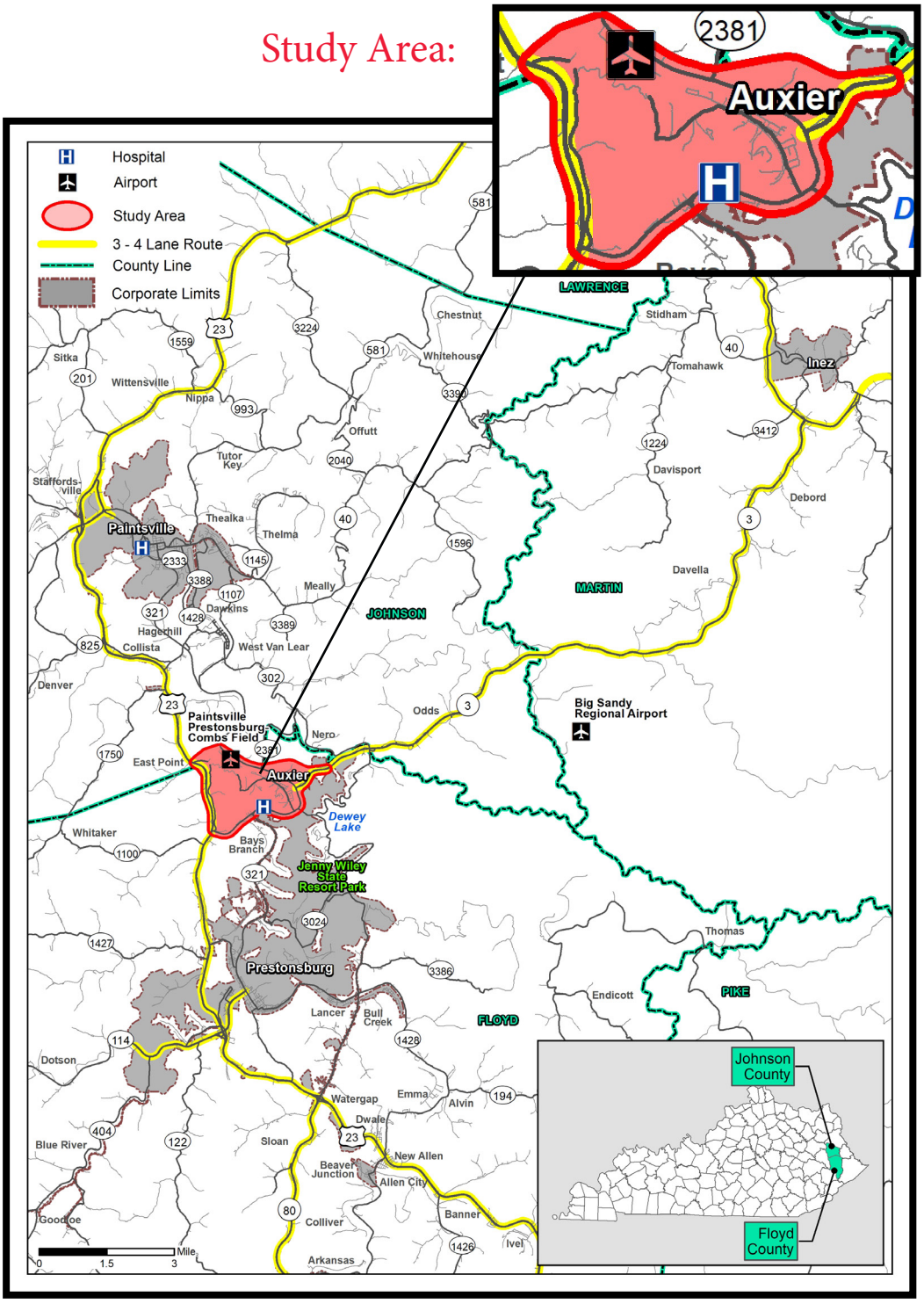
KY 3 CORRIDOR STUDY AT AUXIER

Floyd and Johnson Counties

FINAL REPORT

FEBRUARY 2023

Study Area:



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ACRONYMNS LIST

ADHS	Appalachian Development Highway System
ADT	Average Daily Traffic
BMP	Best Management Practice
BSADD	Big Sandy Area Development District
CDAT	Crash Data Analysis Tool
DHV	Design Hourly Volume
EEC	Excess Expected Crashes
FHWA	Federal Highway Administration
FY	Fiscal Year
HIS	Highway Information System
KEEC	Kentucky Energy and Environment Cabinet
KHC	Kentucky Heritage Council
KYTC	Kentucky Transportation Cabinet
LEP	Limited English Proficiency
LO/S	Local Officials/Stakeholders
LOS	Level of Service
LOSS	Level of Service of Safety
LWCF	Land and Water Conservation Fund
MP	Milepoint
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHS	National Highway System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
PACE	Purchase of Agricultural Conservation Easement
PDO	Property Damage Only
STIP	Statewide Transportation Improvement Program
TED	Transportation Enterprise Database
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
UST	Underground Storage Tank
v/c	Volume-to-Capacity Ratio
vpd	Vehicles per day

EXECUTIVE SUMMARY

The Kentucky Transportation Cabinet (KYTC) launched the KY 3 Corridor Study in Spring 2022 to investigate transportation issues along KY 3 in Floyd and Johnson counties, Kentucky, near the community of Auxier. This study examines the last 2.5-mile, two-lane gap in the existing 19-mile long, multi-lane KY 3 highway connection between US 23 near Auxier and KY 645 at Inez in Martin County.

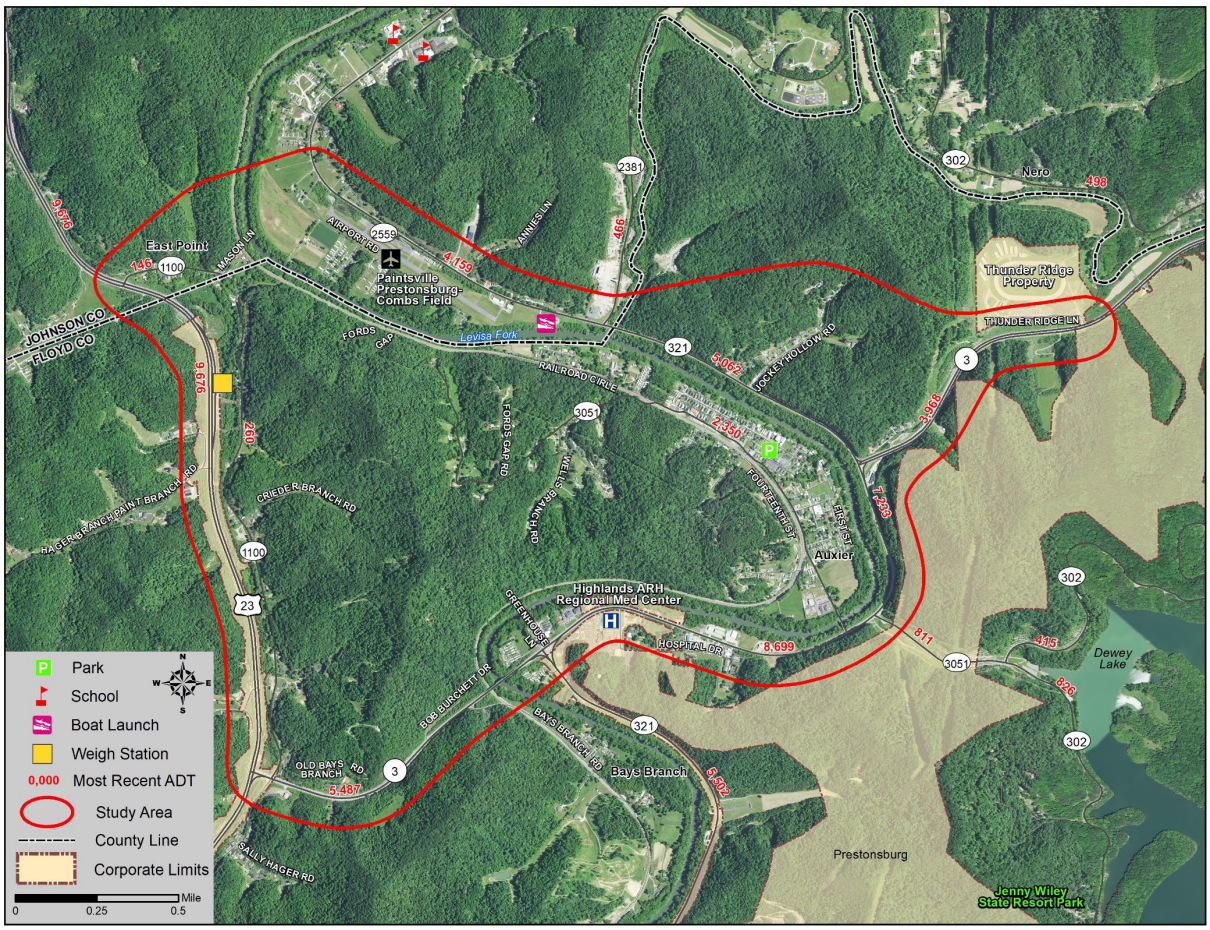


Figure ES-1: Study Area

The 2.5-mile, two-lane stretch of KY 3 near Auxier is considered a bottleneck to mobility along the corridor, stifling economic development efforts for the area. KY 3 accesses more developable property than elsewhere in the three-county area, including 180 acres of available industrial land within the Eastern Kentucky Business Park. According to local officials, the two-lane segment is the key factor deterring some businesses from choosing the business park. Meanwhile, the two-lane portion of KY 3 provides access to US 23, a regional medical center, and the community of Auxier. Only the KY 3051 (W.L. Fat Wells Memorial Bridge) over Levisa Fork connects residents of Auxier to the larger

transportation network. At the eastern edge of the study area, the city-owned, 58-acre Thunder Ridge site is also poised for development. KY 3 also provides access to Jenny Wiley State Resort Park.

Existing Conditions

Key characteristics for KY 3 and US 23 are summarized in Table ES-1.

Table ES-1: Existing Study Area Transportation Characteristics

Characteristic	KY 3	US 23
Functional Class	Minor Arterial	Principal Arterial
Lanes + Shoulders	Two to four 12 ft lanes Varying width shoulders (1-10 ft)	Four 12 ft lanes 10 ft paved shoulders
Speed Limit	35-55 mph	55 mph
Daily Traffic	3,800-9,200 vehicles per day (vpd) 8-9% trucks	9,700 vpd, 16.5% trucks
Systems	State truck network Extended weight, Coal haul	Federal & state truck network National Highway System (NHS) Extended weight, coal haul Appalachian Dev. System, Scenic Byway

Operational analyses suggest current capacity is adequate for traffic flows. Besides vehicles, numerous bicyclists also use state-maintained highways within the study area, especially to access nearby Jenny Wiley State Resort Park.

During 2016-2020, 102 crashes occurred on study routes: three fatalities (all on KY 3), 34 injury collisions, and the remainder property damage only (PDO). Most crashes were one of three types: single vehicle (40%), rear-end (28%), or angle (22%) crashes. No bicycle or pedestrian crashes were reported in the dataset. Further assessment highlighted elevated crash locations along study routes that may be candidates for short-term spot improvements.

KYTC's statewide travel demand model estimated future year growth for all study area roadway segments. A 1% annual background growth rate was applied throughout the study area for future No-Build forecast projections. KY 3 is expected to carry between 5,200 and 11,100 vpd in the No-Build scenario. By 2045, most study intersections degrade by one Level of Service (LOS) in one or both peak hours but continue to operate at LOS D or better. The exception is the northbound stop-controlled KY 321 approach to KY 3, which is governed by the high volume on free-flow cross-traffic during the peak hours.

Concept Development

Study goals include identifying and evaluating options to improve KY 3 safety and connectivity between US 23 and the multi-lane section of KY 3 while also…

- ☑ supporting local economic development efforts,
- ☑ promoting continuity of four-lane access,
- ☑ providing redundant connectivity for Auxier, and
- ☑ minimizing community and environmental impacts.

Six long-term, five-lane Build corridor concepts were developed for further consideration. Of these, one would widen existing KY 3 and five would construct a roadway partially or almost totally on new alignment. With few exceptions, each of the corridor concepts is based on a five-lane rural typical roadway section, 55 MPH design speed, 12-foot lanes, and 10-foot-wide paved shoulders.

Options to provide a new, two-lane local street connector from each long-term corridor to the existing Auxier street network were initially considered but discarded as a secondary bridge over Levisa Fork would be less costly and have substantially fewer environmental impacts.

Figure ES-2, Table ES-2, and Table ES-3 provide a comparison between the six long-term Build corridor concepts.

Table ES-2: Comparison of Corridor Concept Impacts

Corridor Concept	Length (Miles)	Earthwork (Millions CY)	Bridge Length (Feet)	Relocations (Approx.)
Widen Existing	2.9	2.1	600	<5
Green	2.7	2.8	900	15-20
Red	2.6	1.6	600	20-30
Purple	2.6	1.7	750	10-15
Yellow	2.7	1.5	600	10-15
Central	2.6	3.5	1,500	20-30

Table ES-3: Corridor Concept Cost Estimates by Phase (2022 Dollars)

Build Concept	Total Cost	Design	Right-of-Way	Utilities	Construction
Widen Existing	**$64.1M**	$5.3M	$1.2M	$5.0M	$52.6M
Green	**$86.9M**	$7.0M	$4.9M	$5.5M	$69.5M
Red	**$62.8M**	$4.8M	$6.2M	$4.0M	$47.8M
Purple	**$68.4M**	$5.4M	$3.9M	$5.4M	$53.7M
Yellow	**$61.2M**	$4.9M	$3.7M	$4.2M	$48.4M
Central	**$103.4M**	$8.4M	$7.0M	$4.0M	$84.0M

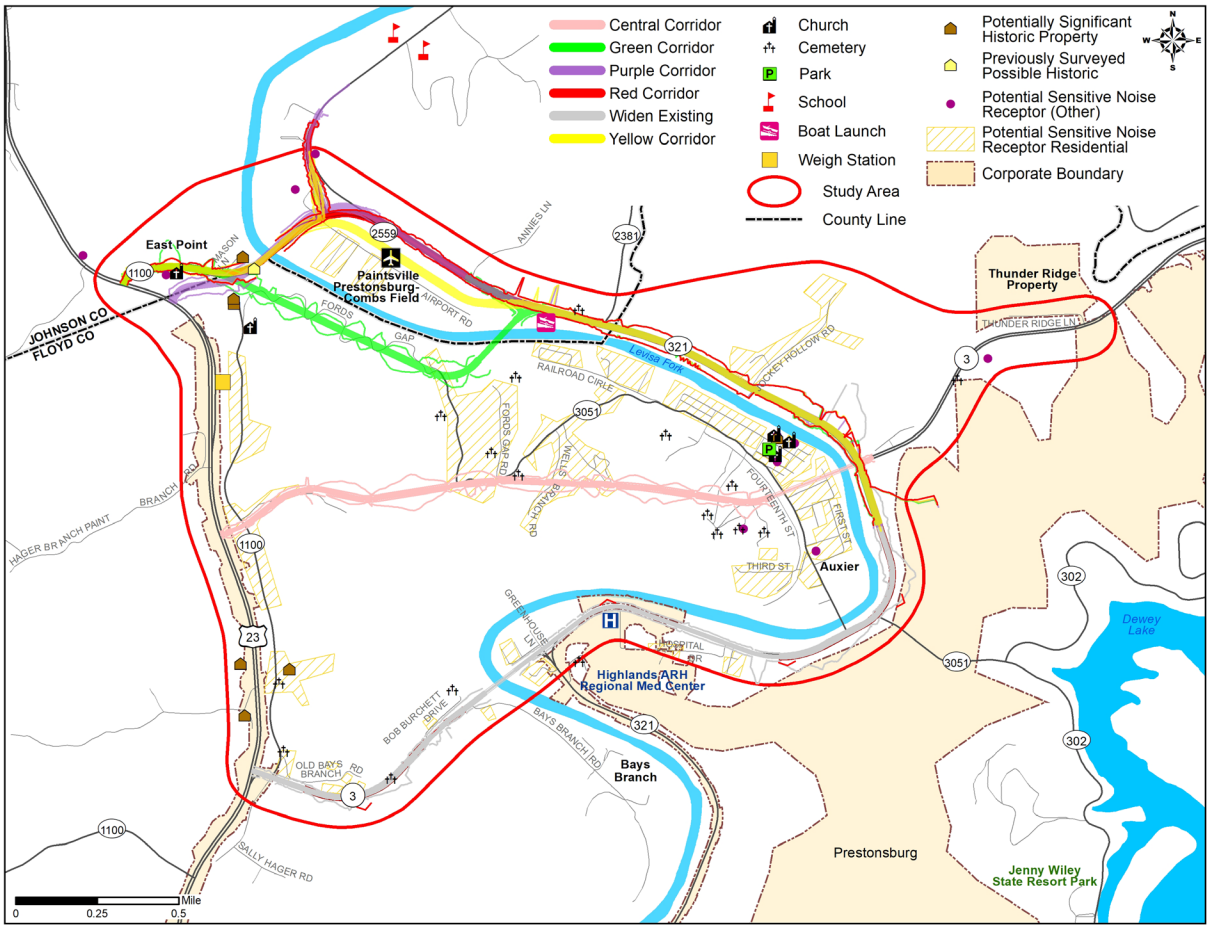


Figure ES-2: Long-Term Build Corridor Concepts

Figure ES-3 shows potential locations for three new bridge options to provide a secondary connection into Auxier: one near the former airport, another in line with the four-lane KY 3, and a third between the two.

Figure ES-3: Auxier Bridge Options

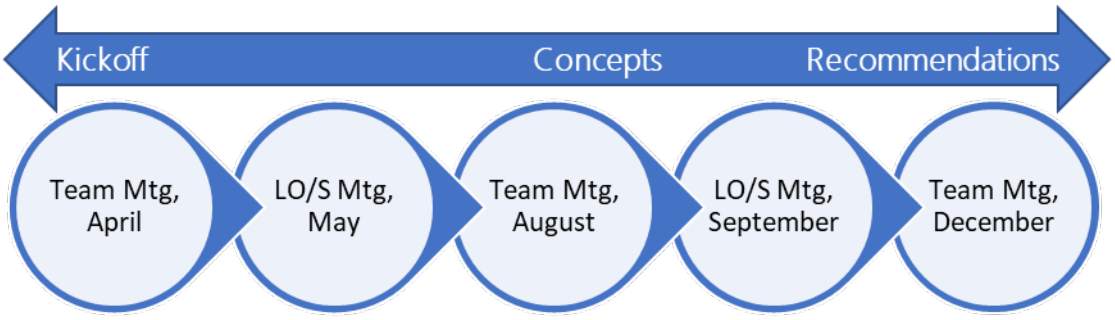
Concepts were developed to minimize property impacts, aligning with open spaces or existing roadways to minimize relocations. Costs range from $9.3 to $13.0 million. It should be noted that not all short-term bridge options work with all long-term corridor options.

Build concepts would result in the loss of vegetation, representing potential habitat for protected forest-dwelling bat species. Build concepts with a new structure would impact Levisa Fork, designated as critical habitat for the Big Sandy crayfish. Floodplain and floodway impacts are also associated with any new river crossing. The northern concepts (i.e, Green, Red, Purple, and Yellow) pass near three likely historic resources and two cemeteries; none of which are expected to experience direct effects but each merits further consideration in any future project development phases. Each northern concept also runs adjacent to a public boat launch—a Section 4(f) recreational resource—but minimal impacts are anticipated.

Geotechnical concerns are also associated with any build concept: the study area is in the Cumberland Plateau (Eastern KY Coal Fields) physiographic region—covered with wooded mountain crests carved by ravines eroded through coal-bearing rocks. Relief varies by over 600 feet throughout the study area. The entirety of the study area is notorious for cut and fill slope stability failures, rock falls, and landslides with much of the region mined. Vertical cuts line sections of existing KY 3 and KY 321, with visible evidence of undercutting and stability issues. Coordination with KYTC geotechnical subject matter experts will be essential if any of the Build corridor concepts advance for further project development.

Community Coordination

Three meetings with the project team and two coordination points with local officials and stakeholders (LO/S) occurred throughout the study process during 2022.



LO/S were actively engaged in the study early on, noting benefits of an improved connection to US 23 to reduce severe crashes and to support regional economic development efforts. Given the devastating flooding throughout the region during July 2022, there was limited local engagement later in the process. While input is not a representative sample of larger community preferences, most LO/S participants agreed any of the three short-term bridge options warranted further consideration. Of the

long-term corridors, Green and No-Build received the least LO/S support while Red/Purple received the most. However, most participants agreed each concept was viable to consider further.

Conclusions

Reviewing the concepts, costs, impacts, and input from LO/S, the project team agreed each of the three secondary Auxier connector bridge options and each of the six long-term corridor concepts are worth additional consideration should funding be identified for future project phases.

1.0 INTRODUCTION

1.1 Study Background

The Kentucky Transportation Cabinet (KYTC) launched the KY 3 Corridor Study in Spring 2022 to investigate transportation issues along KY 3 in Floyd and Johnson counties, Kentucky, near the community of Auxier. This study examines the last 2.5-mile, two-lane gap in the existing 19-mile long, multi-lane KY 3 highway connection between US 23 near Prestonsburg and KY 645 at Inez in Martin County.

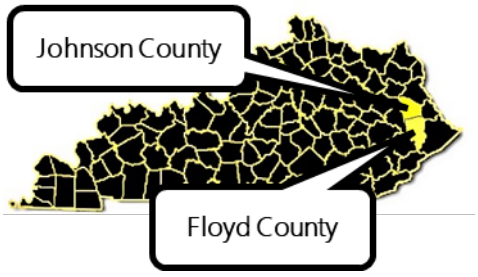


Figure 1: Project Location

1.2 Regional Planning Context

The 2.5-mile, two-lane stretch of KY 3 near Auxier is considered a bottleneck to mobility along the corridor, stifling economic development efforts for the area. KY 3 has more developable property than elsewhere in the three-county area, including 180 acres of available industrial land within the Eastern Kentucky Business Park. According to local officials, the two-lane segment is the key factor deterring more businesses from choosing the business park. Eastern Kentucky Business Park is an eight-hour drive from the east coast of the United States, which offers advantages to companies having driver-shift restrictions (such as limits on the number of consecutive hours driven). An unimproved KY 3 forces commercial drivers to use KY 645 in Martin County, thus losing the benefit due to added distance and drive time.

Meanwhile, the two-lane portion of KY 3 provides access to US 23, a regional medical center, and the community of Auxier, a historic coal town nestled in an oxbow loop of Levisa Fork. Only the KY 3051 (W.L. Fat Wells Memorial Bridge) over the river connects residents of Auxier to the larger transportation network. Located along KY 3 at the eastern edge of the study area, the city-owned, 58-acre Thunder Ridge site is also poised for development. The corridor also provides access to Jenny Wiley State Resort Park.

The study area (Figure 2) incorporates the KY 3 corridor between US 23 milepoint (MP) 0.000 and Thunder Ridge Lane (MP 3.518) and other the state-maintained routes surrounding the Auxier community: US 23, KY 321, KY 1100, and KY 3051.

1.3 Study Goals

Study goals include identifying and evaluating options to improve KY 3 safety and connectivity between US 23 and the multi-lane section of KY 3 while supporting local economic development efforts, promoting continuity of four-lane access, providing redundant connectivity for Auxier, and minimizing community and environmental impacts.

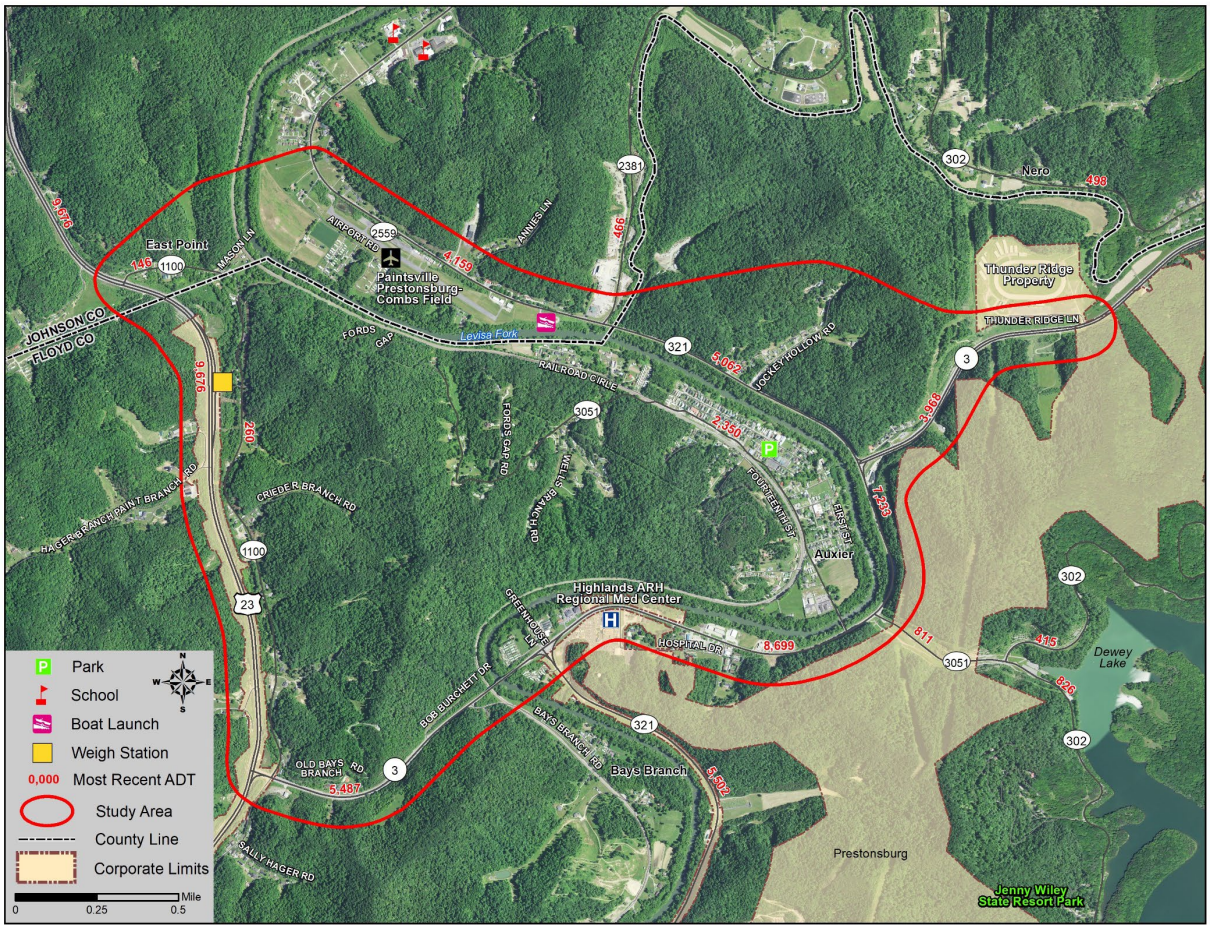


Figure 2: Study Area

1.4 Committed Projects

Kentucky's fiscal year *(FY) 2022–FY 2028 Highway Plan* appropriates nearly $6.8 million in FY 2023 to Item Number 12-10096.00 for the Wireman-Shoals Bridge (036B00135N) on KY 3 over CSX Railroad and Levisa Fork. No other funding for transportation improvements within the study area is identified in the current plan. Current plans include a typical rehabilitation effort for the bridge, with no accompanying widening.

2.0 EXISTING CONDITIONS

Existing transportation conditions are described in the following sections. Roadway geometry, functional classification, traffic volumes and operations, and historic crash data were obtained from KYTC's Highway Information System (HIS) database, KYTC's Transportation Enterprise Database (TED), traffic counts, and field reviews.

2.1 Roadway Systems and Geometry

Functional Classification is the process of grouping streets and highways according to the character of travel service and access to adjacent land use they provide. This classification system is a hierarchical system of facilities that progress from lower classifications handling short, locally oriented trips to higher classifications serving longer distance travel at higher mobility levels. A roadway's classification is further designated as urban or rural based upon whether it is located within a Federal Highway Administration (FHWA) Adjusted Urban Area boundary. Functional classes with brief definitions are listed below and shown in Figure 3.

Freeways & Interstates	Principal Arterials	Minor Arterials	Collectors	Local Roads
•Provide high speed, high mobility links for long distance trips.	•Serve major centers for metropolitan areas, provide a high degree of mobility, and can also provide mobility through rural areas.	•Provide service for trips of moderate length, serve geographic areas smaller than their Principal Arterial counterparts, and offer connectivity to the Principal Arterial system.	•Gather traffic from local roads and funnel it to the arterial network. Classified as either a major or minor Collector, these generally serve intra-county travel and shorter trips.	•Not intended for long distance travel, except at the origin or destination end of the trip, due to their direct access to abutting land. Often designed to discourage through traffic.

KYTC's HIS database was queried to obtain geometric characteristics, including speed limits, number of lanes and lane widths, and shoulder types and widths.

- KY 3 is functionally classified as a minor arterial and has two 12-foot-wide travel lanes with shoulder widths varying from 10 feet to 1 foot from the intersection with US 23 to the northern KY 321 intersection. Heading east from this intersection, it widens to four travel lanes and 10-foot-wide paved shoulders. Speed limits range from 35 to 55 MPH. KY 3 is included in the Kentucky Highway Freight Network and in the extended weight and coal haul systems (350 annual tons).
- US 23 is a principal arterial consisting of four 12-foot-wide driving lanes, mostly 10-foot-wide paved shoulders, and a 55 MPH speed limit. A federally designated truck route, US 23 is in the National Highway System (NHS), extended weight, coal haul system (600 annual tons), and Appalachian Development Highway System (ADHS); and is part of the Kentucky Highway Freight Network. US 23 is also a scenic byway, designated as the Country Music Highway.

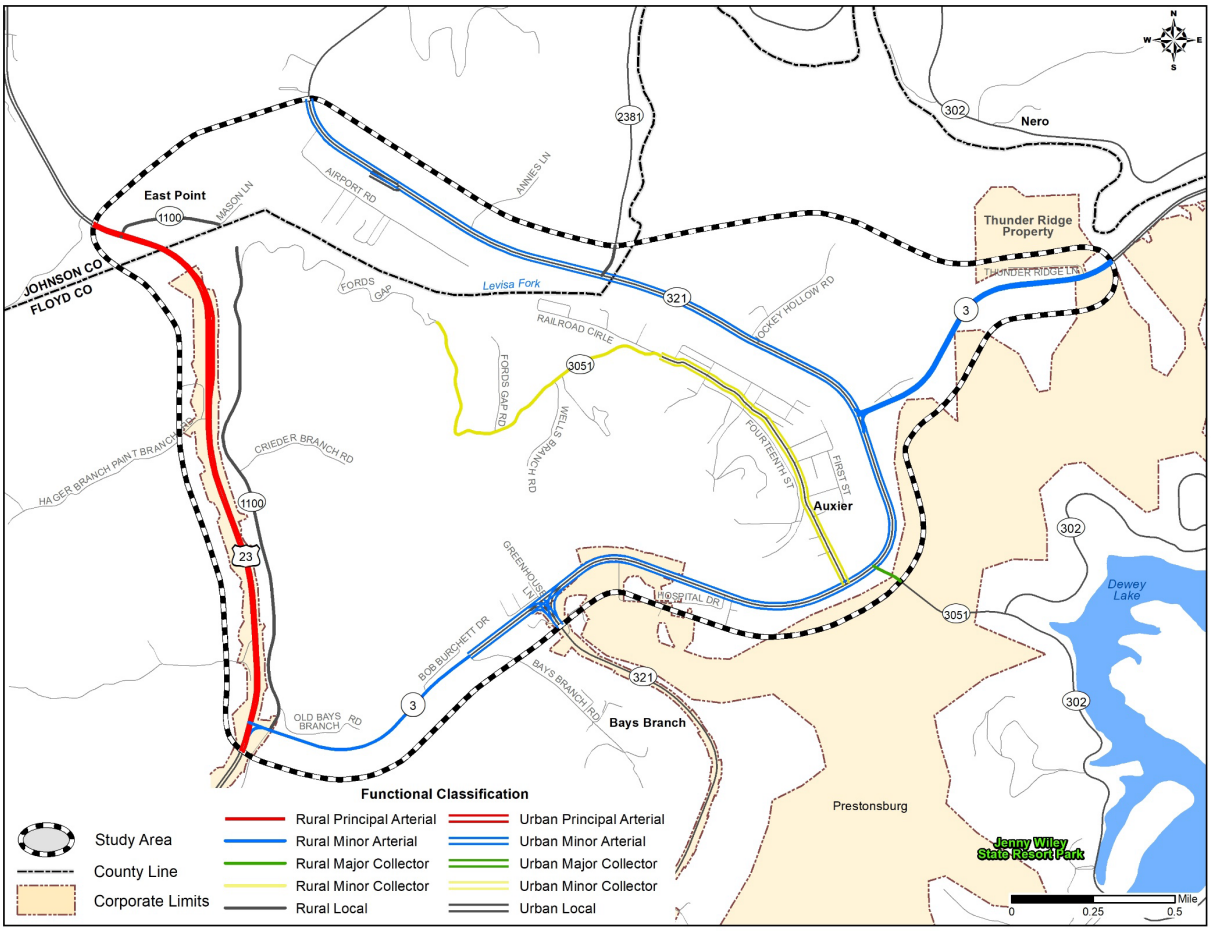


Figure 3: Functional Classifications

- KY 321 is listed as a minor arterial with two 12-foot-wide driving lanes and two-foot-wide paved shoulders. The route is in the Kentucky Highway Freight Network and has a 55 MPH speed limit.
- KY 1100 is functionally classified as a local road with less than 9-foot-wide driving lanes and 1-foot-wide paved shoulders. Since no speed limit signs are posted, the legal speed limit defaults to 55 MPH, though much slower speeds are practical. Removal of the aged bridge over Levisa Fork left the route disjointed within the study area.
- KY 3051, the lone connection available for the community of Auxier, is listed as a minor collector with less than 9-foot-wide travel lanes and paved shoulder widths from 0 to 1 foot.

Bridges. Three bridges were identified on study area routes (**Figure 4**). KYTC's Bridge Data Miner database listed two in fair condition: 036B00077N, KY 321 over Johns Creek and 036B00078N, KY 3051 over Levisa Fork. The Wireman-Shoals Bridge, 036B00135N, carrying KY 3 over CSX/Levisa Fork, is listed in poor condition and noted as structurally deficient, but has *Highway Plan* funding for replacement.

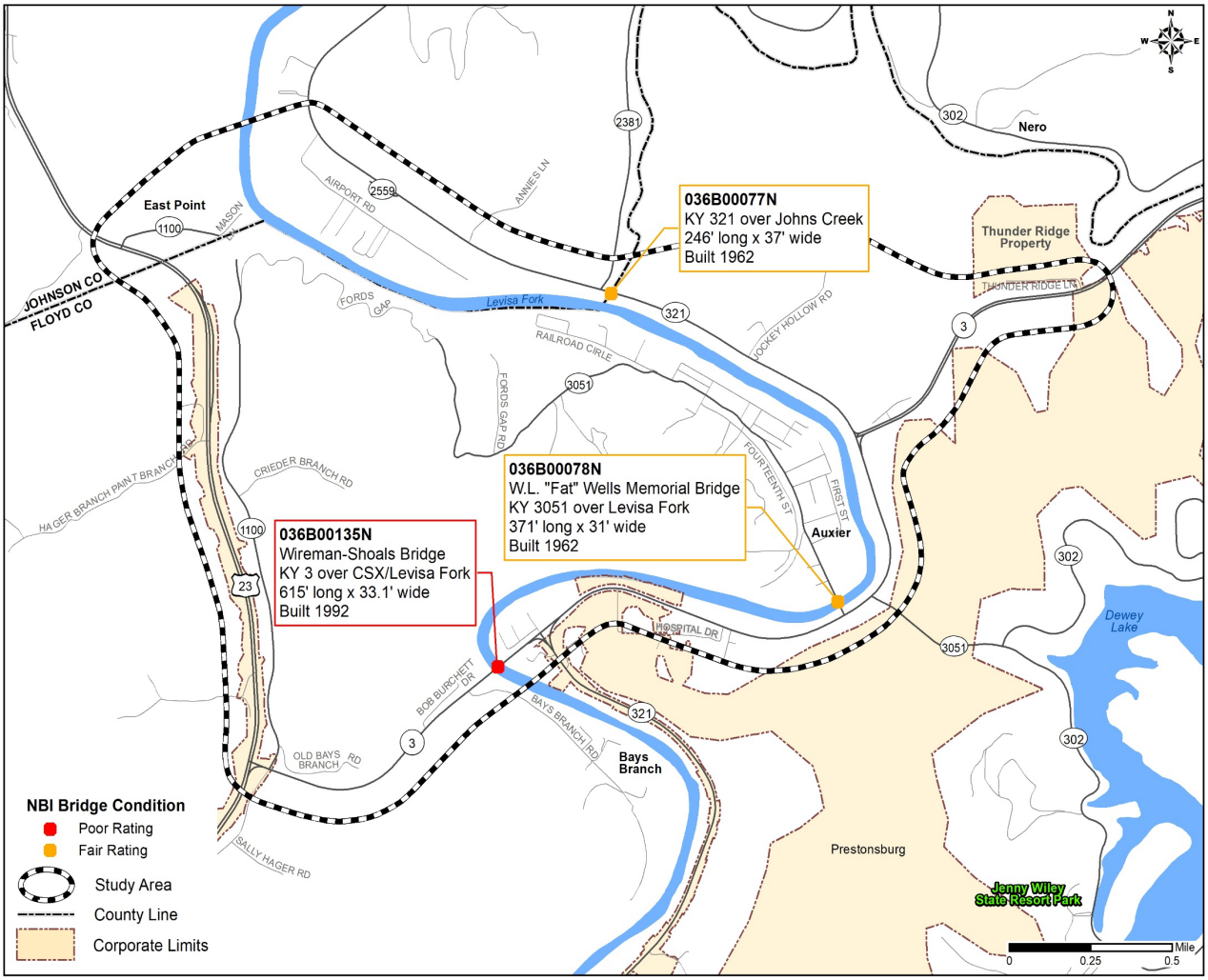


Figure 4: Bridges in Study Area

2.2 2022 Traffic Volumes and Operations

Analysts reviewed existing traffic volumes retrieved from KYTC's HIS database for the study area roadways, including truck percentages, K-factors,[1] and peak-hour directional distributions. Figure 6 (p.7) illustrates 2022 traffic volumes and operations on study area routes. Additional information on existing and future traffic is presented in Appendix A.

Existing Traffic Volumes. Year 2022 segment volumes were calculated based on historical trends, adjusting pre-2022 volumes to create a consistent 2022 dataset. Historic counts show 9,700 vehicles per day (vpd) on US 23 through the study area, including 16.5% trucks. Volumes range from 3,800–

[1] K-factor is defined as the proportion of annual average daily traffic occurring in the design hour.

9,200 vpd on KY 3 in the study area, including 8–9% trucks. KY 321 carries an average 4,200–5,100 vpd representing 4–6% trucks.

2.2.1 Traffic Operations

Two commonly applied highway performance indicators, level of service (LOS) and volume-to-capacity (v/c) ratios, were calculated to describe traffic operations along the corridor. Computations were performed in accordance with *Highway Capacity Manual* (HCM) *6th Edition* procedures for study route segments.

Level of Service. LOS is a qualitative measure that describes traffic conditions based on measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. LOS typically represents a driver's outlook of traffic conditions based on perceived congestion. As illustrated in Figure 5, LOS A is associated with free flow conditions, high freedom to maneuver, and little or no delay. Conditions at or near capacity typically are associated with LOS E. LOS F represents oversaturated traffic conditions beyond capacity, with low travel speeds, little or no freedom to maneuver, and lengthy delays. LOS D is generally considered acceptable for urban areas or LOS C for rural areas.

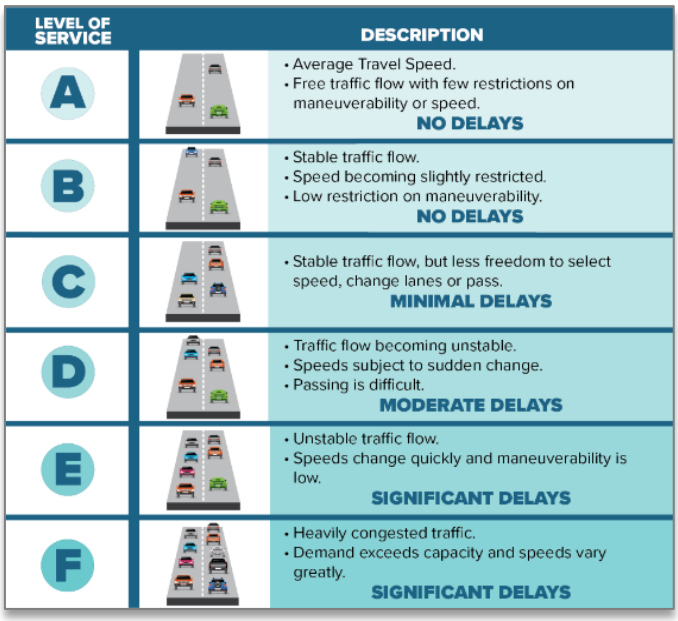


Figure 5: What is Level of Service (LOS)?

Existing segment LOS was determined for the highest traffic hour based on design hourly volume (DHV) calculations, applying K- and d-factors (i.e., hourly and directional adjustments) to average daily traffic (ADT) counts to estimate peak hourly flows. Results show all routes operate at LOS A to B except KY 3 which ranges from LOS A to D.

Volume-to-Capacity. Another measure, v/c, compares a facility's traffic volume to its theoretical capacity over a specific duration, one hour in this instance. A v/c ratio greater than 1.0 indicates a route has exceeded its theoretical capacity and additional throughput may be justified.

At the segment level, the maximum v/c ratio calculated for study area routes is 0.47, suggesting current capacity is adequate for traffic flows. As v/c is measured over an hour period by segment, a roadway or intersection could be congested during peak commuter periods but show a relatively low v/c averaged over a longer duration.

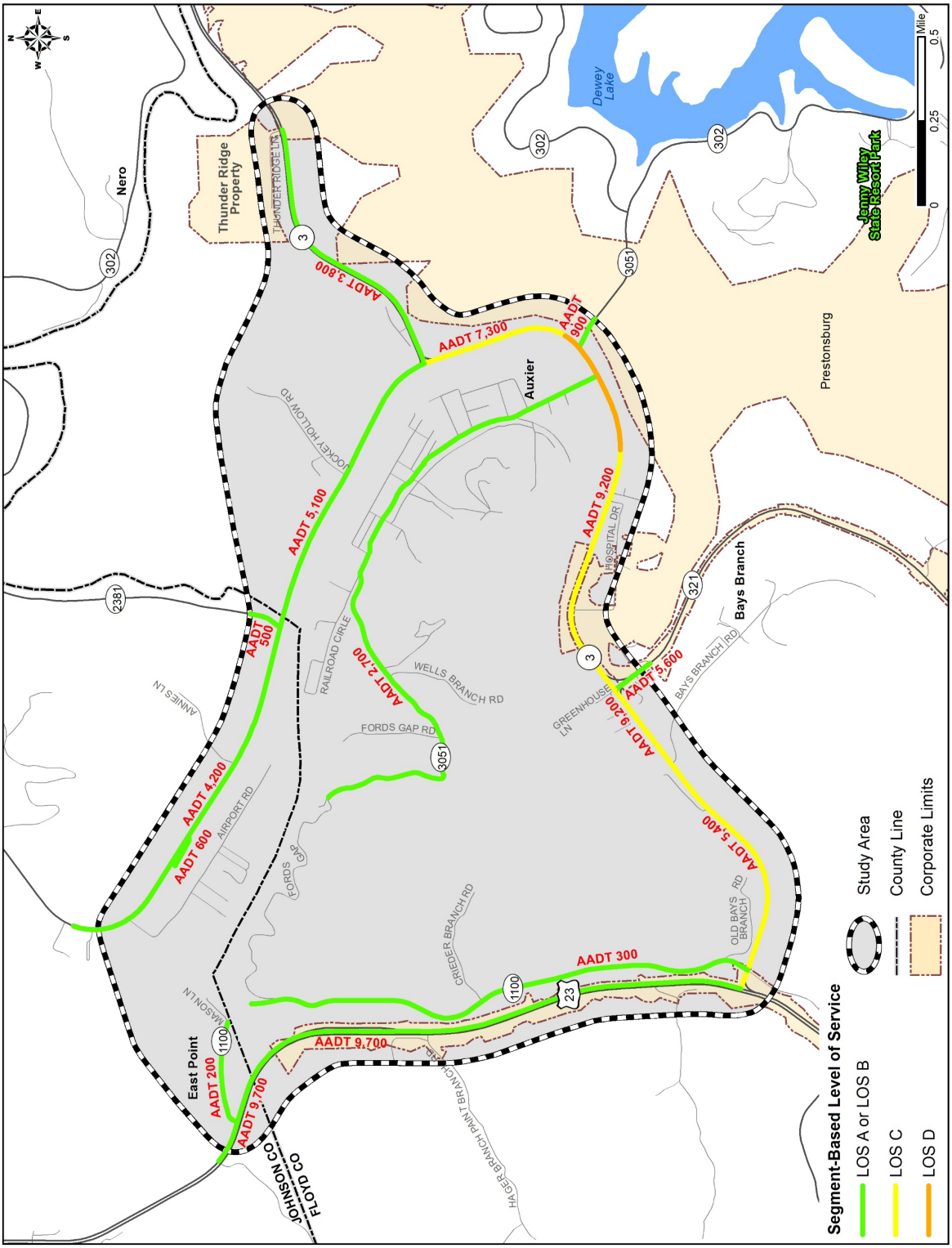


Figure 6: 2022 Traffic Volumes and Operation

Intersection Level of Service. In addition to segmental LOS analysis, 12-hour turning movement counts were collected in February 2022 using Miovision technology to analyze operations at key intersections. An overall LOS is calculated for signalized intersections while a LOS for each stop-controlled approach is computed at unsignalized intersections. Traffic counts were performed at four intersections along KY 3: US 23, KY 321 south towards Prestonsburg, KY 3051 towards Auxier, and KY 321 north towards Paintsville. Summarized in Figure 7, findings show most intersections operate at LOS C or better during both weekday peak hours with one exception: the KY 321 northbound approach at the southern KY 3/KY321 intersection operates at LOS D in the AM peak hour. Although the volume using the northbound approach is low, KY 3 thru traffic volumes delay morning drivers in making the northbound turn.

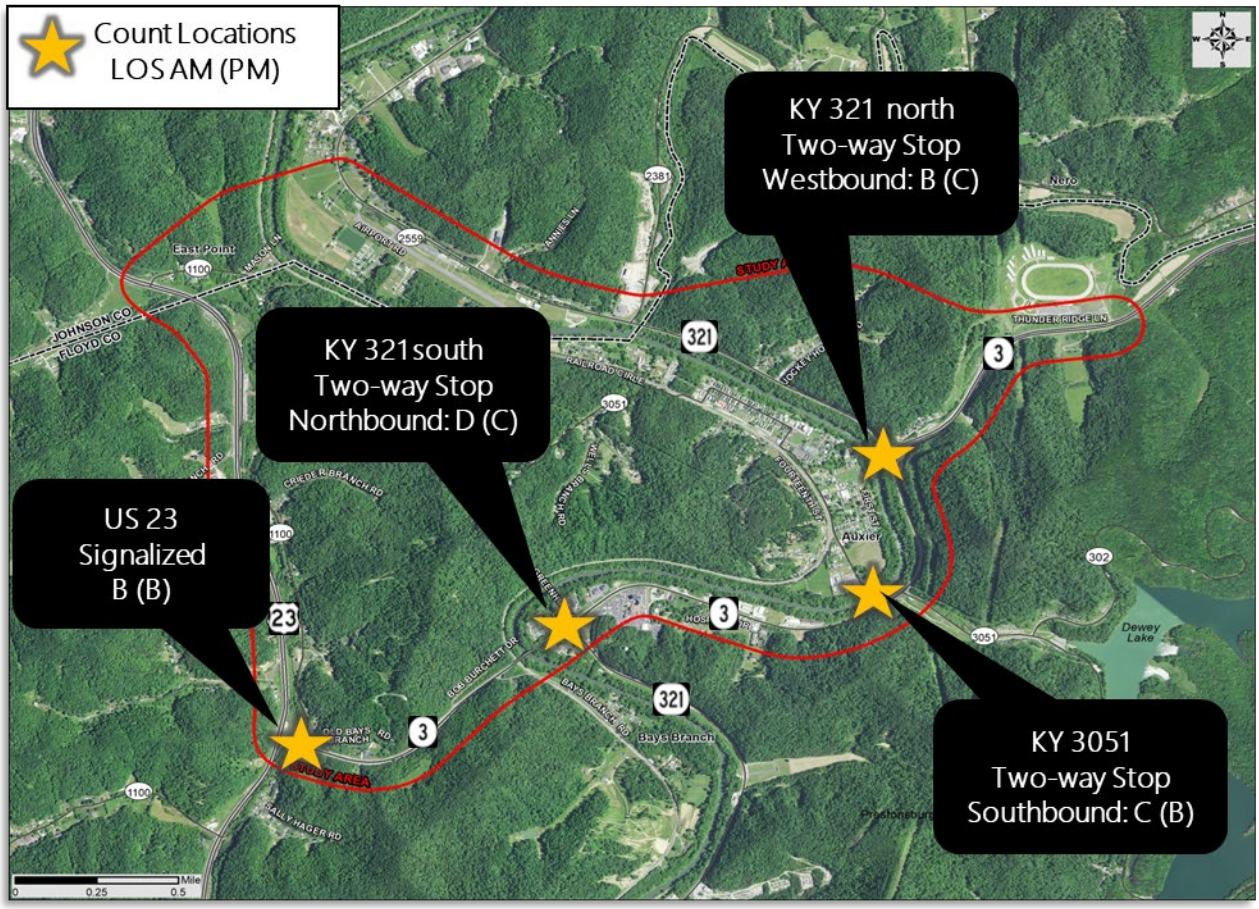


Figure 7: Turning Movement Counts with AM (PM) Peak LOS

2.2.2 Active Transportation Users

Besides vehicles, bicyclists also use state-maintained highways within the study area. Jenny Wiley State Resort Park is located southeast of the study area and is a popular destination for cyclists. Figure 8

shows a Strava heat map of cycling (left) and pedestrian (right) usage, with brighter colors representing higher densities.

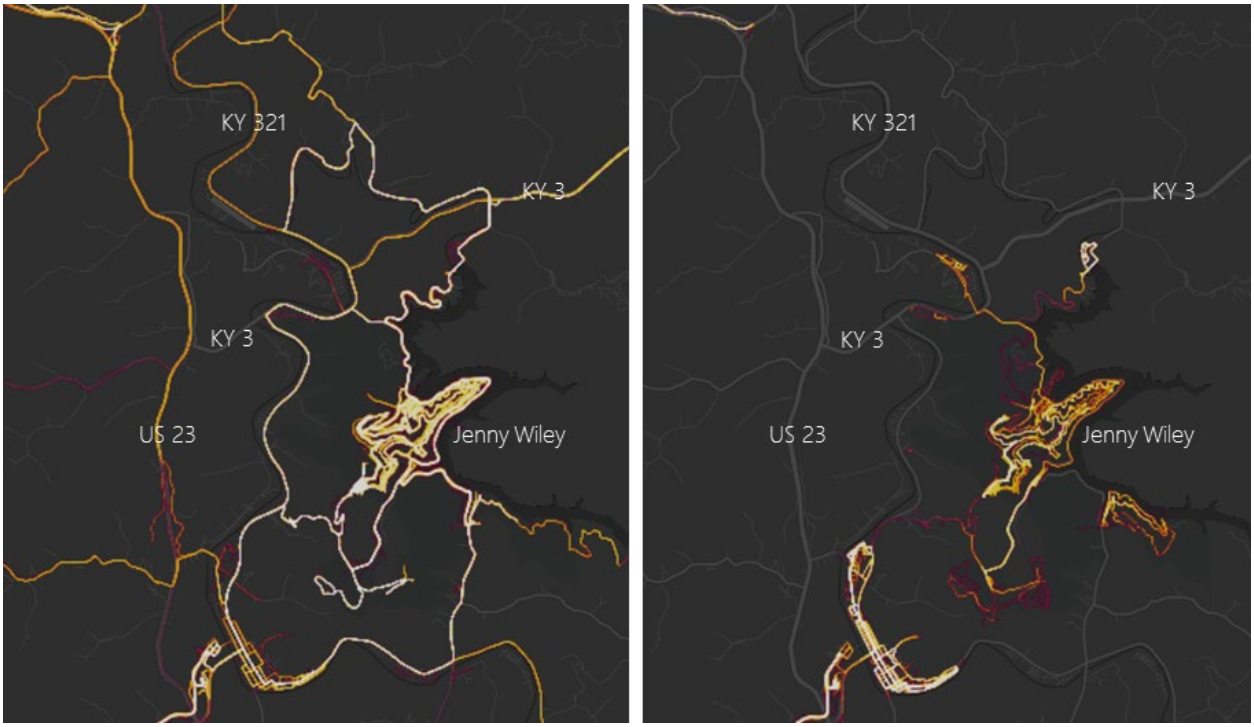


Figure 8: Strava Heat Maps for Cycling (Left) and Pedestrians (Right)

As shown, cyclists travel KY 3, especially the section east of the southern KY 321 intersection (towards Prestonsburg). Pedestrian activity is less common, with a few trips along KY 3 adjacent to the hospital but most confined to KY 3051 between Auxier and Jenny Wiley. It should be noted that heat maps are based on primarily recreational trips, collected from Strava app users.

As of 2022, the City of Prestonsburg is developing a *Bicycle/Pedestrian Master Plan* in coordination with the Big Sandy Area Development District (BSADD).

2.3 Crash History

Historical crash data retrieved from KYTC's TED warehouse were evaluated for study area roadways for a five-year period (January 2016 through December 2020) to ascertain crash severity, crash type and crash trends. The KABCO scale is one tool to classify crashes by injury severity. The letters represent injury levels: K–fatality, A–suspected serious injury, B–suspected minor injury, C–possible injury, and O–no injury or a property damage only (PDO) crash.

A summary of crash locations, severity, and manner of collision are shown in Figure 9. While traffic patterns were atypical during the 2020 pandemic year, the distribution of crashes is comparable to other years in the analysis period.

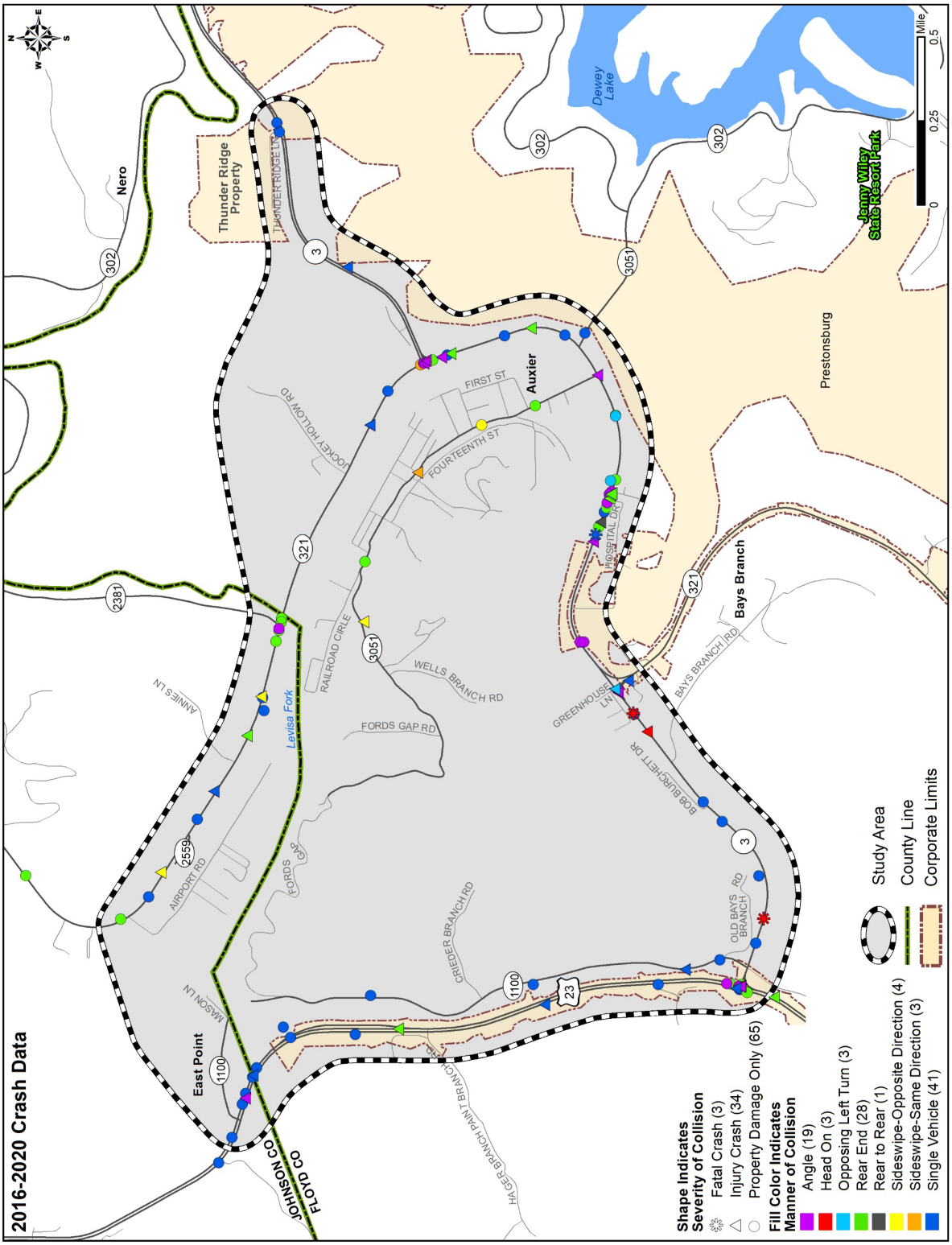


Figure 9: Crash Location, Severity, and Manner of Collison on Study Routes

Severity. During the study period, 102 crashes occurred on study routes. Figure 10 shows that of these crashes, 3 (3%) were fatalities and 34 (33%) were injury collisions. The remaining 65 (64%) crashes were PDO. A table of corresponding crash data is in Appendix B.

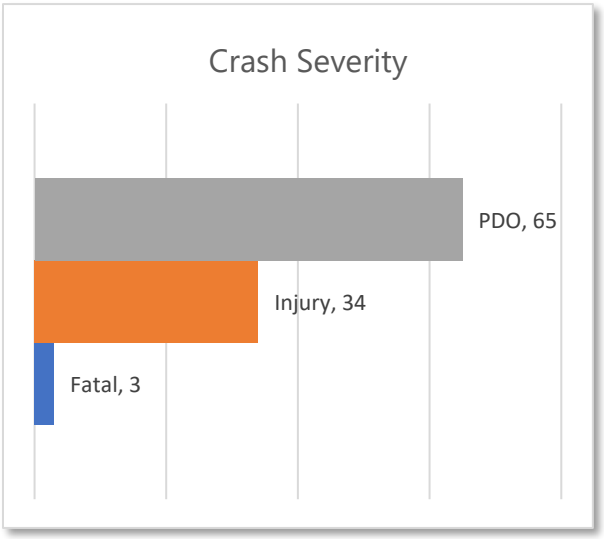


Figure 10: Crash Severity on Study Routes

Manner of Collision. The manner of collision breakdown is shown in Figure 11. Most crashes were one of three types: single vehicle (41 crashes or 40%), rear-end (28 crashes or 28%), or angle (22 crashes or 22%). No bicycle or pedestrian crashes were reported in the dataset.

Distribution. Crash distribution analysis among study area routes is illustrated in Figure 12. Results showed KY 3 contained 44% of all study area crashes, including the three fatalities, followed by US 23 (24%), KY 321 (22%), KY 3051 (6%), and KY 1100 (4%). Further assessment highlighted elevated crash locations along study routes that may be candidates for short-term spot improvements.

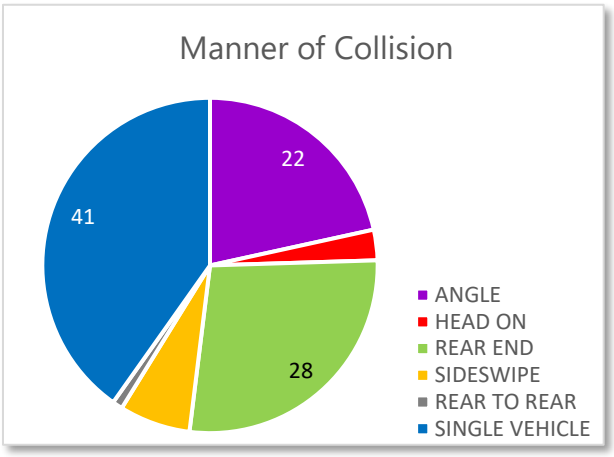


Figure 11: Manner of Collision on Study Routes

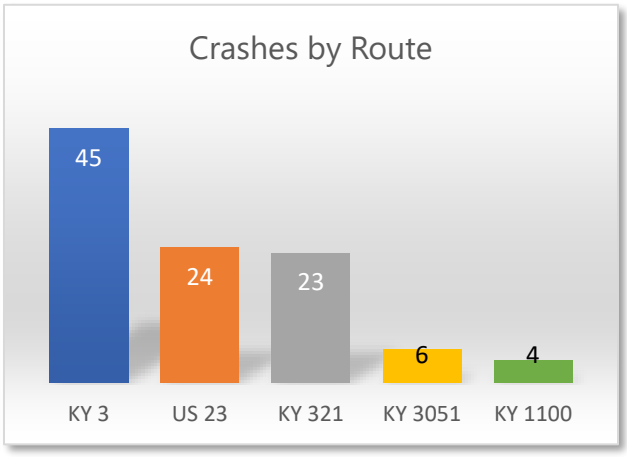


Figure 12: Crash Distribution among Study Roues

2.3.1 Statistical Analysis: Level of Service of Safety

Advanced statistical analyses were performed using the Kentucky Transportation Center's Crash Data Analysis Tool (CDAT) to identify areas of crash concentrations, Excess Expected Crashes (EEC) and Level of Service of Safety (LOSS) along study area routes.

Excess Expected Crashes. EEC provides a statistical model to calculate crash distributions. Defined in the *Highway Safety Manual*, this methodology is based on a crash prediction model estimating the number of crashes expected on an average roadway segment of a given type and length. EEC represents the number of excess crashes a segment is experiencing compared to other roadways of its type, adjusting for traffic volumes and a statistical correction. EEC is positive when more crashes are occurring than expected and negative when fewer crashes are occurring than expected.

Level of Service of Safety. Once established, EECs are then grouped into one of four categories, identified as the LOSS. LOSS categories 1 and 2 characterize sites with fewer than anticipated crashes (negative EEC); thus, safety countermeasures have little crash reduction potential. LOSS 3 and 4 represent sites with higher than anticipated crashes (positive EEC) having moderate to high crash reduction potential and are in greatest need of safety improvements. LOSS can be used to compare segment priority for different roadway types.

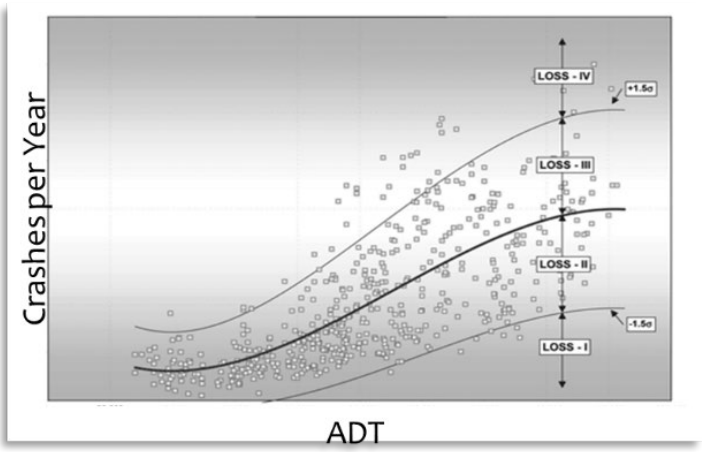


Figure 13: LOSS Categories

LOSS for the corridor was calculated for both severe (KAB) and non-severe (CO) crash distributions (**Figure 14**, p. 13). As shown, several segments and many intersections within the study area exhibit an elevated crash pattern. The northern KY 3/KY 321 intersection exhibits LOSS 4 for severe crashes, suggesting a relatively high potential that countermeasures at this location could reduce observed crash rates.

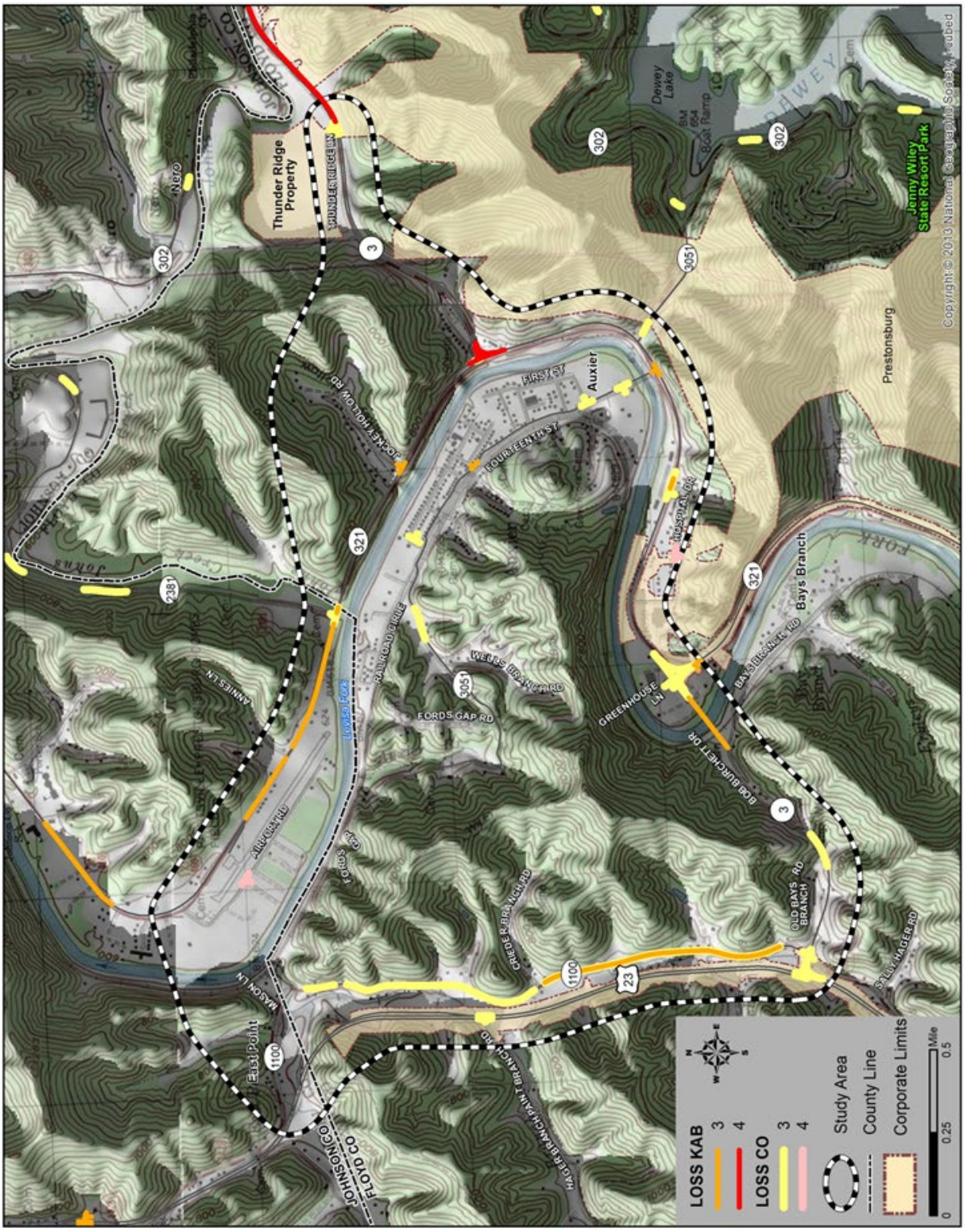


Figure 14: Study Area LOSS

3.0 ENVIRONMENTAL OVERVIEW

An environmental overview was prepared to identify resources for consideration during the development of transportation improvement concepts. Discussed in detail in the following subsections, natural and human environmental resources were identified from available literature, database reviews, and site visits.

The purpose of this overview was not to quantify potential environmental impacts, but instead to identify potential environmental issues to consider during the project development process. This information should aid the project team in making decisions to avoid, minimize, and/or plan for mitigation of potential project impacts, as appropriate. Should future projects develop following this study, additional environmental studies may be required.

If there is a federal nexus (e.g., federal funds, lands, permits, etc.) on a future project, then the procedures established from the National Environmental Policy Act (NEPA) must be followed. NEPA requires, to the fullest practicable extent, that federal actions be interpreted and administered in accordance with its environmental protection goals. It requires an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. The potential environmental impacts and need for safe and efficient transportation must be considered to reach a decision that is in the best overall public interest.

3.1 Natural Environment

The natural environment includes all living and non-living things occurring naturally (not artificial or human-built). This includes aquatic ecology, such as rivers, streams, and wetlands; threatened and endangered species; farmlands; and geotechnical resources. Figure 15 includes a map of identified red flag concerns.

3.1.1 Water Resources

Several named water resources are in the study area: Levisa Fork, Little Paint Creek, Johns Creek, Hager Branch, Auxier Branch, Shot Gun Hollow Creek, Hunter Branch, George Branch, and Road Branch. Between Johns and Abbotts creeks, Levisa Fork is designated as an Exceptional Use Water and Outstanding State Resource Water for the presence of Big Sandy crayfish, a federally protected species.

The study area is located within the Daniels Creek-Johns Creek and Miller Creek-Levisa Fork watersheds. Databases show 100-year floodplains are designated along sections of Levisa Fork, Johns Creek, and Little Paint Creek.

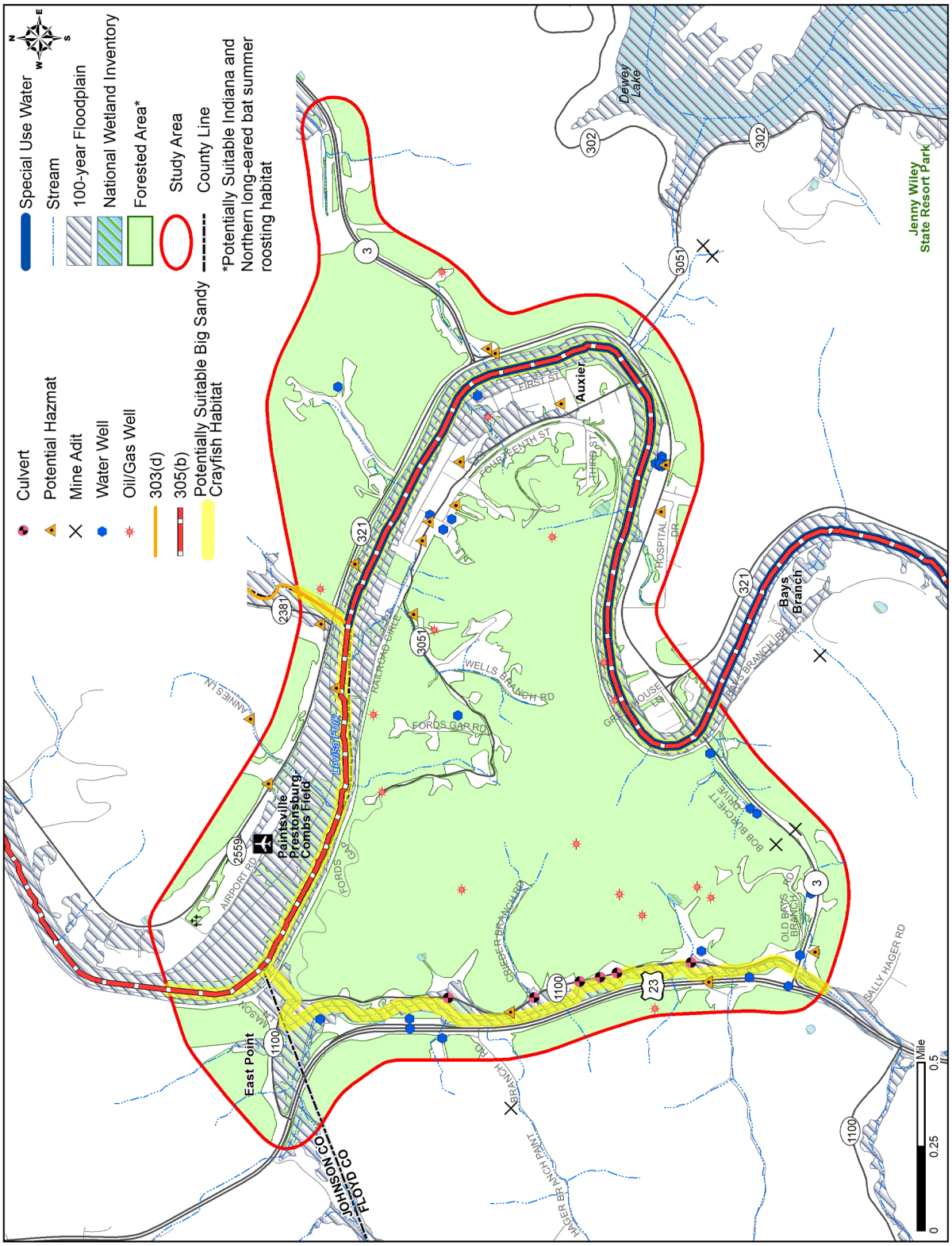


Figure 15: Natural Resources in Study Area

No National Wetlands Inventory wetlands are within the study area; however, one potential wetland was observed during field reconnaissance along KY 3051 near MP 1.0 west of Auxier.

Kentucky Geological Survey records identify nine water wells within the study area, but no springs or ponds.

Impacts to streams and wetlands require permit coordination with the US Army Corps of Engineers (USACE), US Coast Guard, and/or KY Division of Water, depending on the scale of the water resource and potential disturbance.

Figure 16: Potential Wetland

3.1.2 Protected Species

The US Fish and Wildlife Service (USFWS) maintains a database of federally protected species—listed as endangered or threatened under the *Endangered Species Act*. There are three listed bat species and one crustacean having the potential to occur within the study area. Additionally, the monarch butterfly is under consideration for official listing. Listing statuses for all species are shown in Table 1.

Table 1: Listed Threatened and Endangered Species

Group	Name	Scientific Name	Status
Mammal	Gray Bat	*Myotis grisescens*	Endangered
Mammal	Indiana Bat	*Myotis sodalis*	Endangered
Mammal	Northern Long-eared Bat	*Myotis septentrionalis*	Threatened
Crustacean	Big Sandy Crayfish	*Cambarus callainus*	Threatened
Insect	Monarch Butterfly	*Danaus plexippus*	Candidate

USFWS designated critical habitat for Big Sandy Crayfish in March 2022, including Levisa Fork through the study area. Over 1,500 acres of forested habitat potentially suitable for forest-dwelling bats lies within the study area.

A habitat assessment may be needed in the early stages of project development for future project(s) to assess potential impacts to threatened and endangered species. Projects that occur within an area of known bat habitat will require project-specific evaluation to assess appropriate minimization/mitigation measures. For other federally listed species, specific ecological surveys may be required for projects that have the potential to impact habitat. Coordination with the USFWS Kentucky Field Office will be necessary to determine the need for future project-specific surveys.

3.1.3 Farmland Classifications

Shown in Figure 17, very little of the study area is actively farmed. Natural Resource Conservation Service (NRCS) soil survey maps were reviewed to identify farmland classifications within the study area. This includes 58 acres of prime farmland soils (2.6% of the study area) and 45 acres of statewide important soil types (2%). No protected easements or agricultural districts were identified within the study area.

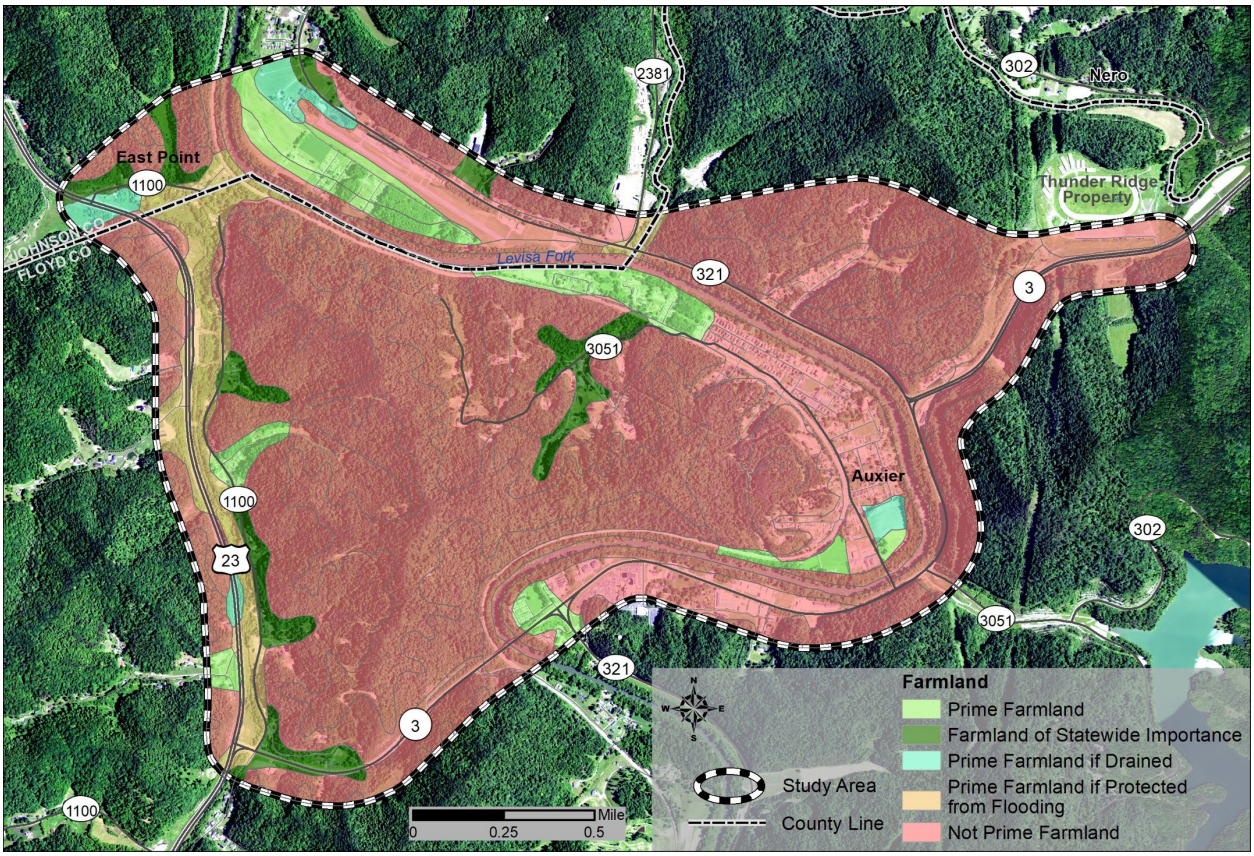


Figure 17: NRCS Farmland Soil Classifications

Should federal funds be used on future projects, the *Farmland Protection Policy Act* must be followed. If there is potential to convert farmland, coordination with the local NRCS office is required.

3.1.4 Geotechnical

KYTC Geotechnical Branch prepared a *Geotechnical Overview Report* to identify geotechnical concerns that may affect potential project designs. A summary of those findings is provided here, with the full report in Appendix C.

The study area is in the Cumberland Plateau (Eastern KY Coal Fields) physiographic region—covered with wooded mountain crests carved by ravines eroded through coal-bearing rocks. Relief varies by over 600 feet throughout the study area, draining towards Levisa Fork. Mapping shows the area is underlain by four Pennsylvanian formations—Princess, Four Corners, Hyden, and Pikeville—mostly consisting of siltstone, sandstone, shale, and coal. Thin layers of residual soils mixed with weathered rock fragments are the predominant soil type along hilltops and hillsides. Alluvium deposits occupy stream channels and floodplains, up to 90 feet thick farther south along Levisa Fork.

Underground and household mining is located throughout the study area. The Kentucky Mine Mapping Information System identifies two underground mines north of Auxier and Levisa Fork: the Williamson,

Haddix, Hamlin, and Hazard coal beds have been mined in this area. Nearby, several caved adits[2] have been identified in the Upper Elkhorn No. 3, Haddix, and Whitesburg coal beds.

The entirety of the project area is notorious for cut and fill slope stability failures. The driving force behind these instabilities can be attributed to groundwater movement, poor rock mass quality, deep colluvium accumulations, and the proximity to streams.

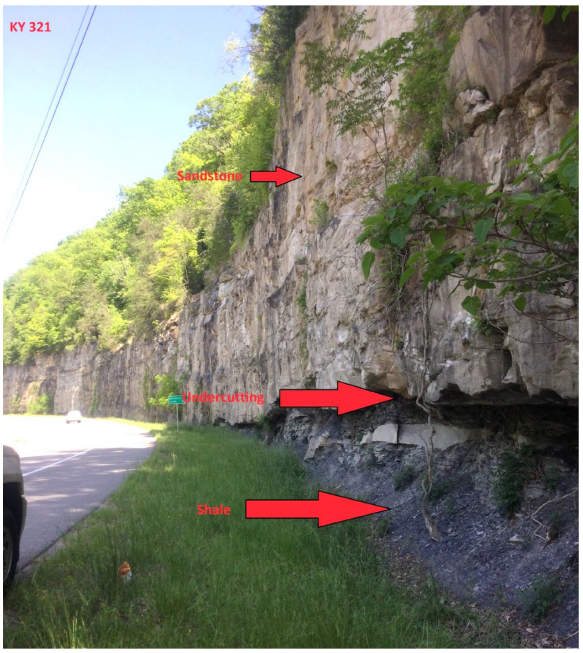


Figure 18: Undercutting along KY 321

The area is prone to rock falls. Special care should be taken in the rock cut slope design phase to minimize conditions that enhance the probability of rock fall conditions. Shales are highly weatherable; when underneath a more resistant sandstone, bed undercutting can occur (Figure 18), increasing rock fall potential. A detailed geotechnical exploration will be required for areas that involve widening existing cuts or creating new cuts.

Rock cuts made in durable or Type 1 non-durable rock generally ranges from 1H:4V to 1H:2V presplit slopes on approximate 30-foot intervals, with 18- to 25-foot intermediate horizontal benches. Cuts constructed in non-durable material and shallow cuts may need to be placed on flatter slopes. Coal presence in cut slopes may also affect the geometry. Cut slopes in overburden and disintegrated rock are generally recommended on 2H:1V slopes. However, flatter slopes are occasionally required in mountainous terrain where overburden depths are shallow. It is often necessary to steepen slopes to 3H:2V in places. Cut stability analyses are generally required when the depth of the overburden is greater than 10 feet.

Embankments constructed of durable rock material generally exhibit adequate stability when using proper construction techniques on 2H:1V slope configurations or flatter, up to 20 feet tall. Flatter embankment slopes may be required for embankments constructed from non-durable shales or in areas of alluvial materials.

It is anticipated that enough durable rock will be available for a subgrade consisting of rock from roadway excavation.

Landslides are an issue in the area. While the Geotechnical Office has only a few landslide reports located within the study area, some slides may have been repaired with recycled railroad rails by District 12 maintenance crews. Roads in a side hill condition are prone to failures; however, most landslides can

[2] A horizontal passage leading into a mine for the purposes of access or drainage.

be mitigated using drilled-in recycled railroad rails due to the shallow depth of bedrock in most cases. Side hill conditions should be avoided if possible.

Subsidence can occur where voids are created by extracting solids or liquid from beneath the surface. The Geotechnical Office recommends at least 100 feet of bedrock coverage between the roadway grade and the ceiling of a mine cavern. During the construction of cuts, underground mines may be exposed at the face of a cut. While not unusual, such exposure may lead to cut instability and eventual intermediate bench loss.

3.1.5 Hazardous Materials

To identify potential hazardous materials concerns, a search of available environmental databases was conducted in March 2022. Results are summarized below and included as Appendix D. The records check identified the following red flag concerns that will require further investigation if a future project is likely to directly impact corresponding sites.

- Six sites with underground storage tanks (USTs), some of which have been removed or closed in place.
- A state hazardous waste site, associated with the former Southern Explosives facility on Railroad Street.
- 34 former spills, most of which have been environmentally closed. This state-level database covers a wide variety of incident types, from complaints of neighbors dumping garbage to chemical releases during vehicle crashes.
- 16 oil/gas wells.
- 14 monitoring/remediation wells.
- 2 "AIRS" sites, with US Environmental Protection Agency (USEPA) permits for airborne emissions.
- 15 "FINDS" records, a central inventory of facilities monitored or regulated by the USEPA.
- 9 sites tracked within USEPA's "ECHO" database, which tracks enforcement and compliance with environmental regulations.

In addition, conversations with local officials noted a former dump site along KY 1100 near its intersection with US 23 that could represent a potential contamination concern.

3.1.6 Air Quality Considerations

USEPA has established National Ambient Air Quality Standards (NAAQs) for six criteria pollutants: ozone, lead, nitrogen dioxide, sulfur dioxide, carbon monoxide, and particulate matter ($PM_{2.5}$ and PM_{10}). Both Floyd and Johnson counties are in attainment for all criteria pollutants.

The study area is not within a metropolitan planning organization (MPO); therefore, any federally funded transportation projects should be included in the statewide transportation improvement program (STIP) to ensure air quality conformity requirements are satisfied.

Future federal projects may need to analyze potential Mobile Source Air Toxics (MSAT) impacts based on the project type. FHWA has developed a tiered approach for three categories to analyze MSATs in NEPA documents, depending on specific project circumstances. The three tiers and associated level of analysis are no potential/exempt projects requiring no analysis, low potential requiring a qualitative analysis, and higher potential requiring quantitative analysis. Based on traffic volumes, any proposed improvements most likely fall into one of the lower two categories.

3.2 Human Environment

The human environment includes people and the resources they define: land use, community features, cultural historic resources, etc. Each could potentially be impacted by any future projects. The following sections identify these resources for consideration during the project development process. Figure 20 (p. 21) locates such resources.

3.2.1 Land Use and Community Resources

Much of the study area is wooded, with steep topography limiting development potential. More developed uses occur on flatter terrain along highway corridors: primarily rural residential with some commercial and institutional uses interspersed.

The community of Auxier lies within a turn of Levisa Fork, originally constructed in the early 1900s by the Northeast Coal Company. Several quarries, mine adits, and mined out areas exist in the vicinity, including one permitted mine boundary within the study area. Most residential development exists along a 1.5-mile stretch along the western side of Levisa Fork, with the KY 3051 bridge providing the sole access.

Figure 19: KY 3051 Bridge to Auxier

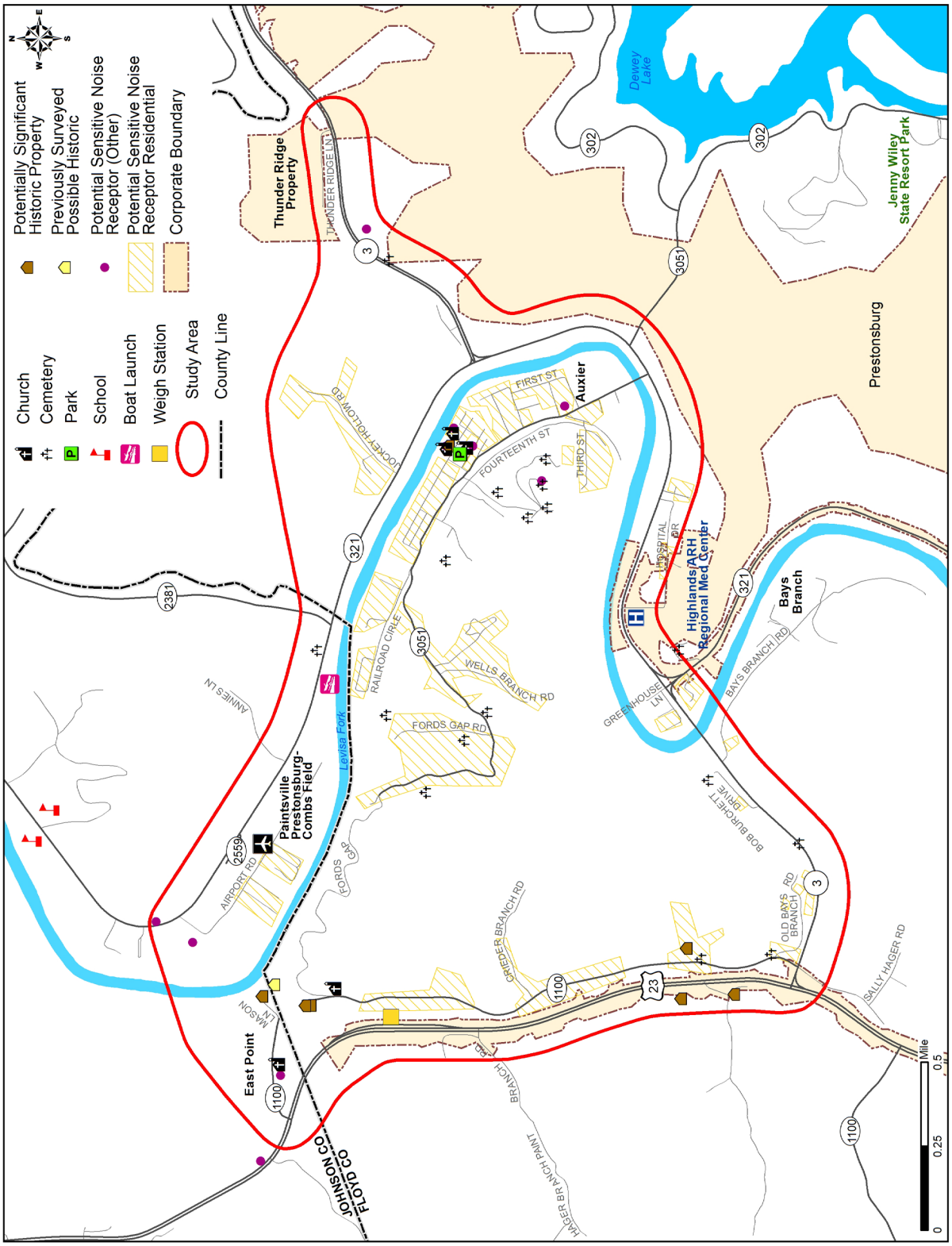


Figure 20: Community Resources in Study Area

Farther south along KY 3, another pocket of commercial land uses lies just east of the southern KY 321 intersection. Most notably, the Highlands ARH Regional Medical Center provides emergency medical care for the region.

Figure 21: Highlands ARH Regional Medical Center

Other key community resources in the study area include:

- The former Paintsville-Prestonsburg-Combs field runway, intermittently used for local events and drag racing
- A public boat ramp, located just west of the county line, accessible from KY 3
- Auxier Community Park, located at 83 Grace Street
- Five churches and 16 small cemeteries

Most civic services are provided in nearby Prestonsburg (Floyd County) and/or Paintsville (Johnson County). Jenny Wiley State Resort Park is just east and south of the study area, with one of its access points from KY 3.

3.2.2 Historic Resources

A *Cultural Historic Overview* (Appendix E) was completed for the study area to identify properties listed or eligible for listing on the National Register of Historic Places (NRHP). A Kentucky Heritage Council (KHC) records review identified three previously surveyed resources within or adjacent to the study area, each listed with undetermined status in KHC files.

Windshield surveys identified seven potentially significant properties, shown as brown house-shaped points in Figure 20 and listed in Table 2. The potential for NRHP-eligible historic districts—including the community of Auxier and/or East Point/Harman Station—was also considered but is not recommended.

Should federal monies or permits be included in future projects, field survey and coordination with KHC will be required to assess project impacts to cultural historic resources.

Table 2: "Red Flag" Historic Resources in Study Area

 Auxier Consolidated School (FD-60), River Street	 John CB Auxier House (JO-30) Off CR-1428	 Dairy Barn Off CR-1100
 Country Store Off CR-1100	 I-House/Outbuildings Off CR-1100	 Log Structure Off George's Branch Road
 I-House/Outbuildings Off George's Branch Road		

3.2.3 Archaeological Resources Potential

An Archaeological Overview was prepared for the study area. A records review identified 15 previous surveys conducted and seven identified sites within or adjacent to the study area. None are NRHP listed. Known sites were identified during the 1970s and 1980s but were not assessed for their NRHP eligibility at that time. To protect identified resources, known site locations are not included on public mapping.

Records review indicated 128 archaeological sites have been previously recorded in Floyd County. Most of these sites consist of prehistoric open habitations without mounds (37%), historic farms/residences (21%), and cemeteries (18%). Most sites are in floodplains (27%) or on dissected uplands (22%), terraces (18%), and hillsides (17%).

Review of historic maps shows approximately 204 historic structures within or adjacent to the study area. The soil data show that portions of the study area have the potential to contain deeply buried,

intact archaeological deposits. However, much of the study area mapped with Inceptisol (young, weakly developed) soil is moderately or steeply sloped, and it is unlikely that archaeological deposits would be buried on these landforms.

Field surveys and coordination with the KHC will be required should federal permits or funds be required for future project development phases. **Appendix F**, on file with KYTC, includes additional information about the archaeological overview.

3.2.4 Socioeconomic Profile

BSADD completed a socioeconomic study for the corridor (**Appendix G**) to highlight potential areas statistically likely to contain elevated concentrations of minority, elderly, economically disadvantaged, limited English proficiency (LEP), and/or disabled populations. The study area covers portions of five US Census block groups, shown in **Figure 22**. Statistics are summarized in **Table 3**, reported from 2020 American Community Survey five-year estimates. Concentrations for the encompassing county serve as the reference threshold, highlighting any block group populations exceeding this level.

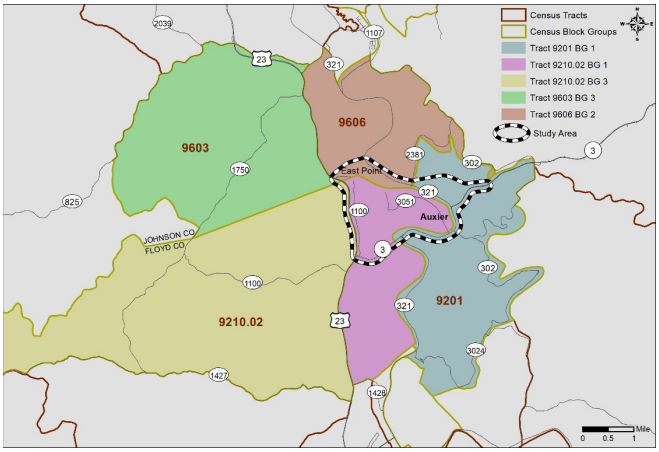


Figure 22: Census Geographies with Study Area

Table 3: Socioeconomic Metrics for Study Area Block Groups

Geography	Population	Minority	In Poverty	Age 65+	Disabled	LEP
Kentucky	4,461,952	15.9%	16.6%	16.4%	15.3%	2.3%
Floyd Co.	35,931	**3.0%**	**28.3%**	**17.9%**	**30.8%**	**0.4%**
9201 BG 1	689	2.0%	6.9%	18.3%	24.6%	1.2%
9210.02 BG 1	1,417	2.3%	26.4%	8.4%	24.0%	0%
9210.02 BG 3	1,683	3.9%	19.0%	8.7%	23.9%	0%
Johnson Co.	22,427	**2.9%**	**20.8%**	**18.1%**	**31.7%**	**0.8%**
9603 BG 3	945	1.7%	33.7%	10.8%	32.1%	0%
9606 BG 2	832	0%	13.2%	9.3%	15.9%	0%

As shown, four of the five block groups exceed county thresholds for one or more categories. It should be noted that block groups encompass much larger areas than just the study area limits with population concentrations largely beyond its borders.

3.2.5 Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 applies to federally funded projects. It is a substantive law that applies to land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites eligible for or listed on the NRHP. A federally funded highway project that uses a Section 4(f) property can only be approved after a determination is made that no prudent or feasible alternative to the use of the property exists and that project planning minimizes harm to Section 4(f) sites.

Potential Section 4(f) protected properties within the study area are public parks plus cultural historic and archaeological sites eligible for listing or listed on the NRHP. No wildlife and waterfowl refuges are located within the study area.

3.2.6 Section 6(f)

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act applies to both state and federally funded projects. The LWCF provides federal grants to acquire land for outdoor recreation, protect important natural areas, and develop or renovate outdoor recreation facilities (campgrounds, picnic areas, swimming facilities, etc.). Impacts must be addressed when projects result in permanent conversion of outdoor recreation property that was acquired or developed using LWCF grant assistance. One property—the Auxier Community Park—has received an LWCF grant; if the park is directly impacted by a future project, coordination with the National Park Service would be required.

3.2.7 Noise Considerations

There are noise sensitive receptors in the vicinity of potential future improvements. Noise sensitive receptors include all outdoor areas of frequent human use such as residential areas, parks, cemeteries, hospitals, churches, schools, and some commercial properties with exterior use.

Specific traffic noise impact analyses may be required as part of future project development activities. State funded projects do not require a traffic noise impact analysis, unless directed by the legislature. However, federally funded projects that add capacity or shift traffic closer to sensitive receptors do require the consideration of traffic noise impacts.

4.0 INITIAL COORDINATION EFFORTS

The project team held meetings over the course of the study to coordinate on key issues. The project team members included representatives from KYTC Central Office, KYTC District 12, BSADD, and the consultant. The following sections highlight main discussion points and detailed meeting summaries are presented in Appendix H.

4.1 Project Team Meeting No. 1

The project team met April 18, 2022, in Pikeville to review existing conditions information and prepare for the first Local Official/Stakeholder (LO/S) coordination meeting. The team reviewed area planned projects and existing conditions including roadway geometry, traffic flow, historical crash trends, and environmental resources.

The team discussed high crash clusters on study routes and applicable safety countermeasures that could be implemented as possible short-term spot improvements at each location.

4.2 Local Official/Stakeholder Meeting No. 1

The project team first met with local officials and other stakeholders May 24, 2022, at the BSADD office in Prestonsburg. The purpose of the meeting was to present an overview of existing conditions in the study area, and garner local insight and input needed to develop future no-build scenarios and improvement concepts. An overview of group discussion topics is presented below.

- With a 55 MPH speed limit and multi-state access, US 23 serves the role of an interstate through the project area. The two-lane section of KY 3 connecting US 23 and the five-lane northeastern section of KY 3 creates a bottleneck to mobility, stifling economic development efforts for the Eastern Kentucky Business Park.
- The orchard at the Eastern Kentucky Business Park has plans to expand by 1,000 acres.
- Highlands ARH serves as a central hub for other medical facilities with planned expansions coming soon.
- Federal prisoner transport vehicles getting stuck in traffic congestion near the hospital is not ideal.
- Area tourism is placing an emphasis on both family car trips and motorcoach tours.
- KY 3 carries significant bike traffic, with groups of weekend cyclists making a loop through Jenny Wiley State Resort Park and back on KY 321.
- Mountain Parkway widening and improvements to KY 645 prime the region for development.
- County populations may be declining; however, the cities of Prestonsburg, Paintsville, and Inez are growing. Strong transportation links among these cities are essential to their growth and economy.
- The Eastern Kentucky Business Park is an eight-hour drive from the east coast, offering advantages to offset driver-shift restrictions. If KY 3 is not improved, trucking companies must use KY 645 in Martin County, thus losing this benefit.
- More developable property exists along KY 3 than anywhere else in the three-county area. The two-lane stretch of KY 3 deters more businesses from choosing the business park than any other

feature. City and county leaders have been targeting the Thunder Ridge property, a former racetrack at the eastern edge of the study area, as an option for a new industrial park.

5.0 2045 TRAFFIC FORECAST AND NO-BUILD OPERATIONS

KYTC's current statewide travel demand model, along with 2022 weekday turning movement counts and input from community leaders, formed the basis of future year 2045 traffic projections. The complete *Traffic Forecast Report* is in Appendix A.

5.1 Future Year Traffic Forecast and Assumptions

KYTC's statewide travel demand model estimated future year growth for all study area roadway segments. The model simulates a 24-hour period, relying on factors to derive DHV. At a high level, the model overlays the roadway network over anticipated changes in household and employment levels for geographic zones to project changes in traffic flows. It is built to examine typical weekday traffic patterns for a broad area.

Two decades of KYTC traffic counts along state-maintained highways in the study area show traffic volumes are trending downward; KY 3051 towards Auxier shows the only positive growth rate in the vicinity. The statewide travel demand model shows declining population and employment for Floyd and Johnson counties; however, assumptions were factored up after conversations with LO/S. Within the study area, the model projects +0.2% growth in vehicle trips annually for the region between 2020 and 2045. This includes an average annual growth of +1.0% trips on the KY 3 corridor and +0.2% trips along US 23. While the model does reflect the slight decline in the countywide socioeconomic data, localized growth along the KY 3 and US 23 corridors as well as a projected increase in heavy vehicle and longer-haul freight support the modeled increase in traffic volumes.

A 1% annual background growth rate was applied throughout the study area for future No-Build forecast projections. KY 3 is expected to carry between 5,200 and 11,100 vpd in the No-Build scenario, up from 3,800 to 9,200 vpd in the Existing scenario.

5.2 Future Year No-Build Operations

In the No-Build scenario, future traffic volumes are applied to the existing highway geometry. Summarized in Table 4, the analysis showed that most study intersections degrade by one LOS in one or both peak hours but continue to operate at LOS D or better. The exception is the northbound stop-controlled KY 321 approach to KY 3, which is governed by the high volume on free-flow cross-traffic during the peak hours. Segment ADTs and LOS is mapped in Figure 23.

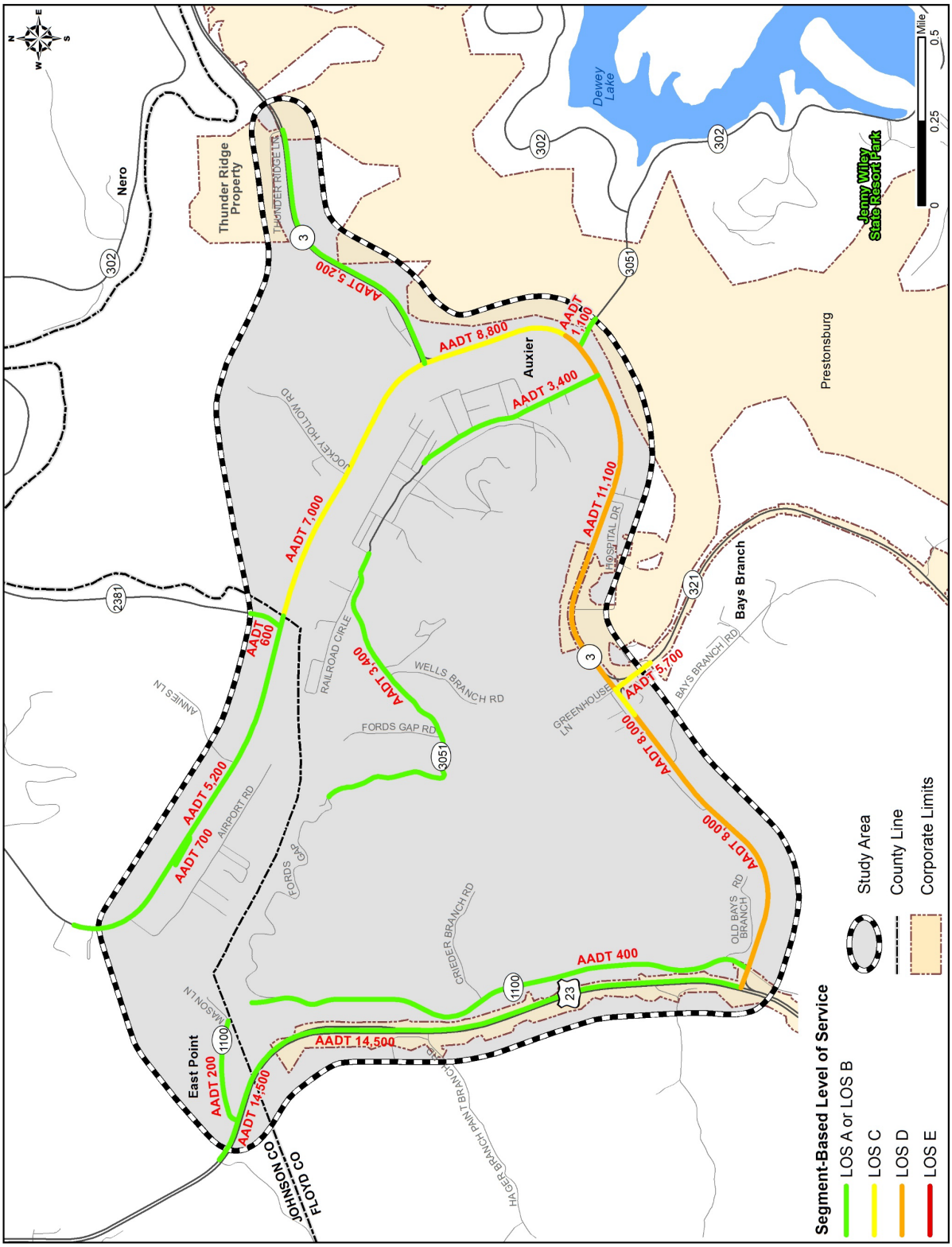


Figure 23: 2045 No-Build Volumes and Segment LOS

Table 4: Existing and No-Build LOS at Study Intersections

Location	Control	2022 Weekday		2045 No-Build	
		AM Peak	PM Peak	AM Peak	PM Peak
KY 3 at US 23	Signalized	B 20 sec	B 20 sec	C 24 sec	C 23 sec
KY 3 at KY 321 (South) toward Prestonsburg	2-Way Stop	D 28 sec	C 24 sec	E 46 sec	E 37 sec
KY 3 at KY 3051 (John CC Mayo Avenue)	2-Way Stop	C 16 sec	B 13 sec	C 23 sec	C 16 sec
KY 3 at KY 321 (North) toward Paintsville	2-Way Stop	B 14 sec	C 15 sec	C 18 sec	C 23 sec

6.0 CONCEPT DEVELOPMENT

6.1 Project Team Meeting No. 2

The project team met August 12, 2022, in Pikeville to discuss assumptions used in future traffic forecast calculations and proposed improvement concepts, as well as to prepare for the second LO/S meeting. The team reviewed existing conditions and environmental resources, focusing on potential short-term safety improvements (Appendix I) and long-term corridors. In addition to long-term, five-lane corridor concepts, the team discussed opportunities to provide a secondary connection into Auxier. Options to provide a new, two-lane local street connector from each long-term corridor to the existing Auxier street network were initially considered but discarded as a secondary bridge over Levisa Fork would be less costly and have substantially fewer environmental impacts.

The project team agreed the long-term corridor concepts and the new bridge options should be presented to LO/S for input and discussion.

6.2 Five-Lane Corridor Concepts

Six long-term, five-lane corridor concepts were developed for further consideration. Of these, one would widen an existing roadway and five would construct a roadway partially or almost totally on new alignment. Unless otherwise noted, each of the following corridor concepts is based on a five-lane rural typical roadway section (Figure 24), 55 MPH design speed, and 10-foot-wide paved shoulders.

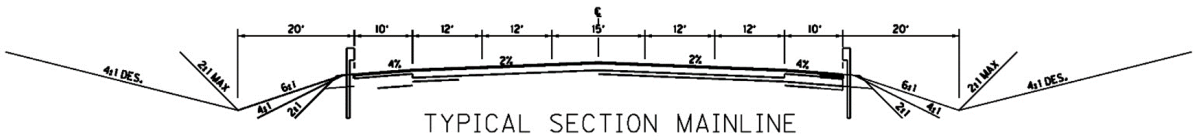


Figure 24: Five-Lane Typical Section

- **Existing KY 3.** This concept widens existing KY 3, with a five-lane urban typical section (curb and gutter) for the more developed area near the hospital and a rural typical section (10-foot-wide paved shoulders) elsewhere. Shown in **Figure 26** (p. 31), this concept results in an estimated 2.1 million cubic yards of earthwork, concentrated along the vertical cuts abutting KY 3 near the eastern study area limits. No new river crossing is required; the narrower typical section through the more developed commercial stretch (i.e., between MPs 1 and 2) reduces property impacts, although some parking impacts are unavoidable.

Figure 25: Representative Roadside Setbacks along KY 3 near Hospital

- **Green Connector**. This concept follows KY 321 from the four-lane KY 3 intersection to the east, bridging over Levisa Fork and CSX rail line southeast of the former airport. It continues west to meet US 23 north of the existing weigh station. Curves on both sides of the proposed bridge are based on a 45 MPH design speed, while other concepts are designed for 55 MPH. Shown in **Figure 27** (p.32), the concept results in a longer structure length and more earthwork quantities than nearby options.

Figure 26: Widen Existing KY 3

Figure 27: Green Connector

- Red or Purple Connectors. Both concepts follow KY 321 from the four-lane KY 3 intersection to west of the former airport, bridging over Levisa Fork and CSX rail line to meet US 23 north of the existing weigh station. Two US 23 connection concepts are shown in Figure 28 (p. 34), with Purple intersecting US 23 nearest the station. Earthwork volumes associated with both connectors are relatively low. The Purple connector results in fewer relocations, while the Red connector has among the most relocations.
- Yellow Connector. This concept follows KY 321 from the four-lane KY 3 intersection to east of the former airport, then follows the old runway before bridging over Levisa Fork and CSX rail line to meet US 23 north of the existing weigh station (see Figure 29, p. 35). Yellow requires the least earthwork and (similar to Purple) results in relatively few relocations.
- Central Connector. This concept runs straight east-west between US 23 and four-lane KY 3 with a 1,500-foot-long bridge elevated over Levisa Fork, Auxier, and CSX rail line. Shown in Figure 30 (p. 36), this concept requires more earthwork than any other Build concept considered and (similar to Red) has a relatively high number of relocations. However, it is the only concept that increases access to "new" areas (i.e., undeveloped areas east of US 23 and west of Auxier), as the other corridors generally follow existing highway corridors.

Table 5 provides a comparison between the six long-term corridor concepts discussed above.

Table 5: Comparison of Corridor Concepts

Corridor Concept	Length (Miles)	Earthwork (Millions CY)	Bridge Length (Feet)	Relocations (Approx.)
Widen Existing	2.9	2.1	600	<5
Green	2.7	2.8	900	15-20
Red	2.6	1.6	600	20-30
Purple	2.6	1.7	750	10-15
Yellow	2.7	1.5	600	10-15
Central	2.6	3.5	1,500	20-30

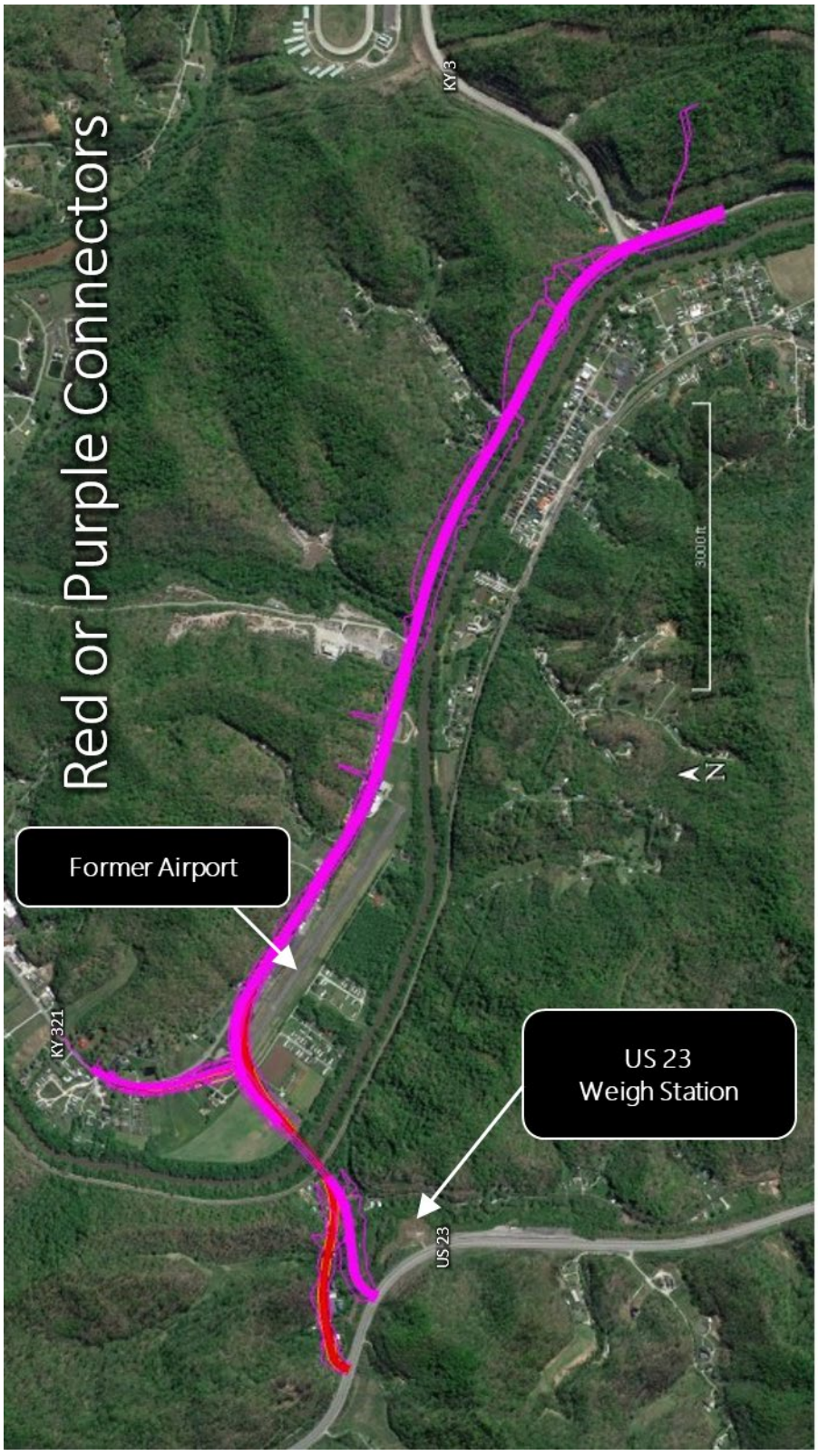


Figure 28: Red and Purple Connectors

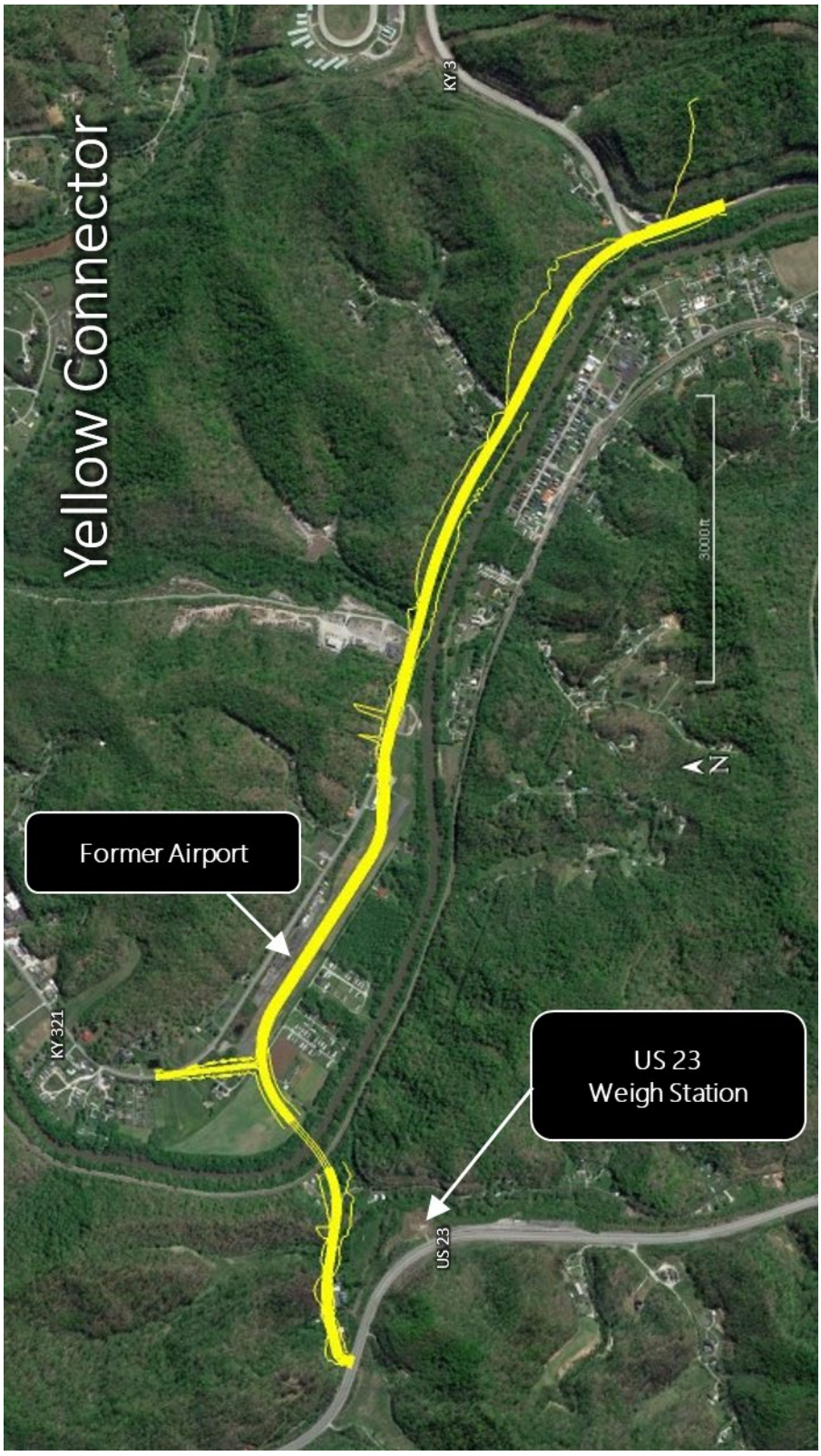


Figure 29: Yellow Connector

Figure 30: Central Connector

6.3 2045 Build Traffic

Two build scenarios were modeled within the statewide model.

- Build 1: Widening existing KY 3 to five lanes showed no change in projected traffic versus the No-Build scenario. Operationally, the increased capacity reduces delay at study intersections through the south. The KY 3/KY 321 intersection remains at LOS E during the AM peak hour.
- Build 2: Yellow was selected as a representative new alignment corridor to estimate how a new connection impacts the larger network. The model shows 3,700 vpd using the new Build corridor with a 15% reduction in traffic using existing KY 3 around Auxier. Operationally, delay decreases at each study intersection versus the 2045 No-Build scenario. The new connection to US 23 is assumed to be stop-controlled, operating at LOS C or better during the peak hours.

Table 6 presents LOS and delay at the four study intersections for each 2045 scenario.

Table 6: Comparison of 2045 Traffic Operations at Study Intersections

Location	Control[3]	2045 No-Build (2 lane)		2045 Build 1 (4 lane + TWLTL*)		2045 Build 2 (New Connector)	
		AM	PM	AM	PM	AM	PM
KY 3 at US 23	Signalized	C 24 sec	C 23 sec	B 18 sec	B 19 sec	C 20 sec	C 20 sec
KY 3 at KY 321 (South) to Prestonsburg	Two-Way Stop	E 46 sec	E 37 sec	E 42 sec	D 30 sec	D 30 sec	D 26 sec
KY 3 at KY 3051 (John CC Mayo Avenue)	Two-Way Stop	C 23 sec	C 16 sec	C 18 sec	B 13 sec	C 17 sec	B 13 sec
KY 3 at KY 321 (North) to Paintsville	Two-Way Stop	C 18 sec	C 23 sec	C 15 sec	C 20 sec	B 14 sec	C 16 sec

*TWLTL = Two-way left-turn lane

6.4 Secondary Connection for Auxier

Figure 31 shows potential locations for three new bridge options to provide a secondary connection into Auxier: one near the former airport, another in line with the four-lane KY 3, and a third between the two. Concepts were developed to minimize property impacts, aligning with open spaces or existing roadways to minimize relocations.

It should be noted that not all short-term bridge options work with all long-term corridor options. For example, the Central Corridor and easternmost bridge option both align opposite the north KY 3/KY 321 intersection so one precludes the other.

[3] For stop-controlled intersections, metrics from the highest delay approach are documented

Figure 31: Potential Secondary Bridge Connections into Auxier

7.0 FINAL COORDINATION MEETINGS

Following development of the concepts, the project team reached out to local leaders to solicit feedback. No public involvement was included at this phase of the study as no funding is currently available for any future project development activities. Corresponding meeting summaries are included in Appendix H.

7.1 Local Official and Stakeholder Meeting No. 2

The project team met with LO/S September 14, 2022, at the BSADD office in Prestonsburg. The purpose of the meeting was to present and gather local input on proposed improvement concepts. Given the devastating flooding throughout the region during July 2022, there was limited local engagement during the meeting. Accordingly, the project team followed up with email updates and an online survey to try to boost involvement.

Corridor connection concepts and secondary bridge options into Auxier (discussed in Chapter 6) were presented. Key comparison metrics such as project length, construction costs, approximate earthwork quantities, bridge lengths, and potential relocations were offered for consideration. Group discussion items included:

- The Central Connector could open to economic development land that is currently inaccessible.
- The Central Connector is closer to the historic coal town, but the proposed bridge generally follows the overhead coal transport used by the Northeast Mining Company.
- Off KY 1100 near the four northern concepts' proposed tie to US 23, there is a former dump site that is likely contaminated.
- While Green preserves the potential to use the former airport for future economic development, the 45 MPH speed drop through its two curves at the bridge is a concern.

Including both interactive polling during the meeting and follow-up survey responses, six to nine responses were received regarding concept preferences. While this is not a representative sample of larger community preferences, input is included for reference.

- Most participants agreed any of the three short-term bridge options warranted further consideration.
- Green received the most responses followed by Central when responders were asked which long-term corridors should be dismissed from further consideration. However, most participants agreed each concept was viable.
- When asked which long-term corridor was preferred, Red/Purple received the most support, followed by Central. No one favored the Green or No-Build options.

7.2 Resource Agency Coordination

Resource agency coordination was conducted to help identify potential environmental resources, development plans, or other issues. The KYTC Division of Planning sent approximately 50 federal, state, and local resource agencies a packet of project-related information including purpose and need, existing traffic and safety data, preliminary Build concepts, and *Environmental Overview* exhibits. Responses are summarized in Table 7 and provided in full in Appendix J.

Table 7: Resource Agency Comments

Resource Agency	Comment(s)
KY Department of Fish and Wildlife Resources	➢ State listed species are known to occur in the area: Coalfields Crayfish, Big Sandy Crayfish, Indiana Bat, Eastern Pipistrelle, Northern Long-eared Bat, Rabbitsfoot Mussel, and Peregrine Falcon. Big Sandy Crayfish, Indiana Bat, Northern Long-eared Bat, and Rabbitsfoot Mussel are also federally listed. ➢ Coordinate any tree removal with USFWS. ➢ Coordinate waterway/wetland work with USACE. ➢ Any channel changes should incorporate natural stream channel designs. ➢ Culverts should allow passage of aquatic organisms and avoid degradation. ➢ Construct during low flow periods to minimize disturbances. ➢ After construction, replant disturbed areas with native vegetation. ➢ Return disturbed in-stream habitat to stable condition. ➢ Preserve overhanging tree canopy. ➢ Use erosion control measures to reduce siltation in streams/karst features.
KY Division of Forestry	➢ No significant issues/concerns.
KY Department of Agriculture	➢ No “PACE” easements in the vicinity.

Resource Agency	Comment(s)
KY Department of Natural Resources	➢ No "PACE" easements in the vicinity. ➢ Erosion control best management practices (BMPs) encouraged.
USEPA	➢ The [future] environmental document should include purpose and need discussion. ➢ Levisa Fork is listed as impaired; coordinate with KEEC to ensure alternatives do not further degrade water quality. ➢ NPDES permit may be required with erosion control measures and BMPs. ➢ Minimize impacts to Waters of the US; USACE permit may be required. ➢ Recommendations cited to reduce exhaust/dust/emissions. ➢ EJScreen tool shows potential environmental justice concerns; conduct future analysis and meaningfully engage with communities.
KY Department of Public Health	➢ The City of Prestonsburg is developing a bike/pedestrian master plan covering the study area. ➢ Bicycle activity is medium-high in the study area with no pedestrian activity recorded, but there are generators. ➢ Best case Build options provide paved shoulder (6+ feet) with signage for bike route with sidewalks on bridges. ➢ Project evaluations should include considerations/benefits for non-motorized facilities (i.e., social connectedness, transportation equity, physical health). ➢ Study area should not adversely affect at risk populations or minority or low-income residential areas (i.e., large high speed/high volume roadways cutting off access and or accommodation to public spaces, schools, or other logical termini for non-motorized travel). ➢ Considerations from the *KY Complete Streets, Roads, and Highways Manual*[4] should be incorporated.
Scenic KY	➢ No concerns.
Appalachian Regional Commission	➢ KY 3 is not designated ADHS but ties to US 23 (ADHS Corridor B, completed in Kentucky). ➢ Appreciates efforts to finish/maintain ADHS system and surrounding network

7.3 Project Team Meeting No. 3

A third and final project team meeting occurred December 1, 2022, at the KYTC District office in Pikeville. The purpose of the meeting was to review study findings to date and reach a consensus on recommendations. Discussion included refinements to safety spot improvements (Appendix I) and unit price assumptions used to develop cost estimates, discussed below.

[4] Online at https://transportation.ky.gov/BikeWalk/Pages/Complete-Streets.aspx

8.0 RECOMMENDATIONS

8.1 Cost Estimates

Planning-level designs for all improvement concepts were used to estimate preliminary quantities of high-cost construction items including earthwork, pavement, and structures. Construction costs were tabulated using KYTC average unit bid prices. KYTC District 12 provided right-of-way and utility cost estimates based on conceptual modeled disturb limits, aerial imagery, approximate locations of existing right-of-way and property lines, and utility records. Cost estimates do not account for mineral rights or for railroad coordination for long-term corridors.

Planning-level cost estimates by phase are presented in Table 8. Costs are shown in 2022 dollars. Each construction phase estimate includes an additional 25% for contingencies.

Table 8: Cost Estimates by Phase (2022 Dollars)

Build Concept	Total Cost	Design	Right-of-Way	Utilities	Construction
Short-Term Connectors					
Bridge 1 (by Airport)	**$13.0M**	$0.9M	$2.2M	$0.3M	$9.6M
Bridge 2 (Middle)	**$9.3M**	$0.7M	$1.0M	$0.3M	$7.3M
Bridge 3 (to KY 3 Four-Lane)	**$9.3M**	$0.7M	$1.2M	$0.3M	$7.1M
Long-Term Corridors					
Widen Existing	**$64.1M**	$5.3M	$1.2M	$5.0M	$52.6M
Green	**$86.9M**	$7.0M	$4.9M	$5.5M	$69.5M
Red	**$62.8M**	$4.8M	$6.2M	$4.0M	$47.8M
Purple	**$68.4M**	$5.4M	$3.9M	$5.4M	$53.7M
Yellow	**$61.2M**	$4.9M	$3.7M	$4.2M	$48.4M
Central	**$103.4M**	$8.4M	$7.0M	$4.0M	$84.0M

8.2 Environmental Impacts

Alongside costs, impacts to the human and natural environment are another consideration when evaluating long-term corridor options. Table 9 compares key impacts that vary among Build concepts, mapped in Figure 32 (p. 42) and Figure 33 (p. 43).

Table 9: Environmental Impacts for Build Corridors

Build Concept	Length (Miles)	Disturbed Area (Acres)	Natural Impacts	Community Impacts
Widen Existing	2.9	50	No new floodplain or floodway	<5 relocations; Impacts business parking lots
Green	2.7	80	5,127 feet floodplain 4 acres floodway	15-20 relocations
Red	2.6	70	6,680 feet floodplain 6 acres floodway	20-30 relocations

Build Concept	Length (Miles)	Disturbed Area (Acres)	Natural Impacts	Community Impacts
Purple	2.6	65	5,854 feet floodplain 6 acres floodway	10-15 relocations
Yellow	2.7	65	7,760 feet floodplain 7 acres floodway	10-15 relocations Precludes events at former airport
Central	2.6	50	1,471 feet floodplain <1 acres floodway	20-30 relocations; Bridge over Auxier Opens new area for development

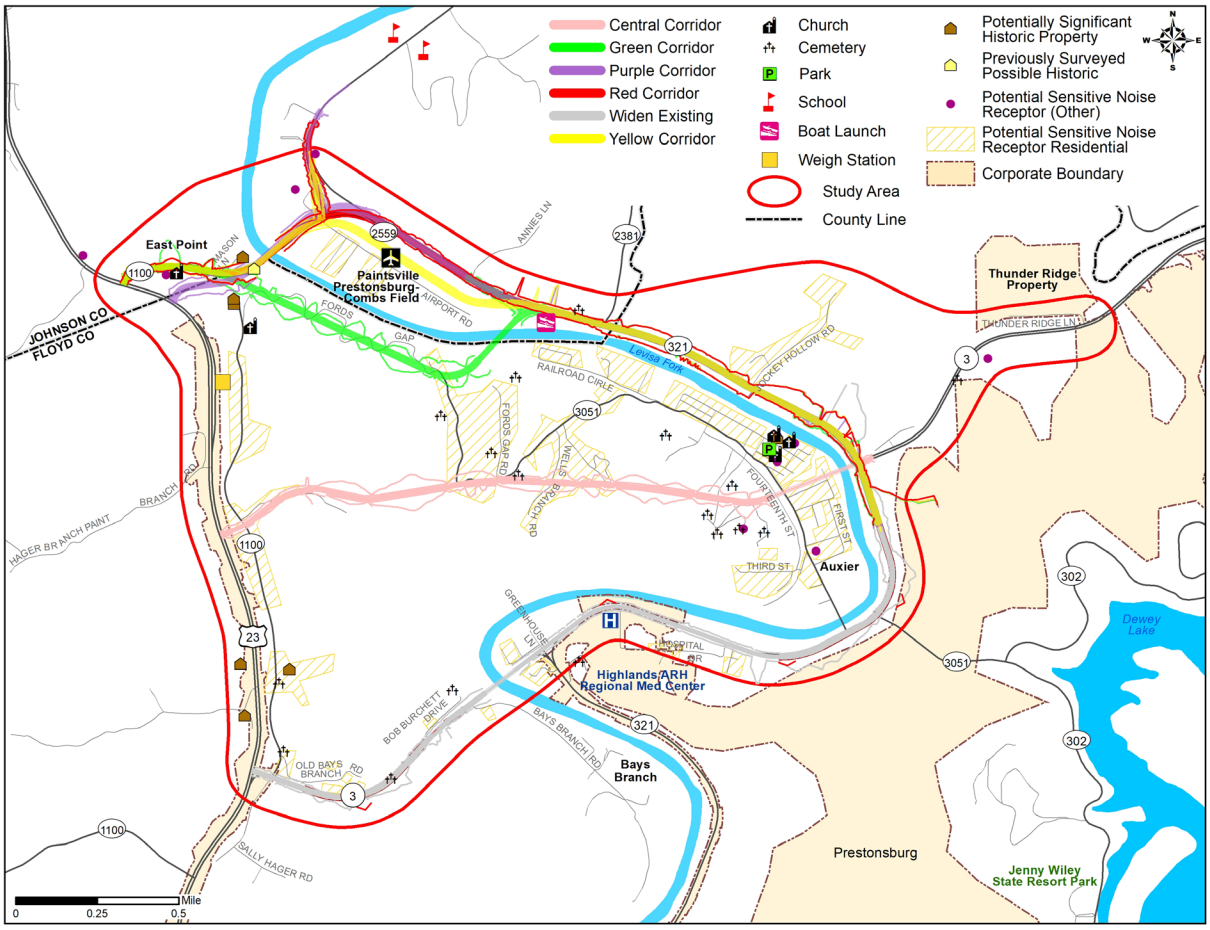


Figure 32: Build Corridors with Human Environment

Build concepts would result in the loss of vegetation, representing potential habitat for protected forest-dwelling bat species. Except Widen Existing KY 3, Build concepts with a new structure would impact Levisa Fork, designated as critical habitat for the Big Sandy crayfish. The northern concepts (i.e, Green, Red, Purple, and Yellow) pass near three likely historic resources and two cemeteries; none of which are expected to experience direct effects but each merits further consideration in future project development phases. Each northern concept also runs adjacent to a public boat launch—a Section 4(f) recreational resource—but minimal impacts are anticipated.

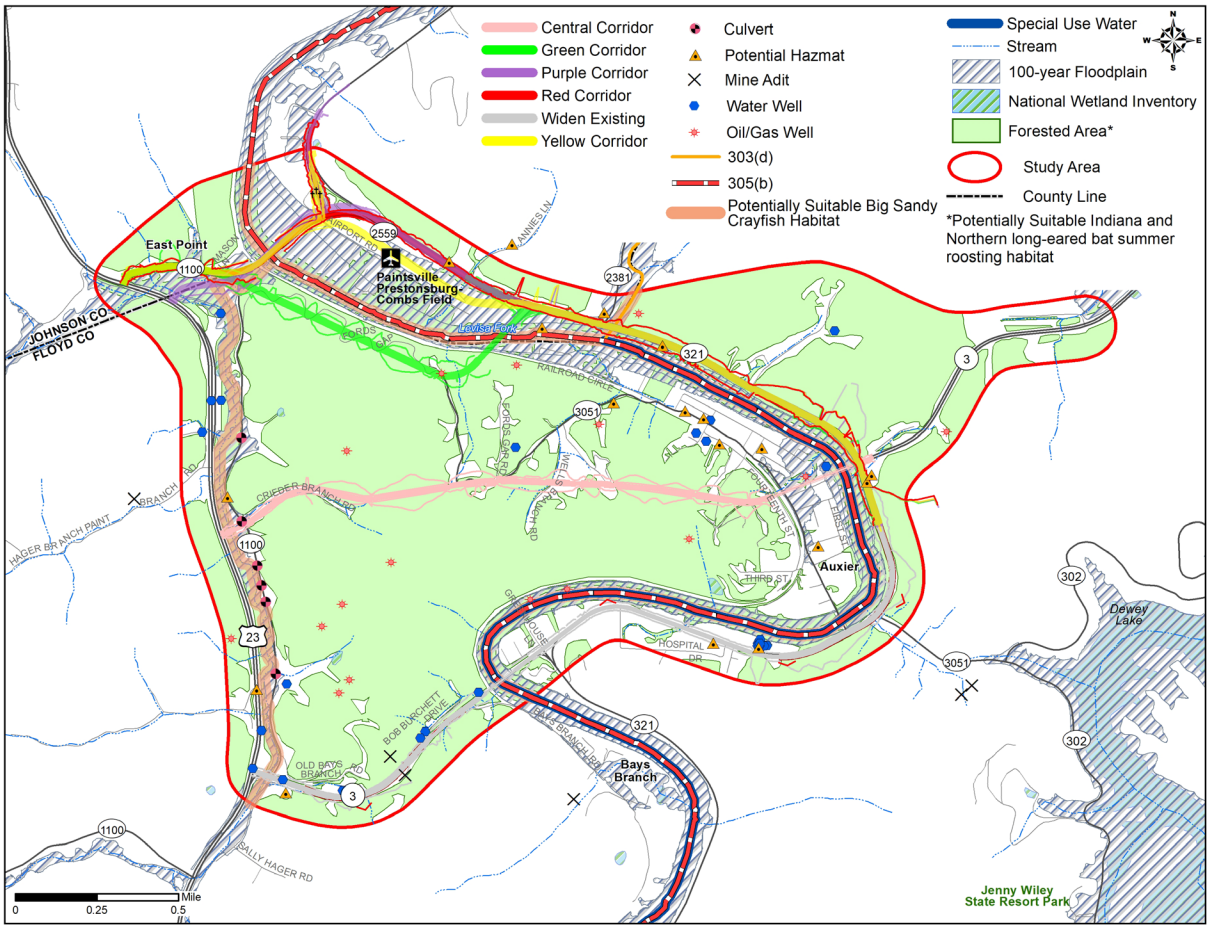


Figure 33: Build Corridors with Natural Environment

8.3 Recommendations and Project Sheets

Reviewing the concepts, costs, impacts, and input from LO/S, the project team agreed each of the three secondary Auxier connector bridge options and each of the six long-term corridor concepts are worth additional consideration should funding be identified for future project phases.

Larger scale maps of the Build corridors are included on the following pages, followed by individual information sheets for each improvement concept.

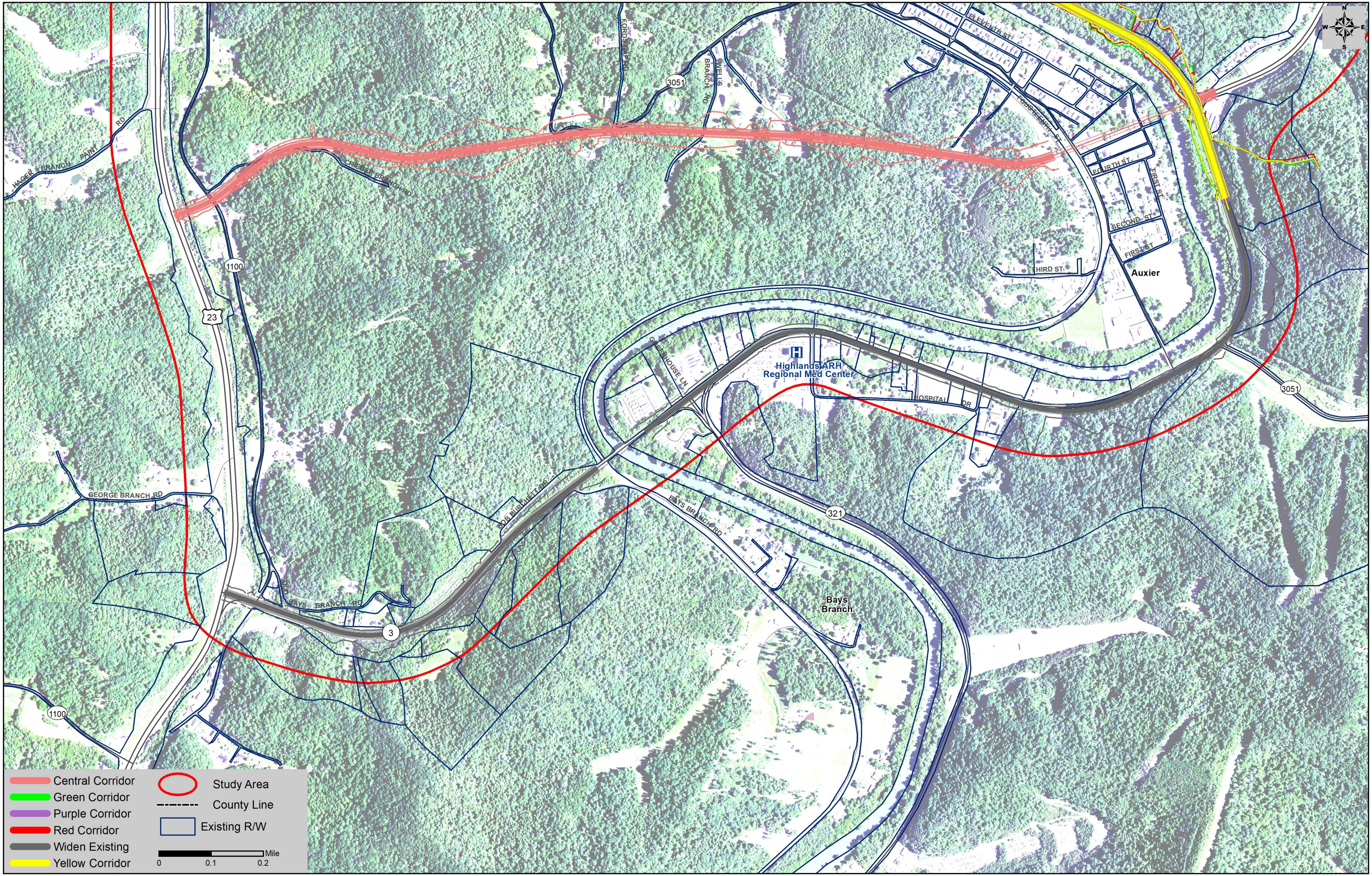
Central Corridor
Green Corridor
Purple Corridor
Red Corridor
Widen Existing
Yellow Corridor

Study Area
County Line
Existing R/W

N
W E
S

Mile
0 0.1 0.2

East Point
1100
MASON LN
2559
Paintsville Prestonsburg-Combs Field
ANNIES LN
2381
AIRPORT RD
FORDS
CAP
Levisa Fork
RAILROAD CIRLE
321
JOCKEY HOLLOW RD
3051
FORDS BRANCH RD
WELLS BRANCH RD
ELEVENTH ST
TWELFTH ST
FOURTH ST
FIRST ST
SECOND ST
FIRST ST
THIRD ST
Auxier
3
3
1100
PAINT BRANCH RD
CREEK
BRANCH RD
23
H



Auxier
Highlands ARH Regional Med Center
Bays Branch
GEORGE BRANCH RD
BAYS BRANCH RD
HOSPITAL DR
ELEVENTH ST
FOURTH ST
SECOND ST
FIRST ST
THIRD ST
3051
1100
23
321
3
Central Corridor
Green Corridor
Purple Corridor
Red Corridor
Widen Existing
Yellow Corridor
Study Area
County Line
Existing R/W
Mile
0
0.1
0.2

Secondary Connection for Auxier

Floyd and Johnson Counties		A		
IMPROVEMENT DESCRIPTION: Construct one of three new bridge options to provide a secondary connection into Auxier: one near the former airport, another in line with the four-lane KY 3, and a third between the two. It should be noted that not all short-term bridge options will work with all long-term corridor options.	2022 Dollars	**B1**	**B2**	**B3**
	Design	$0.9M	$0.7M	$0.7M
	Right-of-Way	$2.2M	$1.0M	$1.2M
	Utilities	$0.3M	$0.3M	$0.3M
	Construction	$9.6M	$7.3M	$7.1M
	Total Cost	**$13.0M**	**$9.3M**	**$9.3M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	KY 321 carries 4,200–5,100 vpd with 4.1–6.6% Trucks; operates at LOS A–B in both peak hours; v/c is 0.13-0.21
2045 No-Build Traffic:	At 1% annual growth, 5,200–7,000 vpd; operates at LOS B–C in both peak hours; v/c is 0.17-0.26
Safety:	15 crashes occurred on KY 321 in 5 years including 4 (27%) injury, and 11 (73%) PDO

CONCEPT:

Auxier Bridge Options

Corridor Concept: Widen Existing KY 3

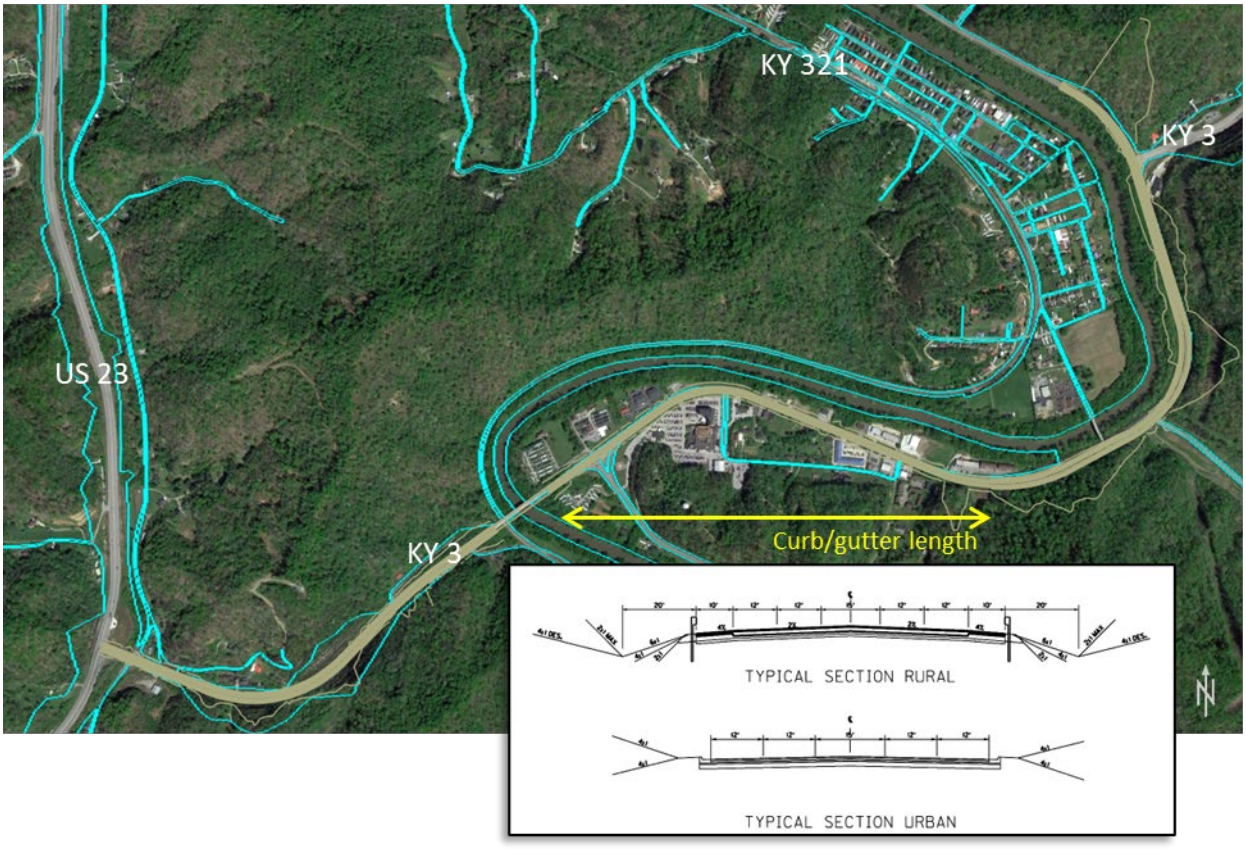
Floyd County | Widen KY 3 from US 23 (MP 0.0) to KY 3/KY 321 Intersection (MP 2.672)		B
IMPROVEMENT DESCRIPTION: Widen KY 3 from US 23 to KY 321 to provide a 5-lane roadway with a TWLTL. No new river crossing is required; construct an urban template through the more developed area to reduce property impacts.	Phase Estimate	(2022 $'s)
	Design	$5.3M
	Right-of-Way	$1.2M
	Utilities	$5.0M
	Construction	$52.6M
	Total Cost	**$64.1M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	3,800–9,200 vpd with 8.9% Trucks; operates at LOS B-D in AM, and LOS A-D in PM peak hours; v/c is 0.19-0.47
2045 No-Build Traffic:	At 1% annual growth, 5,200—11,100 vpd; operates at LOS B-E in AM, and LOS C-D in PM peak hours; v/c is 0.24-0.51
Safety:	45 crashes occurred on KY 3 in 5 years including 3 (7%) fatal, 16 (36%) injury, and 26 (58%) PDO; crash types include 31% rear end collisions; 31% single vehicle, and 22% angle crashes

CONCEPT:

Widen Existing KY 3



Corridor Concept: Green

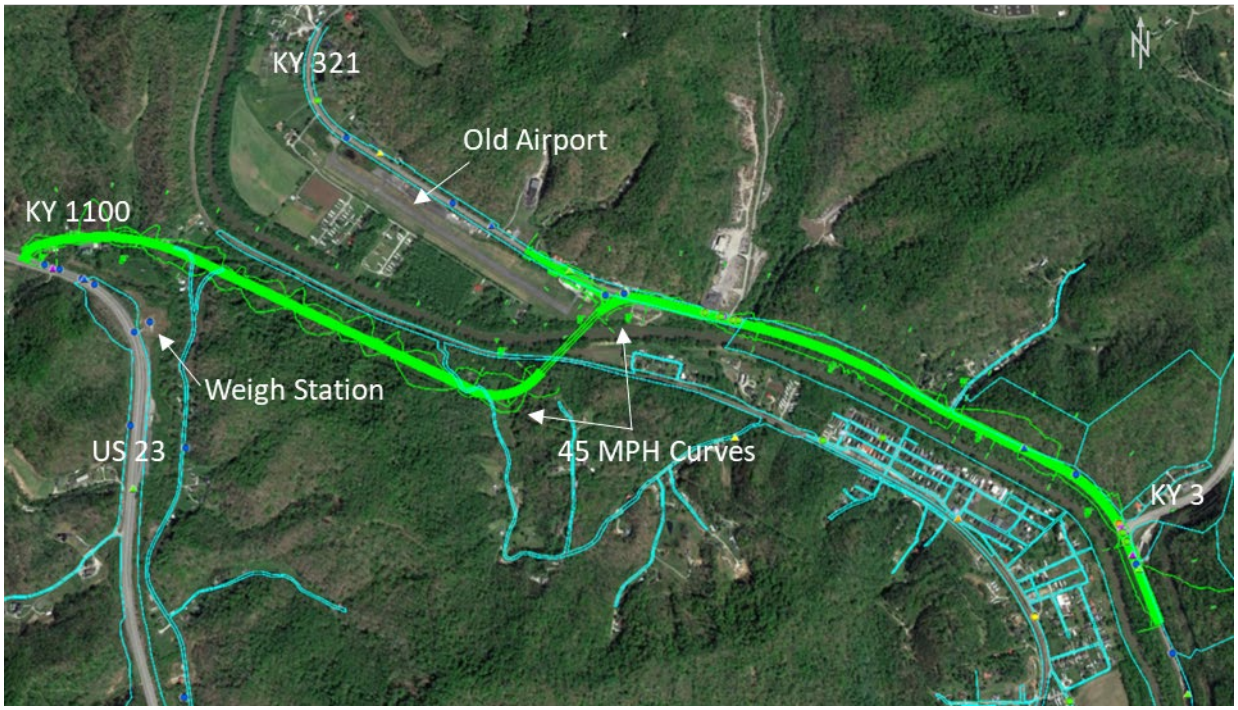
Floyd and Johnson Counties		C
IMPROVEMENT DESCRIPTION: Construct a 5-lane roadway following KY 321 from the four-lane KY 3 intersection to the east, bridging over Levisa Fork and CSX rail line southeast of the former airport. Continue west to meet US 23 using KY 1100, north of the weigh station. Curves entering and exiting proposed bridge are based on a 45 MPH design speed.	Phase Estimate	(2022 $'s)
	Design	$7.0M
	Right-of-Way	$4.9M
	Utilities	$5.5M
	Construction	$69.5M
	Total Cost	**$86.9M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	KY 321 carries 4,200–5,100 vpd with 4.1–6.6% Trucks; operates at LOS A–B in both peak hours; v/c is 0.13-0.21
2045 No-Build Traffic:	At 1% annual growth, 5,200–7,000 vpd; operates at LOS B–C in both peak hours; v/c is 0.17-0.26
Safety:	15 crashes occurred on KY 321 in 5 years including 4 (27%) injury, and 11 (73%) PDO

CONCEPT:

Green Corridor



Corridor Concept: Red

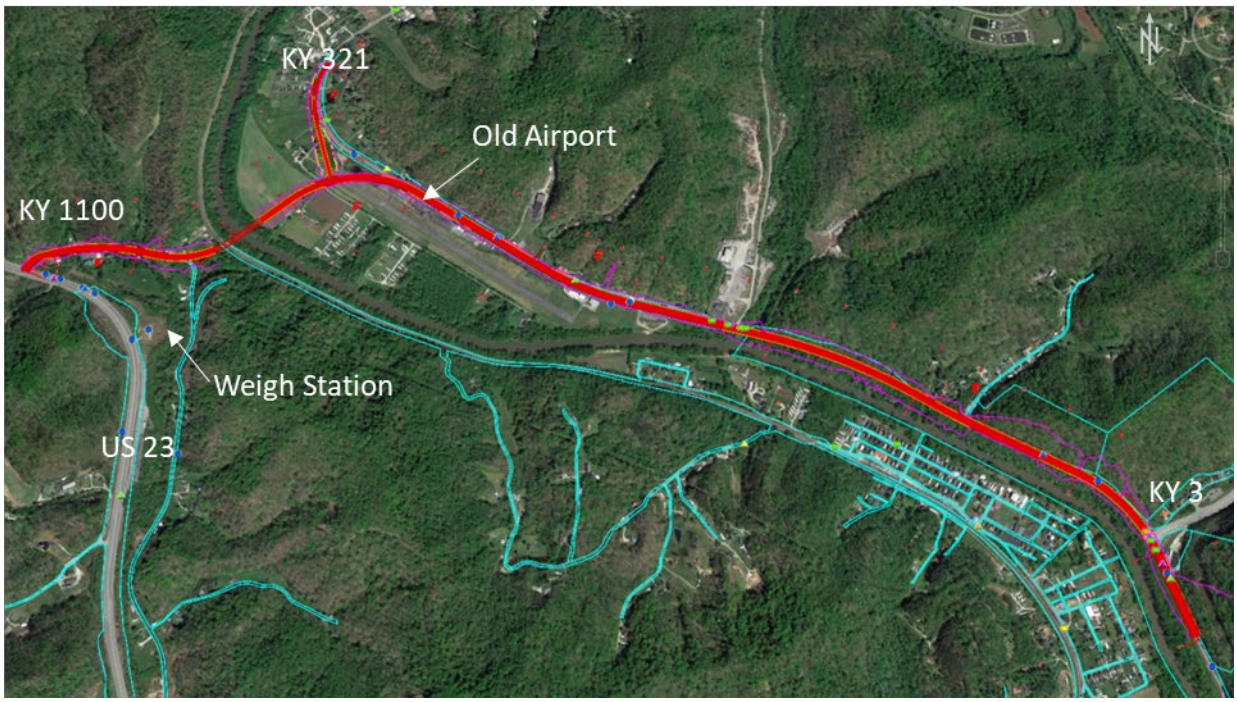
Floyd and Johnson Counties		D
IMPROVEMENT DESCRIPTION: Construct a 5-lane roadway following KY 321 from the four-lane KY 3 intersection to west of the former airport, bridging over Levisa Fork and CSX rail line to meet US 23 using KY 1100, north of the weigh station.	Phase Estimate	(2022 $'s)
	Design	$4.8M
	Right-of-Way	$6.2M
	Utilities	$4.0M
	Construction	$47.8M
	Total Cost	**$62.8M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	KY 321 carries 4,200–5,100 vpd with 4.1–6.6% Trucks; operates at LOS A–B in both peak hours; v/c is 0.13-0.21
2045 No-Build Traffic:	At 1% annual growth, 5,200–7,000 vpd; operates at LOS B–C in both peak hours; v/c is 0.17-0.26
Safety:	15 crashes occurred on KY 321 in 5 years including 4 (27%) injury, and 11 (73%) PDO

CONCEPT:

Red Corridor



Corridor Concept: Purple

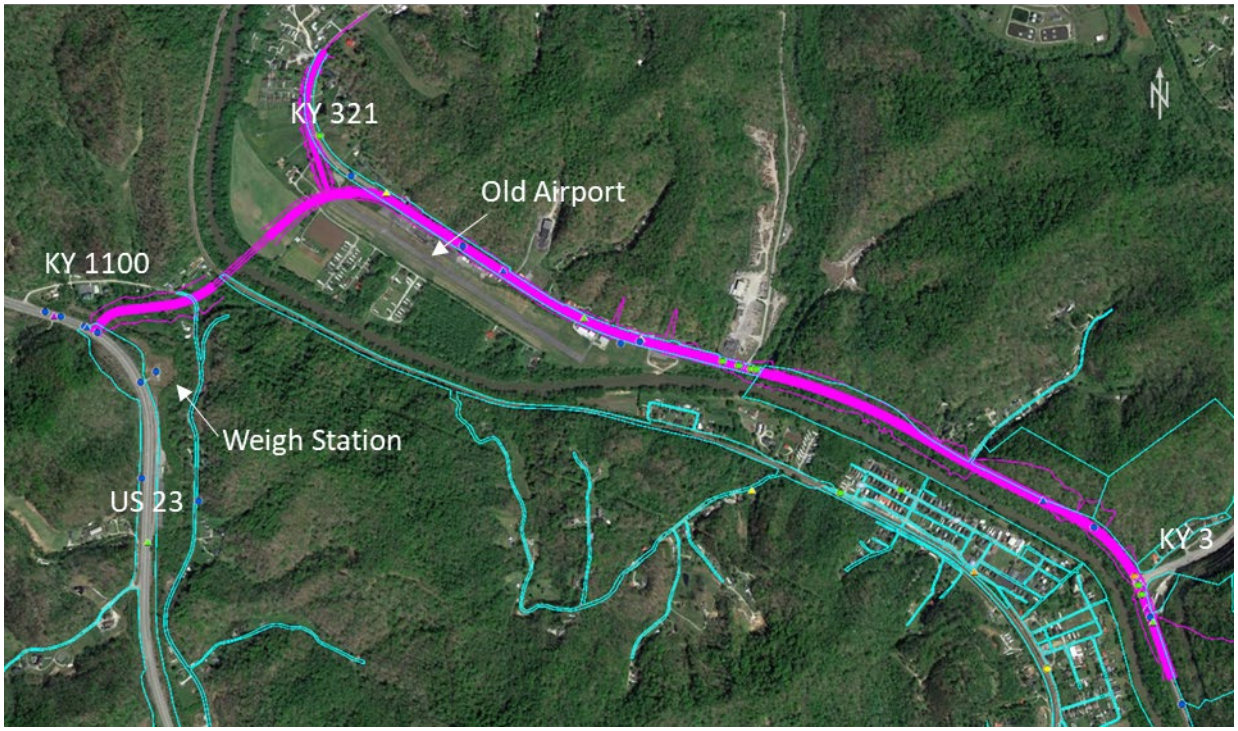
Floyd and Johnson Counties		E
IMPROVEMENT DESCRIPTION: Construct a 5-lane roadway following KY 321 from the four-lane KY 3 intersection to west of the former airport, bridging over Levisa Fork and CSX rail line to meet US 23 south of KY 1100, just north of the weigh station.	Phase Estimate	(2022 $'s)
	Design	$5.4M
	Right-of-Way	$3.9M
	Utilities	$5.4M
	Construction	$53.7M
	Total Cost	**$68.4M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	KY 321 carries 4,200–5,100 vpd with 4.1–6.6% Trucks; operates at LOS A–B in both peak hours; v/c is 0.13-0.21
2045 No-Build Traffic:	At 1% annual growth, 5,200–7,000 vpd; operates at LOS B–C in both peak hours; v/c is 0.17-0.26
Safety:	15 crashes occurred on KY 321 in 5 years including 4 (27%) injury, and 11 (73%) PDO

CONCEPT:

Purple Corridor



Corridor Concept: Yellow

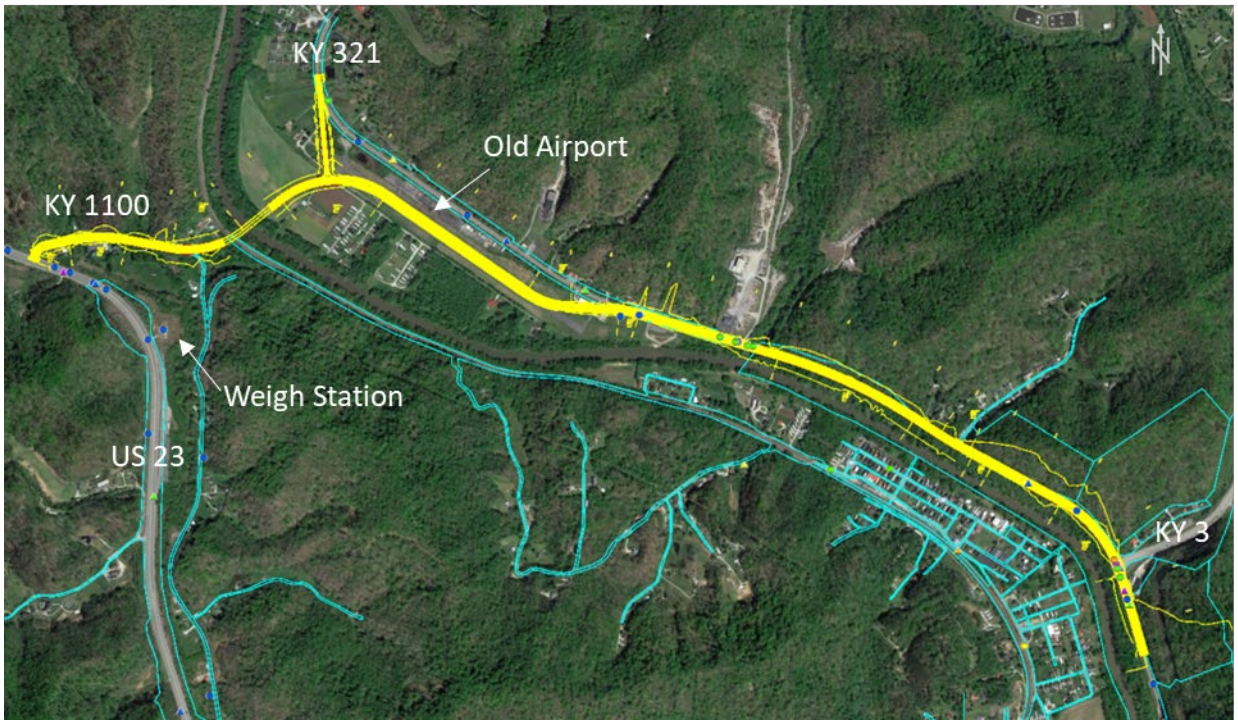
Floyd and Johnson Counties		F
IMPROVEMENT DESCRIPTION: Construct a 5-lane roadway following KY 321 from the four-lane KY 3 intersection to east of the former airport, then following the old runway before bridging over Levisa Fork and CSX rail line to meet US 23 using KY 1100, north of the weigh station.	Phase Estimate	(2022 $'s)
	Design	$4.9M
	Right-of-Way	$3.7M
	Utilities	$4.2M
	Construction	$48.4M
	Total Cost	**$61.2M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	KY 321 carries 4,200–5,100 vpd with 4.1–6.6% Trucks; operates at LOS A–B in both peak hours; v/c is 0.13-0.21
2045 No-Build Traffic:	At 1% annual growth, 5,200–7,000 vpd; operates at LOS B–C in both peak hours; v/c is 0.17-0.26
Safety:	15 crashes occurred on KY 321 in 5 years including 4 (27%) injury, and 11 (73%) PDO

CONCEPT:

Yellow Corridor



Corridor Concept: Central

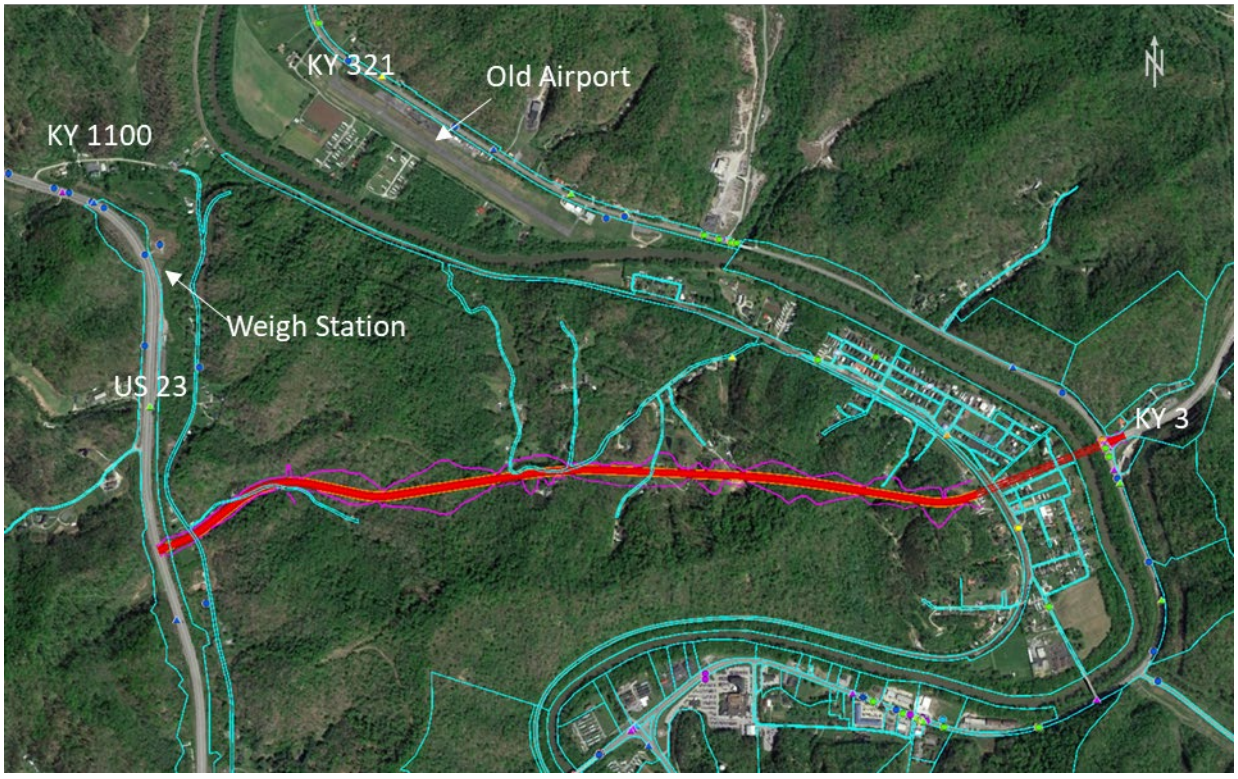
Floyd County		G
IMPROVEMENT DESCRIPTION: Construct an east-west 5-lane roadway between US 23 and four-lane KY 3, constructing a 1,500-foot-long bridge over Levisa Fork, Auxier, and CSX rail line.	Phase Estimate	(2022 $'s)
	Design	$8.4M
	Right-of-Way	$7.0M
	Utilities	$4.0M
	Construction	$84.0
	Total Cost	**$103.4M**

TRAFFIC OPERATIONS AND IDENTIFIED NEEDS:

2022 Existing Traffic:	3,800–9,200 AADT with 8.9% Trucks; operates at LOS B-D in AM, and LOS A-D in PM peak hours; v/c is 0.19-0.47
2045 No-Build Traffic:	At 1% annual growth, 5,200—11,100 AADT; operates at LOS B-E in AM, and LOS C-D in PM peak hours; v/c is 0.24-0.51
Safety:	45 crashes occurred on KY 3 in 5 years including 3 (7%) fatal, 16 (36%) injury, and 26 (58%) PDO; crash types include 31% rear end collisions; 31% single vehicle, and 22% angle crashes

CONCEPT:

Central Corridor



9.0 NEXT STEPS

One representative bridge connector and one representative five-lane corridor should be added to KYTC's CHAF database to be considered alongside other projects in the next SHIFT prioritization cycle. Once funding is identified, the next phase in the project development process is Phase I Design (Preliminary Engineering and Environmental Analysis), likely including environmental analyses to be eligible for federal funding. Likewise, KYTC's STIP should be amended to reflect any future project development phases.

Further funding will be necessary to advance any improvement concept to the design phase. Coordination with local officials, key stakeholders, and the public will be critical considering the potential for impacts to nearby community resources.

10.0 ADDITIONAL INFORMATION

Written requests for additional information should be sent to:

KYTC Division of Planning
ATTN: Director
200 Mero Street
Frankfort, KY 40622
Phone: 502.564.7183