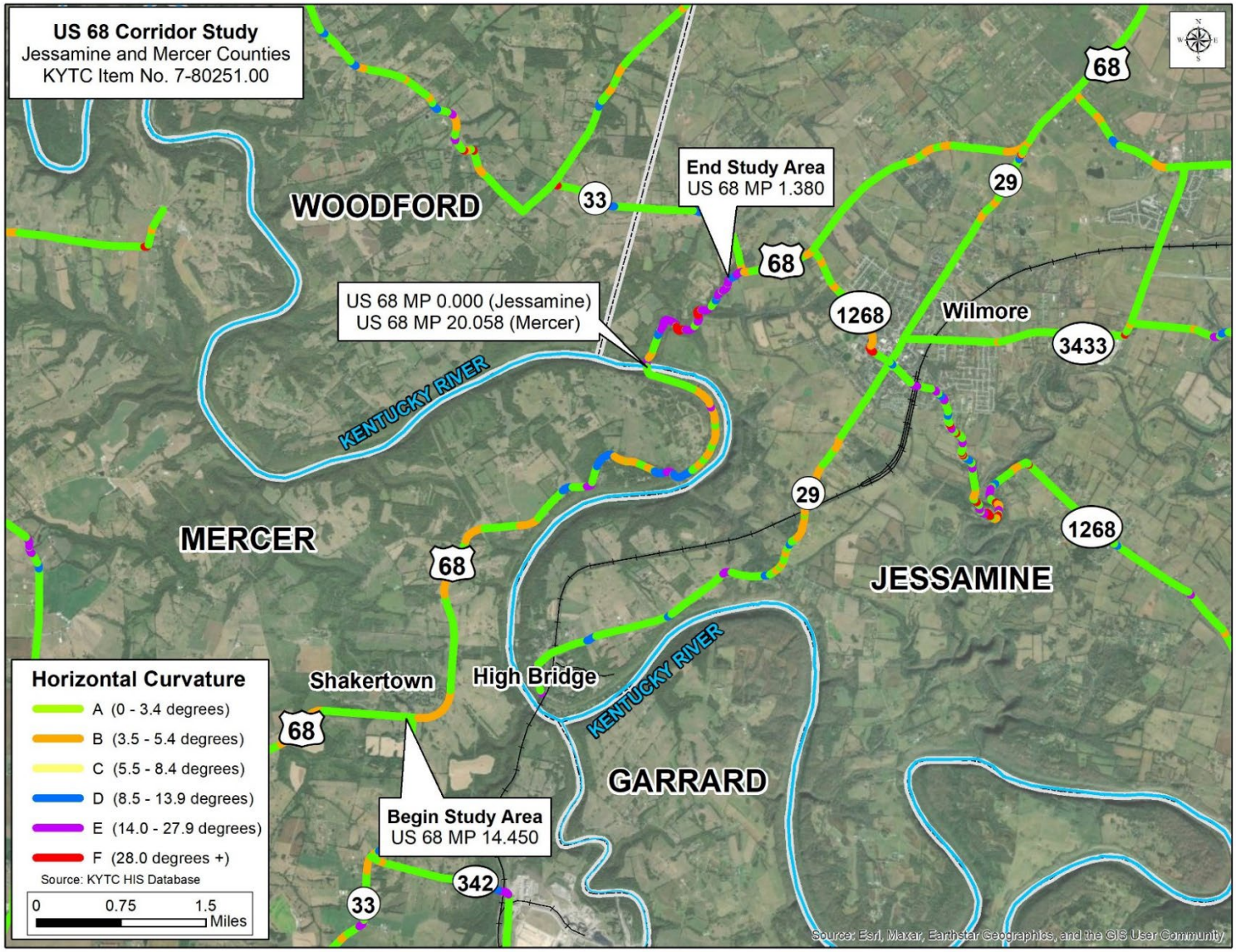

Figure 6: Horizontal Curvature

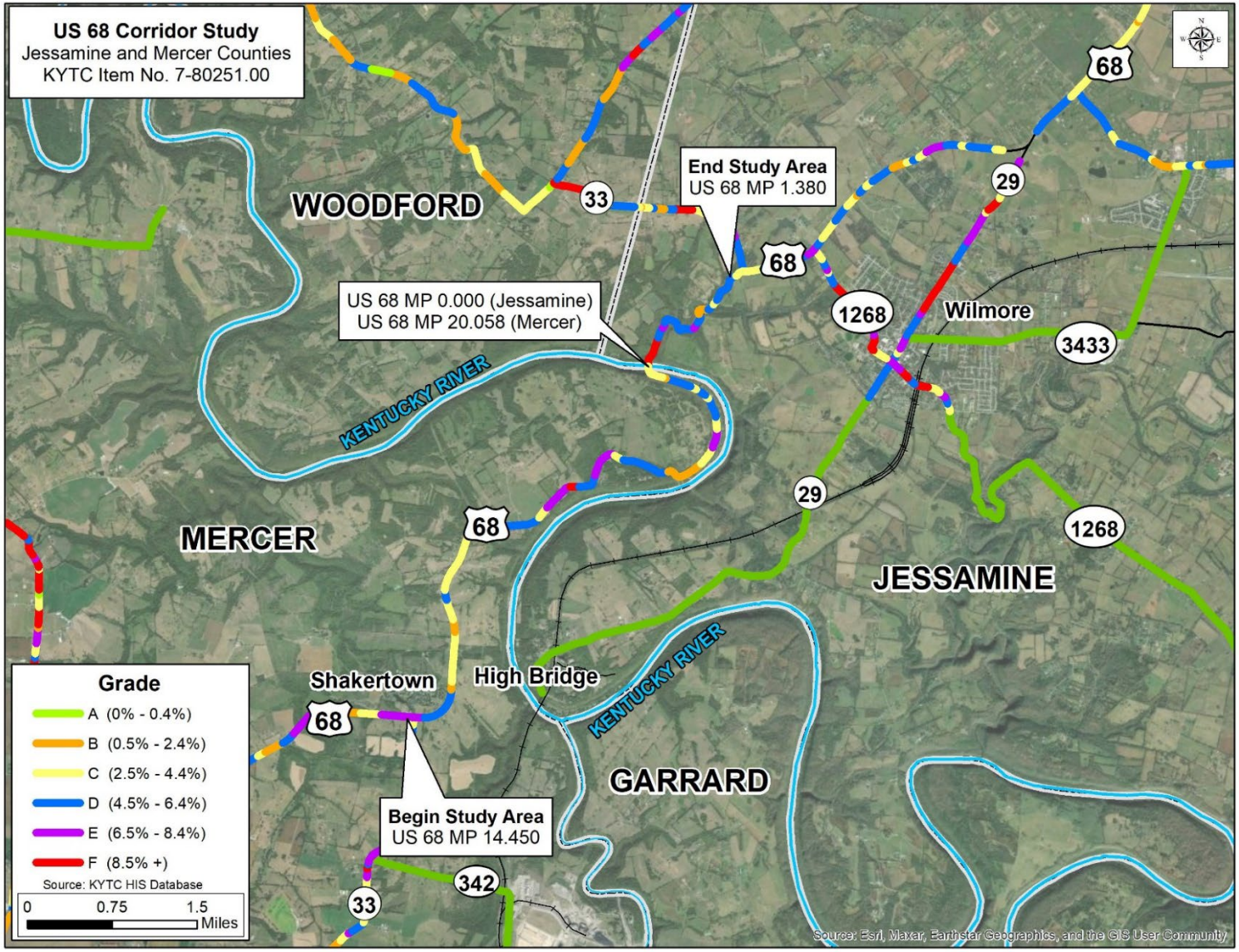

Figure 7: Grades

2.3 SPEED LIMIT

Posted speed limits along the study corridor and adjacent roads are shown in **Figure 8**. US 68 maintains a 55 mile per hour (mph) speed limit along the majority of the study corridor. Advisory speeds, however, range from 15-mph to 45-mph along the corridor.

Based on a review of 2023 – 2024 Streetlight[3] speed data, shown in **Figure 9**, vehicles travel close to the 55-mph speed limit in Mercer County near Shaker Village. Average speeds decline to 40 to 45 mph as vehicles approach the more severe horizontal and vertical curvature near the Kentucky River and are slowest in Jessamine County, with average speeds as low as 33 mph. While the curvature in Jessamine County does not allow drivers to regain speed between curves, there are several "out of context" curves in Mercer County that do not meet driver expectations. Drivers are able to speed up on tangent sections between curves.

2.4 KENTUCKY RIVER CROSSING

The US 68 bridge, shown below, across the Kentucky River was constructed in 1954 (71 years old as of 2025) and is fast 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 (71.98). The following summarizes the rating of the deck, superstructure, and substructure:

- The deck is concrete cast-in-place and was rated as fair, with a score of five out of ten, as it has been rated for the past 20 years.
- The superstructure has been rated poor since 2020 with a score of four out of ten.
- The substructure was rated as fair, with a score of five out of ten. This rating has not changed since 2009.

The existing structure is a vital crossing for local and regional trips and replaced the previous bridge, which collapsed in 1953 when a food service truck attempted to cross[4].

US 68 Kentucky River Crossing (looking south)

[3] https://www.streetlightdata.com/
[4] https://bridgestunnels.com/location/boone-tunnel/

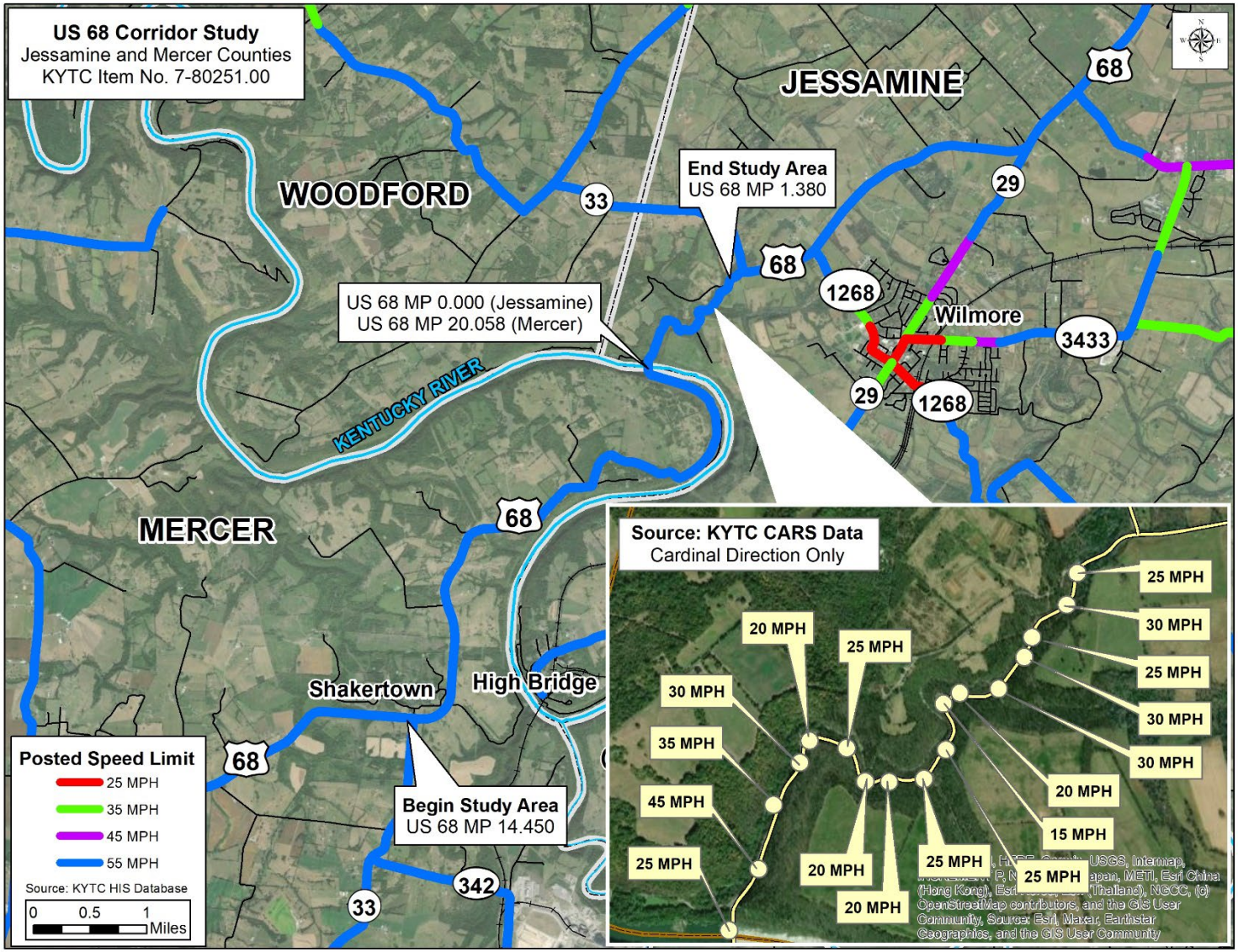

Figure 8: Posted Speed Limit and Jessamine County Advisory Speeds

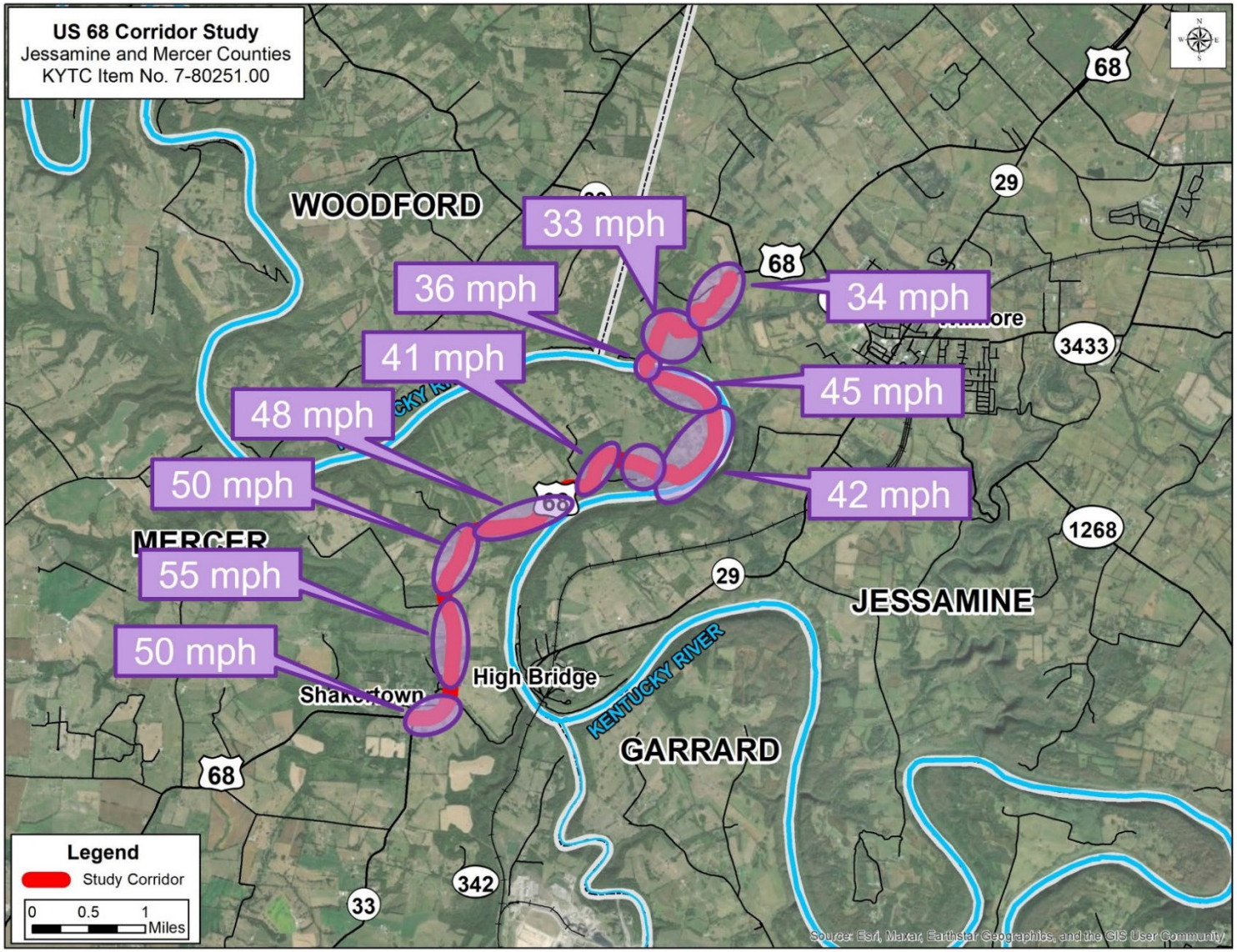

Figure 9: Streetlight Average Speeds

2.5 EXISTING TRAFFIC ANALYSIS

Existing daily traffic volumes were reviewed for the study corridor and adjacent roadways. The most current annual average daily traffic (AADT) volumes from KYTC traffic count stations are shown on **Figure 10.** Daily traffic on the study portion of US 68 ranges from 2,900 vehicles per day (VPD) in Mercer County to 3,000 VPD in Jessamine County. Truck percentages on US 68 range from six percent in Mercer County to 7.3 percent in Jessamine County.

North of the study area, daily traffic increases on US 68 as it approaches Lexington to 12,700 VPD. In Mercer County, KY 33 carries 1,200 VPD while in Jessamine County, KY 33 carries 800 VPD. Traffic on KY 29 ranges from 600 VPD in High Bridge to 5,400 VPD north of Wilmore.

Turning movement estimates were developed for the US 68 intersections with KY 33 in Mercer and Jessamine Counties using Streetlight turning movements and KYTC hourly count volumes. Level of service (LOS), a qualitative measure describing operational conditions, was used to evaluate the traffic operations of the intersections. In rural areas, LOS C or better is desirable and in urban areas, LOS D or better is desirable. Results from a Highway Capacity Software (HCS) analysis indicate that the US 68 intersections with KY 33 in Mercer and Jessamine Counties both currently operate at LOS B or better during the a.m. and p.m. peak hours.

2.5.1 Streetlight Origin-Destination Analysis

Streetlight data from 2021 – 2022 were analyzed to identify origin and destination trip patterns for trips that travel the full length of the US 68 study corridor. Using a middle filter on the US 68 bridge, the following trip patterns were observed:

- 33 percent to / from US 68 West (Harrodsburg)
- 31 percent to / from US 68 East (Lexington)
- 16 percent to / from KY 33 (Burgin and Harrodsburg)
- 12 percent to / from KY 29 (Nicholasville)
- 4 percent to / from KY 1268 (Wilmore)
- 4 percent to from other minor roadways

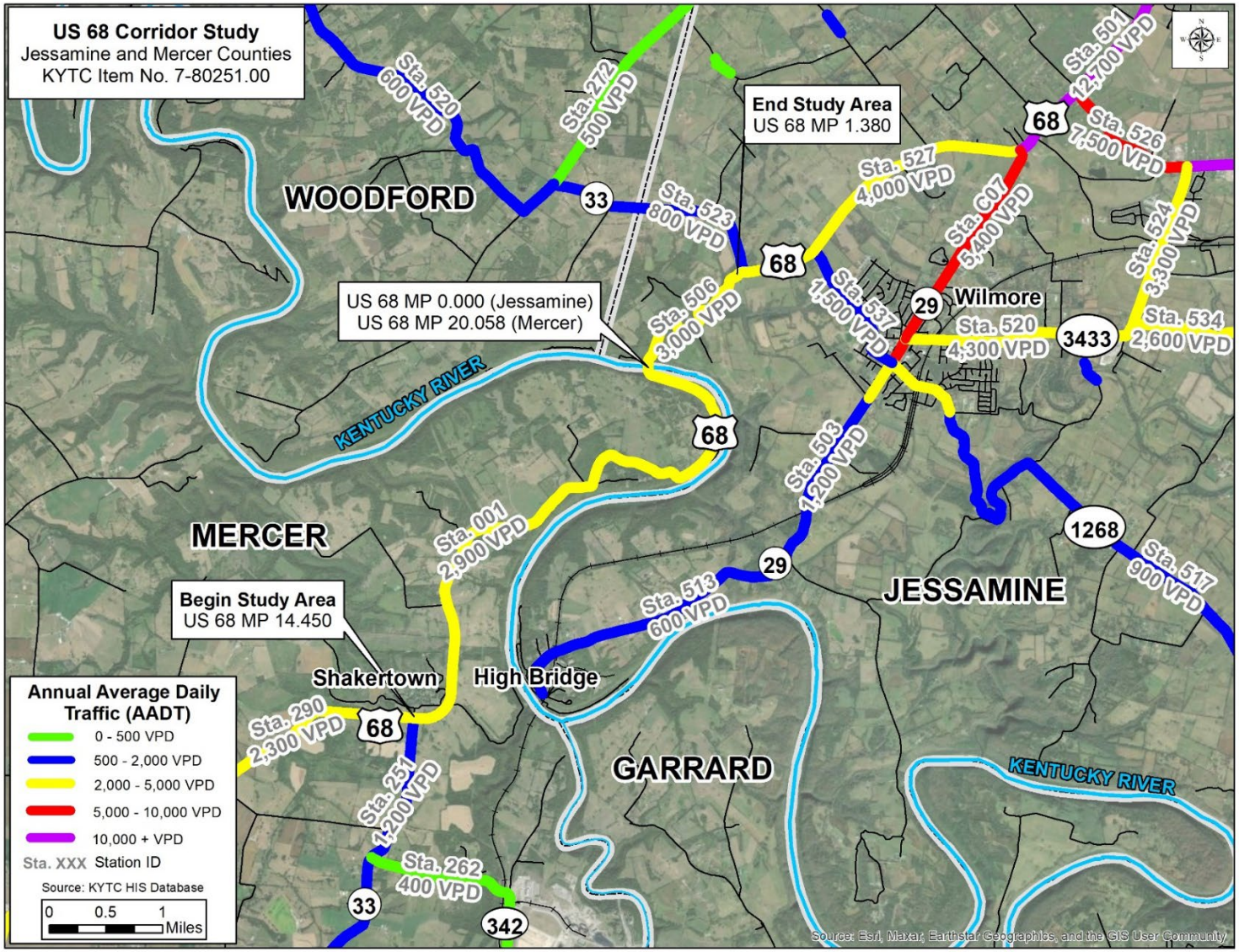

Figure 10: Annual Average Daily Traffic (AADT)

2.6 CRASH HISTORY

Crash data were collected along US 68 for the five-year period between 2019 and 2023. The crash records are included in **Appendix A.** Over that period, there were 109 reported crashes on the study portion of US 68, as shown in

Figure 11. Of the 109 reported crashes, 21 resulted in an injury (19 percent), and 88 resulted in property damage only (81 percent).

Of the 21 injury crashes, five (20 percent) were classified as A indicating an incapacitating injury. Of these five serious injury collisions, three were single vehicle motorcycle crashes in which operators lost control around a curve, one collision was a head on collision that occurred on wet pavement, and one was a collision with an animal.

The most common crash types, as shown in **Figure 12**, were single vehicle (76 percent) and sideswipe crashes (nine percent).

The Kentucky Transportation Center's (KTC's) Crash Data Analysis Tool (CDAT) was used to perform an Excess Expected Crashes (EEC) analysis. EEC is a measure of the crash frequency at a given site compared to what is expected on an average road with similar current conditions (geometrics, traffic, etc.). A positive EEC indicates more crashes are occurring more than should be expected. Results from this analysis showed US 68 in Jessamine County with an EEC greater than four and US 68 in Mercer County with an EEC greater than zero, as shown in **Figure 13**. All intersections within the study area had slightly positive EECs, and the intersection with KY 33 in Mercer County had an EEC greater than one.

Between 2019 and 2023, there were an average of 6.7 crashes per year per mile in Jessamine County and an average of 2.2 crashes per year per mile in Mercer County, as shown in **Table 1**. In the eight months after the HSIP project was completed in Jessamine County, there were three property damage only collisions, which lowered the average to 3.3 crashes per year per mile.

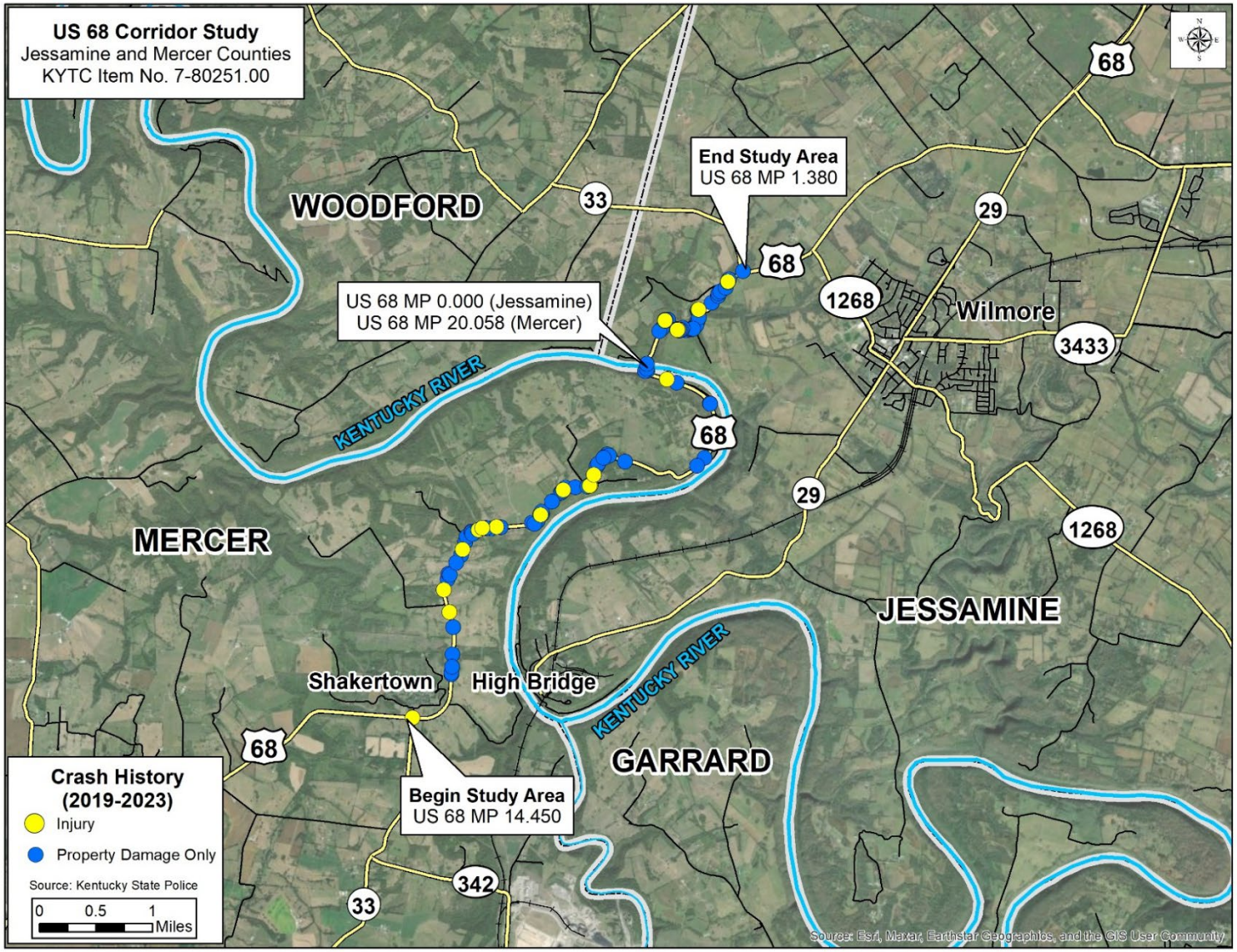

Figure 11: Crash Severity (2019 - 2023)

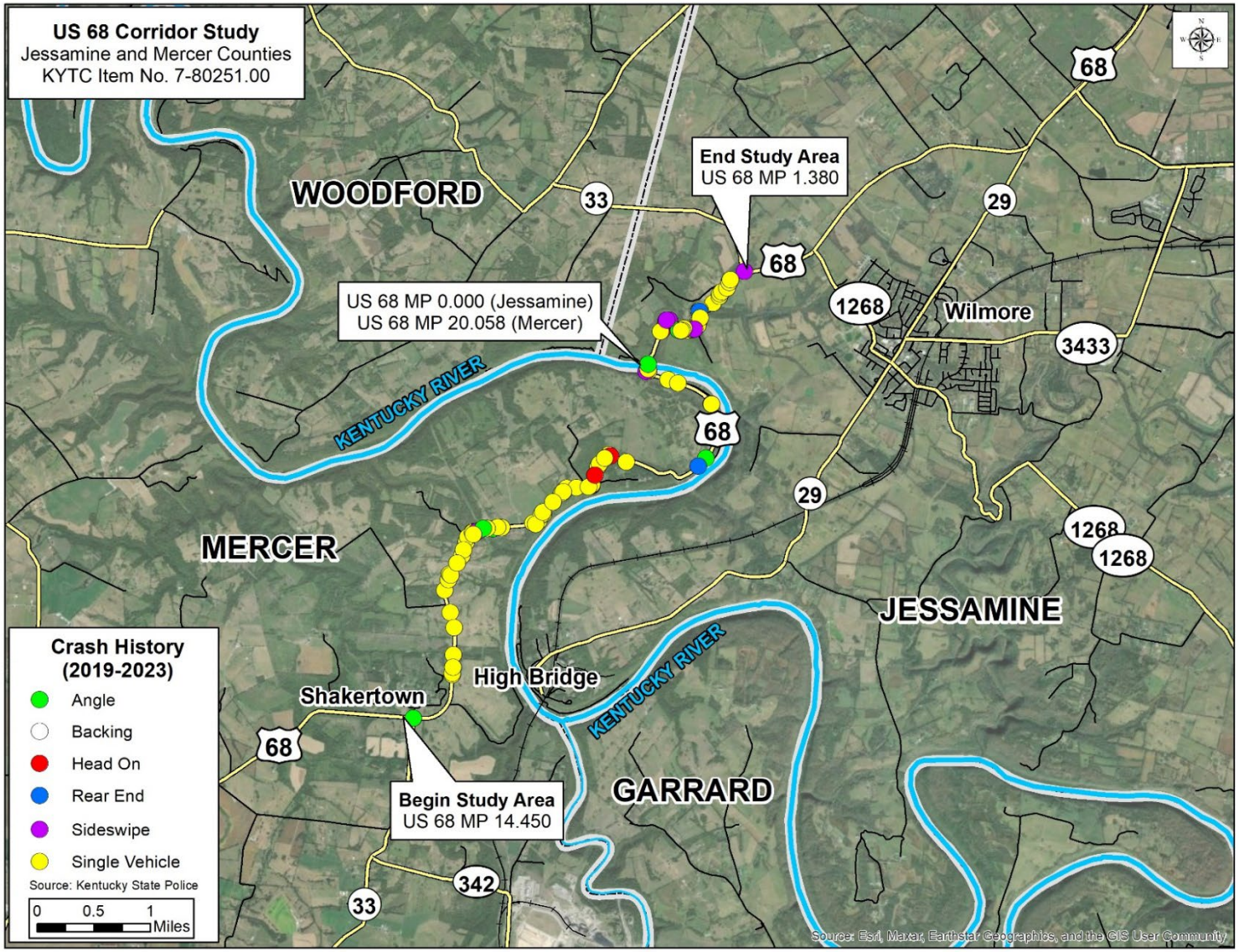

Figure 12: Crash Type (2019 - 2023)

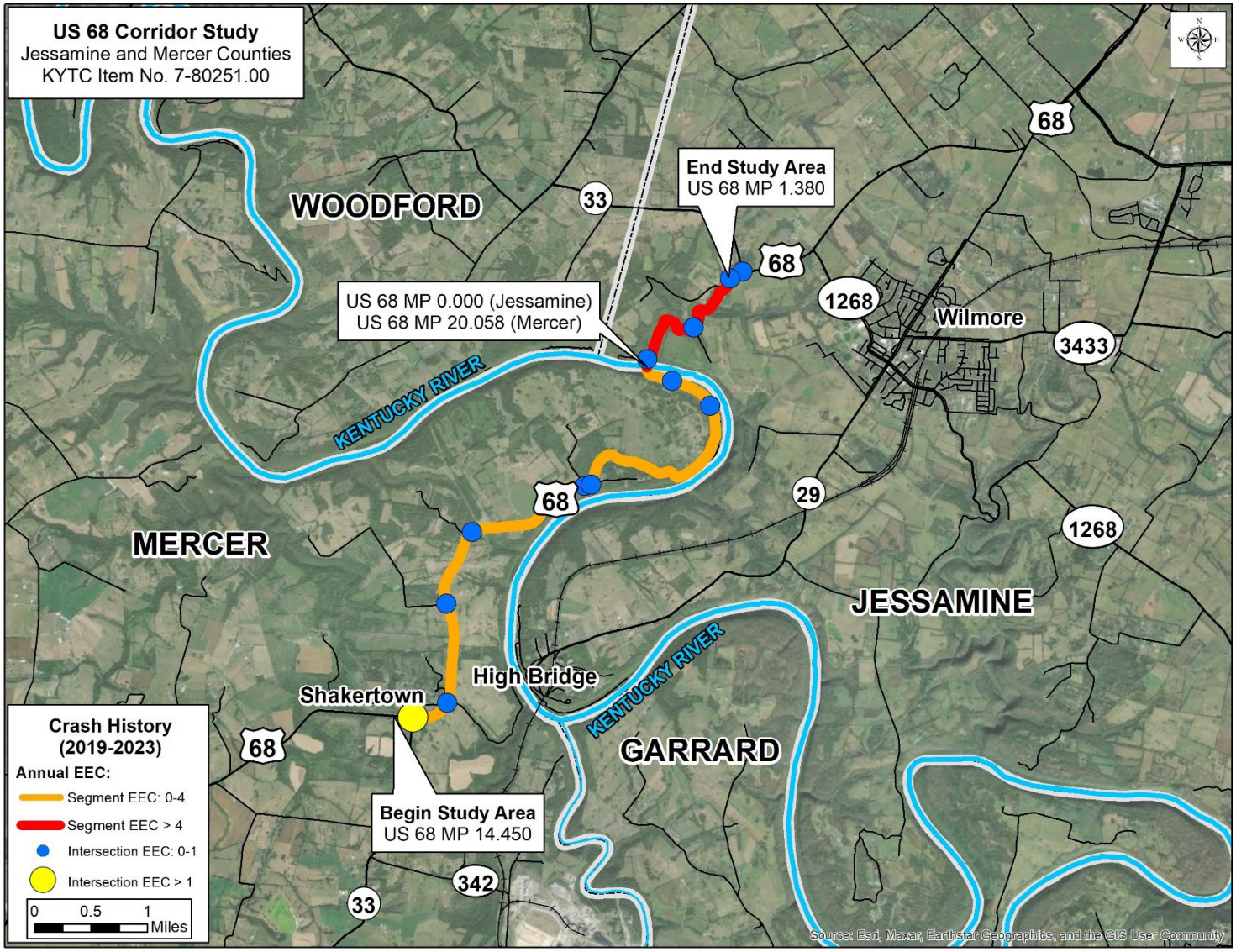

Figure 13: Excess Expected Crashes

Table 1: US 68 Crashes Per Year by County

Year	Jessamine County (1.38 miles)	Mercer County (5.608 miles)
2019	11	13
2020	8	11
2021	15	6
2022	7	17
2023	5	16
Total	**46**	**63**
Annual Average Crashes Per Mile	**6.7**	**2.2**

A crash tree diagram was developed to identify crash characteristics that are overrepresented on US 68. Eighty four percent of non-animal, non-intersection single vehicle collisions occurred on horizontal curves. These crashes were more likely to result in an injury if they occurred on dry pavement than wet pavement. This could indicate that motorists are more likely to exceed advisory speeds during dry conditions. Alternatively, head on collisions were more likely to be severe on wet pavement.

A second crash tree diagram was developed to only analyze collisions on US 68 in Mercer County, as shown in **Figure 14**. Results from the analysis mirrored results for the overall corridor, with single vehicle collisions on horizontal curves more likely to result in an injury on dry pavement.

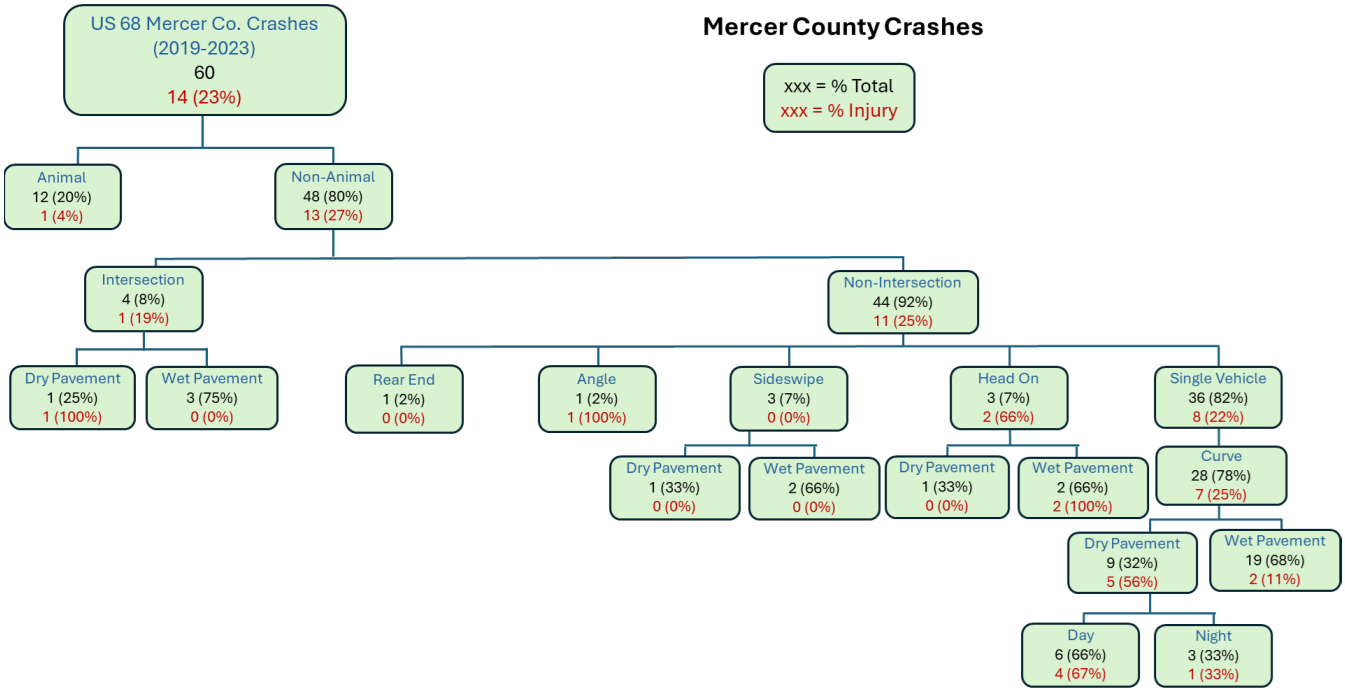

Figure 14: US 68 Crash Tree Diagram (Mercer County)

3.0 ENVIRONMENTAL OVERVIEW

An Environmental Overview (EO) was completed to identify known natural and human features which occur within the study area. These features were considered during the development and advancement of improvement concepts along with avoidance or minimization of impacts to the sensitive resources. The complete document is included in **Appendix B**.

3.1 NATURAL ENVIRONMENT

There were 164 National Wetland Inventory (NWI) features (315 acres) mapped within the study area. Most of the acreage identified is associated with the Kentucky River (207 acres). A review of available data revealed 15 state-listed water wells occur within the study area, two of which are listed as agricultural and 10 are listed as domestic. An overview of the water resources in and around the study area is shown in **Figure 15.**

The study area is underlain by bedrock and has no karst features, sinkholes, or caves within the study area. There are zero listed oil and gas wells reported within the study area.

According to the United State Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) resource list, there are six federally listed endangered species in Jessamine and Mercer Counties. All have the potential to occur within the study area. No specific locations were identified at this time. They will be identified and studied in more detail when a project advances to a preliminary design phase.

A significant portion of the Mercer County side of the study area lies within the designated 100-year floodplain, particularly adjacent to the Kentucky River. This area experienced substantial flooding in Spring 2025, resulting in the closure of US 68 for multiple days. In response to this event, the study team added "resiliency" as a key objective to address the corridor's vulnerability to extreme weather and improve long term reliability.

US 68 within 100-year Floodplain (Mercer County)

The Kentucky River Palisades, a series of gorges and limestone outcroppings, are not in the study area. The EO, however, notes the existence of the Palisades and their proximity to the study area.

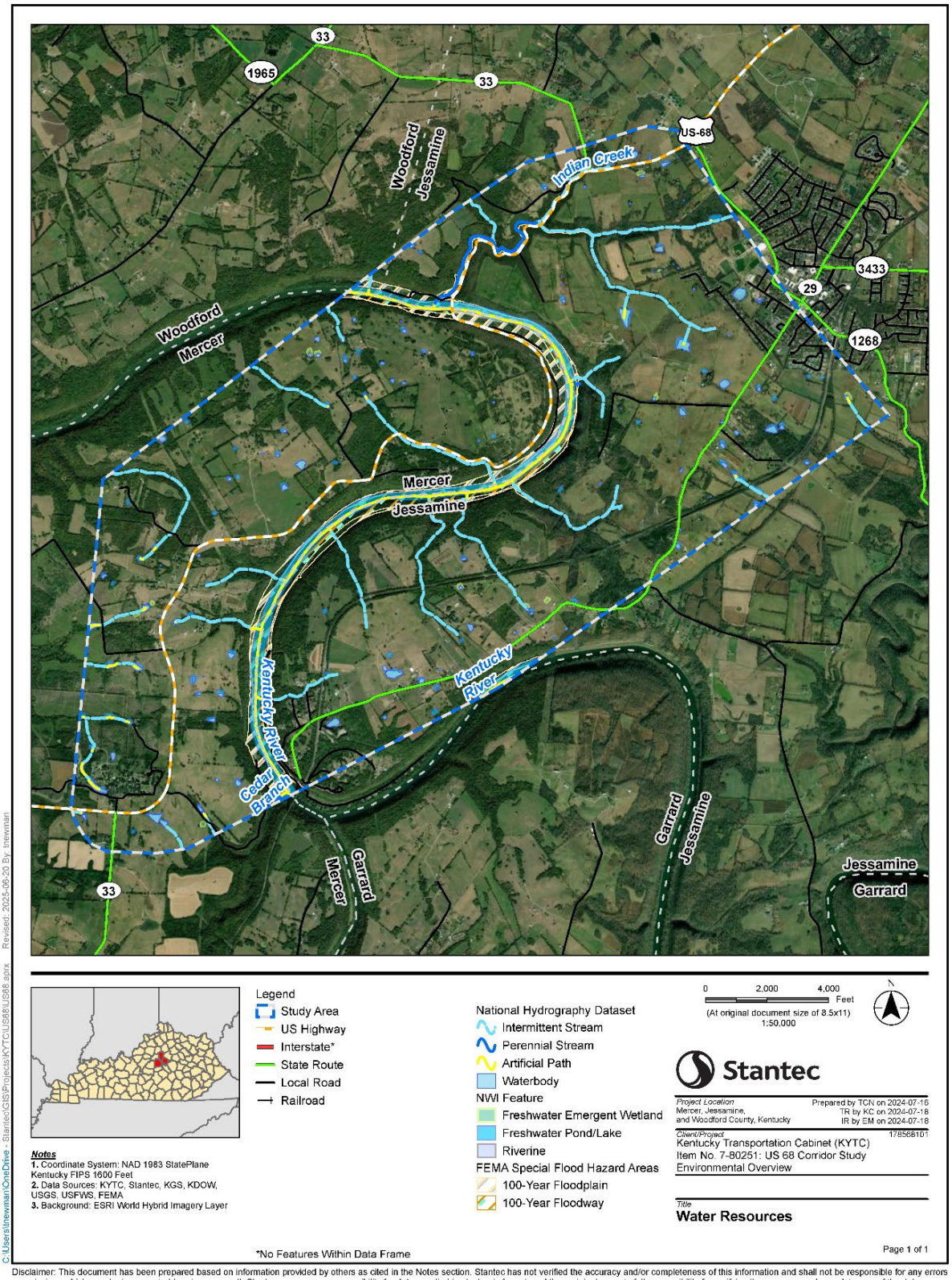

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Figure 15: Water Resources

3.2 HUMAN ENVIRONMENT

An overview of the human environment in and around the study area is shown in **Figure 16**. Based on a review of National Register of Historic Places (NRHP), there are eight properties listed: four are rural historic districts and the remaining four are individual properties. Shaker Village of Pleasant Hill, one of the NRHP listed historic districts, is also a registered National Historic Landmark. Founded in 1805, Shaker Village is located at the southwestern terminus of the US 68 study corridor and is home to a restaurant, an inn, and a gift shop and provides daily tours and other adventures. It is a popular destination for school field trips.

Prime farmland is defined as land that contains the best attributes for producing food with nutrient rich soil producing high yields. Approximately 47 percent of the study area has a farmland designation because it contains soils of statewide importance or prime farmland soils.

Community resources and sensitive noise receptors in the study area include single family houses, noise-sensitive buildings at Asbury University (i.e. library, recital hall, dorms, etc.), Shaker Village at Pleasant Hill, and Potter's Inn bed and breakfast. Utility infrastructure in the area includes approximately three electric substations and a railroad line that runs primarily east-west across the southern extent of the study area.

No natural gas pipelines were located within the study area. Kentucky River Lock and Dam #7 and associated Mother Ann Lee Hydroelectric Station are also located within the study area.

Boone Tunnel

There are five cemeteries identified by the Kentucky Heritage Council (KHC) within the study area, including locations near High Bridge and Brooklyn Hill. High Bridge, completed in 1877, spans the Kentucky River and remains an active rail corridor. The nearby Brooklyn Hill community lies just west of Wilmore.

Boone Tunnel is an abandoned tunnel in Jessamine County that dates back to the early 20th century[5]. The tunnel connected to the Brooklyn Bridge, which opened in 1871. The current US 68 bridge was constructed after the bridge collapsed in 1953 and made the Boone Tunnel obsolete. Chinn's Cave is located on the south side of US 68 in Mercer County approaching the Kentucky River bridge. It was originally a gas station and restaurant established by Colonel George M. Chinn[6]. It gained notoriety during Prohibition for hidden gambling and remains a local point of historical interest.

[5] https://www.onlyinyourstate.com/state-pride/kentucky/boone-tunnel-ky
[6] https://vintagenewsdaily.com/the-amazing-story-of-chinns-cave-house-at-brooklyn-bridge-kentucky/

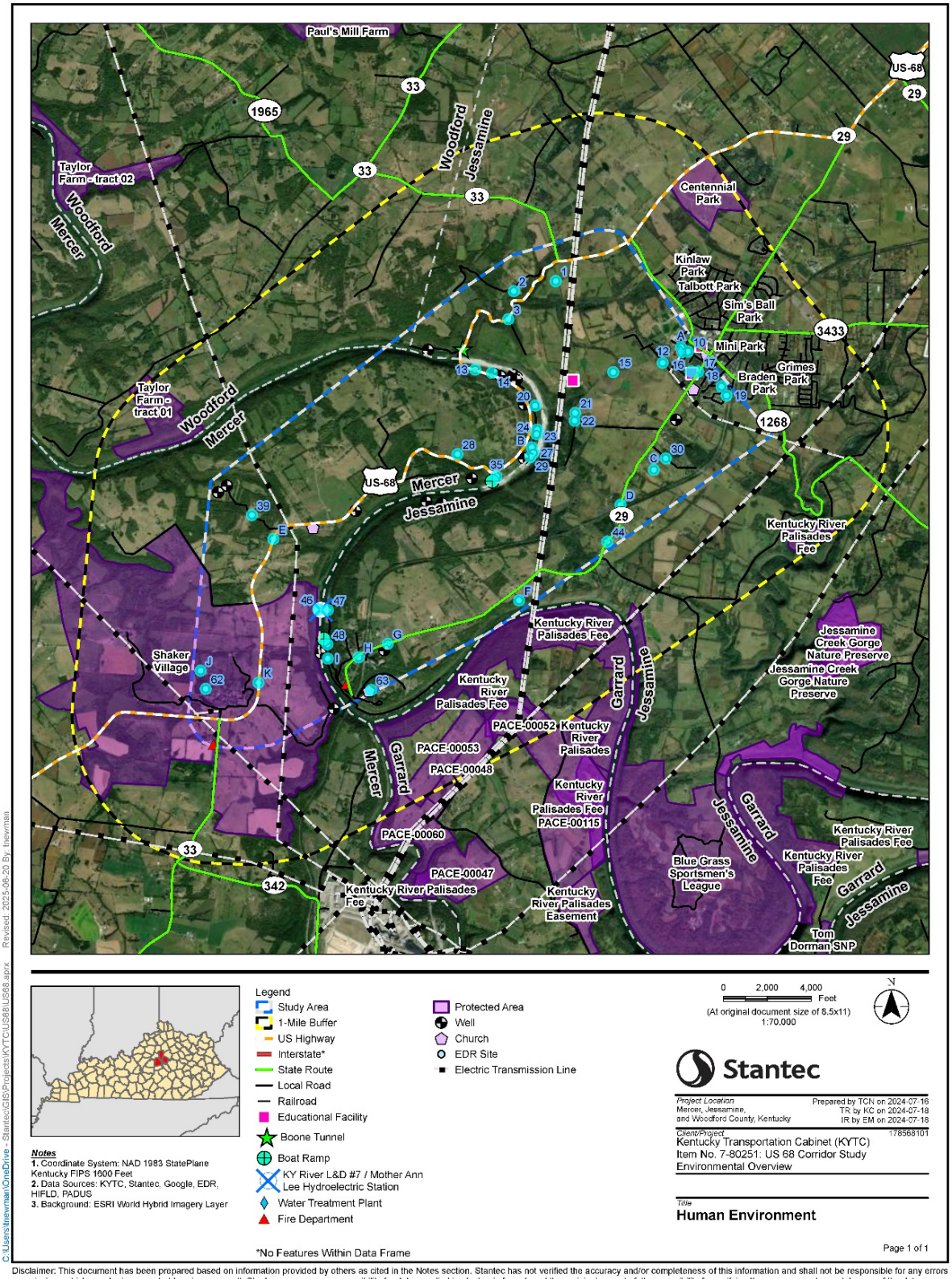

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Figure 16: Human Environment

3.3 SOCIOECONOMIC STUDY

A socioeconomic study was conducted by BGADD to summarize the socioeconomic characteristics of the study area. The full study can be found in **Appendix C**. Results of the study are summarized below.

- None of the study area census block groups have a higher percentage of persons of racial minority origins or a higher percentage of populations under the poverty line than the statewide averages. One Census Tract, between Shaker Village and the Kentucky River, has a higher percentage under the poverty line than the county average.
- Two of the five census block groups within the study area have a higher percentage of adults over the age of 65 than the statewide and Jessamine County averages (southeast of Wilmore and northwest of Wilmore).
- One census block group has a higher percentage of adults with a disability than the statewide and Jessamine County averages (southeast of Wilmore).
- Two of the census block groups have a higher percentage of population with limited English proficiency than the statewide average (Wilmore and south of Wilmore).

4.0 FUTURE TRAFFIC CONDITIONS

To determine the need for and purpose of potential transportation improvement options, it is necessary to estimate future traffic conditions. This chapter summarizes the anticipated future conditions within the study area. The Traffic Forecasting Technical Memorandum can be found in **Appendix D**.

4.1 POPULATION TRENDS

Population data, including data from the 2020 Census, were obtained from the Kentucky State Data Center (KSDC) at the University of Louisville, Kentucky's official clearinghouse for Census data. Population projections for the state of Kentucky, Jessamine County, and Mercer County are summarized in **Table 2** and shown graphically in **Figure 17.** Between the 2010 and 2020 census, the population in both counties has increased. The population increase is expected to continue in both counties through 2050.

Table 2: Population Estimates and Projections

Area	Census Estimates		Annual Growth	2050 Projection	Annual Growth
	2010	2020	2010-2020		2020-2050
Kentucky	4,339,367	4,505,836	0.38%	4,785,233	0.20%
Jessamine County	48,586	52,987	0.87%	64,162	0.64%
Mercer County	21,331	22,643	0.60%	24,430	0.25%

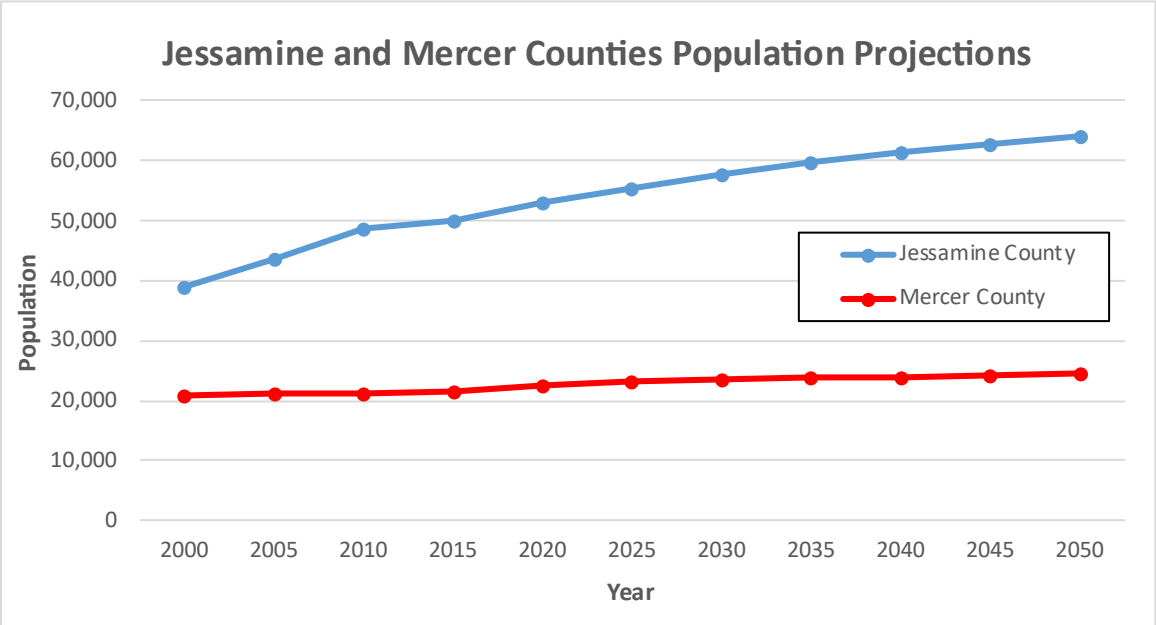

Figure 17: Population Projections
(Source: Kentucky State Data Center, 2022)

4.2 HISTORICAL TRAFFIC COUNTS

Historical traffic count data on study area roadways were analyzed to determine traffic growth patterns. Compound annual growth rates (CAGR) for medium-term (around 10 years) and long-term (around 20 years) periods were calculated to determine historical growth trends in the study area. Historical ADT volumes and annual growth rates, between 2004 and 2024, for US 68 are summarized in **Table 3**. Over the past 20 years, daily traffic on US 68 has remained relatively flat. More recently, daily traffic in Jessamine County has grown slightly and daily traffic in Mercer County has slightly declined.

The red text in **Table 3** represents traffic counts from 2020 and early 2021, which are not an accurate representation of recent traffic patterns due to COVID shutdowns. The 2020 and early 2021 traffic counts are provided for reference but were not used to calculate the compound annual growth rates.

Table 3: KYTC Historical Average Daily Traffic

Year	US 68		KY 33	
	Mercer	Jessamine	Mercer	Jessamine
2004				
2005				919
2006	2,860	2,980	1,300	
2007				
2008				993
2009	2,850	3,060	1,240	
2010				
2011				956
2012	2,942	2,886	1,228	
2013				
2014				884
2015	2,741		1,206	
2016				
2017				787
2018	3,175	3,177	1,318	
2019				
2020				946
2021	2,641	2,811	1,047	
2022				
2023				
2024	2,860	2,990	1,232	
Long Term GR	0.0%	0.0%	0.2%	-1.3%
Medium Term GR	-0.2%	0.3%	0.0%	-2.6%

Source: Kentucky Transportation Cabinet (KYTC)
*2020 / early 2021 counts not used in growth rate calculations

4.3 KENTUCKY STATEWIDE TRAFFIC MODEL (KYSTM)

Study area assignments and growth rates from the Kentucky Statewide Travel Demand Model (KYSTM) version 19 were reviewed. Daily traffic on US 68 in both Jessamine and Mercer Counties along the study corridor is expected to increase at an annual rate of 1.6 percent per year from 2019 to 2045 if there are no capacity improvements. This growth is likely due to expectations of significant household and employment growth in both counties by the model. Adjacent roadways, with alternate Kentucky River crossings at Bluegrass Parkway and US 27 show similar growth, at 1.1 percent and 0.8 percent per year respectively. Growth rates derived from the KYSTM are shown on **Figure 18** and in **Table 4**.Error! Reference source not found.

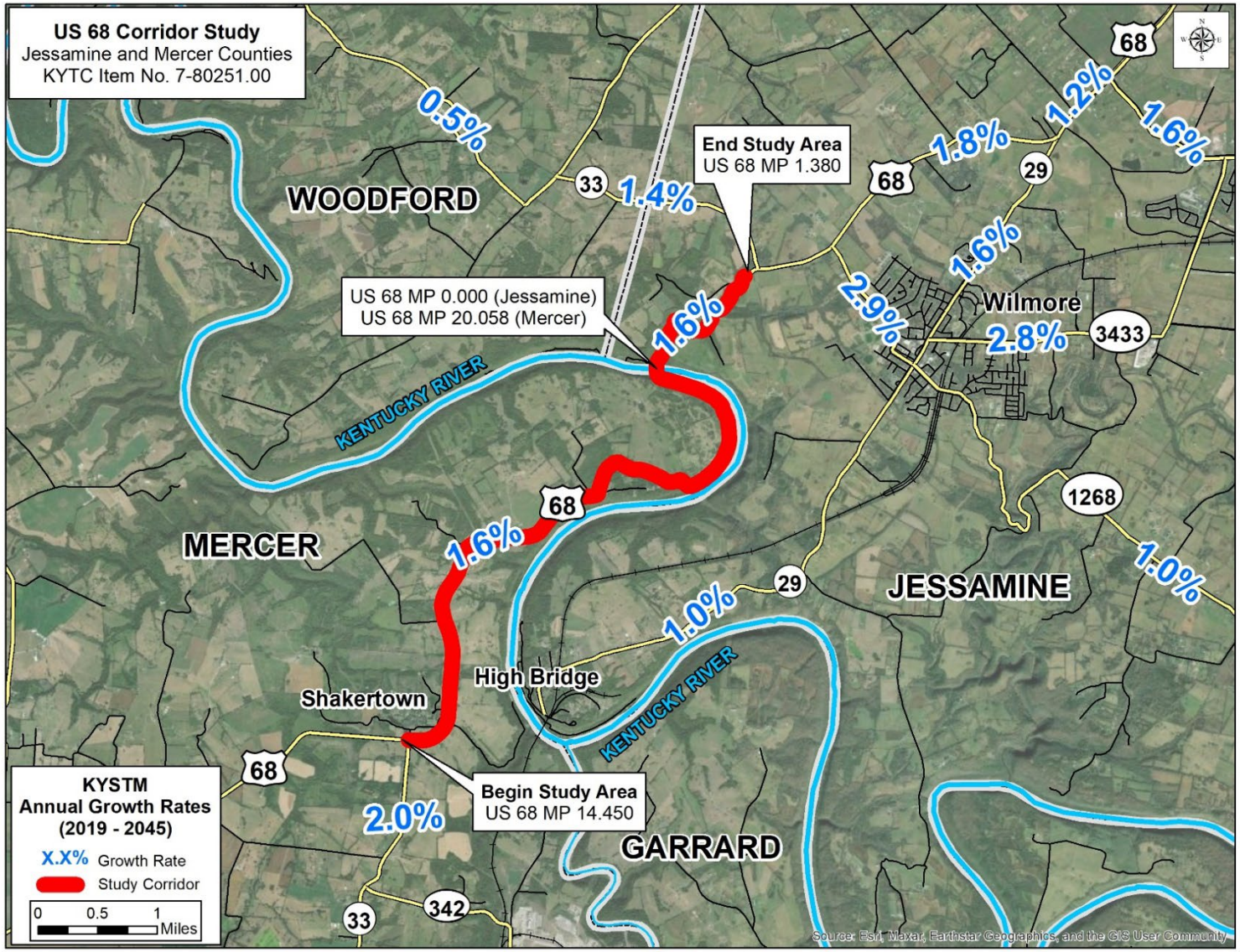

Figure 18: KYSTM Annual Growth Rates (2019 – 2045)

Table 4: KYSTM Growth Rates

KY River Crossing	2019	2045	Annual GR
US 68	**3,461**	**5,086**	**1.5%**
Bluegrass Pkwy.	25,333	33,316	1.1%
US 27	17,916	22,069	0.8%

4.4 2045 DAILY TRAFFIC FORECASTS

Because the existing US 68 bridge will eventually need to be rehabilitated and/or replaced, there is no true "No-Build" option for the study. Growth scenarios were instead developed for on- and off-alignment concepts. The On-Alignment scenario assumes safety improvements to the existing US 68 corridor that will not increase capacity or speed and a bridge replacement at the existing Kentucky River crossing. The Off-Alignment scenario includes a new Kentucky River crossing and the potential for travel time savings due to anticipated 55 mph operating speeds.

4.5 2045 ON-ALIGNMENT TRAFFIC FORECASTS

Based on the KYTC historical traffic count data, population estimates and projections, and results from the KYSTM, an annual growth rate of one percent was selected to grow On-Alignment scenario traffic through the year 2045. While historical traffic has remained relatively flat over the past 20 years, individual daily counts and results from the model show that the area has grown and is expected to continue growing. The US 68 bridge is also regionally important, as it is the only Kentucky River crossing in the area, with the nearest crossings 16 miles (US 27) to 21 miles (Bluegrass Parkway) away. The annual growth rate was used to forecast daily traffic to 2045. Daily traffic is expected to range from 3,600 in Mercer County to 4,200 in Jessamine County in 2045.

4.6 2045 OFF-ALIGNMENT TRAFFIC FORECASTS

2045 Off-Alignment daily traffic forecasts were developed through multiple KYSTM runs assuming various new Kentucky River crossings. 2045 traffic across the Kentucky River is shown as a range, as shown in **Figure 19**, to capture the traffic possibilities resulting from travel time savings of different river crossing locations. Daily assignments from the model were used to forecast traffic on the potential new and upgraded roadways.

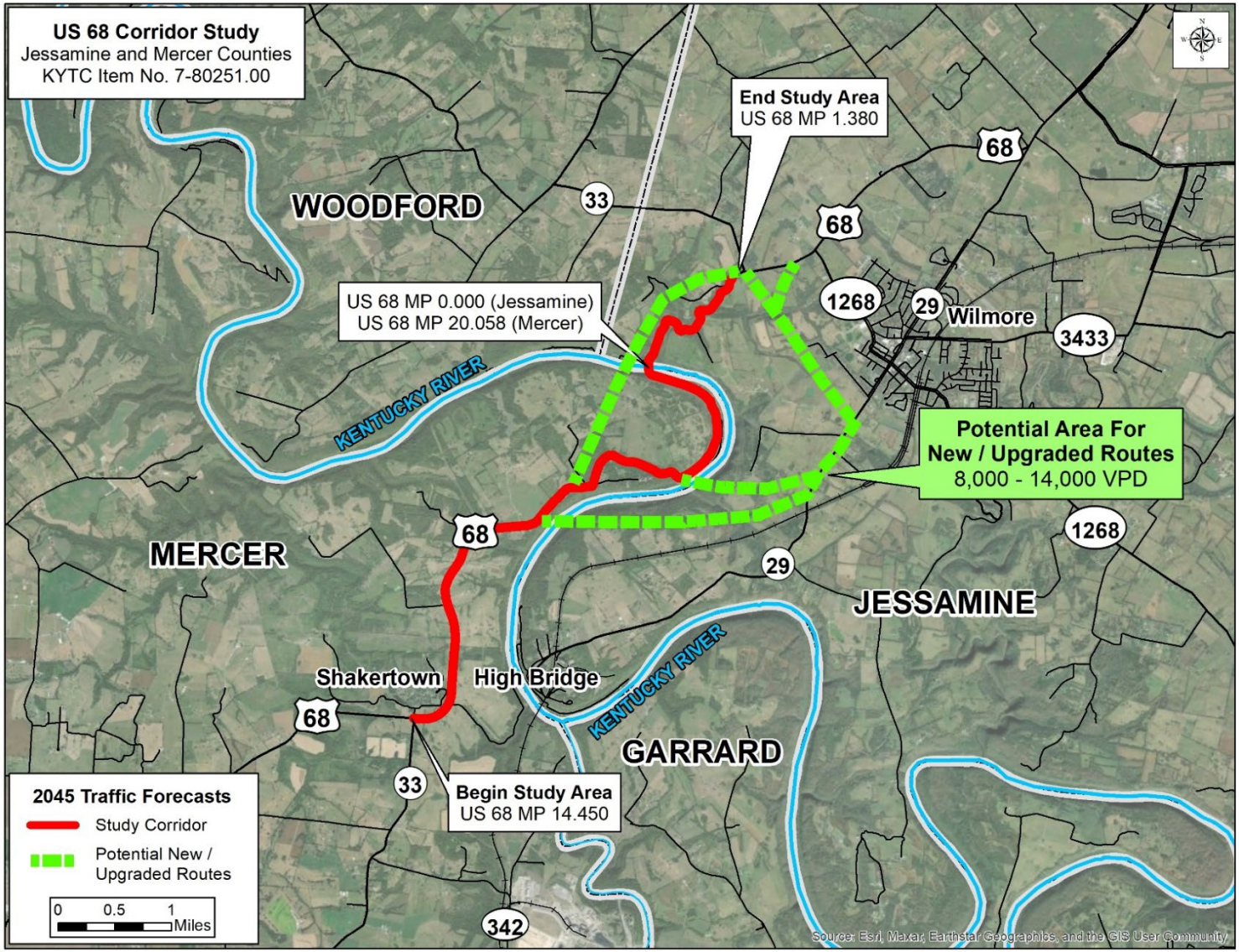

Figure 19: 2045 Off-Alignment Daily Traffic Forecast

5.0 STUDY OBJECTIVE

After analyzing existing and future conditions, reviewing the environmental overview, reviewing nearby projects, and meeting with local officials, a study objective statement was developed to guide any potential projects that will be developed as part of this study.

A Study Objective provides the foundation for decision-making and the basis for evaluation and comparison of improvement concepts. Therefore, the project team developed a draft study objective prior to developing conceptual improvement options.

The objective of the US 68 Corridor Study is to identify and evaluate potential concepts to improve safety, truck mobility, driver expectations (geometrics), and resiliency on US 68 in Jessamine and Mercer Counties and to determine the need for and optimal location of a replacement bridge over the Kentucky River.

6.0 INITIAL STUDY OUTREACH

Over the course of the study, the project team met with Local Officials and Stakeholders to coordinate on key issues. The project team included representatives from KYTC Central Office, KYTC District 7, Lexington Area Metropolitan Planning Organization (LAMPO), the Bluegrass Area Development District (BGADD), and the consultant, Stantec. Detailed summaries of each meeting are presented in **Appendix E**.

6.1 PROJECT TEAM MEETING NO. 1

The first Project Team Meeting was held at the KYTC District 7 office and virtually via Microsoft Teams on August 28, 2024. The purpose of the meeting was to present the results from the existing conditions analysis and to get feedback from the project team on transportation issues in the study area and preliminary improvement concepts. Discussion topics included:

- This study serves as a pilot study to incorporate Road Safety Assessments (RSAs) from an independent team through the Statewide HSIP contract. The Safe System Framework from the Federal Highway Administration (FHWA) was used as guidance.
- Multimodal traffic on US 68 mostly consists of bicyclists in group rides and pedestrians crossing to access the portion of Shaker Village adjacent to the Kentucky River. The Kentucky River Palisades, a series of gorges and limestone outcroppings, are not in the study area. However, the project team will be sensitive to the existence of the Palisades and their proximity to the study area.
- It was determined that on-alignment safety improvements along with the realignment and straightening of horizontal curves along the study corridor will be considered.
- It was noted that based on the traffic modeling, a new crossing would attract more trucks. The new river crossing options are currently showing a bypass around Wilmore to keep the increased truck traffic from traveling on KY 29 through downtown Wilmore.

6.2 LOCAL OFFICIALS / STAKEHOLDER MEETING NO. 1

The first Local Officials / Stakeholder Meeting was held at Wilmore City Hall on October 17, 2024. The purpose of the meeting was to discuss existing conditions and solicit feedback for the corridor study. Attendees were asked to fill out a survey to provide feedback regarding transportation issues on US 68. Nineteen local officials and stakeholders completed the survey.

When asked if they live or work in the study area, nine participants indicated they work in the study area and six indicated they live and work in the study area. Participants were then asked how often they travel through the study area. Twelve of the 19 participants (63 percent) indicated that they travel through the study area at least once per week, as shown in **Figure 20**.

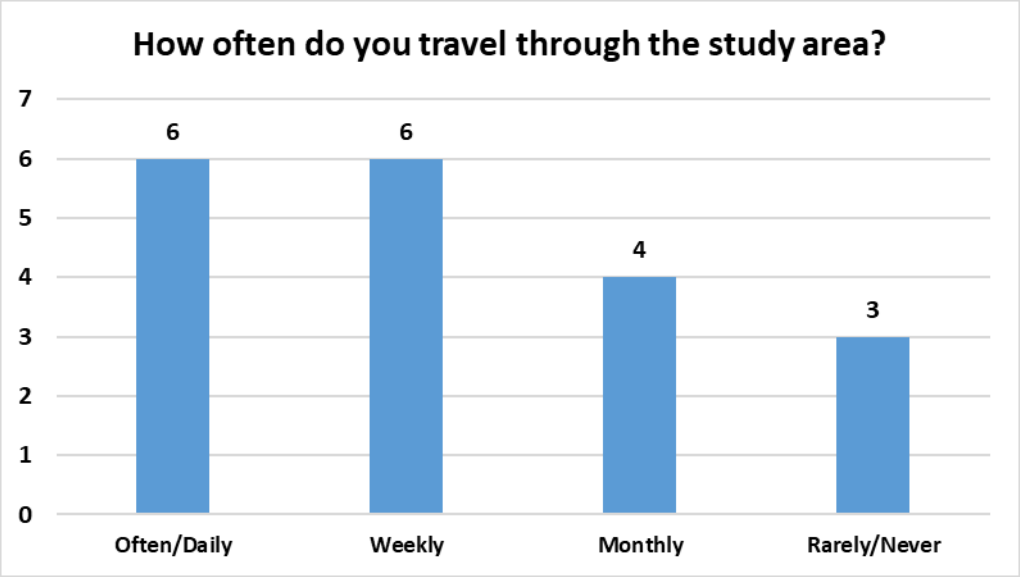

Figure 20: Local Officials / Stakeholder Meeting No.1 Survey - Travel Frequency

Survey participants were asked what type of vehicle they operate on US 68. 16 of the 19 (84 percent) indicated they drive a passenger vehicle while three (16 percent) indicated they drive a single- or multi-unit truck.

Respondents were asked to rank their top five transportation issues in the study area in order, #1 being the highest priority. The ranking system was assigned a point scale, with a #1 ranking receiving five points, #2 ranking receiving four points, #3 ranking receiving three points, #4 ranking receiving two points, and a #5 ranking receiving one point. The highest ranked priority was sharp curves, followed by steep grades and truck traffic, as shown in **Figure 21**.

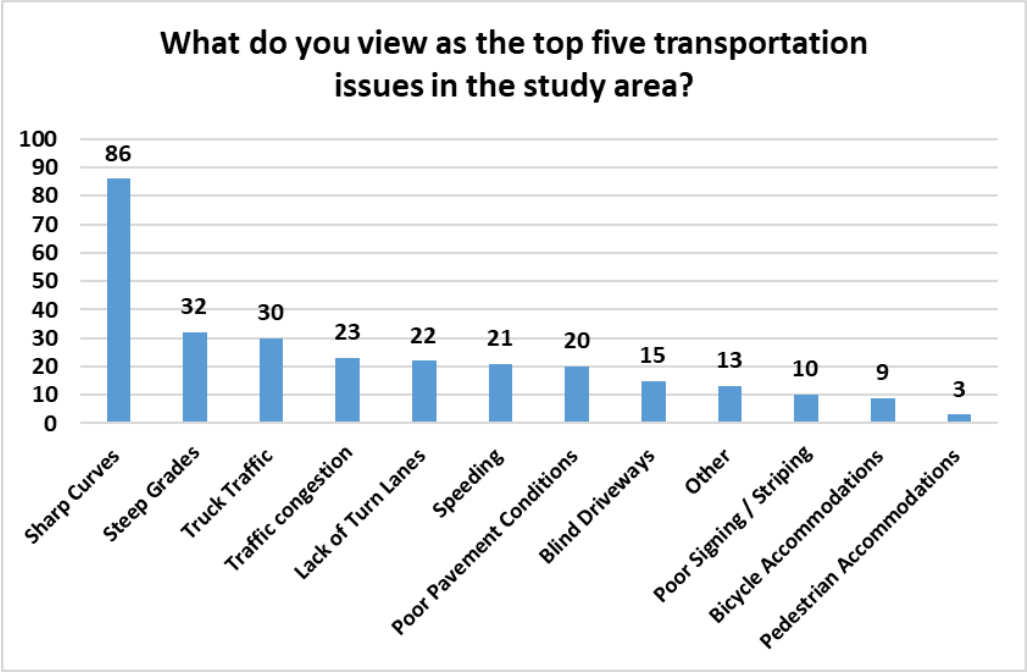

Figure 21: Local Officials / Stakeholder Meeting No.1 Survey - Transportation Issues

Participants were then given a study area map and asked to identify trouble spots related to safety and congestion along with any potential improvements. The following summarizes the responses:

- The most identified issue was horizontal curves. Locations were identified on both sides of the Kentucky River.
- US 68 at KY 33 in Mercer County is a common location for speeding and can be challenging to make turns due to limited sightlines.
- Drainage is an issue during storms, especially approaching the river.
- Bluegrass Energy has facilities in the study area on both sides of the river
- Slow traffic can negatively impact commuters because there are no passing opportunities.
- Collisions can back up traffic for long periods of time.

Respondents were asked to indicate on a study area map historic or environmental concerns not shown in the Environmental Overview map. No new locations were identified.

The final question of the survey asked respondents if they have any other general suggestions for improvements along US 68. The responses included:

- Straighten the road and keep the beauty and historic integrity of the Palisades
- Improve safety of school bus stops.
- Keep US 68 a scenic corridor.

- Would love to see a better lane for cyclists and option for hikers. A new bridge would be best and use old bridge for pedestrian pathway. New road will increase tourism.
- Jessamine County field trip and sporting event school bus drivers are instructed to go through Danville and avoid this portion of US 68.
- Create a wider road from the bridge to Shaker Village. Connecting KY 29 over the river is intriguing though it would be expensive. High Bridge is insulated.
- Widen the proposed roads, even if just two lanes.

6.3 PUBLIC SURVEY

After the Local Officials meeting, a public MetroQuest survey was released online and made available from October 17, 2024 to November 22, 2024. A link to the survey was made available on KYTC District 7's website, mailed to study area property owners, and disseminated by the local officials. A summary of the results is described below.

Of the 1,319 respondents, 50 percent drive US 68 at least two to three times per week. Harrodsburg was the most common home location and Lexington was the most common work destination for those who utilize US 68 to get to work. Respondents were also asked to rank transportation issues on US 68. As shown in **Figure 22**, lack of shoulders/recovery area and sharp curves were the highest ranked transportation issues.

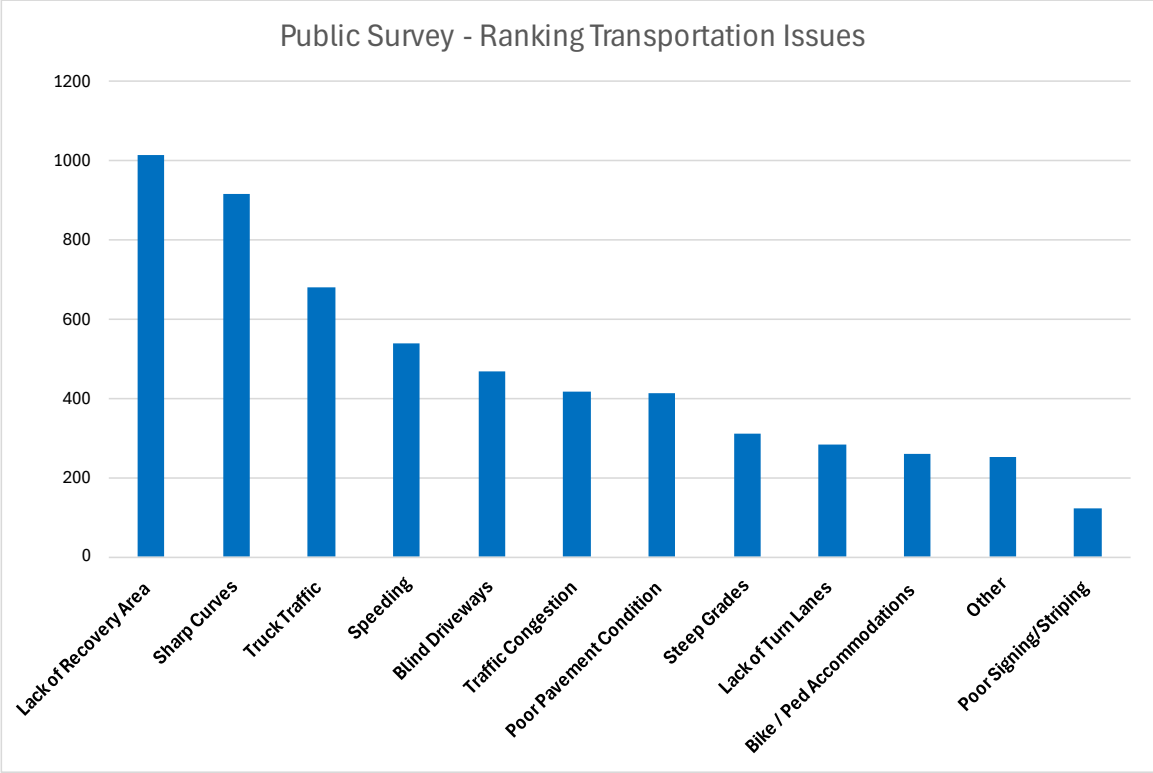

Figure 22: Public Survey – Ranking Transportation Issues

Survey respondents were then asked to identify safety concerns in the study area by placing markers on an interactive map. Dangerous curves were the most identified safety concern, with 900 individual points, followed by sight distance (300 points) and speeding (160 points), as shown in **Figure 23** and mapped on **Figure 24**. The most common congestion concern was the lack of passing lanes (96 points) followed by vehicles slowing to turn (88 points).

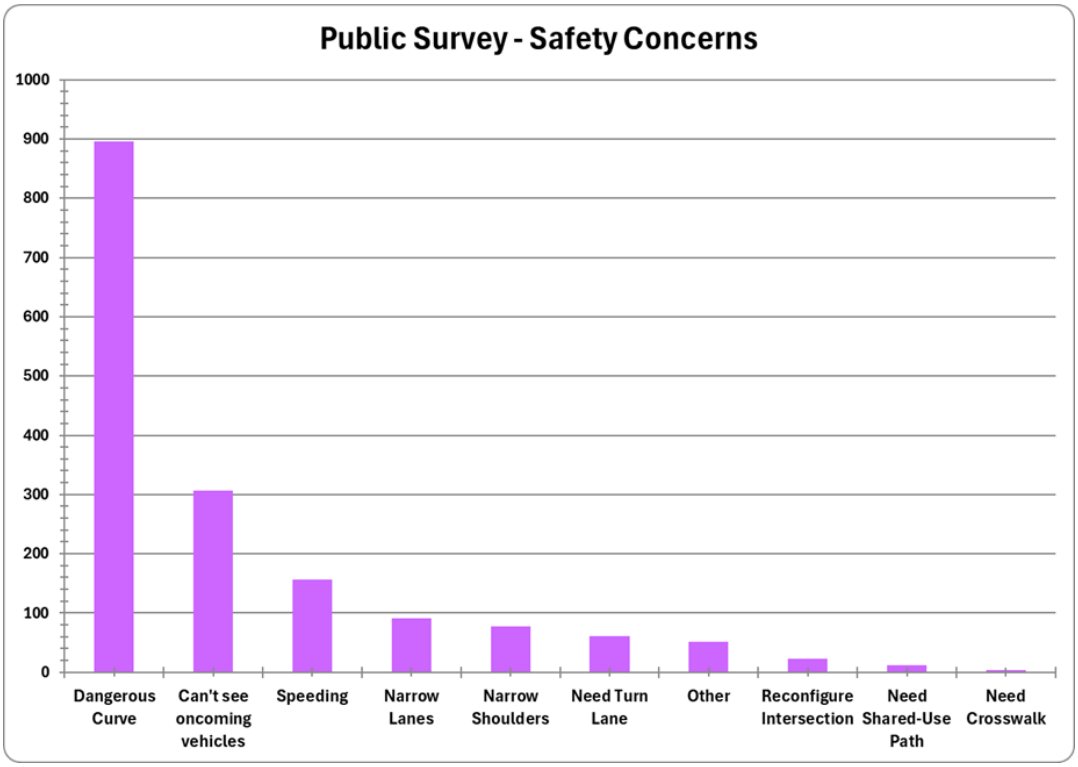

Figure 23: Public Survey - Safety Concerns

The next question asked participants to identify potential improvement ideas. The most common improvement ideas were the construction of a new Kentucky River bridge and a new route / bypass to eliminate the horizontal and vertical curves. Other frequently mentioned ideas were increasing the number of passing opportunities and pull-over areas.

Respondents were provided an interactive map showing environmental and historical features within the study area and asked to identify missing features. The most common environmental concern was deer crossing US 68, followed by preserving the Kentucky river and the watershed. Historical concerns included preserving Chinn Cave, Boone Tunnel, and Shaker Village.

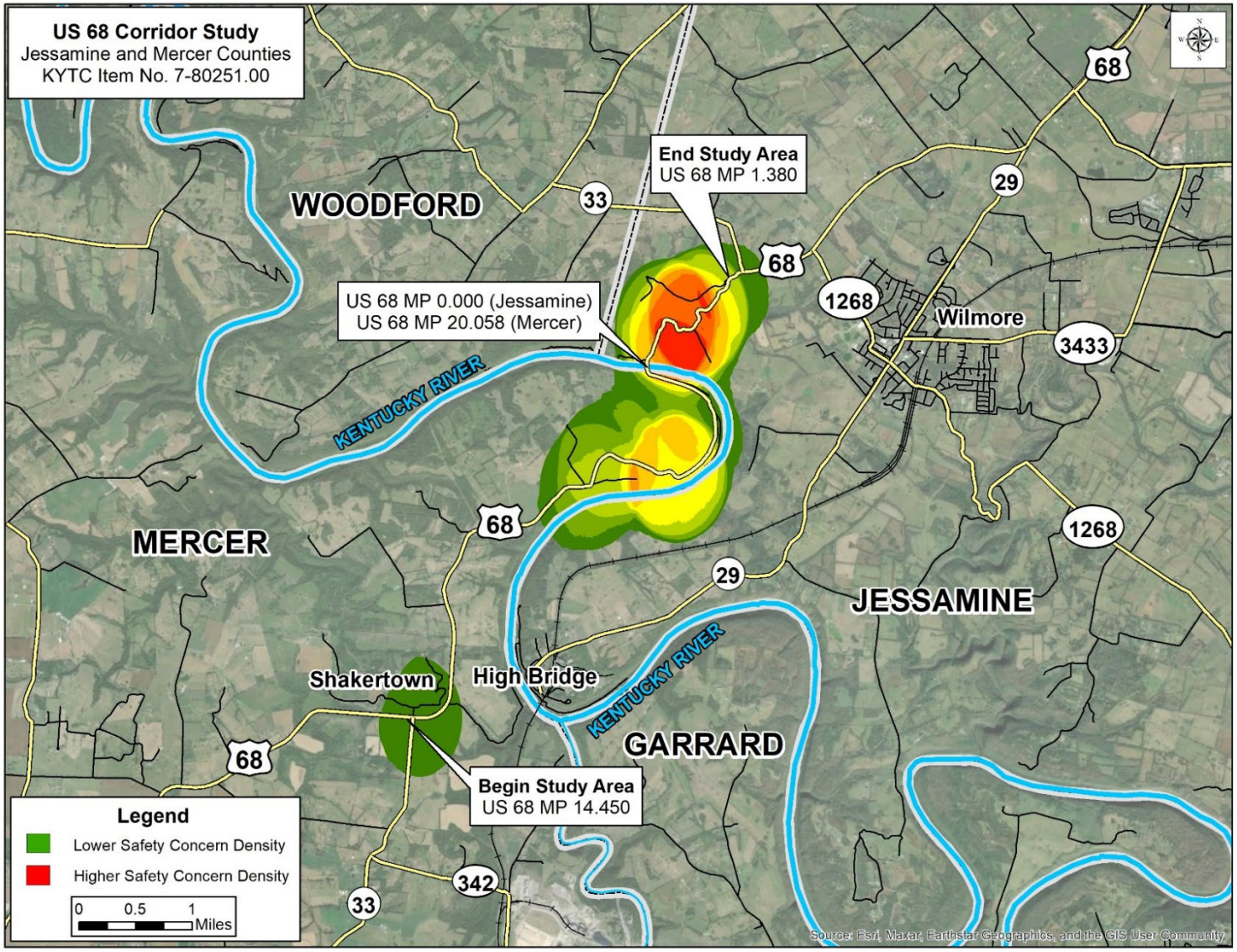

Figure 24: Public Survey – Heat Map of Safety Concerns

Key takeaways from the survey indicate strong public support for a new roadway and river crossing with fewer curves to improve safety and travel efficiency. Many respondents expressed a desire to divert truck and bicycle traffic, citing safety concerns with the existing corridor. Safety is compromised when impatient drivers pass slower moving vehicles, including trucks and bicycles, especially at horizontal curves. Several respondents indicated that both KY 33 intersections in the study area have sight distance issues and could benefit from intersection warning lights. Respondents also emphasized the importance of preserving key cultural and natural resources, including Chinn's Cave, Boone Tunnel, Shaker Village, and the Kentucky River Palisades.

7.0 ROAD SAFETY ASSESSMENT

The US 68 Corridor Study served as a pilot study to incorporate the Safe System Approach in Planning Studies through Road Safety Assessments (RSAs). In coordination with Palmer Engineering through the KYTC statewide HSIP contract, the project team developed a Kentucky-specific Safe System Assessment Framework tailored for rural two-lane roads in Kentucky. While the framework draws on foundational principles from both the Austroads Safe System Assessment Framework[7] and the FHWA Project-Based Alignment Framework[8], it was adapted to reflect Kentucky's roadway conditions.

The Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries and includes the following elements:

- Safe People
- Safe Vehicles
- Safe Roads
- Safe Speeds
- Post-Crash Care
- Partnership

A scoring system was developed to score rural two-lane roads and potential improvement concepts on how well Safe System elements are considered. To measure how well the existing alignment or a new project aligns with the Safe Systems Approach, the scoring system grades roads on three principles:

1. **Exposure** - the number of road users
2. **Likelihood** - the probability that a crash occurs
3. **Severity** - the probability that a fatality or severe injury will occur

[7] https://austroads.gov.au/publications/road-safety/ap-r509-16
[8] https://highways.dot.gov/safety/zero-deaths/safe-system-project-based-alignment-framework

Within each principle, roads are scored for different crash and user types. KYTC Highway Information System (HIS) data was used to develop Kentucky-specific thresholds for the subcategories. **Table 5** summarizes the RSA framework. Each crash and user type was scored zero through ten for the three Safe System principles. These scores were then multiplied together for a score of up to 1,000 for each crash and user type and then added together for a maximum score of 8,000. The lower the score, the more closely aligned a road is with the Safe System approach. Additional scoring options are presented in Section 13.1.

Table 5: RSA Framework

	Exposure	Likelihood	Severity
Run off Road	AADT	Edgeline Rumble Strips Roadway Width Out of Context Curves Recoverable Area Crash History	Operating Speed Clear Zone
Head On	AADT	Centerline Rumble Strips Separation of Traffic Out of Context Curves Vertical Sight Distance Crash History	Operating Speed Horizontal Curvature
Corridor Approaches	AADT	Access Points Lighting Approach Sight Distance Dedicated Turn Lanes Crash History	Operating Speed Sight Distance
Other	AADT	Access Points Lighting Approach Sight Distance Vertical Sight Distance Crash History	Operating Speed Clear Zone
Truck	Truck %	Roadway Width Curvature Vertical Sight Distance Recoverable Area Crash History	Operating Speed Clear Zone
Motorcycle	AADT	Roadway Width Out of Context Curves Vertical Sight Distance Recoverable Area Crash History	Operating Speed Clear Zone
Pedestrian	Destinations within 1 mile Population Density	Existing Pedestrian Facility	Operating Speed Pedestrian Facilities
Bicycle	Destinations within 3 miles Population Density	Existing Bicycle Facility	Operating Speed Bicycle Facilities

8.0 PRELIMINARY IMPROVEMENT CONCEPTS

Initial improvement concepts were developed based on a combination of input from the project team and local officials / stakeholders, review of existing conditions, and the Study Objective. Four potential improvement concepts were developed, including three off-alignment concepts and one collection of on-alignment improvements of US 68. Descriptions of the preliminary options are included in the following sections.

As the US 68 Kentucky River bridge will eventually need to be replaced, there is no true "No-Build" option. Rehabilitating the bridge extends its usable life, but a new bridge will eventually be needed. Replacing the bridge in its current location would not improve geometrics on the approaches, including the "out of context" curves that don't meet driver expectations for an arterial with a 55-mph posted speed limit.

8.1 CONCEPT 1: REALIGNMENT WITH NEW SOUTHERN RIVER CROSSING

Concept 1 includes two options to realign US 68 with new Kentucky River crossings to the south of the existing crossing, as shown in **Figure 25**. Concept 1A departs from the existing alignment near MP 18.4 in Mercer County, tying into KY 29 around MP 3.3, and connecting back to US 68 at MP 2.15 at KY 1268. Concept 1B departs from the existing alignment near MP 16.7, tying into KY 29 around MP 3.3, and connecting back to US 68 at MP 2.15 at KY 1268.

The proposed typical section for Concepts 1A and 1B includes two 12-foot lanes, six-foot paved shoulders, a four-foot flush median, and a ten-foot shared use path, as shown in **Figure 26**. Modifications to the typical section, including cost-saving reductions to the total width, should be considered during the design phase.

Based on feedback from the public survey, these concepts allow for safer bicycle and pedestrian travel by providing a separated shared use path. While a lateral offset of five feet is the minimum recommended by the KYTC *Complete Streets, Roads, and Highways Manual*, the typical section for Concepts 1A and 1B provide an additional buffer, 16 feet from the outside of the travel lane, to account for the drainage ditch. The final typical section will be determined during the Design Phase.

Another concern from the public survey was that the existing US 68 alignment is difficult for trucks to navigate due to the vertical and horizontal curves near the Kentucky River. Local Officials indicated that Jessamine County field trip and sporting event school bus drivers are instructed to take longer detour routes through Danville to avoid this portion of US 68. Concepts 1A and 1B eliminate these geometrics and maintain a consistent 55-mph design speed. The off-alignment options also cross the Kentucky River at a much higher elevation than the existing bridge and remove the Mercer County approach from the 100-year floodplain.

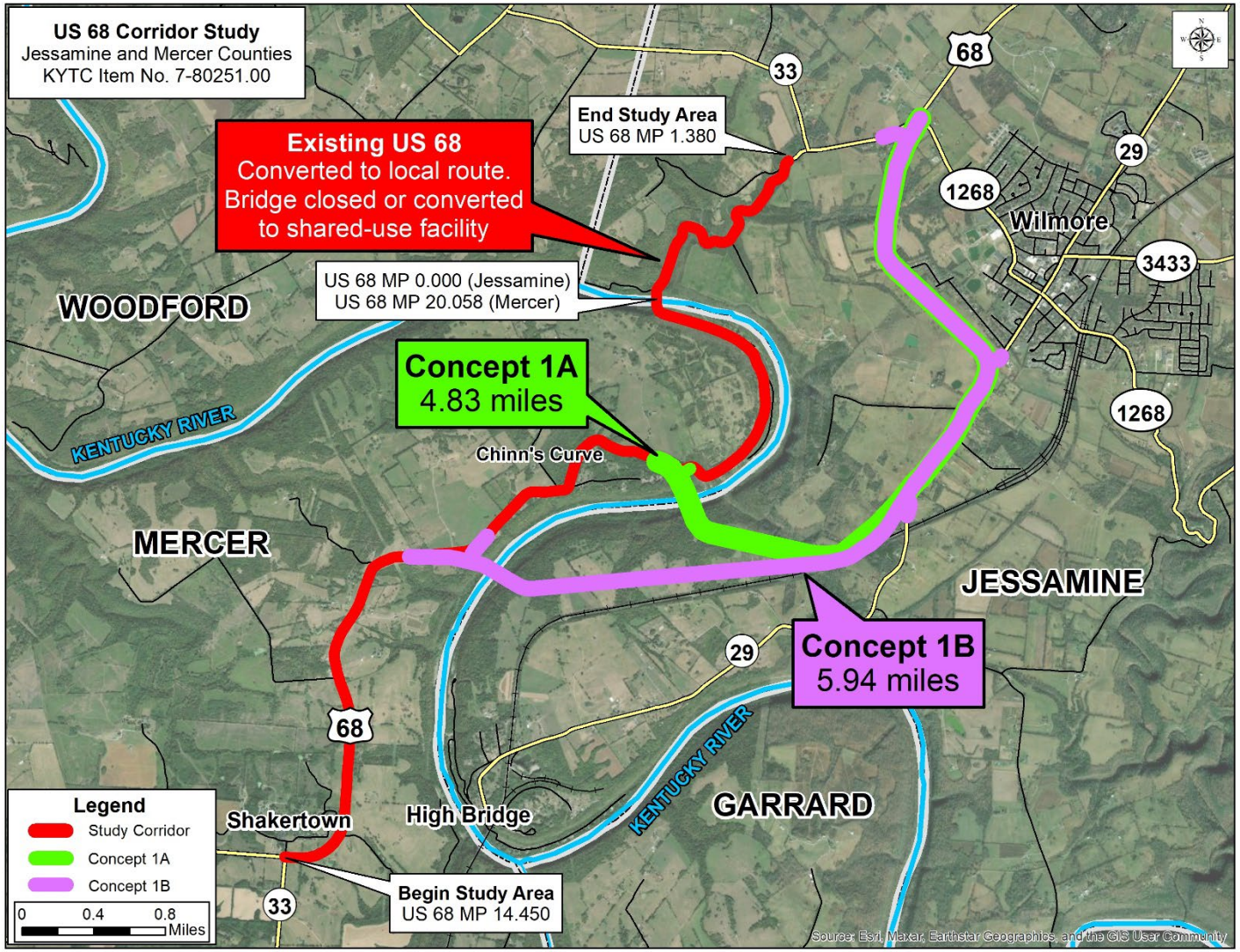

Figure 25: Concepts 1A & 1B

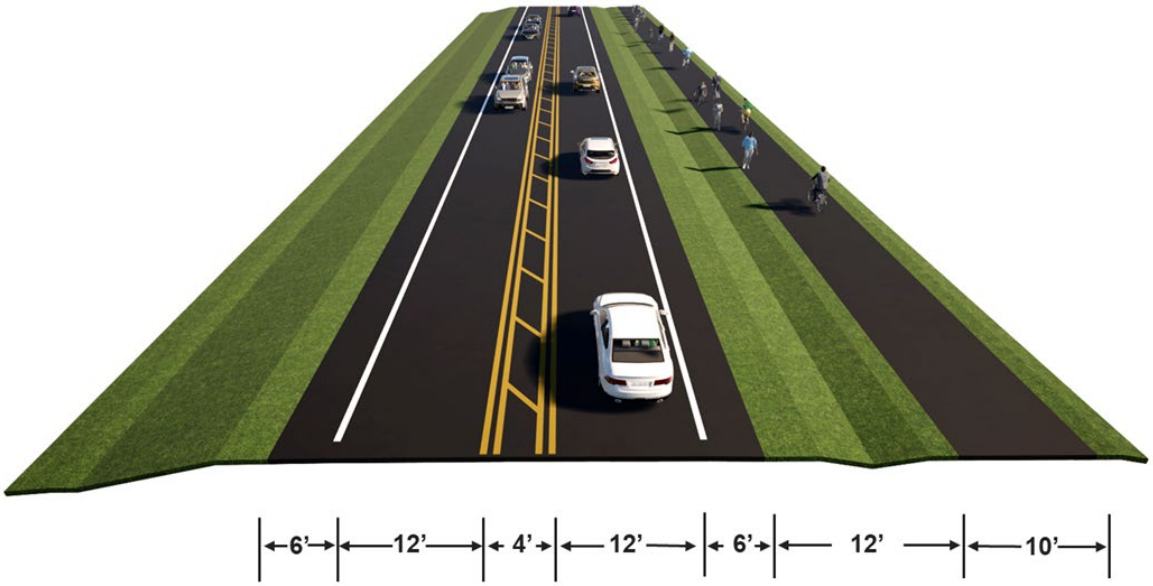

Figure 26: Concepts 1 & 2 Typical Section

8.2 CONCEPT 2: REALIGNMENT WITH NEW CENTRAL RIVER CROSSING

Concept 2 includes two options to realign US 68 with new Kentucky River crossings just west of the existing bridge, as shown in **Figure 27**. Concepts 2A and 2B leave the existing alignment near MP 17.3 in Mercer County, with slight differences in location, and eliminate the out of context horizontal and vertical curves approaching the Kentucky River. The new river crossings are located west of the existing US 68 bridge, with the new alignment continuing to just north of the KY 33 intersection in Jessamine County. Concepts 2A and 2B were developed for a 55-mph design speed and cross the Kentucky River at a much higher elevation that the existing bridge and remove the Mercer County approach from the 100-year floodplain.

The proposed typical section for Concepts 2A and 2B is the same as Concept 1 and includes two 12-foot lanes, four-foot paved shoulders, a four-foot flush median, and a ten-foot shared use path, is shown in **Figure 26**.

8.3 CONCEPT 3: CHINN'S CURVE REALIGNMENT

Concept 3 includes two options to realign Chinn's Curve and improve the existing alignment from MP 13.5 to MP 14.7 in Mercer County. **Figure 28** shows the location of the two options, Concepts 3A and 3B, which include two 11-foot lanes and eight-foot shoulders.

8.4 CONCEPT 4: ON-ALIGNMENT IMPROVEMENTS

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.

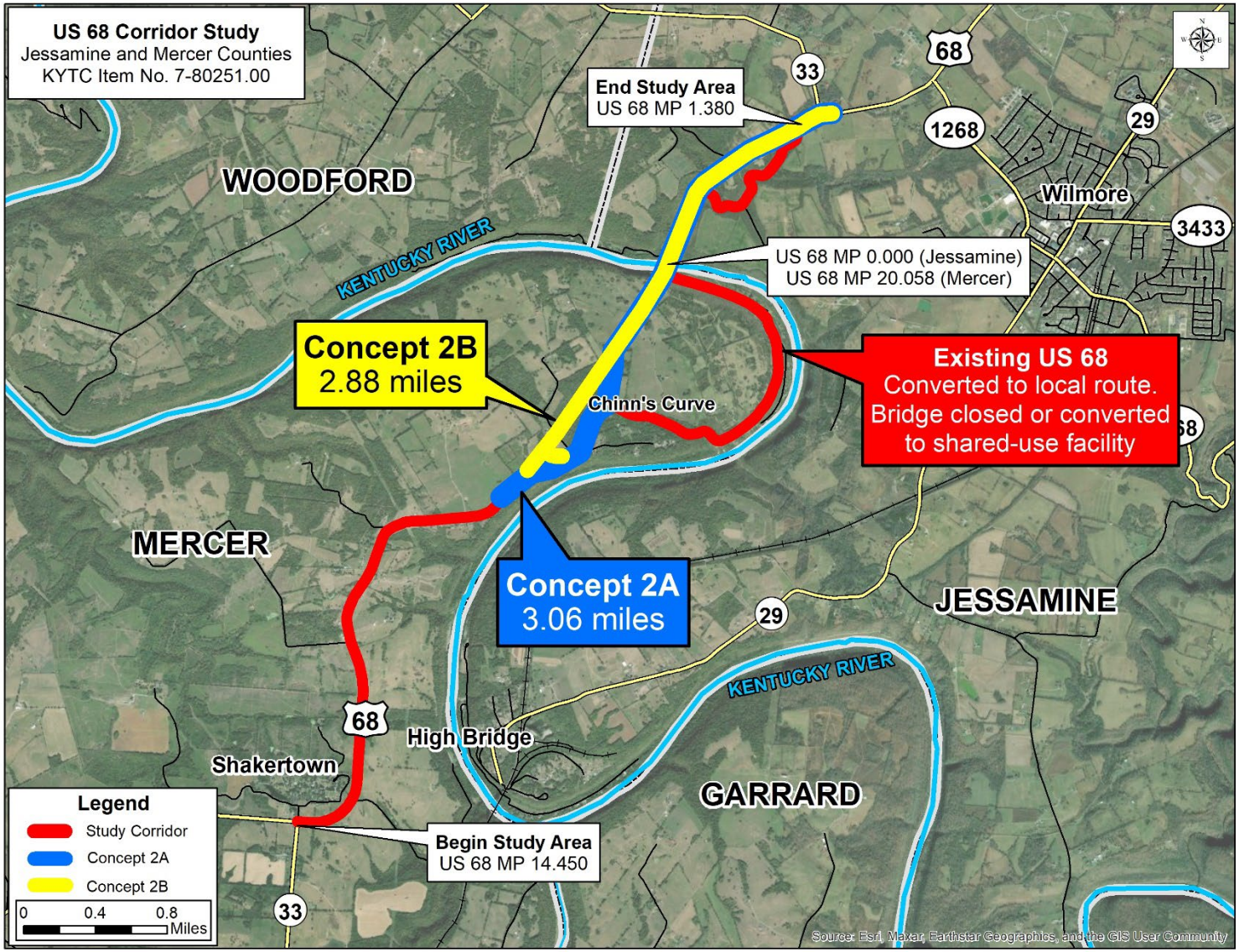

Figure 27: Concepts 2A & 2B

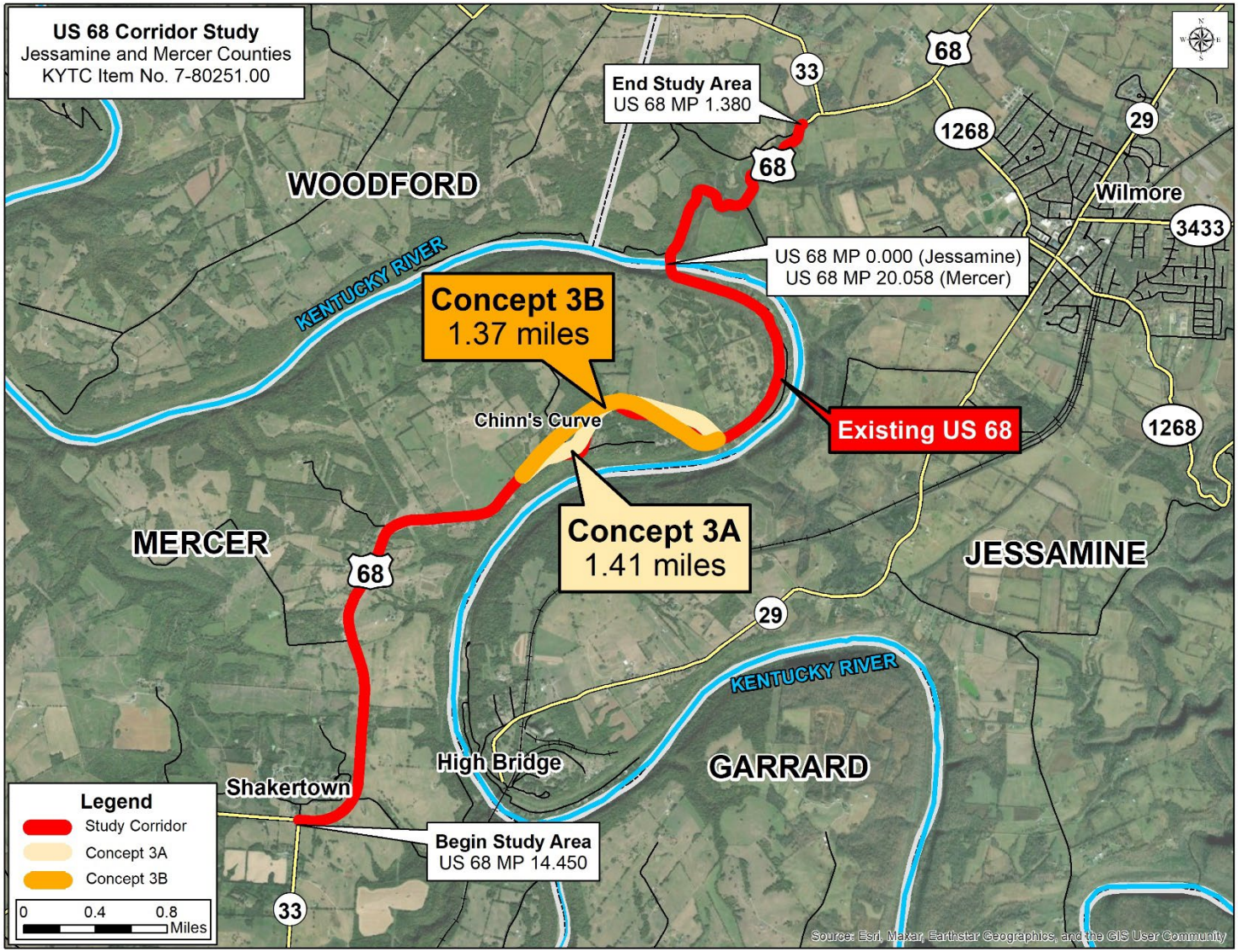

Figure 28: Concepts 3A & 3B

Potential improvements include signing, striping, replacing guardrail, repaving, edge line / centerline rumble strips, and high friction surface treatment (HSFT) at horizontal curves.

9.0 INTERSECTION CONTROL EVALUATION (ICE)

KYTC utilizes the Intersection Control Evaluation (ICE) process as a data-driven, performance-based framework to guide intersection planning and design decisions. The ICE process is required for all intersections involving state-maintained roadways when substantive changes are proposed. It helps identify the most appropriate intersection control type, such as a roundabout, signal, or innovative design, by evaluating safety, operational performance, cost-effectiveness, and environmental impacts. KYTC's ICE framework promotes consistent documentation and the consideration of innovative intersection types.

Stage 1 ICE was performed for the two-way stop-controlled US 68 / KY 33 intersection in Jessamine County and the US 68 / KY 33 intersection in Mercer County. **Table 6** presents the ICE summary for the Jessamine County intersection and **Table 7** presents the summary for the Mercer County intersection. Results for both counties are similar. Traffic signals are not warranted based on the existing and future traffic. Therefore, signalizing the intersections was not moved forward. An all-way stop-controlled intersection does not fit within the context of existing US 68 for either intersection, as vehicles currently do not stop in the study area, and was therefore not moved forward for consideration. Restricted Crossing U-turn (RCUT) intersections were not moved forward because they would require acquisition of additional right of way to accommodate truck U-turns and therefore do not fit within the context of the road. Roundabouts will be considered during the design phase as part of any realignment projects.

Table 6: ICE for US 68 / KY 33 - Jessamine County

Intersection Control Alternative Screening									
Intersection or Interchange Alternative	a) CAP-X v/c ratio	b) CAP-X Pedestrian Accommodation Score	c) CAP-X Bicycle Accommodation Score	d) SSI Score	e) Impractical to implement (considering cost, potential r/w and environmental impacts)?	f) Meets the transportation purpose and need?	g) Addresses the key system performance criteria (safety, all roadway users, operations, etc.)?	h) Alternative is deemed to advance to Stage 2 for further evaluation.	Justification:
Signalized Control	0.27	3.34	4.42	96	No	No	No	No	Not warranted; Does not fit within context of road
Two-Way Stop-Controlled	0.24	2.23	3.67	96	No	Yes	Yes	Yes	
All-Way Stop-Controlled	0.55	3.58	4.42	100	No	No	No	No	Does not fit within context of road
RCUT (Unsignalized)	0.07	2.19	3.35	99	No	Yes	Yes	No	Does not fit within context of road
Roundabout (1-lane)	0.33	5.51	4.58	100	No	Yes	Yes	Yes	

Table 7: ICE for US 68 / KY 33 - Mercer County

Intersection Control Alternative Screening									
Intersection or Interchange Alternative	a) CAP-X v/c ratio	b) CAP-X Pedestrian Accommodation Score	c) CAP-X Bicycle Accommodation Score	d) SS Score	e) Impractical to implement (considering cost, potential right-of-way and environmental impacts)?	f) Meets the purpose and need?	g) Addresses the key system performance criteria (safety, all road way users, operations, etc.)?	h) Alternative is considered to advance to Stage 2 for further evaluation.	Justification:
Signalized Control	0.22	3.07	4.42	100	No	No	No	No	Not warranted; Does not fit within context of the road
Two-Way Stop-Controlled	0.21	2.29	3.67	100	No	Yes	Yes	Yes	
All-Way Stop-Controlled	0.25	3.25	4.42	100	No	No	No	No	Does not fit within context of road
RCUT (Unsignalized)	0.11	2.42	3.35	100	No	Yes	Yes	No	Does not fit within context of road
Roundabout (1-lane)	0.2	5.66	4.67	100	No	Yes	Yes	Yes	

10.0 SECOND ROUND OF STUDY OUTREACH

After initial coordination with the local officials and stakeholders and development of preliminary improvement concepts, there was a second round of meetings to solicit feedback on the concepts.

10.1 PROJECT TEAM MEETING NO. 2

The second Project Team Meeting was held virtually via Microsoft Teams on February 19, 2025. The purpose of the meeting was to discuss the results from the local officials and public survey, the HSIP RSA, Intersection Control Evaluation (ICE), and preliminary concepts for the US 68 Corridor Study. Discussion topics included:

- It was noted that for the RSA, exposure, or the number of users on the road, is not inherently problematic. It's the combination of exposure, likelihood, and severity that increase the risk for a crash resulting in a fatality or severe injury.
- There was a question about how a new river crossing option will impact traffic on KY 29 and other routes in Wilmore. Based on results from the KYSTM, traffic in Wilmore will likely not be significantly impacted with a new river crossing, with the exception of the upgraded section of KY 29 included in Concept 1B.
- The new river crossing options cross higher than the existing bridge to minimize horizontal and vertical curvature on the approaches.
- The KYTC Complete Streets, Roads, and Highways Manual recommends a lateral offset of at least five feet from the edge of the travel lane to a shared use path. Concepts 1 and 2 have a wider buffer because of the expected posted speed limit of 55 mph.

- A reduced paved shoulder width will be considered to align closer with the Safe Systems Approach. The KYTC Design Manual allows a minimum of two-foot paved shoulders.
- Concepts 1B, 2B, 3B, and 4 were moved forward to be shown at the second local officials / stakeholder meeting.

10.2 LOCAL OFFICIALS / STAKEHOLDER MEETING NO. 2

The second Local Officials / Stakeholder Meeting was held at Wilmore City Hall on March 24, 2025. The purpose of the meeting was to discuss the results from the initial local officials and public survey, the HSIP RSA, Intersection Control Evaluation (ICE) and preliminary concepts for the study. After the presentation, attendees were asked to complete a survey to solicit feedback on the improvement concepts. Fifteen attendees filled out the survey.

The first question asked respondents to rank the four corridor improvement concepts, with #1 being the highest ranking, with a #1 ranking worth four points, a #2 ranking worth three points, a #3 ranking worth two points, and a #4 ranking worth one point. Concept 2 received the highest ranking, followed by Concepts 3, 1, and 4. **Figure 29** summarizes these results.

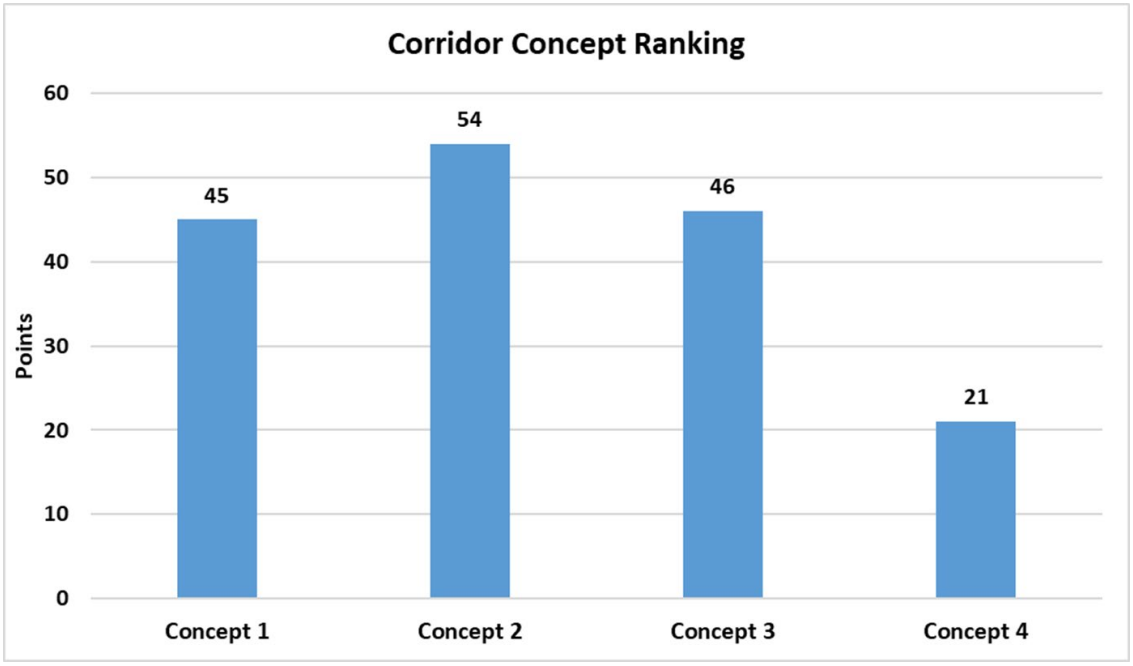

Figure 29: Local Officials / Stakeholder Meeting No. 2 Survey - Concept Ranking

Respondents were asked if they agree with the proposed typical section, which includes two 12-foot lanes, four-foot paved shoulders, a flush four-foot median, and a ten-foot shared use path. Nine respondents indicated that they agree with the typical section, three do not agree, and three were unsure, as shown in **Figure 30**. Those who were unsure want more information on cost and the impact to private land. Some felt a shared use path is unnecessary and would require the acquisition of too much right of way that could be used for recovery areas. One participant noted that a shared use path isn't necessary because the bicyclists and pedestrians in this area are not commuting but rather traveling for pleasure. The project manager explained that KYTC designs roads for all users and does not differentiate between trip purposes. The decision to eliminate the shared use path as a cost or land-saving measure will be considered during the Design Phase.

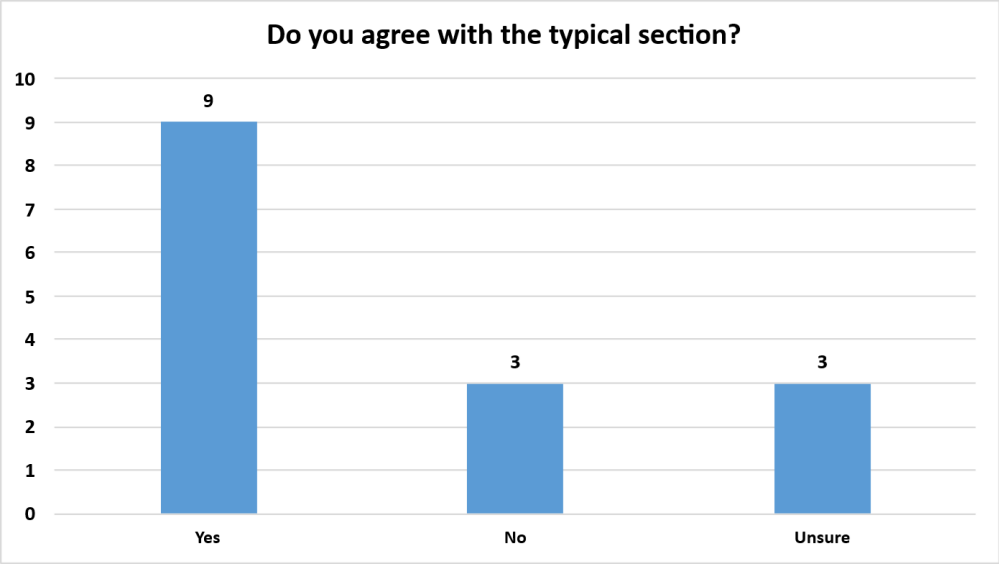

Figure 30: Local Officials / Stakeholder Meeting No. 2 Survey - Concept Ranking

Based on conversations with Mercer County local officials, there is a potential megasite[9], or a large tract of land prepared for large-scale industrial projects, in Harrodsburg that could bring 2,000 jobs to the area within 5-10 years which could increase traffic projections. Based on a KYSTM analysis with 2,000 non-retail jobs added for the Megasite, fewer than 1,000 trips per day from the site are expected to use US 68. Due to the site's proximity to US 127, most trips will use the Bluegrass Parkway.

11.0 PROJECT TEAM MEETING NO. 3

The third Project Team Meeting was held at the KYTC District 7 office and virtually via Microsoft Teams on April 30, 2025. The purpose of the meeting was to discuss the results from the second local officials / stakeholders survey, the HSIP RSA, and revised concepts for the US 68 Corridor Study. Discussion topics include:

[9] https://www.hmcida.com/WilkinsonMegasite.aspx

- The US 68 Mercer County approach to the Kentucky River crossing, located in a 100-year floodplain, flooded in April 2025 and was closed to traffic for several days. This closure initiated a discussion to add resiliency to the Study Objective.
- There is very little bicycle and pedestrian commuter demand due to the corridor not having significant attractors, such as grocery stores, schools, hospitals, and employment. However, there is significant recreational demand for bicyclists and pedestrians given he scenic nature of the corridor and Shaker Village as a tourist destination.
- Replica is a platform that provides data insights on mobility and land use to support urban planning and transportation decisions. Replica data shows an average of fewer than 10 pedestrians and fewer than 10 bicycles on US 68 per day 2024. This may reflect the unsafe conditions on US 68 rather than the lack of demand.
- Alternative intersections, such as roundabouts, will be considered at intersecting roadways during the design phase.
- Cost estimates for Concepts 1 and 2 without the shared use path will be developed.
- A cost and lifecycle analysis for rehabilitation of the existing bridge will be conducted.
- A fifty percent contingency was added to the construction costs of Concepts 1, 2, and 3 to account for the fact that a long-term US 68 project does not have future funding in the Highway Plan.

12.0 REVISED IMPROVEMENT CONCEPTS

Improvement concepts were revised based on results from the traffic and safety analyses and feedback from the local officials / stakeholders and the project team.

12.1 REVISED IMPROVEMENT CONCEPTS

The project team advanced Concepts 1B, 2B, 3B, and 4 for further development. Concepts 1B, 2B, and 3B were renamed Concepts 1, 2, and 3, and Concepts 1 and 2 were updated to include improvements between KY 33 in Mercer County and KY 1268 in Jessamine County, including improvements to existing US 68, as shown in **Figure 31**. These revised concepts reflect refinements based on engineering analysis, safety performance, and community feedback. Each concept was selected for its potential to address the project specific needs such as safety, mobility, and resiliency, while aligning with the study's objectives.

Wide conceptual corridors, rather than definitive alignments, were explored within the study area to identify environmental red flags and to better assess potential benefits and impacts. Definitive alignments will be determined during the design phase. However, there are no funds currently identified for future phases of work (design, right of way, utilities, construction).

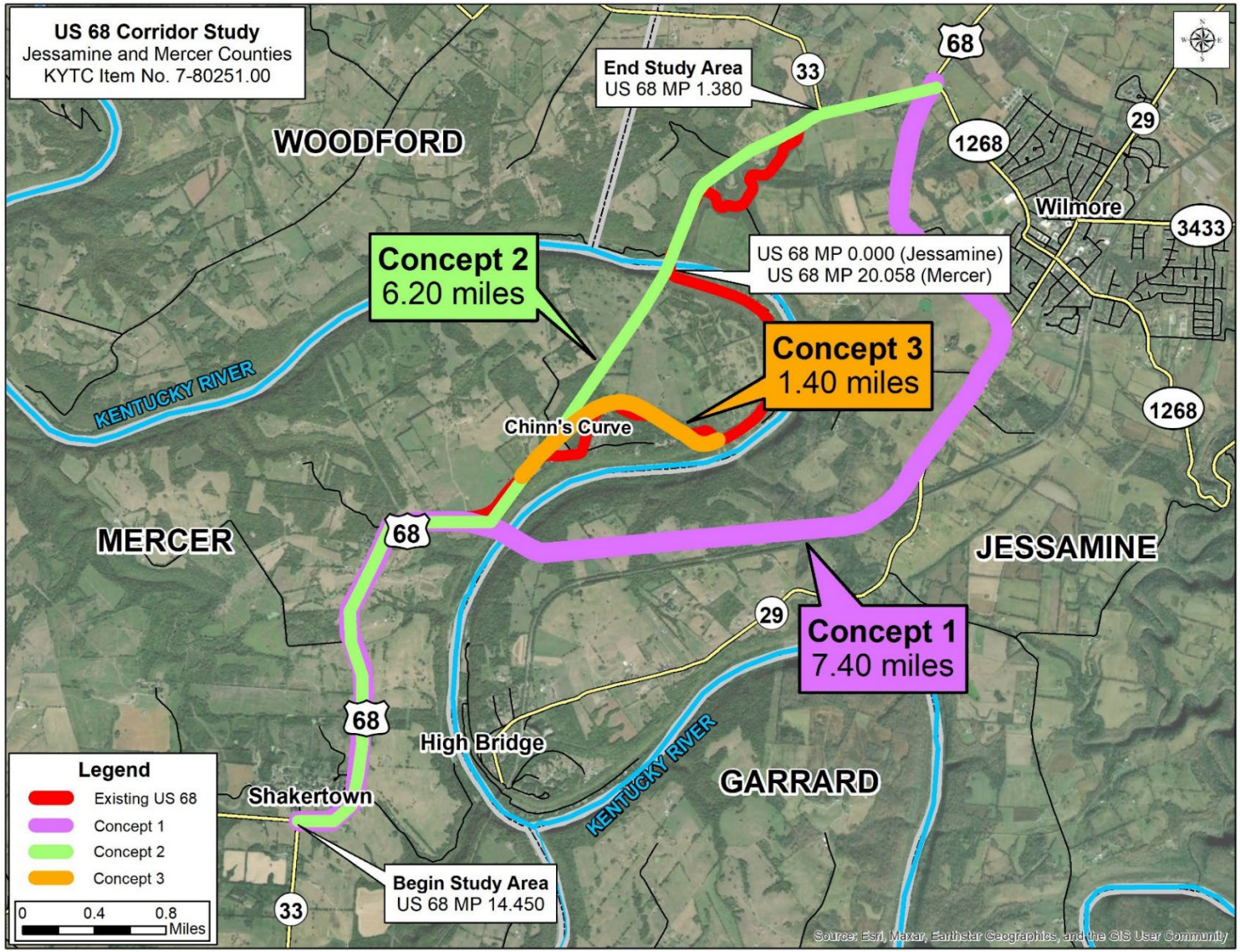

Figure 31: Revised Off-Alignment Concepts

Intersection analyses at the US 68 intersection with KY 33 in Jessamine and Mercer Counties revealed that traffic signals and turn lanes are not warranted at either intersection. Currently, the intersection in Mercer County has static flashing lights, likely due to past crashes. This study recommends replacing this control with a Intersection Conflict Warning Systems (ICWS) because it has been shown to be much more effective in reducing crashes. ICWS use vehicle detectors under the pavement to alert drivers of approaching traffic. This study also recommends that District 7 traffic consider installing ICWS as a preventive measure at the Jessamine County intersection.

12.2 BRIDGE REHABILITATION OPTIONS

A planning-level evaluation of the US 68 Kentucky River bridge was performed to determine short-term rehabilitation needs as a way to extend the life of the bridge. The US 68 bridge was constructed 71 years ago and is approaching the typical 75-year design lifespan. Rehabilitation options extend the lifespan of the bridge five to 15 years past the end of the design lifespan (2029). Longer-term solutions, like superstructure replacement, would likely require realignment of the existing curved approaches. The following summarizes the results from the evaluation:

Option 1

Rehabilitation items in Option 1 are of immediate concern and will likely extend the structure life for five or more years. Option 1 rehab includes:

- Replacing the deteriorated steel bearings with elastomeric bearing assemblies.
- Installing crack monitoring gauges at critical shear crack locations and performing routing monitoring for continued crack development.
- **Cost estimate (2025 dollars) = $600,000**

Option 2

The second rehabilitation option includes the items from Option 1, along with additional measures that could extend the life of the structure an estimated 10 to 15 years or more. Option 2 rehab includes:

- Option 1 rehabilitation measures.
- 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. This assumes five percent of the superstructure and substructure surface area.
- Adding a galvanic anode to control the corrosion of metal surfaces.
- Cleaning and repairing expansion joints.
- **Cost estimate (2025 dollars) = $3,600,000**

13.0 CONCLUSIONS

The objective of the US 68 Corridor Study was to identify and evaluate potential concepts to improve safety, truck mobility, driver expectations (geometrics), and resiliency on US 68 in Jessamine and Mercer Counties and to determine the need and optimal location for a replacement of Kentucky River crossing.

Table 8 provides a comparative evaluation of the four concepts, showing how well each one addresses the five study objectives. Concepts 1 and 2 fully address all five study objectives, as indicated by green checkmarks across each criterion. In contrast, Concepts 3 and 4 address or somewhat address only three of the five objectives. These two concepts do not improve resiliency, nor do they provide a new river crossing.

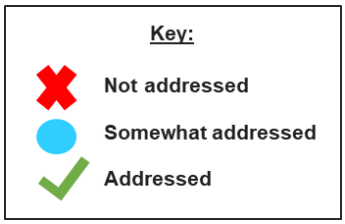

Table 8: Study Objectives Matrix

Issues / Project Goals	Existing (No Build)	Concept 1 Southern River Crossing	Concept 2 Realignment of US 68 w/ New River Crossing	Concept 3 Chinns Curve Realignment	Concept 4 Mercer County On-Alignment Improvements
Improves Safety	✗	✓	✓	✓	✓
Improves Truck Mobility	✗	✓	✓	●	●
Improves Driver Expectations	✗	✓	✓	●	●
Improves Resiliency	✗	✓	✓	✗	✗
Provides New KY River Crossing	✗	✓	✓	✗	✗

13.1 EVALUATION MATRIX

An evaluation matrix was developed to summarize the concepts, as shown in **Table 9**.

Based on results from the travel demand analysis, Concept 2 has the shortest travel time along US 68 from KY 33 in Mercer County to KY 33 in Jessamine County of seven minutes, followed by Concept 1 at 8.7 minutes. Concepts 3 and 4 do not significantly improve travel times. Concepts 1 and 2 also have the highest estimated 2045 daily traffic with 12,800 VPD and 13,700 VPD, respectively.

13.1.1 Cost Estimates

2025 opinions of probable cost 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" contingency was then added to the long-term concepts to account for lack of future funding in the Highway Plan. The cost estimates can be found in **Appendix F**.

Table 9: Evaluation Matrix

Concept	No-Build	Concept 1	Concept 2	Concept 3	Concept 4
Length (mi.)	6.988	7.36	6.16	1.37	5.608
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

13.1.2 RSA Safe System Scoring

As summarized in Chapter 7, a spreadsheet tool was developed to score how well rural two-lane roads or improvement concepts for two-lane roads align with the Safe System principles. US 68 was divided into three sections, each with a unique set of roadway characteristics: MP 14.45 – MP 17.5 in Mercer County, MP 17.5 – MP 20.058 in Mercer County, and MP 0.0 – MP 1.38 in Jessamine County.

Each section of US 68 was scored from 0 to 8,000 with a lower score more closely aligned with Safe System principles. This scoring system is not linear, but rather parabolic, which can make results challenging to understand. The scoring shown in the evaluation matrix includes the cost per mile per percent reduced (without the 50 percent time contingency). It also includes an SSA Index, which was calculated by taking one minus the cubed root of the score of each section divided by the maximum score. This index indicates how closely aligned each concept is with

the Safe System Approach, with a score of zero percent not aligning at all and a maximum score of 100 percent perfectly aligning.

13.1.3 Benefit-to-Cost Analysis (BCA)

A benefit-to-cost analysis 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 benefits outweigh the costs. Costs and BCRs are shown for Concepts 1 and 2 with and without the shared use path.

The safety benefits were estimated using crash modification factors (CMFs) from the Crash Modification Clearinghouse. A CMF is a multiplicative factor used to estimate the expected number of crashes after implementing a given countermeasure at a specific site. The travel time savings were calculated using the KYSTM.

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.

13.2 RECOMMENDATIONS

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

- **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
- **Bridge Rehabilitation Option 2**: includes replacing the deteriorated steel bearings with elastomeric bearing assemblies, installing crack monitoring gauges at critical shear crack locations and performing routing monitoring for continued crack development, installation of fiber reinforced polymer (FRP) if the shear cracking continues to develop, replace the existing barrier rail with standard mono-slope bridge rail, concrete patching of spall areas, galvanic anode to control corrosion, and cleaning and repairing expansion joints. This option may extend the life of the structure 10 to 15 or more years.

Long-Term

Based on the expected benefits and a positive BCR, it is recommended to advance Concepts 1 and 2 forward to Phase 1 Design and Environmental.

13.3 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.

In accordance with 23 USC 106, the long-term recommendation 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 and will have to be included in the Lexington Area Metropolitan Planning Organization (LAMPO) Transportation Improvement Plan (TIP) to be eligible for federal funding.

14.0 CONTACTS/ADDITIONAL INFORMATION

Written requests for additional information should be sent to Mikael Pelfrey, Director, KYTC Division of Planning, 200 Mero Street, Frankfort, KY 40622. Additional information regarding this study can also be obtained from the KYTC District 7 Project Manager, Casey Smith, at (859) 246- 2355 (email at casey.smith@ky.gov).