TEAM KENTUCKY®
TRANSPORTATION CABINET

KENTUCKY TRANSPORTATION CABINET

STATEWIDE PLANNING
KY 290 CORRIDOR STUDY

ITEM NO. 11-80202

Final Report | July 2024

WSP HDR TAYLOR SIEFKER WILLIAMS design group

(This page intentionally left blank)

Executive Summary

The objective of the KY 290 Corridor Study is to identify potential concepts to improve safety along the KY 290 corridor, as well as evaluate existing and new connecting routes from KY 290 to KY 30 in Jackson County. The study includes short- and long-term improvement strategies that the Kentucky Transportation Cabinet (KYTC) may use for further project development and implementation. The study area is shown in **Figure ES-1**. It extends from to KY 3630 in Annville to US 421 in McKee, mile point (MP) 0.000 to MP 8.850, along KY 290, and also includes a larger area surrounding KY 290 south to KY 30. Additional corridors in the study area include:

- KY 30 from Ward Road (MP 3.195) to KY 3444 (MP 5.447)
- KY 578 from KY 30 (MP 4.723) to KY 3630 (MP 5.697)
- KY 3444 from KY 3630 (MP 0.000) to KY 30 (MP 0.514)
- KY 3630 from KY 290 (MP 7.664) to KY 3444 (MP 8.675)

There is one project in the study area in the KYTC Continuous Highway Analysis Framework (CHAF) database:

- IP20150101: KY 578 from MP 7.000-7.202 – Address intersection approach grade of KY 578 onto KY 290

Existing Conditions

An inventory of roadway characteristics was completed to identify factors that may be contributing to safety or operational issues along KY 290. Additionally, segments of KY 578, KY 3630, and KY 3444 were evaluated to determine their suitability as an alternative to providing a connection to KY 30.

KY 290 is classified as a two-lane undivided highway and a rural major collector throughout the study area. It has a 55 mile per hour (mph) speed limit for most of the study area, dropping to 35 mph approaching US 421 in McKee. Lane widths vary between nine and 10 feet throughout the study area, and shoulder widths are one-foot wide through most of the corridor, with four-foot curbed shoulders near McKee.

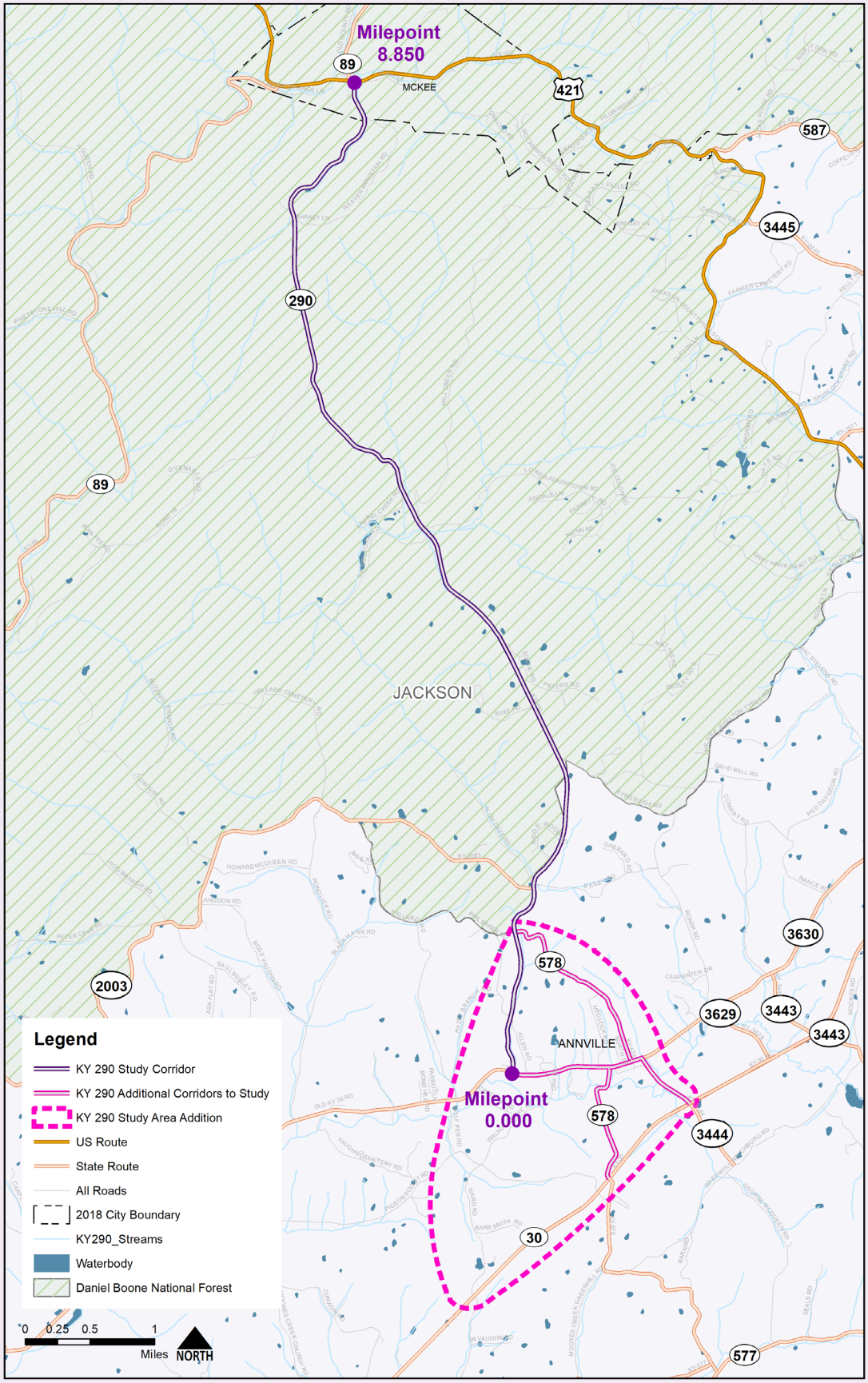
KY 290 has 41 horizontal curves in the study area. Of these, 27 do not meet the design criteria for horizontal curves for the design speed and there are 28 superelevation transition overlaps. There are 74 total vertical curves, 36 of which do not meet the minimum stopping sight distance or headlight sight distance. Four sections along the study area have a vertical grade over 10%; the maximum grade for a 55 mph rural collector in mountainous terrain is 9%.

Traffic Volumes & Operations

KY 290 is a low-volume corridor and no traffic operational issues have been identified within the study area. Most recent year Average Annual Daily Traffic (AADT) volumes range from 2,000 to 2,300, and traffic growth is not expected in the study area over the next 20 years.

Speeds for the study area were generally at or above the posted speed limit of 55 mph. From MP 0.000 to 7.750, the 85th-percentile speeds were typically between 50 and 60 mph. From MP 7.750 to 8.850, the 85th-percentile speeds ranged between 35 and 50 mph, gradually decreasing towards McKee and the end of the study area.

Figure ES-1: KY 290 Study Area



Safety

A historical crash analysis was performed to examine traffic safety trends and identify potential safety issues on KY 290 within the study area. The crash information was derived from data obtained from the Kentucky State Police (KSP) database. Five years of data (2018 to 2022) were used in the analysis. Within the five-year analysis period, there were 83 total crashes reported on KY 290 in the study area, two of which were fatal crashes and one serious injury crash (3.6% combined).

Most crashes (54, 65.1%) were property damage-only crashes, and 59 (71.1%) were single vehicle crashes. This is consistent with the low volume rural nature of the study area. Sideswipe-Opposite Direction crashes and angle crashes were the other two major crash categories. Angle crashes had the highest average severity of all the categories with three of the six involving a fatality or injury (one fatal, one severe injury, and one possible injury). It was also noted that commercial vehicles were involved in six crashes (7.2%).

The location and density of crashes within the study area is shown in **Figure ES-2**. Crash density was generally highest in locations of horizontal / vertical curvature deficiencies or at intersections. Two of the three fatal and serious injury crashes occurred in areas with geometric deficiencies or at driveways that have limited sight distance.

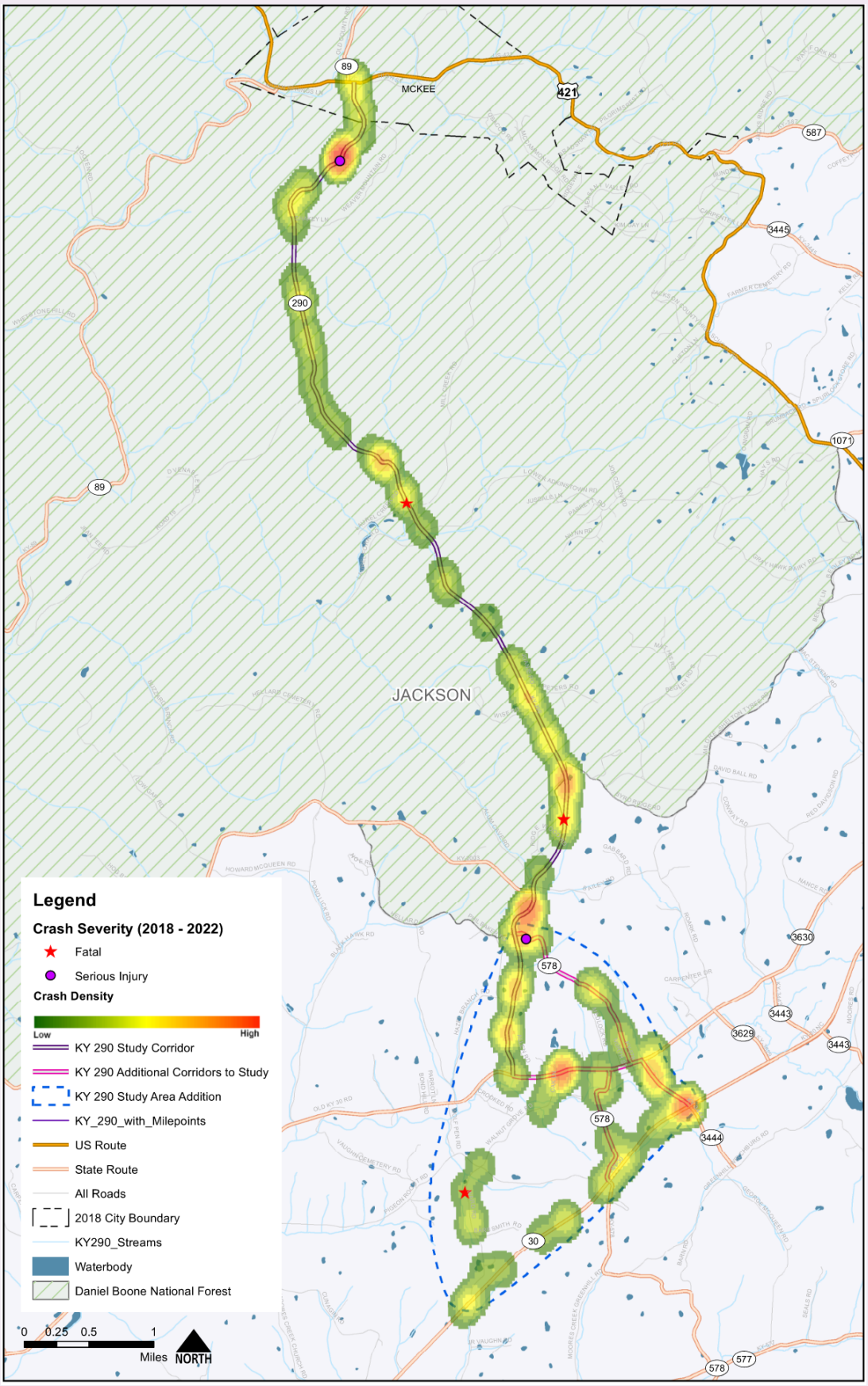
KY 290 experiences a mixture of positive and negative Excess Expected Crashes (EEC) values. Overall, intersections in the study area experience a cumulative negative EEC value of -7.93, indicating fewer than expected crashes, however many individual intersections in the study have a positive EEC. Positive EEC values (higher than expected crashes) are located in areas of geometric deficiencies, with a positive cumulative EEC value of 3.29 for segments. A comparison of crash rates within the study area shows that KY 290 experiences comparable crash rates as other rural two-lane roadways in the state. The review of historic crashes has shown that relationships exist between high crash segments / intersections and locations with geometric deficiencies and potentially limited sight distance. The review of speed data has yielded a relationship between locations where drivers are traveling in excess of the advisory speeds and an increase in crashes.

Development and Evaluation of Potential Improvement Concepts

Using the existing conditions, safety analysis, input from Local Elected Officials and Stakeholders (LO/S), and a public survey, an initial list of potential improvement concepts was developed. A high-level analysis of each concept was performed to refine the list of improvements for a detailed evaluation which included Design, Right-of-Way, Utility, and Construction cost estimates in 2023 dollars, an escalated cost in 2033 dollars for longer-term projects, a benefit-cost ratio based on predicted safety benefit, the 20-year total crash reduction and crash savings benefit, and environmental impacts. A planning-level benefit-cost analysis was conducted to determine the value each improvement concept provided.

In addition to evaluating improvement concepts along KY 290, a detailed evaluation was performed to compare the cost and benefits of improving the existing route from KY 290 to KY 30 via KY 3630 and KY 3444, to constructing a new corridor. Each of the options were evaluated based on estimated costs, right-of-way impacts, environmental impacts, and estimated travel times. The safety benefit of improving the existing route was also evaluated. The improvement concepts along KY 290 were categorized into short-term and long-term improvements, and these along with the new alignments and improvements to KY 3630 and KY 3444 were shared with the LO/S.

Figure ES-2: KY 290 Crash Density Map (2018-2022)



Study Recommendations

Using the feedback from the LO/S along with the detailed evaluation of the potential improvement concepts, the Project Team prioritized the short-term and long-term potential improvement concepts along KY 290. The Project Team agreed that the full-corridor projects would be cost prohibitive, and that moving the spot improvements forward would provide the greatest benefit to the corridor. Project sheets were created for each improvement concept that was recommended for future project development. Project sheets provide information on the issue identified, the improvement concept, the safety benefits and a cost estimate that includes Design, Right-of-Way, Utilities and Construction (DRUC) costs. The potential for safety improvement as well as LO/S feedback were used to prioritize the short- and long-term improvement concepts as low, medium, or high. **Table ES-1** and **ES-2** show the prioritized list of short-term and long-term recommended improvements along KY 290. **Figure ES-3** shows the location of the potential improvement concepts.

A new route between KY 290 and KY 30 was supported by stakeholders, however the cost of constructing a new route is dramatically higher than improving the existing routes. Therefore, the Project Team recommends evaluating both a new alignment, and improving KY 3630 and KY 3444 in the future Phase I Design, allowing for more detailed evaluation and design to make the final decision. **Table ES-3** shows the detailed evaluation of the preferred new alignment and the improvements to KY 3630 and KY 3444.

Table ES-1: KY 290 Short-Term Potential Improvement Concepts

Priority	ID	MP	Description	2023 Cost ($) Total	B/C
High	ST-9	5.2-5.55	Add High Friction Surface Treatment to Existing Curves	$978,000	1.04
High	ST-10	4.711-4.757	Shave back hillside and cut vegetation @ Mill Creek and Lower Adkinstown / Intersection warning signage @ Mill Creek and Lower Adkinstown / Add end treatments to bridge	$397,000	0.45
High	ST-13	0.0-0.2	Transverse rumbles thermo restriping, HFST, solar powered warning signage approaching KY 3630	$80,300	0.00
Medium	ST-1	8.85	Convert the US 421 intersection to a mini roundabout	$735,000	0.90
Medium	ST-2	8.85	Add Crosswalks at the US 421 intersection, including ramps, curbing, and pedestrian signals at the crossing location	$19,910	0.00
Medium	ST-5	8.545-8.6	Curb and gutter at the park (on east side) / shave hill back on west side / connect side walk up to Fire Station, vehicular traversable sidewalk across fire department entrances	$636,000	0.00
Medium	ST-6	8.4	Transverse rumble strips approaching McKee / congested area advisory speed to 25 mph	$8,250	6.10
Medium	ST-7	~6.3	Improve pull-off for school bus	$31,900	0.00
Low	ST-3	8.83-8.85	Just south of US 421, add sidewalk between parking and KY 290 (see example from Frankfort).	$9,020	0.00
Low	ST-4	8.726	Bump out at Old School Road to tighten up intersection / thermo striping	$42,100	0.00
Low	ST-8	6.255	Realign Indian Ridge Road intersection / add signage	$308,000	0.00
Low	ST-11	2.6	Mildred Road intersection (remove access point)	$8,200	0.00
Low	ST-12	1.941	Ridgewood Drive - improve sight distance (S)	$29,600	0.00

Table ES-2: KY 290 Long-Term Potential Improvement Concepts

Priority	ID	MP	Description	2023 Cost ($) Total	B/C
High	LT-1B	8.0-8.4	Widen road and straighten out/level road - 45 mph design speed	$1,900,000	10.57
High	LT-2B	7.5-7.85	Widen road and straighten out/level road - 45 mph design speed	$2,780,000	0.25
High	LT-4B	4.71-6.22	Realign curves in high crash cluster area / curve widening, high friction surface treatment - 45 mph design speed	$4,920,000	0.23
Medium	LT-5	2.6-3.589	TWLTL through the section / curb and gutter	$7,420,000	0.19
Medium	LT-6C	1.1-1.7	Realign KY 290 @ Bailey / T-intersection at KY 2003 separate from Bailey / realign KY 290 @ KY 578	$9,130,000	0.23
Low	LT-3	6.35-7.0	Add passing lanes	$3,610,000	0.15

Figure ES-3: **Potential Improvement Concept Locations**

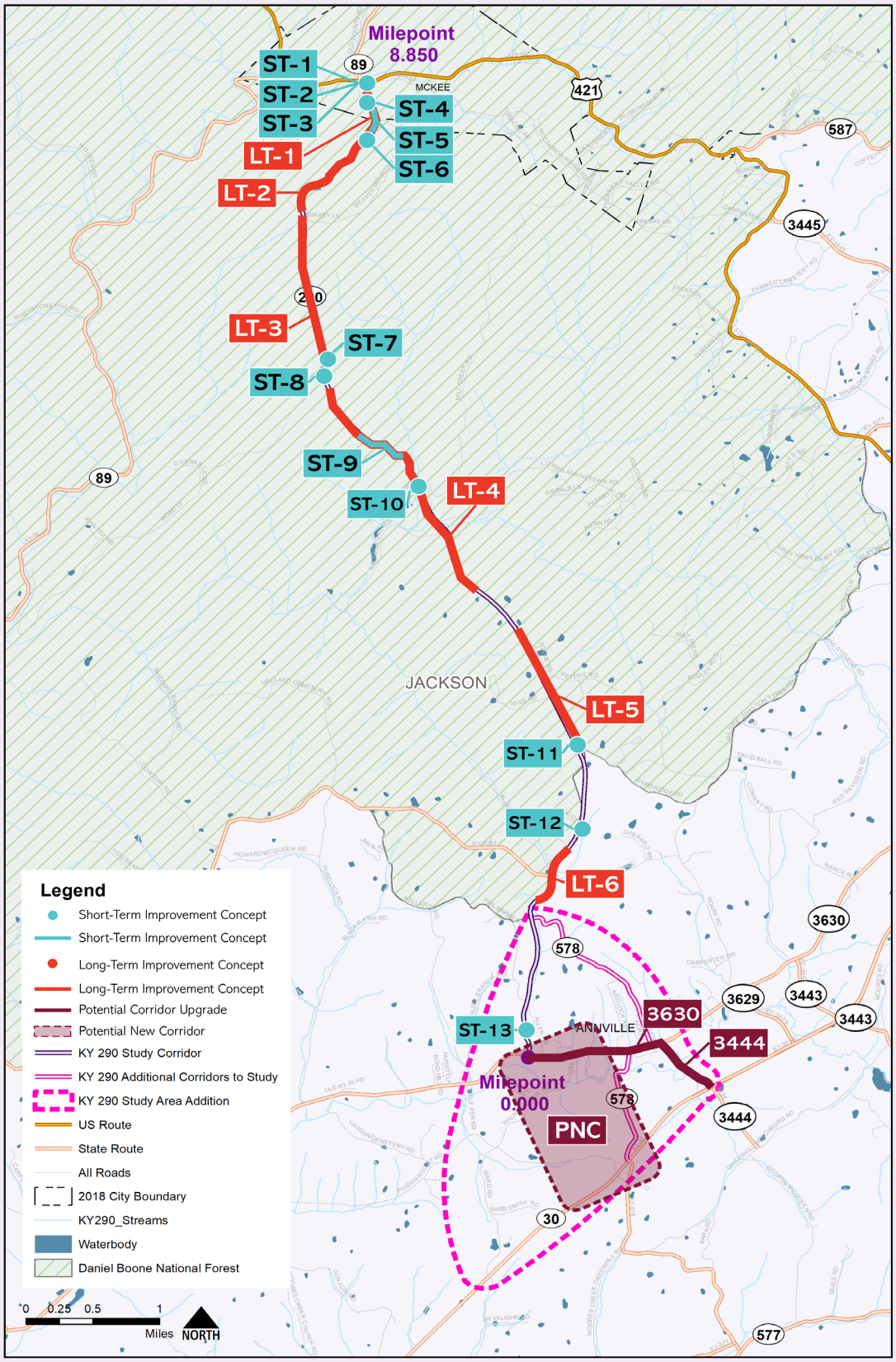


Table ES-3: Comparison of Improving Existing Route to New Connection between KY 290 and KY 30

Route	Description	2033 Cost ($)	2023 Cost ($)	2023 Cost ($) Design	2023 Cost ($) ROW	2023 Cost ($) Utilities	2023 Cost ($) Construction	ROW req'd (acres)	Property Takes	Safety Benefit	B/C
KY 3630	Add TWLTL / Access control	$8,880,000	$6,680,000	$440,000	$640,000	$1,200,000	$4,400,000	8		1 Sideswipe Same Direction - PDO 2 Sideswipe Opposite Direction - 1 B, 1 PDO 1 Opposing Left Turn - PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2	0.03
KY 3444	Improve to match KY 290 typical	$2,630,000	$2,030,000	$110,000	$320,000	$500,000	$1,100,000	8		5 Angle (4 at KY 30 intersection) - 1 B, 4 PDO 1 Sideswipe Opposite Direction - 1 PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2	0.01
KY 290	Roundabout @ KY 290 / KY 3630	$1,770,000	$1,270,000	$90,000	$80,000	$200,000	$900,000	2		2 Single Vehicle - 2 PDO KY 3630 approaches 1 Backing/Parking Lot PDO	0.02
New Corridor	Option 2	$18,300,000	$13,200,000	$1,100,000	$1,200,000	$700,000	$10,200,000	30	1		

(This page intentionally left blank)

Table of Contents

Figures

Tables

(This page intentionally left blank)

1 Introduction

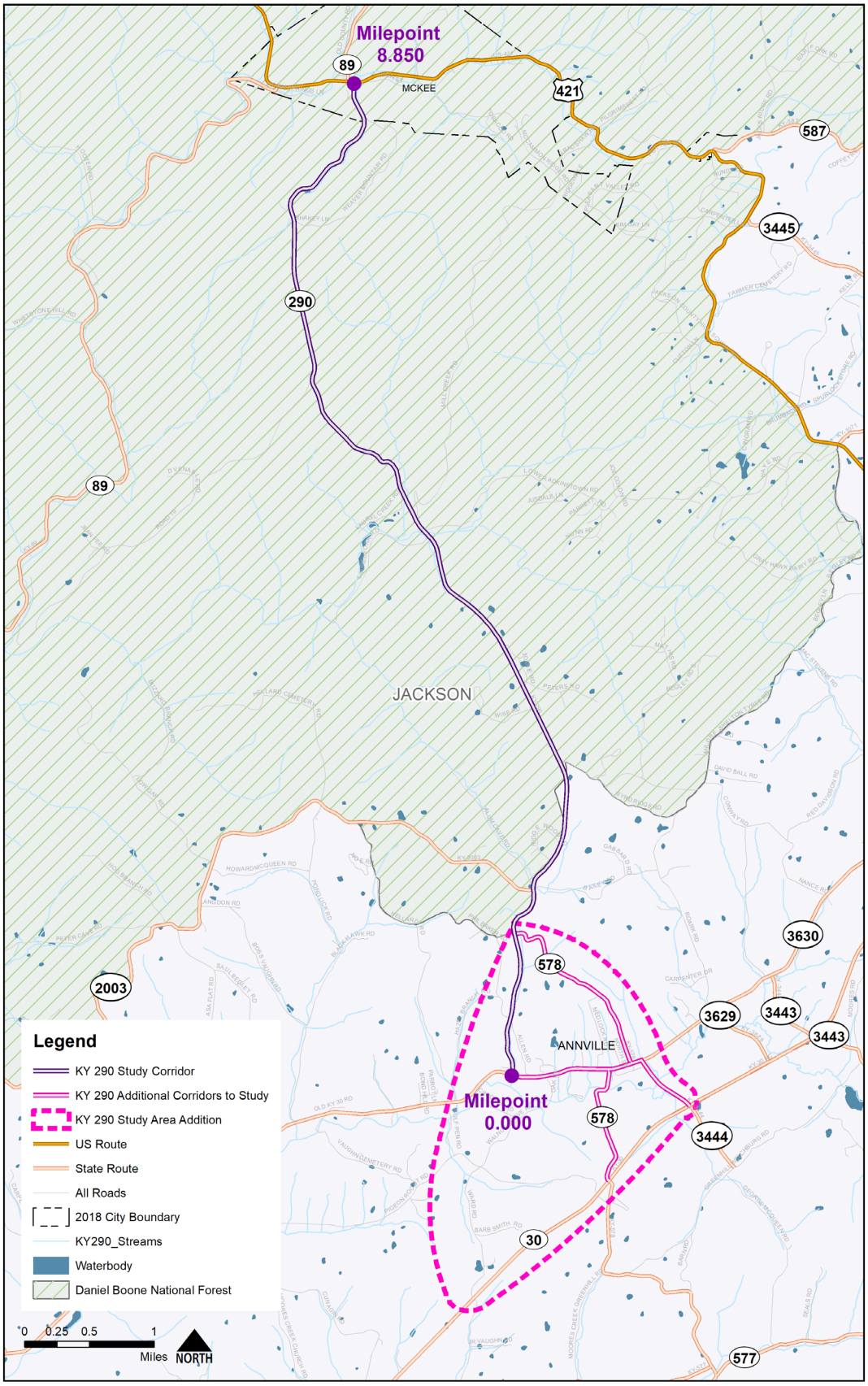
The KY 290 corridor between and KY 3630 and US 421 in Jackson County, Kentucky, was identified in the Kentucky 2022-2028 Enacted Highway Plan as a corridor for addressing safety and evaluating potential improvements along the corridor, as well as evaluating the connecting routes from KY 290 to KY 30, including a new corridor. The study includes short- and long-term improvement strategies that KYTC may use for further project development and implementation. Members of the Project Team included KYTC District 11, KYTC Central Office Division of Planning, and the Consultant Team.

1.1 Study Area

The KY 290 study area is shown in **Figure 1**. The study area extends from KY 3630 in Annville to US 421 in McKee, mile point (MP) 0.000 to MP 8.850, along KY 290, and also includes a larger area surrounding KY 290 down to KY 30. Additional corridors in the study area include:

- KY 30 from Ward Road (MP 3.195) to KY 3444 (MP 5.447)
- KY 578 from KY 30 (MP 4.723) to KY 3630 (MP 5.697)
- KY 3444 from KY 3630 (MP 0.000) to KY 30 (MP 0.514)
- KY 3630 from KY 290 (MP 7.664) to KY 3444 (MP 8.675)

Figure 1: KY 290 Study Area



1.2 Committed & Proposed Projects

There is one project in the study area in the KYTC Continuous Highway Analysis Framework (CHAF) database:

- IP20150101: KY 578 from MP 7.000-7.202 – Address intersection approach grade of KY 578 onto KY 290

1.3 Study Objective

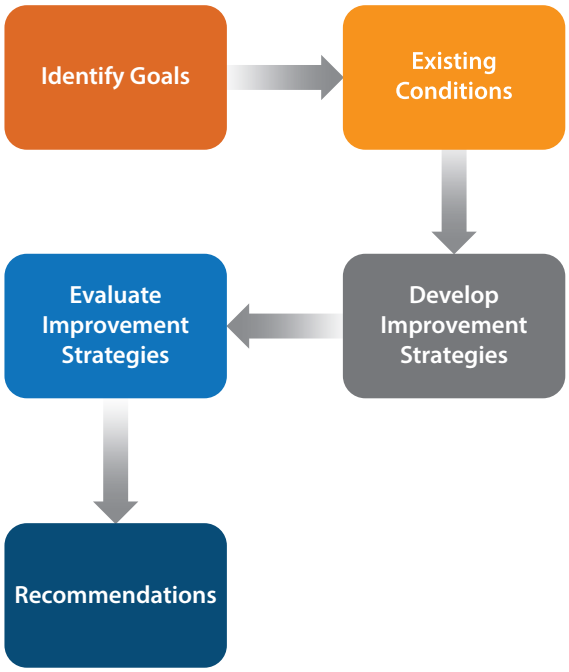
The objective of the KY 290 Corridor Study is to identify and evaluate potential improvement concepts to address safety on KY 290 and examine a potential new connection from KY 290 to KY 30.

1.4 Study Process

The study process consists of five major elements (**Figure 2**):

1. Identify the goals of the study
2. Examine the existing conditions and identify areas with safety concerns
3. Develop potential improvement strategies
4. Evaluate the improvement strategies based on the study goals
5. Provide a list of short-term and long-term improvement recommendations

Figure 2: Study Process



The subsequent chapters of this report detail these steps, with additional information provided in the appendices as referenced.

1.5 Study Goals

The Project Team identified goals for the study based on the transportation challenges in the area. The goals of the study are to:

- Improve safety for all users along KY 290.
- Provide a reliable route from McKee to Annville.
- Evaluate the feasibility and cost of a new cross-country connection from KY 290 to KY 30.
- Engage the public and stakeholders throughout the study and incorporate feedback into the recommendations.

(This page intentionally left blank)

2 Existing Conditions

To evaluate the existing conditions along KY 290, a detailed inventory of the existing physical and geometric design characteristics was completed using the following sources:

- KYTC Highway Information System (HIS) data
- KYTC record plans and bridge inspection reports
- Google Earth aerial imagery and Street View
- KYTC Photolog Viewer
- Field review

This chapter summarizes the existing conditions analysis.

2.1 Roadway geometrics

An inventory of roadway characteristics was completed to identify factors contributing to safety issues along KY 290. Additionally, the existing roadway characteristics for the segments of KY 578, KY 3630, KY 30, and KY 3444 that were part of the study area were collected.

FUNCTIONAL CLASSIFICATION, ROADWAY SYSTEM DESIGNATION, & TRUCK ROUTES

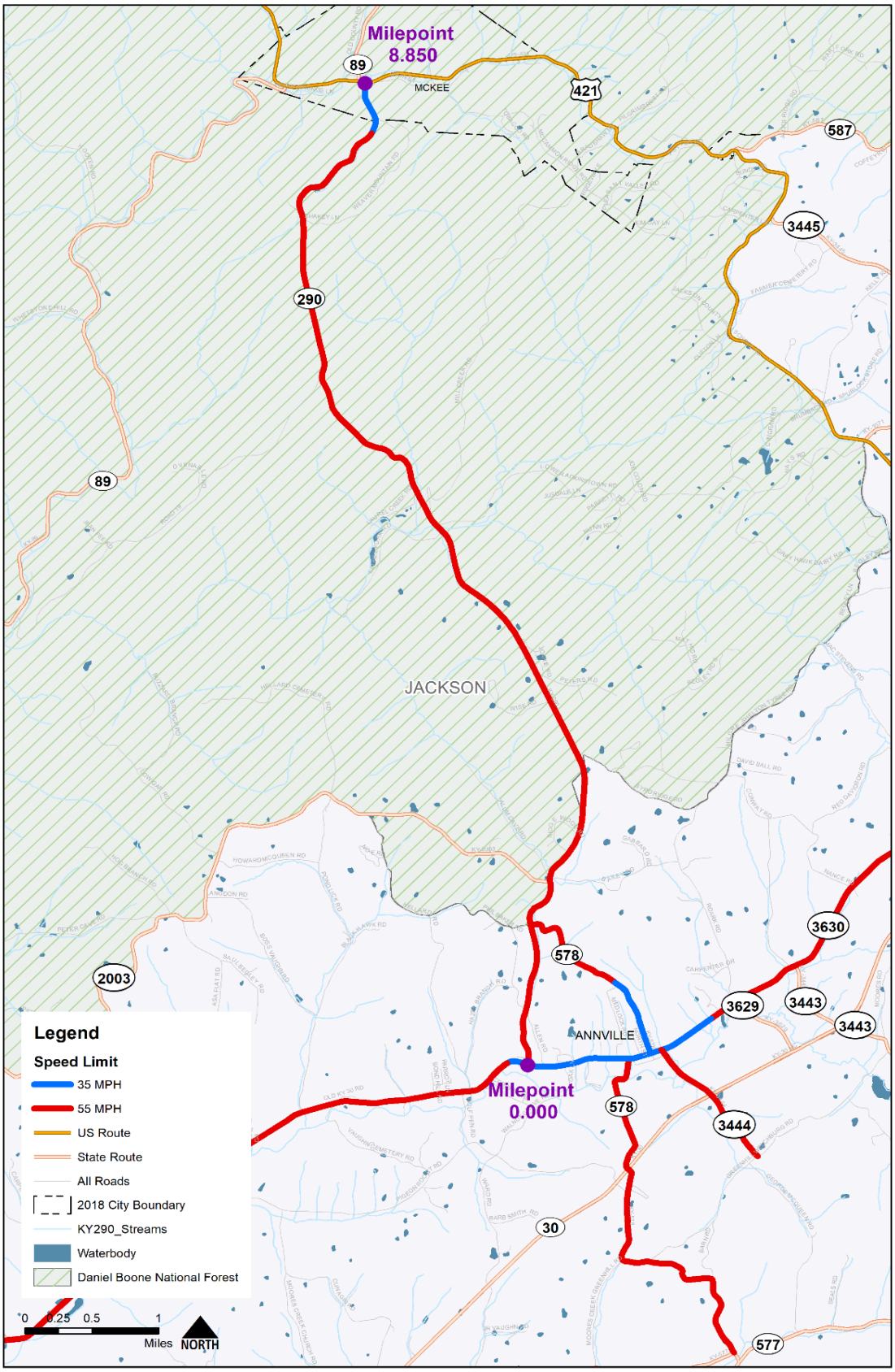
KY 290 is classified as a rural major collector throughout the study area. It is not part of the National Highway Freight Network (NHFN) or the Kentucky Highway Freight Network (KHFN). The maximum truck weight permitted along KY 290 is 44,000 pounds.

SPEED LIMIT

The speed limit along KY 290 is 55 miles per hour (mph) for most of the study area, dropping to 35 mph approaching US 421 in McKee from mile point 8.420 to 8.850. Advisory speeds are posted along the study area in several places where the roadway geometrics do not meet the 55 mph design speed, typically for sections with sharper curves, compound curves, and sight distance issues. Roadway lighting is partially present through utility lighting along KY 3630 in Annville.

Along the other study area routes, the speed limit varies. On KY 3444 and KY 578, a 55 mph speed limit is observed from MP 5.697 to 6.320. On KY 3630 and KY 578, a lower speed limit of 35 mph is enforced between MP 2.602 to 5.697 and from MP 6.32 to 7.202. Study area speed limits are shown in **Figure 3**.

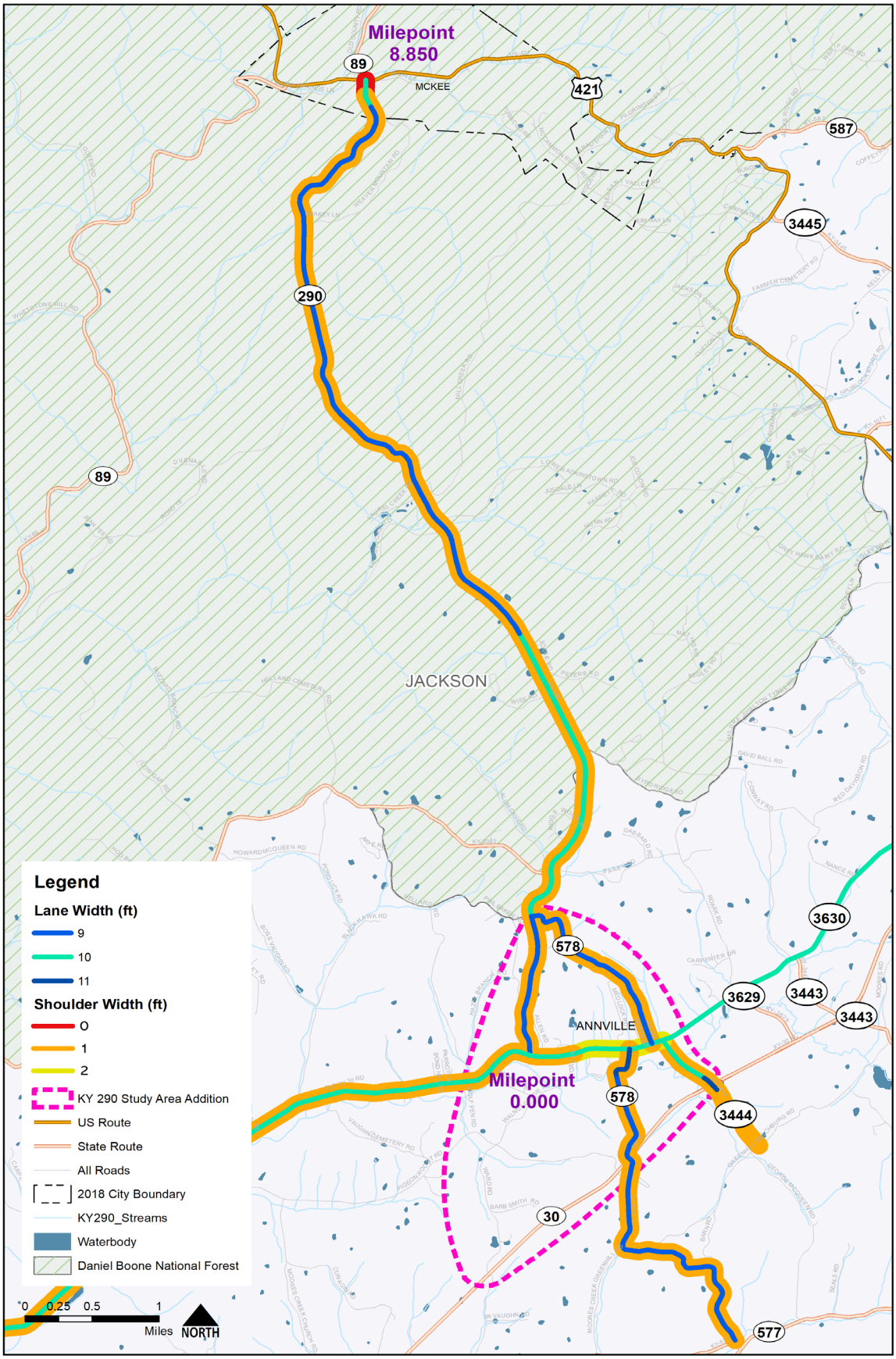
*Figure 3: **Study Area Speed Limits***



LANE, SHOULDER, & MEDIAN WIDTH

Study area lane, shoulder, and median widths are shown in **Figure 4**. Lane widths vary between nine and 10 feet throughout the KY 290 corridor. Nine-foot lanes can be found on KY 578 spanning from MP 2.602 to 5.437 and again from 5.697 to 7.202. Ten-foot lanes are on KY 3444 from MP 0.000 to 0.431. There are also 11-foot lanes on KY 578 between MP 5.437 and 5.697 and on KY 3444 from MP 0.431 to 0.563. The corridor is a two-lane undivided roadway throughout its entirety. Auxiliary lanes have been incorporated on KY 30, following a 2+1 corridor design. Based on HIS, shoulder widths are one-foot wide and are an asphalt combination (partially paved and partially unpaved) through most of the corridor, with four-foot curbed shoulders near McKee. Medians are not present in the study area.

*Figure 4: **Lane, Shoulder, and Median Width***

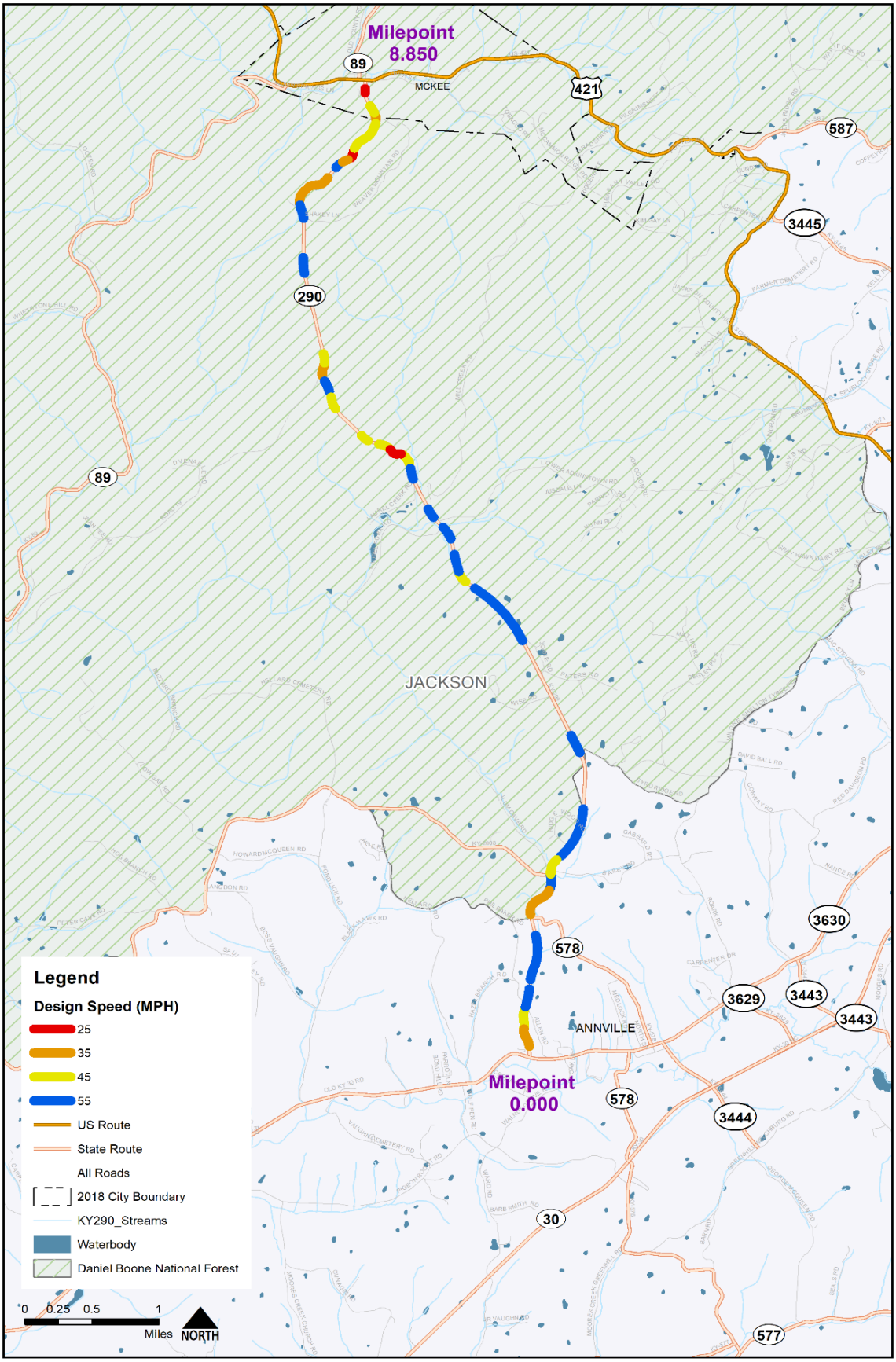


HORIZONTAL ALIGNMENT

KY 290 has 41 horizontal curves in the study area. Of these, 27 do not meet the design criteria for horizontal curves for the signed speed limit. Although the study area speed limit is primarily 55 mph, the design speed for horizontal curves ranges from 30-55 mph and an auxiliary speed sign typically accompanies each curve with a design speed of less than 55 mph. **Figure 5** shows horizontal curves by design speed.

Superelevation transition overlaps can cause issues for vehicles driving at the design speed as the vehicle in motion does not have enough time to recover before the next curve begins. There are 28 superelevation transition overlaps in the KY 290 study area. Plan and profile sheets that show the vertical and horizontal geometrics of the study area are included in **Appendix A**.

Figure 5: Design Speed of Horizontal Curves in the Study Area



VERTICAL ALIGNMENT

The American Association of State Highway and Transportation Officials (AASHTO) 2018 Green Book Tables 3-35 and 3-37 states that the stopping sight distance for crest vertical curves and the headlight sight distance for sag vertical curves is 495 feet for a design speed of 55 mph and 250 feet for a design speed of 35 mph. There are 74 total vertical curves in the KY 290 study area and 36 vertical curves that do not meet the minimum stopping sight distance or headlight sight distance.

The 2018 Green Book Table 3-4 shows the criteria for passing sight distance. For a design speed of 55 mph, the standard passing sight distance is a minimum of 900 feet. Nineteen passing zones exist in the study area and all but one exceed the minimum sight distance of 900 feet. The passing zone sight distance near KY 578 is less than 900 feet throughout the passing zone.

The maximum vertical grade for a 55 mph rural highway is 10% per the Green Book Table 5-2 for mountainous areas. Four sections along the study area have a vertical grade over 10%. **Figure 6** shows vertical curves by design speed. **Figure 7** shows the passing zones and where they do and do not meet the sight distance, as well as vertical grades over 10%. **Appendix A** shows the vertical geometrics in plan and profile sheets.

*Figure 6: **Design Speed of Vertical Curves in Study Area***

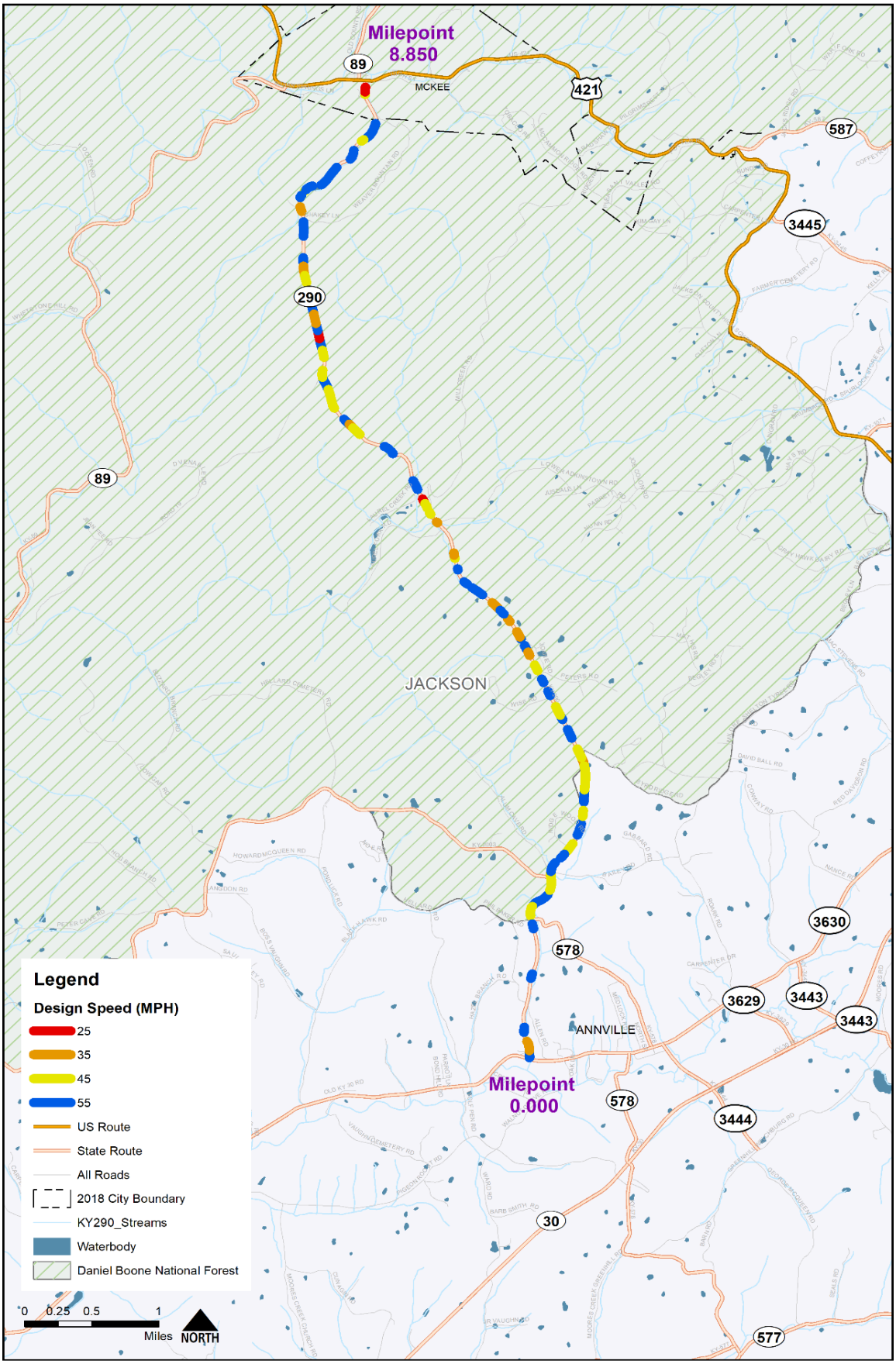
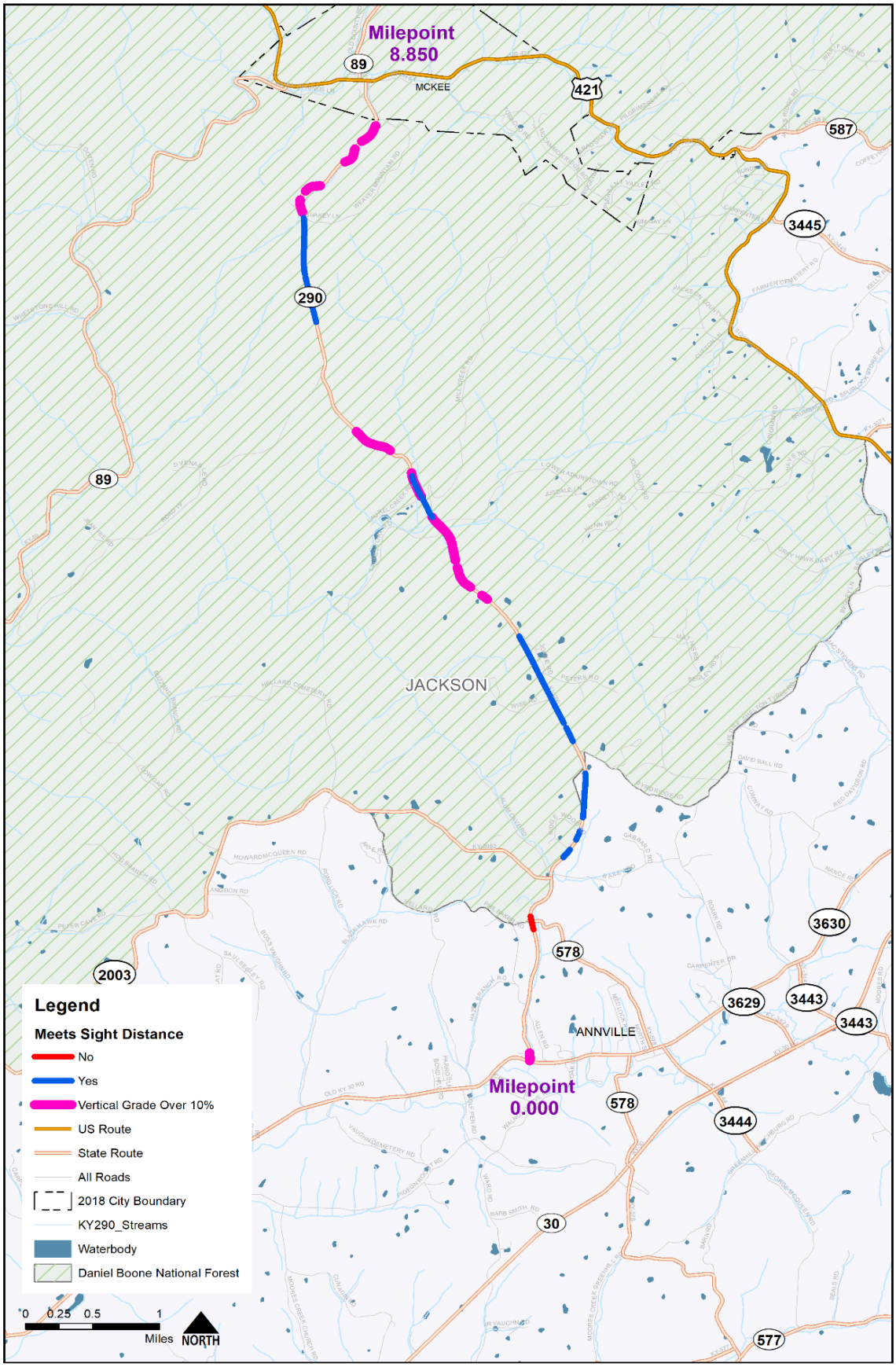


*Figure 7: **Sight Distance Adequacy of Existing Passing Zones and Vertical Grades Greater than 10% in Study Area***



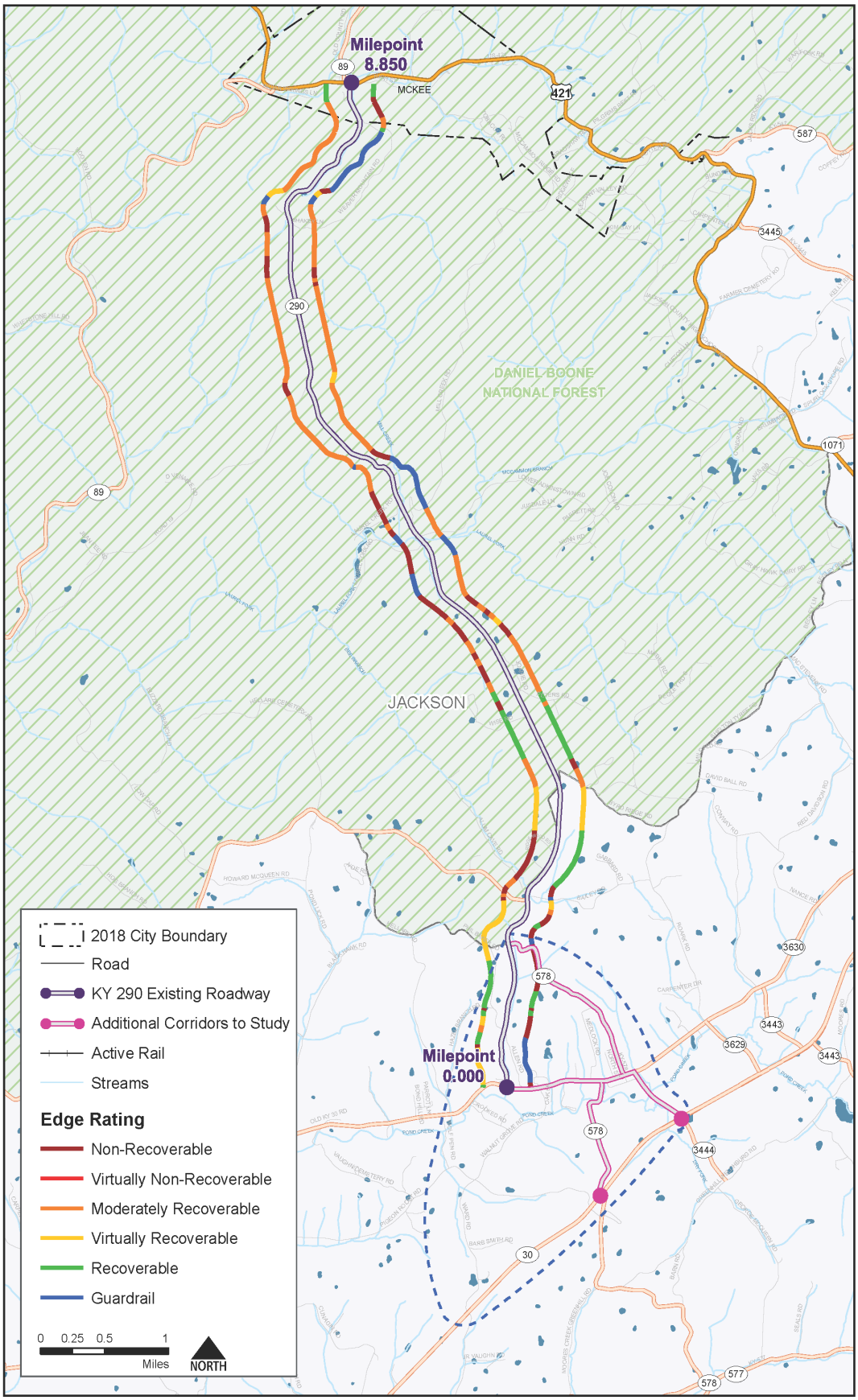
ROADSIDE CHARACTERISTICS

The roadside edge rating system was developed by the Project Team with clarity and simplicity being the priorities. The rating was performed by the Consultant Team and consists of five levels. The length and percent of the corridor with the given level was determined:

- Recoverable (2.54 miles, 14.4%)
- Virtually Recoverable (1.96 miles, 11.1%)
- Moderately Recoverable (5.78 miles, 32.7%)
- Virtually Non-Recoverable (1.24 miles, 7.0%)
- Non-Recoverable (3.97 miles, 22.5%).

Guardrail locations were also evaluated (2.18 miles, 12.4%). The evaluation was performed using GoPro footage from a field review and KYTC Photolog of the study area. A map of the ratings across the study area along with existing guardrail is shown in **Figure 8**. The 2011 Roadside Design Guide and the KYTC Highway Design Manual provide guidance on the application and situation of guardrail placement. According to the 2020 KYTC Standard Drawings and Active Sepias, any new guardrail is to be installed at a height of 31 inches at the edge of the paved shoulder. The previously accepted height for guardrail was 27 inches, and KYTC has allowed this guardrail to remain on some Resurfacing, Restoration, and Rehabilitation (3R) Projects.

*Figure 8: **Roadside Edge Ratings***



2.2 Intersections & Access Points

There are 21 intersections along KY 290, as well as 82 direct driveway access for businesses and private residences. The areas with a higher density of access include MP 0.000 to 2.000, MP 2.500 to 3.800, MP 4.500 to 5.200, and MP 7.900 to 8.850.

INTERSECTION SKEW & SIGHT DISTANCE

The 2018 Green Book Table 9-7 highlights the design criteria for intersection sight distance, which is 610 feet for a 55 mph facility and 390 feet for a 35 mph facility. Using this guidance, the intersections along the study corridor were evaluated. **Table 1** lists all the intersections along KY 290 and whether the intersection has a skew issue (intersection angle not within the 75-to-105-degree zone) and/or a sight distance issue. The intersections are listed from north to south. Eight intersections have a skew issue, and 10 intersections have a sight distance issue.

Table 1: KY 290 Study Area Intersections Skew and Sight Distance

Intersection	Milepoint	Skew Issue	Sight Distance Issue
US 421	8.850	No	No
Old School Rd	8.726	No	No
Shakey Ln North (Park)	8.545	No	Yes
Tower Rd	7.509	Yes	Yes
Shakey Ln South	7.480	No	No
Indian Ridge Rd	6.234	Yes	Yes
Mill Creek Rd	4.757	Yes	Yes
Lower Adkinstown Rd	4.711	Yes	Yes
County Road (CR)-1803	4.633	No	Yes
McCowan-Parrett Rd	3.589	No	No
CR-1252	3.216	Yes	No
Wise Rd	3.056	No	No
Mildred Rd	2.600	Yes	No
Ridgewood Dr North	1.941	Yes	No
Ridgewood Dr South	1.795	No	Yes
Bailey Rd / Alum Branch Rd	1.551	Alum Yes, Bailey No	Yes
KY 2003	1.524	No	Yes
KY 578	1.114	No	Yes
Anna Moore Rd	0.450	No	No
Allen Rd	0.442	No	No
KY 3630	0.000	No	No

2.3 Structures

Five bridges occur within the study area. Two bridges exist on KY 290, 055B00017N (MP 4.900) built in 1942, and 055B00016N (MP 4.700) built in 1955, and were rated as "Fair" in the KYTC Bridge Data Miner database. Both have nine-foot lane widths and no shoulders. The other three bridges are along other routes within the study area including: 055B00043N (MP 5.546) which is in "Good" condition along KY 578, 055B00019N (MP 0.202) which is in "Fair" condition along KY 3444, and 055C00028N (MP 0.208) which is in "Good" condition along Walnut Grove Road (CR 1304).

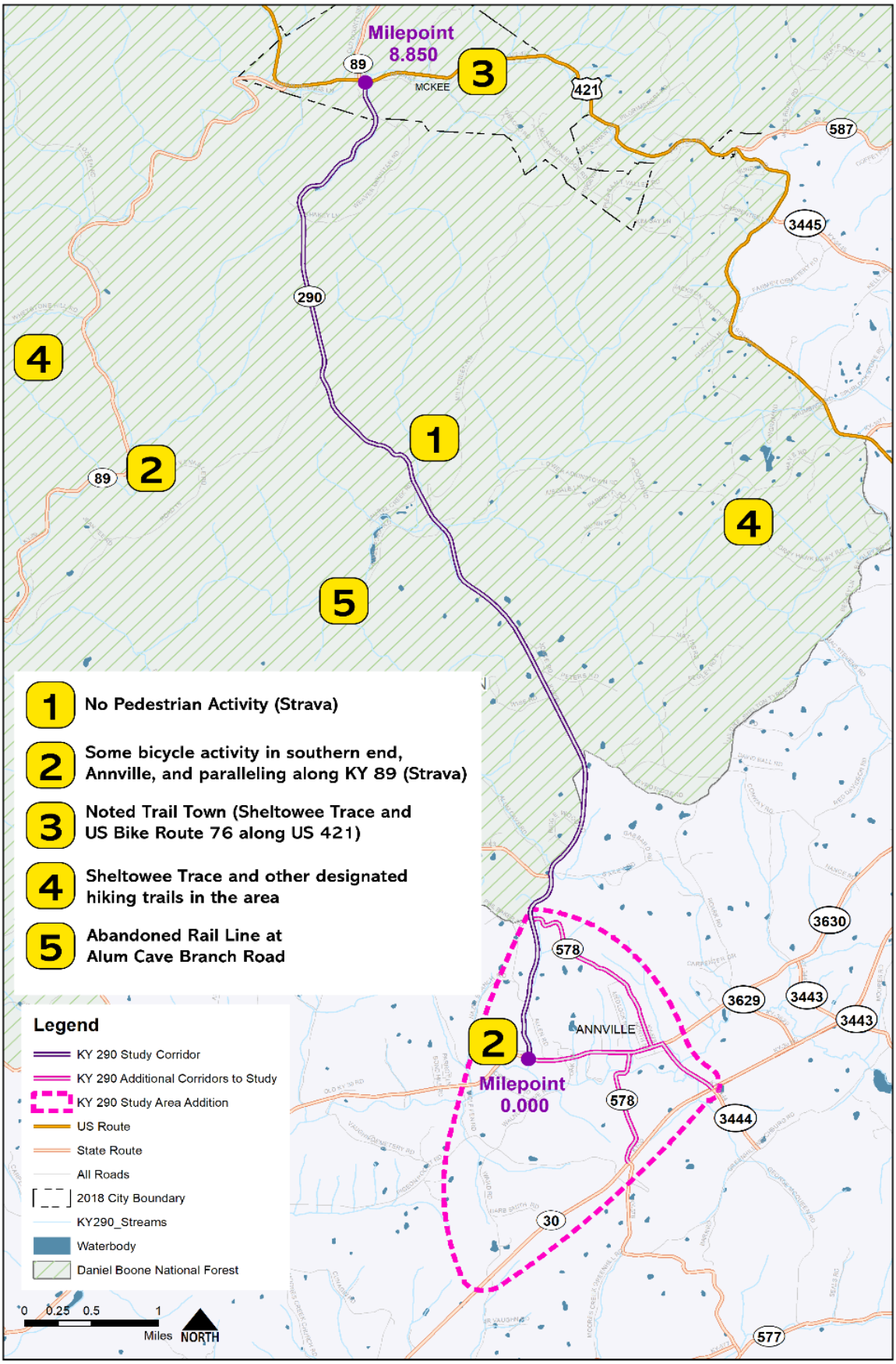
2.4 Bicycle, Pedestrian, & Amish Activity

Bicycle infrastructure does not exist within the study area. However, sidewalks exist along KY 290 from MP 8.631 to MP 8.850 near McKee, along KY 578 from MP 5.694 to MP 6.282 near Annville, and along KY 3630 from MP 8.002 to MP 8.646 in Annville. **Figure 9** shows areas of bicycle, pedestrian, and trail activity.

Additional multimodal activity in the study area noted by stakeholders includes:

- McKee is a noted trail town in Kentucky and US Bike Route 76 travels along US 421. Jackson County hosts the Red Bud ride annually in April where some cyclists use KY 290 as a practice route.
- The area between Indian Ridge Road and Lower Adkinstown Road regularly hosts mountain bikers.
- The use of horse drawn buggies by the Amish community is noted to occur along all routes within the study area.

*Figure 9: **Bicycle, Pedestrian, and Trail Activity In and Around the KY 290 Study Area***



3 Traffic Volumes & Operations

KY 290 is a low-volume corridor and no traffic operational issues have been identified within the study area. Existing study area traffic volumes were collected from KYTC's Automated Traffic Recording (ATR) count stations. Count station data were used to develop Average Annual Daily Traffic (AADT) volumes, design hourly volumes (DHV), and truck volumes and percentages for the most recent count year.

Traffic growth is not expected in the study area over the next 20 years; therefore, a detailed traffic forecast was not required. KYTC prepared a Traffic Forecast Executive Summary that highlights relevant traffic data that supports this conclusion. The Traffic Forecast Executive Summary is included in **Appendix B**.

A traffic operational analysis was conducted using the Highway Capacity Manual (HCM)[1] to determine capacity and Level of Service (LOS). Highway LOS is a qualitative measure that is used to describe the operating conditions of a roadway or intersection based on factors such as speed, travel time, maneuverability, delay and safety. It is characterized by an A to F scale with A representing the best operating conditions and F representing the worst.

The analysis was completed using the existing traffic volumes. Segments were created aligning with each KYTC traffic count station along the study area roads. A high-level capacity analysis was performed for each segment (which is associated with a count station) using the two-lane highway analysis method from the (HCM) as implemented by the HCS 2022 software. The AM and PM peak periods in each direction were analyzed to determine the LOS.

LOS thresholds for two-lane highways are based on the follower density represented by followers/mi/ln and the range of LOS values falls into two groupings depending on the posted speed limit. **Table 2** provides the LOS range for two-lane highways operating over and under 50 mph.

Associated traffic data for each count station, including the most recent count year, AADT, DHV, daily truck percentages and volumes and design hourly truck volumes, as well as LOS are presented for each of the study area segments in **Table 3** and shown in **Figure 10**. Current conditions show a LOS A on KY290, as well as the other segments in the study area, for both AM and PM peak traffic hours.

Table 2: Level of Service Ranges for Two-Lane Highways

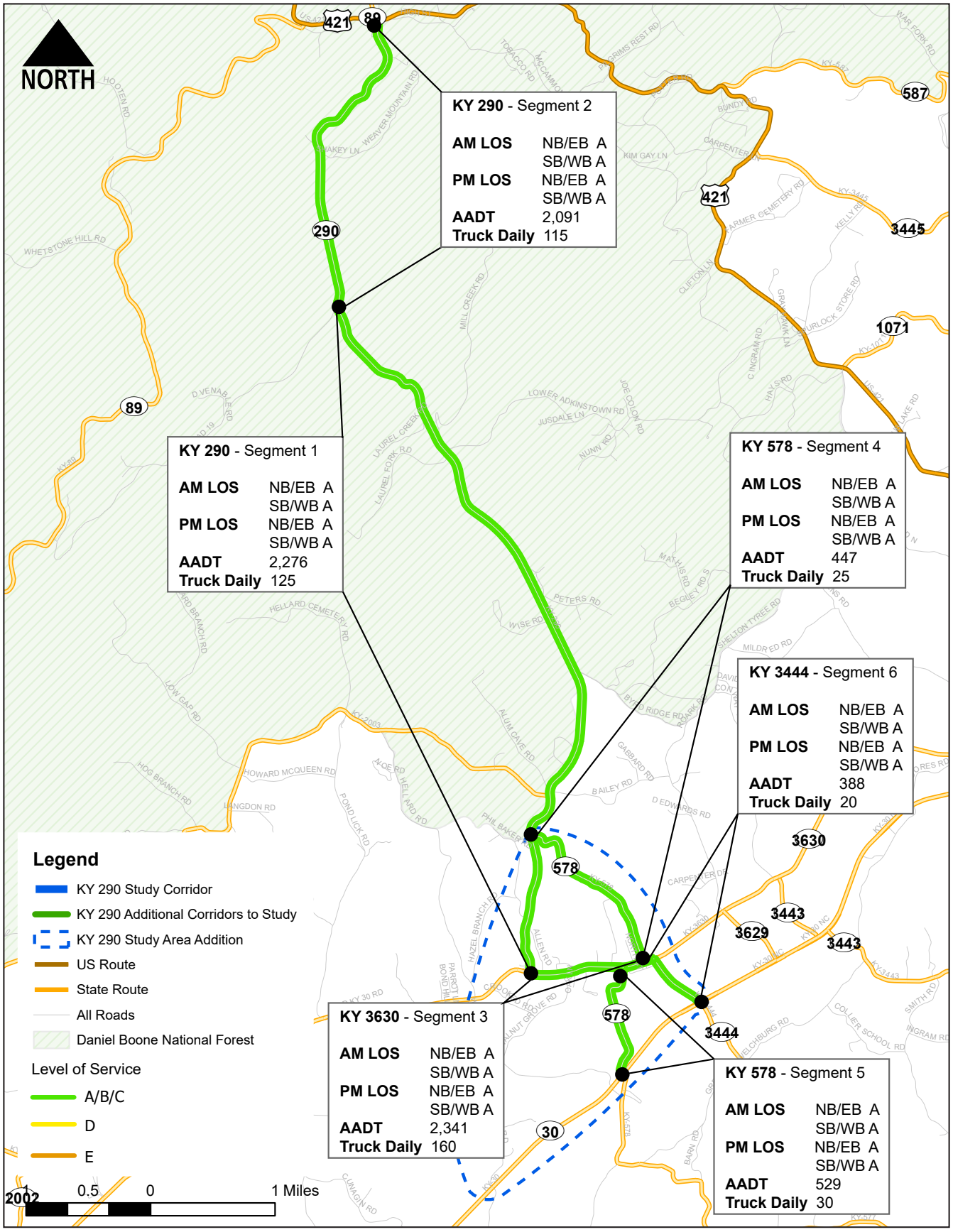
LOS	Follower Density (follower/mi/ln) for speeds < 50 mph	Follower Density (follower/mi/ln) for speeds ≥ 50 mph
A	≤ 2.5	≤ 2.0
B	>2.5 – 5.0	>2.0 – 4.0
C	>5.0 – 10.0	>4.0 – 8.0
D	>10.0 – 15.0	>8.0 – 12.0
E	> 15.0	> 12.0
F	Demand exceeds capacity	Demand exceeds capacity

1 Highway Capacity Manual, 7th Edition

Table 3: Existing Traffic Volumes and LOS

Count Station	Route	Beginning Description	Beginning Milepoint	Ending Description	Ending Milepoint	Most Recent Year Count	Most Recent Year AADT	Truck % ADT	Trucks (Daily)	AM K Factor	AM DHV	AM TDHV	NB/ EB AM LOS	SB/ WB PM LOS	PM K Factor	PM DHV	PM TDHV	NB/ EB PM LOS	SB/ WB PM LOS
055527	KY 290	KY 30	0	Venable Road	6.255	2022	2,276	5.5%	125	12.4%	283	15	A	A	10.6%	242	15	A	A
055750	KY 290	Venable Road	6.255	Ring Road (KY 3005)	8.85	2017	2,091	5.5%	115	7.2%	151	10	A	A	10.2%	213	10	A	A
055254	KY 3630	KY 290	7.664	Roark Rd	9.355	2021	2,341	6.9%	160	7.4%	174	10	A	A	11.9%	278	20	A	A
055280	KY 578	KY 3630	5.697	KY 290	7.202	2022	447	5.5%	25	9.2%	41	0	A	A	11.6%	52	5	A	A
055285	KY 578	KY 30	4.728	KY 3630	5.697	2017	529	5.5%	30	7.6%	40	0	A	A	9.1%	48	5	A	A
055284	KY 3444	KY 30	0	Greenhill-Welchburg Rd	1.11	2022	388	5.5%	20	8.8%	34	0	A	A	9.8%	38	0	A	A

Figure 10: Study Area Traffic Volumes and LOS



3.1 Origin and Destination Patterns

Origin and destination (O-D) data obtained from Streetlight was used to evaluate trip patterns in the study area. The data was used to quantify the number of daily trips originating in McKee, their destinations, and routes taken. Additionally, the number of daily trips going south on KY 30 was quantified. **Figure 11** shows the trips originating in McKee and **Figure 12** shows the trips ending at KY 30 southbound. Based on the Streetlight analysis, approximately 2,000 vehicles travel south along KY 290 every day, but most trips end in Annville. Approximately 60 vehicles per day continue to KY 30, while 1,350 vehicles travel south from McKee on US 421. Most vehicles traveling south on KY 30 come from either US 421 or Tyner (approximately 680), while approximately 260 trips come from KY 290.

Figure 11: Top Routes Originating in McKee

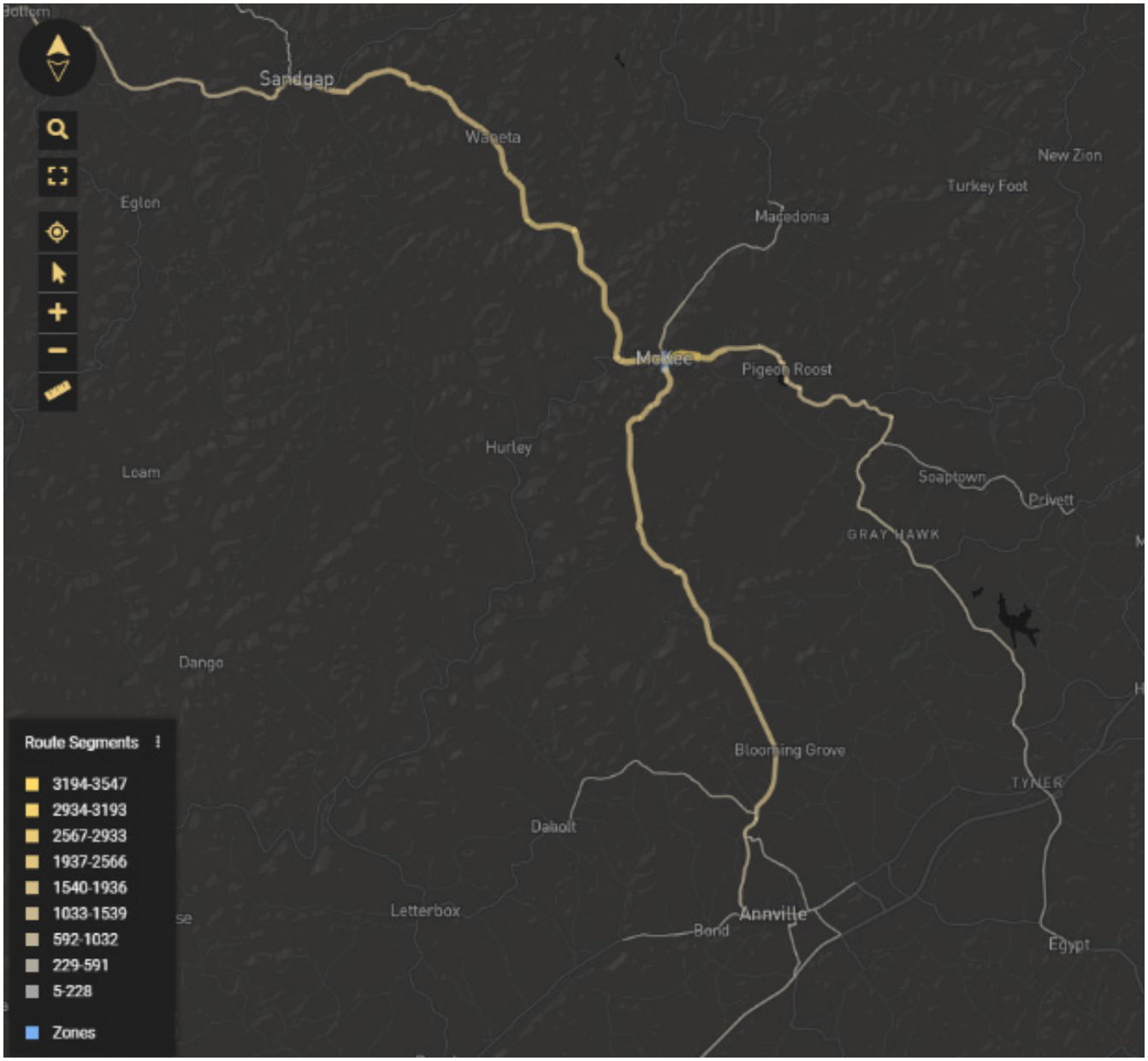


Figure 12: Top Routes to KY 30 Southbound

A second analysis was conducted using the Streetlight data, to determine the roadways most used to travel from the KY 290 and KY 3630 intersection to KY 30 southbound (**Figure 13**), and the reverse trip from KY 30 northbound to the KY 290 and KY 3630 intersection (**Figure 14**). Approximately half of the 230 daily southbound trips use KY 578 (route 1), 35% use KY 3444 (route 2), and the remaining use either Silver Dollar Lake Road or Pigeon Roost Schoolhouse Road (routes 3 and 4). The percentages are nearly the same in the northbound direction, with a total of approximately 235 daily trips.

Figure 13: KY 290 to KY 30 Southbound Travel Patterns

Figure 14: KY 30 to KY 290 Travel Patterns

3.2 Corridor Speeds

Travel speeds are an indicator of how a roadway facility is operating. Under normal operating conditions, drivers on a two-lane highway would typically be traveling close to the posted speed limit. Locations with typical operating speeds below the posted speed could indicate a geometric deficiency, such as a curve with a tight radius, or the lower speeds could be the result of intersection related delay and / or congestion along the roadway itself. To aid in the evaluation, KYTC provided 2019 HERE speed data for the KY 290 study area. The speed data was used to determine typical operating speeds throughout the day, including peak traffic hours and off-peak hours. Travel speeds by location were compared to the location of crashes to determine if crash trends were present.

Speeds for the study area were generally at or above the posted speed limit of 55 mph. From MP 0.000 to 7.750, the 85th-percentile speeds were typically between 50 and 60 mph. From MP 7.750 to 8.850, the 85th-percentile speeds ranged between 35 and 50 mph, gradually decreasing towards McKee and at the north end of the study area, where the speed limit changes to 35 mph. At various points along the study area there are horizontal and vertical curves with design and advisory speeds that fall well below the posted speed limit that show a correlation to lower measured speeds.

As shown in **Figures 15** and **16** and in more detail in **Appendix C**, fatal and serious injury (KA) crashes were overlaid on a graph that included the 85th-percentile speeds in the northbound (NB) and southbound (SB) directions during the AM and PM peak hours, the posted speed limit, and advisory speeds (through curves). When the crashes were overlaid with speeds, there was no clear correlation between speed and serious injury crash locations on KY 290.

Figure 15: KY 290 Northbound 85th Percentile Auto Speeds

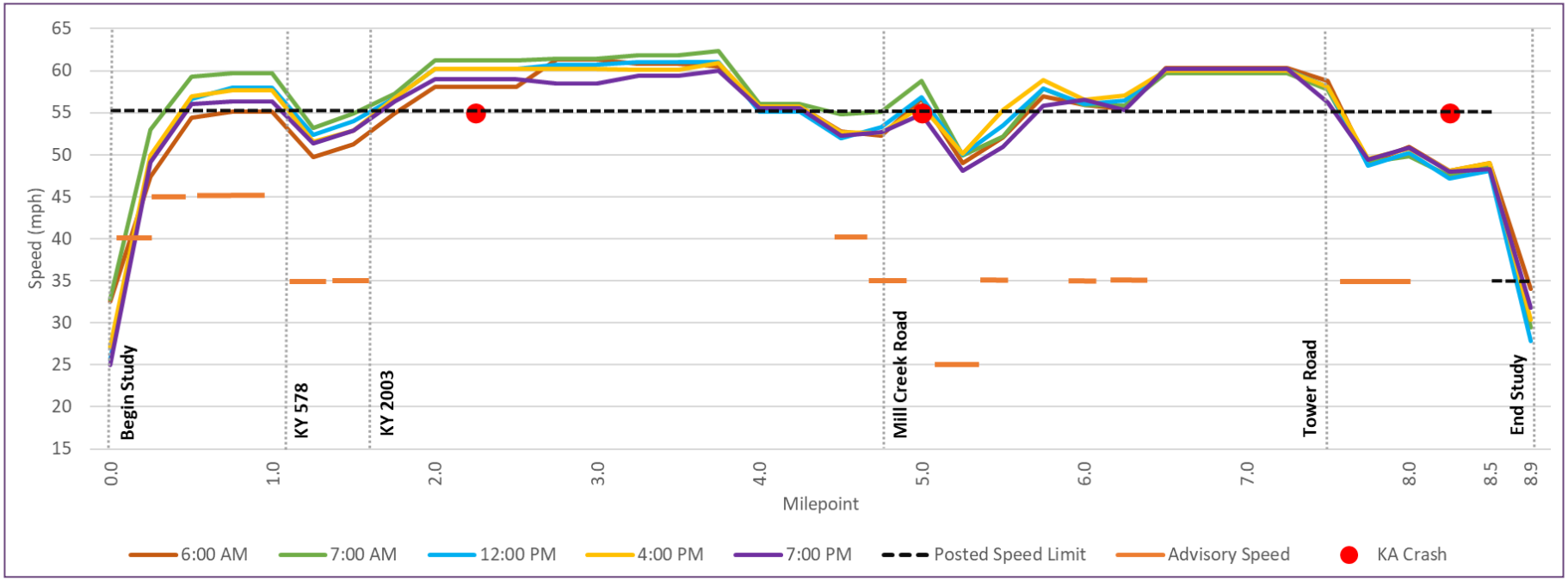
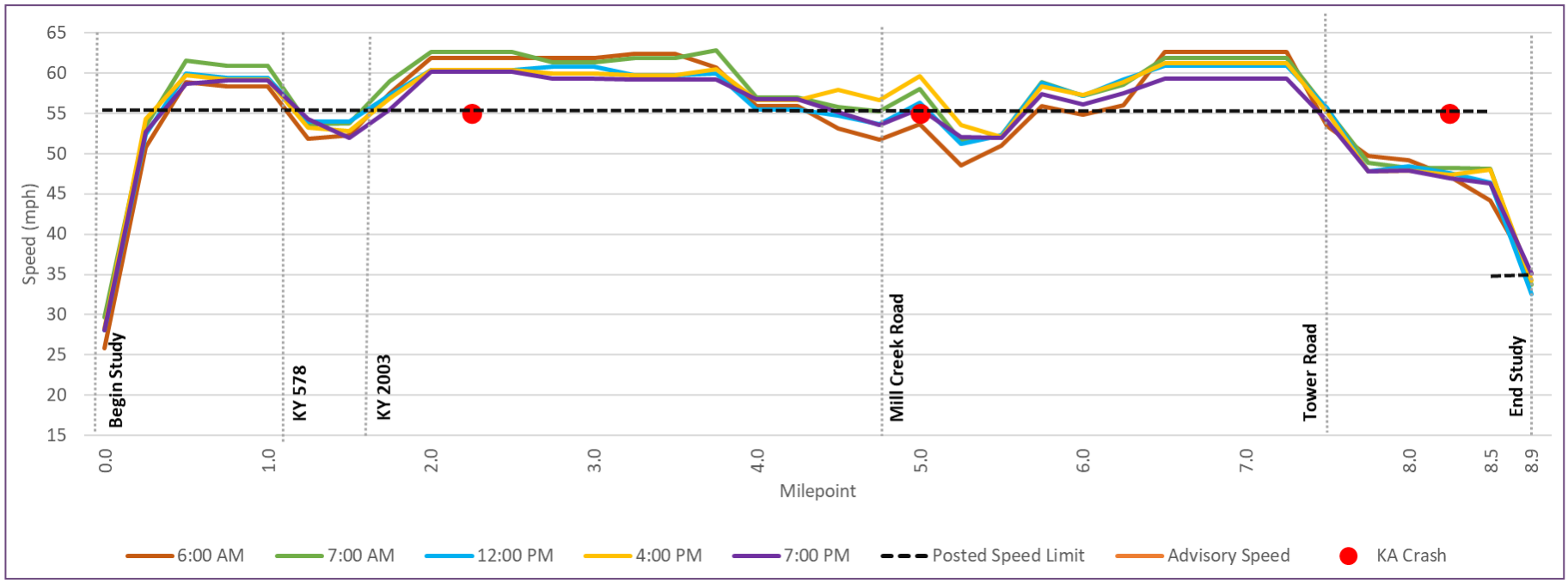


Figure 16: KY 290 Southbound 85th Percentile Auto Speeds



3.3 Corridor Travel Times

The corridor speeds were used to estimate travel times along the KY 290 corridor from McKee to Annville, and also from the KY 290 and KY 3630 intersection to KY 30 via KY 578, and from the KY 578 departure on KY 290 to KY 3630, then KY 3444 to KY 30. **Figure 17** shows the travel times in both the northbound and southbound directions along KY 290 using the 50th and 85th percentile speeds, at different times throughout the day. The 85th percentile travel times are right under 10 minutes for all times of day in both directions, while the 50th percentile travel times are just above 11 minutes for all times of day in both directions.

Figure 17: KY 290 Travel Time from Annville to McKee

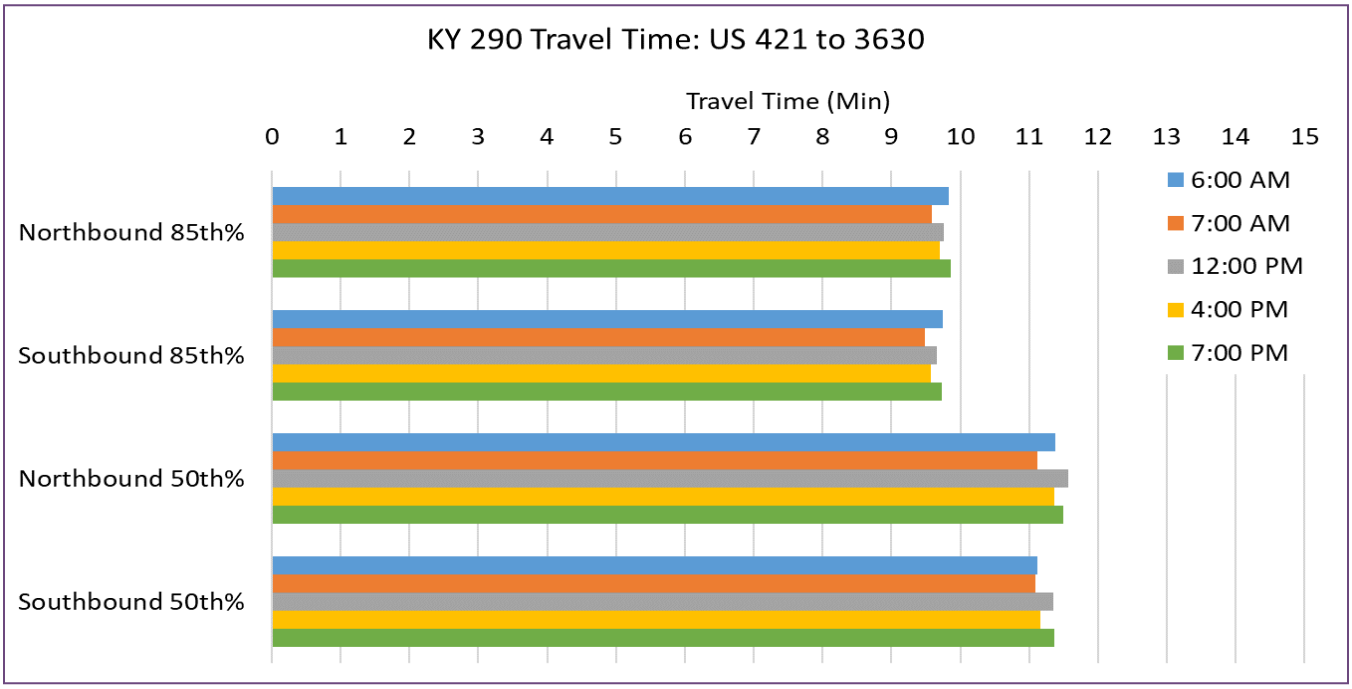


Figure 18 shows the travel times in both the northbound and southbound directions from McKee to KY 30 using KY 290, then departing at KY 578 to KY 3630 to KY 3444 and terminating at the KY 3444 and KY 30 intersection. Travel times were calculated using both the 50th and 85th percentile speeds, at different times throughout the day. The 85th percentile travel times are between 11 and 12 minutes for all times of day in both directions, while the 50th percentile travel times are between 13 and 14 minutes for all times of day in both directions. **Figure 19** shows the same analysis using a different route from McKee to KY 30. This one travels the entirety of KY 290, then KY 3630 to KY 578, and terminates at the KY 578 and KY 30 intersection. The 85th percentile travel times are around 12 minutes in both directions for all times of day, and the 50th percentile travel times are between 14 and 15 minutes in both directions for all times of day.

Figure 18: Travel Times from McKee to KY 30 using KY 578, KY 3630 and KY 3444

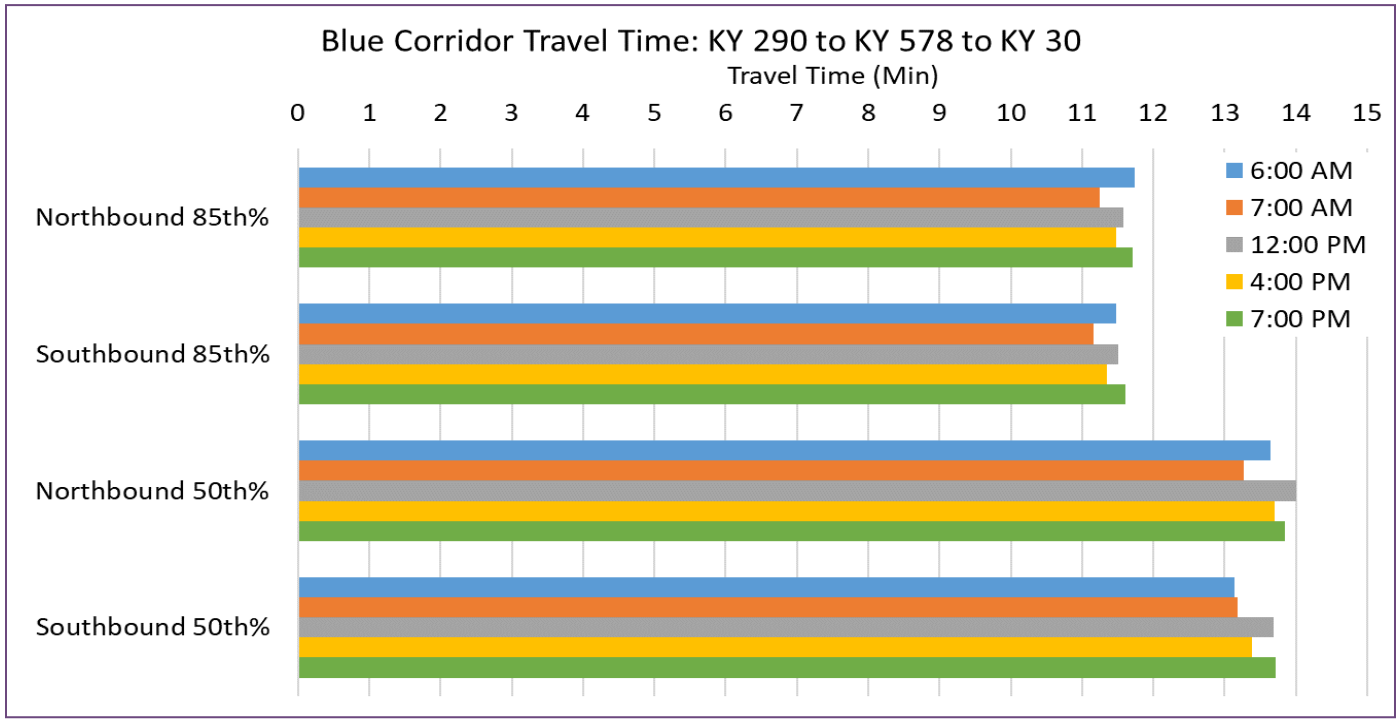
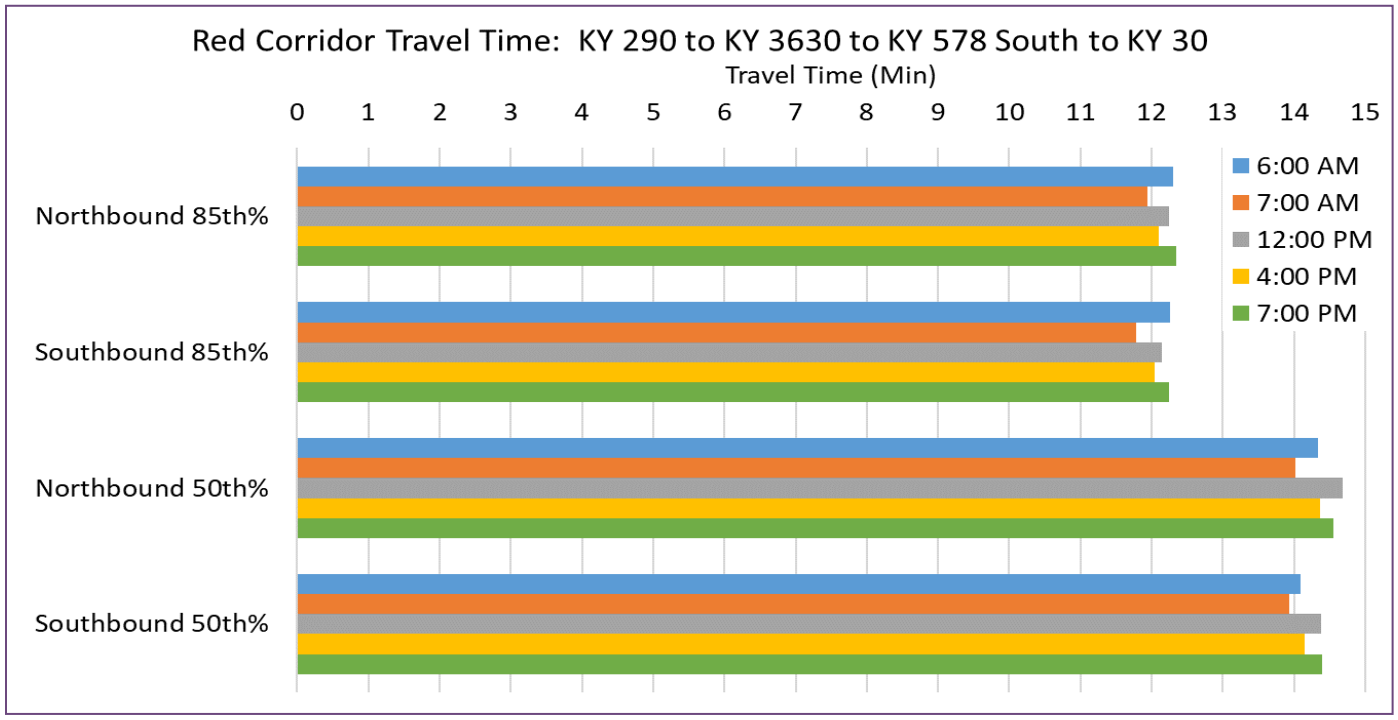


Figure 19: Travel Times from McKee to KY 30 using KY 3630 and KY 578



(This page intentionally left blank)

4 Safety

4.1 Historic Crash Analysis

KY 290 CRASHES

A historical crash analysis was performed to examine traffic safety trends and identify potential safety issues on KY 290 within the study area. The other corridors in the study area that were considered to improve the connection to KY 30 were examined separately. The crash information was derived from data obtained from the Kentucky State Police (KSP) database. Five years of data (2018 to 2022) were used in the analysis. It should be noted that the crash data from 2020 (during the Coronavirus disease [COVID]-19 pandemic) appeared to have similar crash characteristics as the previous years and was included in the analysis. Within the five-year analysis period, there were 83 crashes reported on KY 290 in the study area. A breakdown of the crashes by severity is presented in **Table 4** and is shown in **Figure 20**. There were two fatal crashes and one serious injury crash (3.6% combined) over the five-year period. Most crashes (54, 65.1%) were property damage-only crashes.

Table 4: KY 290 Crash Severity (2018-2022)

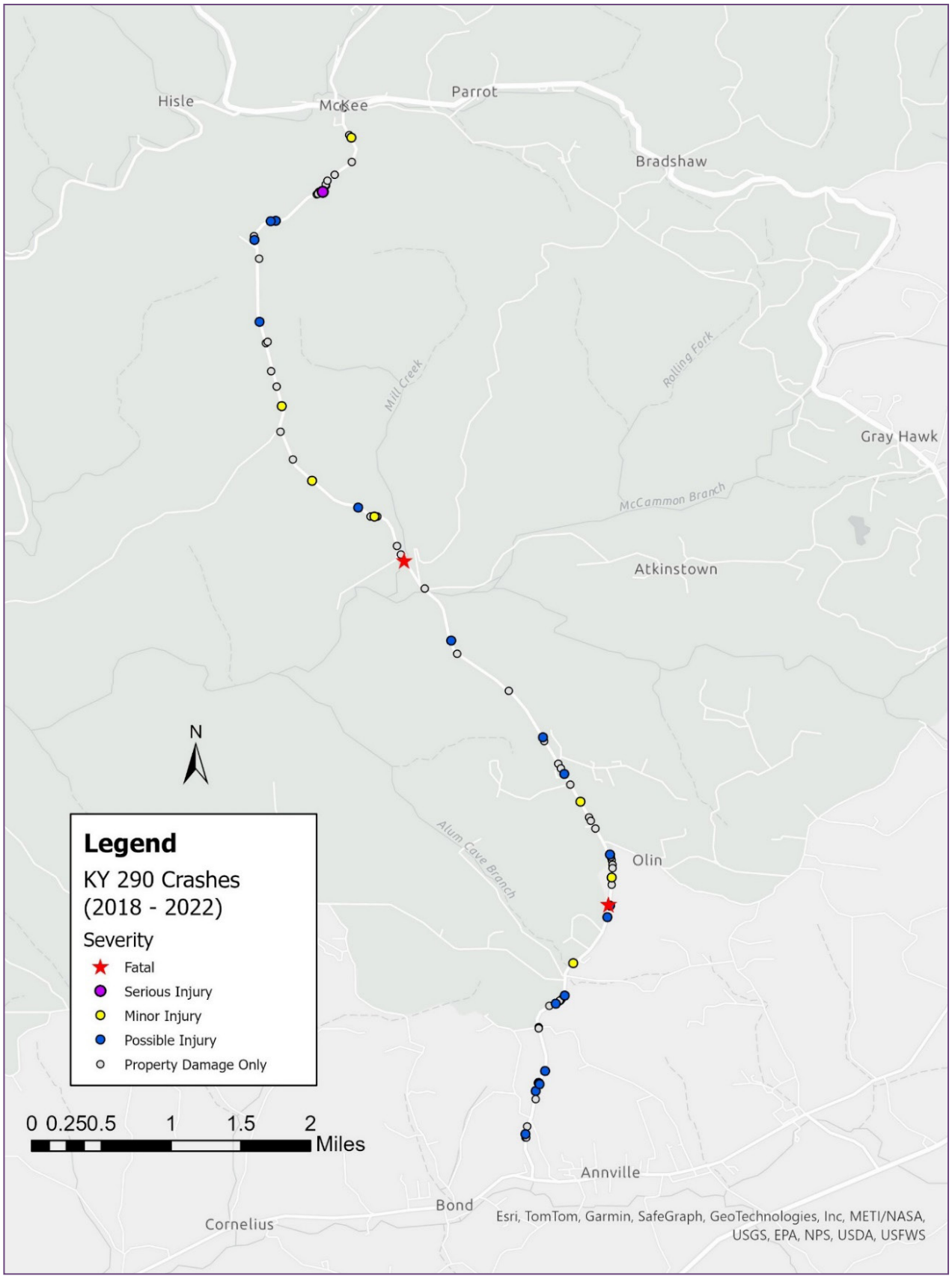
Severity of Crash	Crashes	Percent
Fatal Injury (K)	2	2.4%
Serious Injury (A)	1	1.2%
Minor Injury (B)	8	9.6%
Possible Injury (C)	18	21.7%
Property Damage Only (O)	54	65.1%
Total	83	100.0%

Crashes by the manner of collision are presented in **Table 5**. Most crashes in the study area (59, 71.1%) were single vehicle crashes. This is consistent with the low-volume, rural nature of the study area. Sideswipe-Opposite Direction crashes and angle crashes were the other two highest crash categories. Angle crashes had the highest average severity of all the categories with three of the six involving a fatality or injury (one fatal, one severe injury, and one possible injury) which may indicate a safety issue at intersections. It was also noted that commercial vehicles were involved in only six crashes (7.2%).

Table 5: KY 290 Crashes by Manner of Collision (2018-2022)

Manner of Collision	Crashes	Percent
Single Vehicle	59	71.1%
Sideswipe-Opposite Direction	9	10.8%
Angle	6	7.2%
Rear End	3	3.6%
Head On	2	2.4%
Opposing Left Turn	2	2.4%
Sideswipe-Same Direction	1	1.2%
Backing	1	1.2%
Total	83	100.0%

Figure 20: KY 290 - Crash Severity by Location (2018-2022)



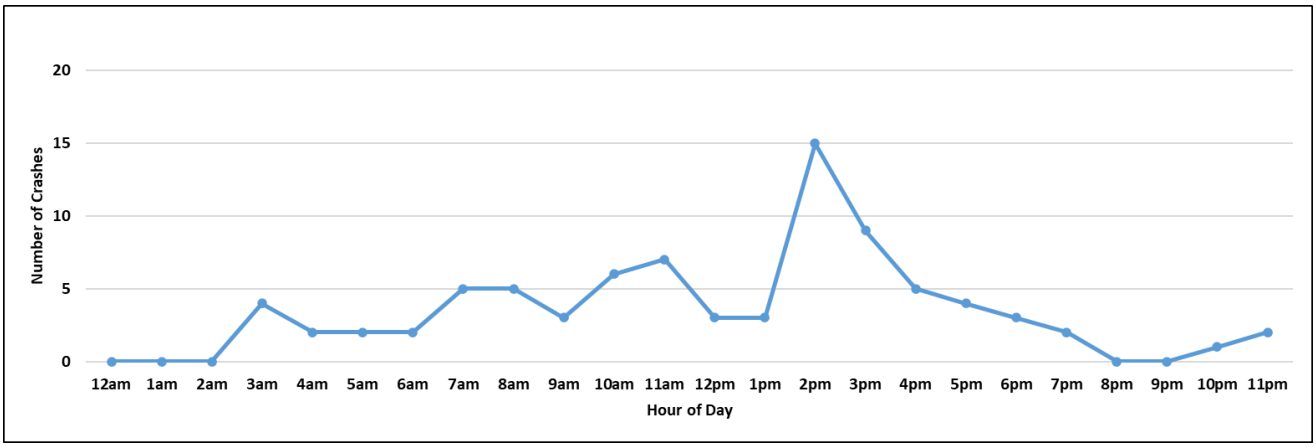
A further investigation of the single vehicle crashes, **Table 6**, showed the majority involved a vehicle leaving the roadway and striking an embankment or ditch (44.1%). Wet pavement appeared to be a factor in single vehicle crashes with 39.0% of these crashes occurring when the pavement was wet.

Table 6: Single Vehicle Crashes by Type (2018-2022)

Category	Single Vehicle Crashes	Percent Single Vehicle	Single Vehicle Wet Pavement Related	Percent Wet Pavement Related
Ran Off Roadway (Embankment/Ditch)	26	44.1%	12	46.2%
Collision with Fixed Object	13	22.0%	7	53.8%
Collision with Animal	12	20.3%	1	8.3%
Other Collisions On Shoulder	4	6.8%	3	75.0%
Other Roadway/Mid-Block Collision	2	3.4%	0	0%
Other	2	3.4%	0	0%
Total	59	100.0%	23	39.0%

A review of crashes by time of day, **Figure 21**, shows that crashes peak in the afternoon, with the largest number of crashes occurring between 1:00 PM and 4:00 PM.

Figure 21: Crashes by Time of Day (2018-2022)

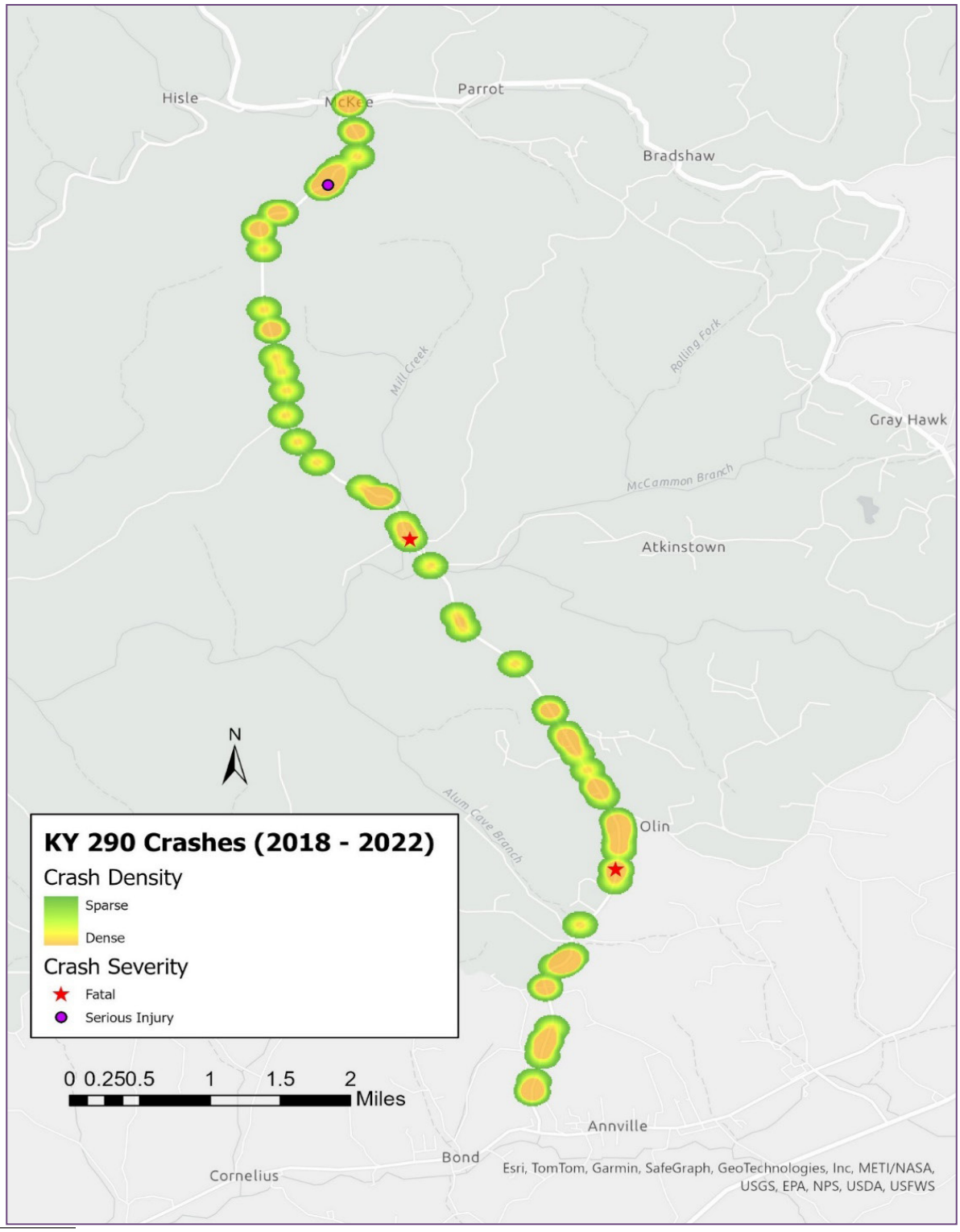


The location and density of crashes within the study area was also examined as illustrated in **Figure 22**. Crash density was generally highest in locations of horizontal / vertical curvature deficiencies or at intersections. **Figure 22** identifies a few locations of high crash density in the study area, including sharp curves south of Baily Road (MP 1.2-1.6), north of Laurel Creek Road (MP 5.3-5.4), north of Tower Road (MP 7.6-7.8), and south of Shakey Road (MP 8.1-8.2). Two fatal crashes and one serious injury crash are shown on KY 290 within the study area. One fatal crash occurred on a straight, level section of KY 290 near a driveway that enters the roadway at a severe skew when a vehicle ran off the roadway and collided with a tree. The other fatal crash occurred on a straight, level section of KY 290 with no obvious deficiencies when a vehicle crossed into the opposing lane and collided with an oncoming vehicle. The serious injury crash occurred on the horizontal curve south of Shakey Road when a vehicle ran off the side of the road then overcorrected and collided with an oncoming vehicle.

KY 290 segment crash rates were calculated using the 2018-2022 crash data and traffic volumes during this period. The crash rates were compared to statewide rural two-lane highway average crash rates[2].

The analysis showed the overall KY 290 corridor within the study area experienced near the average number of crashes per 100 million vehicle miles traveled (MVM) compared to similar type facilities throughout Kentucky. The south end is 5% below average, however the north end is 30% above average. **Table 7** provides further crash rate analysis details.

Figure 22: KY 290 - Crash Density Map (2018-2022)



2 Analysis of Traffic Crash Data in Kentucky 2015-2019, Research Report KTC-20-32/KSP2-20-1F

Table 7: KY 290 Crash Rate Data

Route	Begin MP	End MP	Volume Source	Volume Year	AADT	# of Crashes	Crash Rate*	Statewide Average Crash Rate*	Ratio
KY 290 (total corridor)	0.000	8.850	Forecast	2022	2,300	83	223	218**	1.02
KY 290 (south end)	0.000	6.255	Count Station 055527	2022	2,329	55	207	218**	0.95
KY 290 (north end)	6.255	8.850	Count Station 055750	2017	2,091	28	283	218**	1.30

**Rate per 100MVM*

***Average statewide crash rate (5-year average) for two-lane rural highways per 100MVM for all crash severities*

During the investigation of specific design issues, the historic crash data along with speed data were used to identify potential safety related issues. These crash data were also used to determine the predicted safety benefits of improvement concepts identified as part of this study.

CRASHES ON OTHER ROUTES IN THE STUDY AREA

A historical crash analysis was also performed on other routes of interest in the study area, with crashes on KY 30, KY 578, KY 3444, and KY 3630 being examined collectively. Within the five-year analysis period, 50 crashes were reported on these routes in the study area. A breakdown of the crashes by severity is presented in **Table 8** and shown in **Figure 23**, with crash density shown in **Figure 24**. As shown, there were no fatal crashes and one serious injury crash (2.0% of total crashes) over the five-year period. Most crashes (43, 86.0%) were property damage-only crashes.

Table 8: Other Routes Crash Severity (2018-2022)

Severity of Crash	Crashes	Percent
Fatal Injury (K)	0	0.0%
Serious Injury (A)	1	2.0%
Minor Injury (B)	4	8.0%
Possible Injury (C)	2	4.0%
Property Damage Only (O)	43	86.0%
Total	50	100.0%

Crashes by the manner of collision is presented in **Table 9**. Most crashes (31, 62.0%) were single vehicle crashes. This is consistent with the low volume rural nature of the study area. Angle crashes were the next major crash category, accounting for 12.0%. Sideswipe-Opposite Direction crashes had the highest average severity of all the categories with two of the three crashes involving an injury (one severe injury and one minor injury). It was also noted that commercial vehicles were involved in only one crash (2.0% of all reported crashes).

*Figure 23: **Other Routes - Crash Severity by Location (2018-2022)***

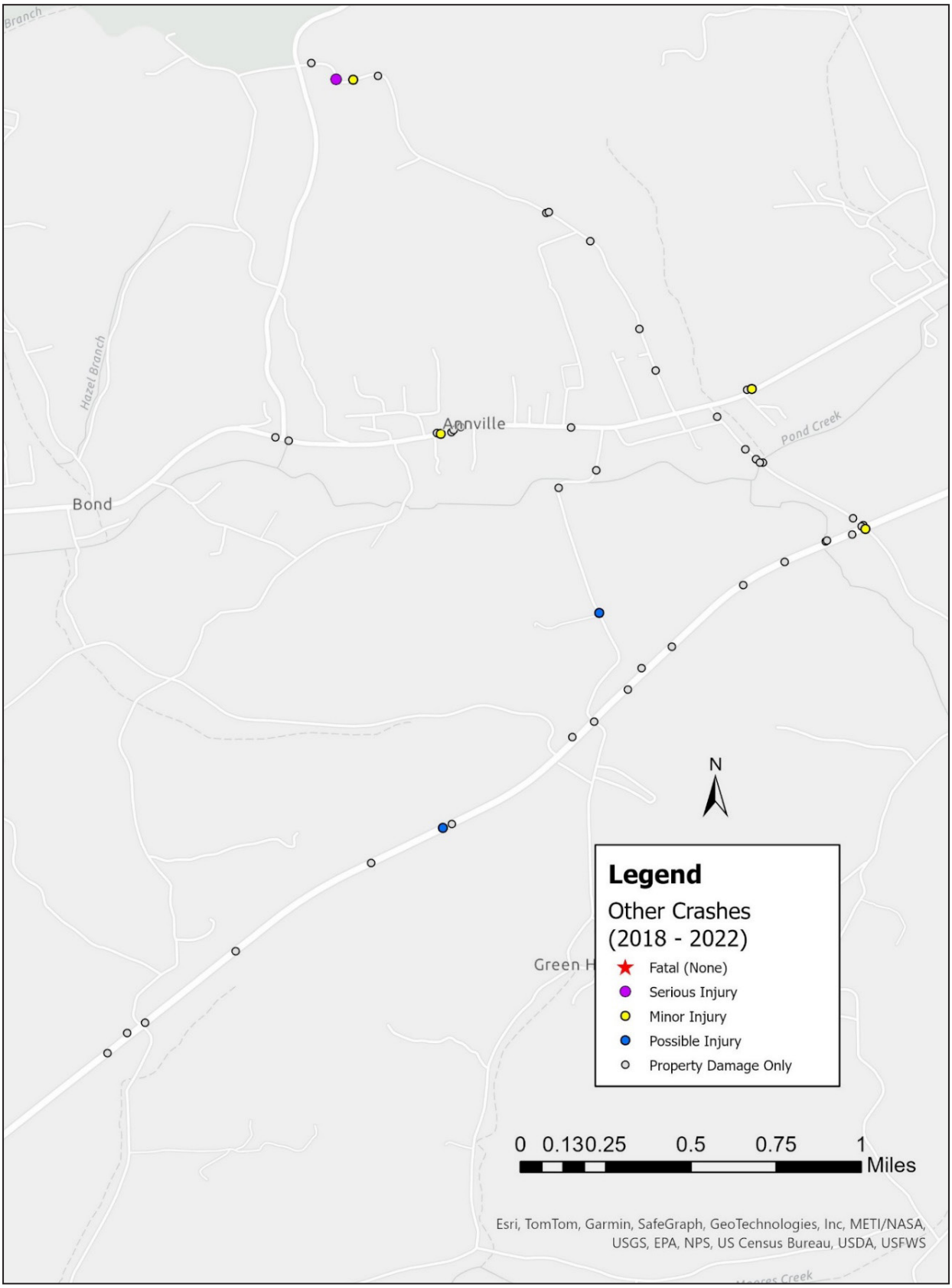
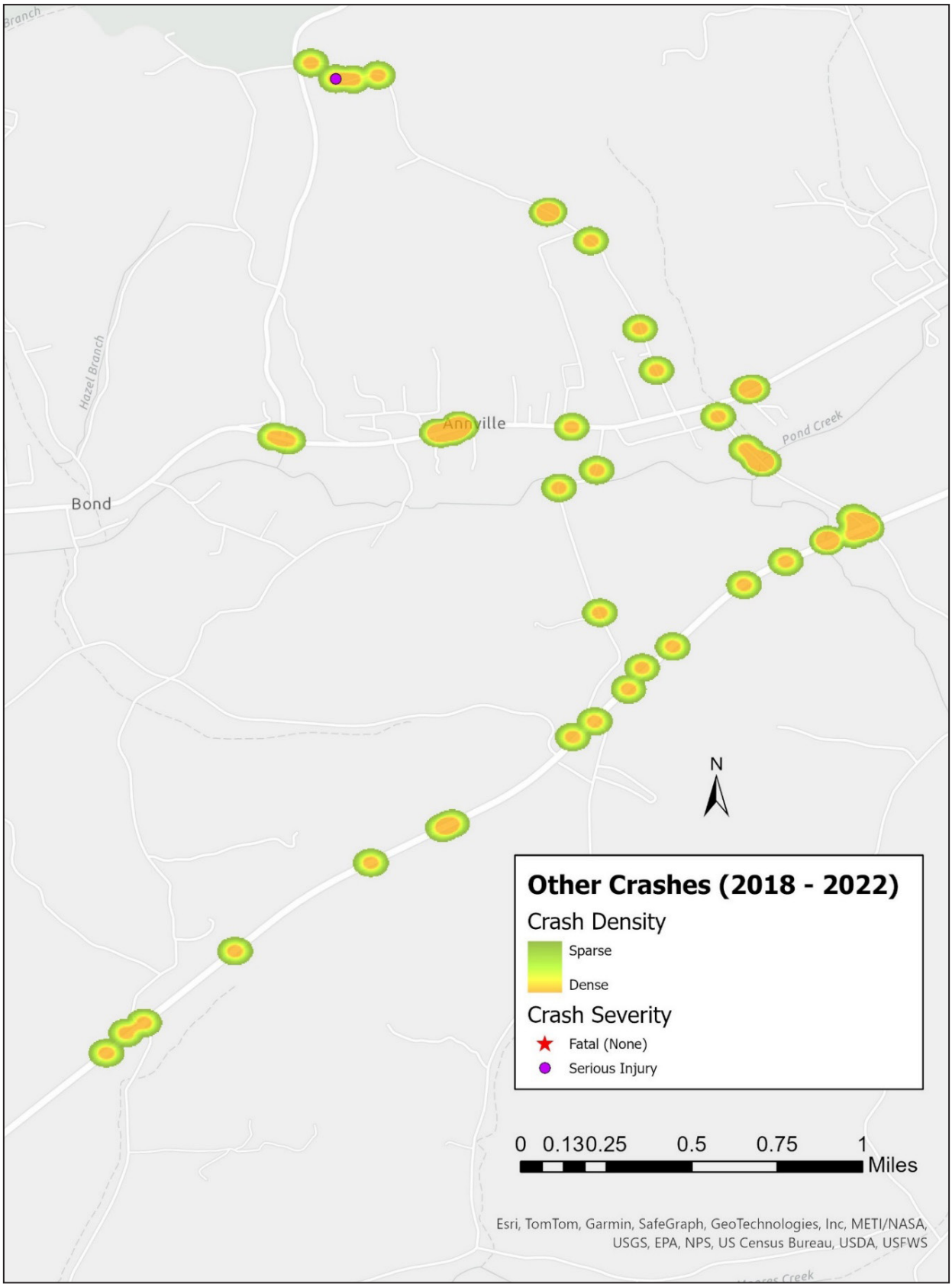


Figure 24: Other Routes - Crash Density Map (2018-2022)



A further investigation of the single vehicle crashes, **Table 10**, showed that most of these crashes involved a collision with an animal (29.0%) followed by running off the roadway (25.8%). Wet pavement did not appear to be a factor in single vehicle crashes with only 12.9% of these crashes occurring when the pavement was wet.

Table 9: Other Routes Crashes by Manner of Collision (2018-2022)

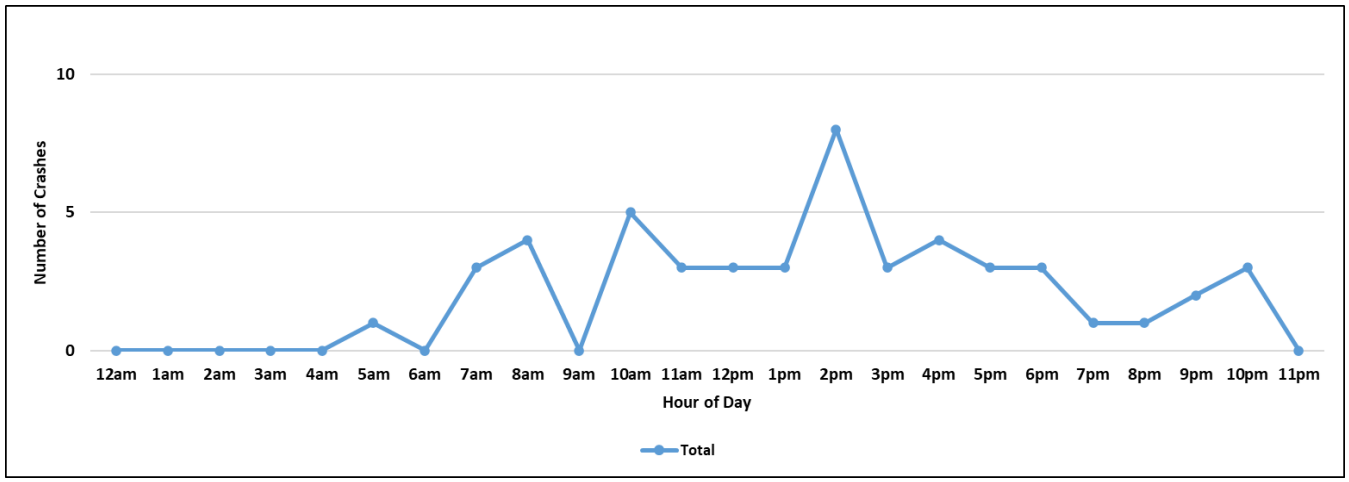
Manner of Collision	Crashes	Percent
Single Vehicle	31	62.0%
Angle	6	12.0%
Rear End	3	6.0%
Sideswipe-Opposite Direction	3	6.0%
Sideswipe-Same Direction	3	6.0%
Opposing Left Turn	2	4.0%
Backing	1	2.0%
Head On	1	2.0%
Total	50	100.0%

Table 10: Single Vehicle Crashes by Type (2018-2022)

Category	Single Vehicle Crashes	Percent Single Vehicle	Single Vehicle Wet Pavement Related	Percent Wet Pavement Related
Collision with Animal	9	29.0%	0	0.0%
Ran Off Roadway	8	25.8%	1	12.5%
Collision with Fixed Object	6	19.4%	1	16.7%
Other Roadway	7	22.6%	1	14.3%
Collision with Non-Fixed Object	1	3.2%	1	100.0%
Total	31	100.0%	4	12.9%

A review of crashes by time of day, **Figure 25**, shows that crashes occur at a fairly uniform rate over the daylight hours, with a slight peak around 2:00 PM.

Figure 25: Crashes by Time of Day (2018-2022)



4.2 Excess Expected Crashes

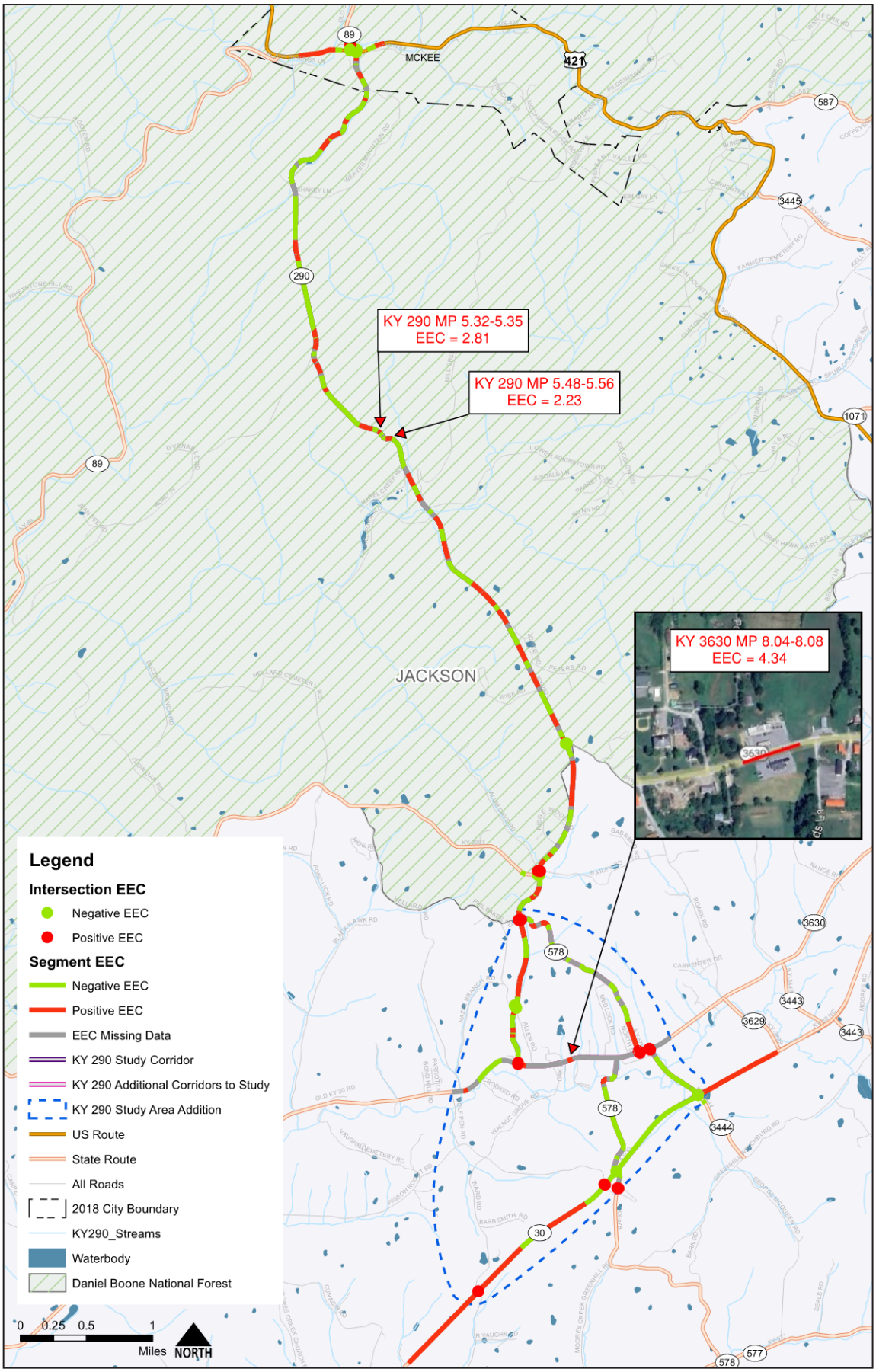
KYTC and the Kentucky Transportation Center (KTC) have developed a more refined statistical methodology based on the Highway Safety Manual to rank highway safety needs. Excess Expected Crashes (EEC) is based on a crash prediction model that estimates the number of crashes expected on a roadway segment of a given type and length. It represents the number of excess crashes a segment has experienced compared to other roadways of its type, adjusting for traffic volumes, physical characteristics (for two-lane highways), and the actual crash history. EEC is positive when more crashes have occurred than were expected and negative when fewer crashes occurred than were expected.

The EEC values for KY 290 were obtained from KYTC and are color coded on **Figure 26**. KY 290 experiences a mixture of positive and negative EEC values. Positive EEC values (higher than expected crashes) are located in areas of geometric deficiencies and at intersections. Generally, the study area experiences a negative EEC value of –7.93 for intersections indicating it experiences fewer than the expected number of intersection crashes, and a positive EEC value of 3.29 for segments indicating it experiences more than the expected number of segment crashes.

It was observed that the crash rate of KY 290 is near the statewide average (**Table 7**), but the EEC analysis showed more crashes than expected. The reason for this result is that the EEC analysis accounts for geometric and operational characteristics of the highway while the crash rate comparison is based strictly on the highway classification type. When key highway characteristics and the historical crash data are considered together, the EEC analysis shows that the segments in the study area are performing worse than expected. However, in a simple comparison to all rural two-lane highways across the state, the segments in the study area are performing near the average in terms of safety. This does not mean that no safety improvements are warranted, but that the highway is operating well relative to other rural two-lane highways in Kentucky.

Breaking EEC down by intersection or segment reveals that intersections have experienced fewer crashes than expected while segments have experienced more crashes than expected. These results indicate that overall, KY 290 is operating as predicted for a rural two-lane highway with similar traffic volumes, with some localized trouble spots, most notably on KY 3630 near the Shell gas station/market (MP 8.04-8.08) and on KY 290 near the horizontal and vertical curves north of Laurel Creek Road (MP 5.32-5.56)

Figure 26: Areas with Positive (Poor) and Negative (Good) Excess Expected Crashes (EEC)



4.3 Summary of Safety Issues & Use of Safety Data

A comparison of crash rates within the study area shows that KY 290 experiences near the same number of crashes as other rural two-lane roadways in the state. The review of historic crashes has shown that relationships exist between high crash segments / intersections and locations with geometric deficiencies and potentially limited sight distance. The review of speed data has yielded a relationship between locations where drivers are traveling in excess of the advisory speeds and an increase in crashes. The results for potential safety improvements at these locations are explored later in this report. The crash data, EEC information, and crash rates (calculated using the crash and volume data) were all used to evaluate the deficient locations and the possible improvements.

(This page intentionally left blank)

5 Environmental Overview

Data were collected for an Environmental Overview (EO) based on existing geographic information system (GIS) datasets, state and federal agency databases, literature research, and archival data. Desktop research was performed to identify and locate areas of importance or concern that lie within a study area along KY 290 in Jackson County, specifically from US 421 in McKee (MP 8.850) to KY 3630 in Annville (MP 0.000) and within a larger area from the KY 290 and KY 578 intersection in Annville southward to KY 30.

The study area, for all resources studied except cultural resources, considered a 600-foot buffer (i.e., 300 feet either side of the existing roadway) along existing KY 290, extending southward from McKee and to the KY 290/KY 578 intersection where the area broadens to include the expanded area south to KY 30. Once resources were identified, the potential for impacts was considered. A summary map of environmental conditions is shown as **Figure 27**, followed by detailed maps for McKee and Annville, respectively (**Figures 28** and **29**). The detailed EO is attached as Appendix D.

The EO considers resources in the following two categories: Natural Environment (ecological resources [i.e., streams, wetlands, and floodplains and important habitats]; threatened and endangered species) and Human Environment (air quality and traffic noise; Environmental Justice [EJ]; land use; Section 4(f) and Section 6(f) resources, underground storage tanks and hazardous materials; and historic and archaeological resources).

A key consideration for potential impacts was existing right-of-way. Improvement recommendations outside of existing right-of-way or creating ground disturbance have greater potential to impact natural and socioeconomic resources. If improvement recommendations are moved to the design phase, the identified resources would require in-depth analysis and review to provide location approval (i.e., National Environmental Policy Act [NEPA] documentation).

5.1 Natural Environment

STREAMS, WETLANDS, AND FLOODPLAINS

Laurel Fork, which crosses KY 290, is an Outstanding State Resource Water (OSRW). Conversely, Alum Cave Branch and Pond Creek are listed as impaired. Other streams either crossed by or within the study area include Mill Creek, Hayes Branch, two unnamed tributaries to Pond Creek, Dry Fork, and Hazel Branch. National Wetlands Inventory mapping shows approximately 25 wetlands within the study area. All are farm ponds and nearly all are in the southern half of the study area and south of Laurel Fork. Floodplains are adjacent to major roadways throughout all of McKee and extend southward along approximately half of Hayes Branch adjacent to KY 290. Additional floodplain is associated with the KY 290 crossing of Laurel Fork and areas along Pond Creek in the expanded portion of the study area.

THREATENED AND ENDANGERED SPECIES AND IMPORTANT HABITATS

Nine federally listed species have potential to occur in the study area; species include four mammals (bats) and five mussel species. The USFWS Kentucky Field Office (KFO) indicates that northern portions of the study area may be within or very close to “Known Swarming 2” habitat of the northern long-eared bat while this northern portion of the study area (approximately half of the study area) is in “Known Swarming 1” Indiana bat habitat. Habitat for all four bat species includes forested areas and forested riparian buffers. Mill Creek Wildlife Management Area (WMA), owned by the US Forest Service (USFS) and part of the larger Daniel Boone National Forest (DBNF) service boundary, is managed by the KY Department of Fish & Wildlife Resources (KDFWR). It is an important habitat spanning a sizeable portion of the study area. Mined areas may also provide winter habitat for all listed bat species or summer roosting habitat for the gray bat and Virginia big-eared bat.

Laurel Fork (OSRW) is a habitat for the listed mussel species. Other larger streams in the study area may have some potential to provide habitat for these mussel species but impaired streams have diminished habitat. Streams would need to be assessed further during any NEPA documentation phase to determine their potential to provide habitat for listed mussel species.

No federally listed species of flora were noted as being present in the study area.

*Figure 27: **Study Area Existing Environmental Conditions***

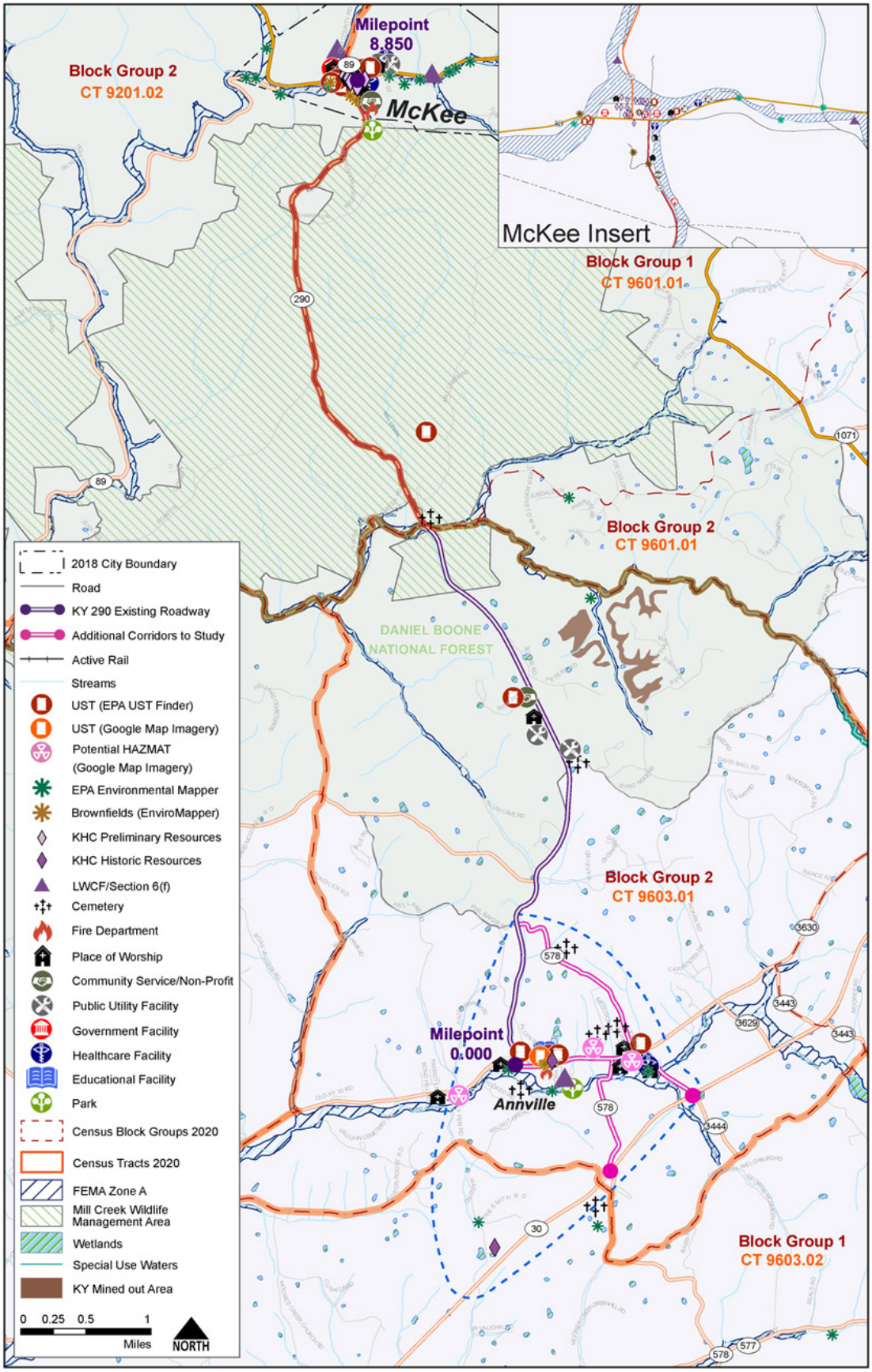


Figure 28: McKee Area Existing Environmental Conditions

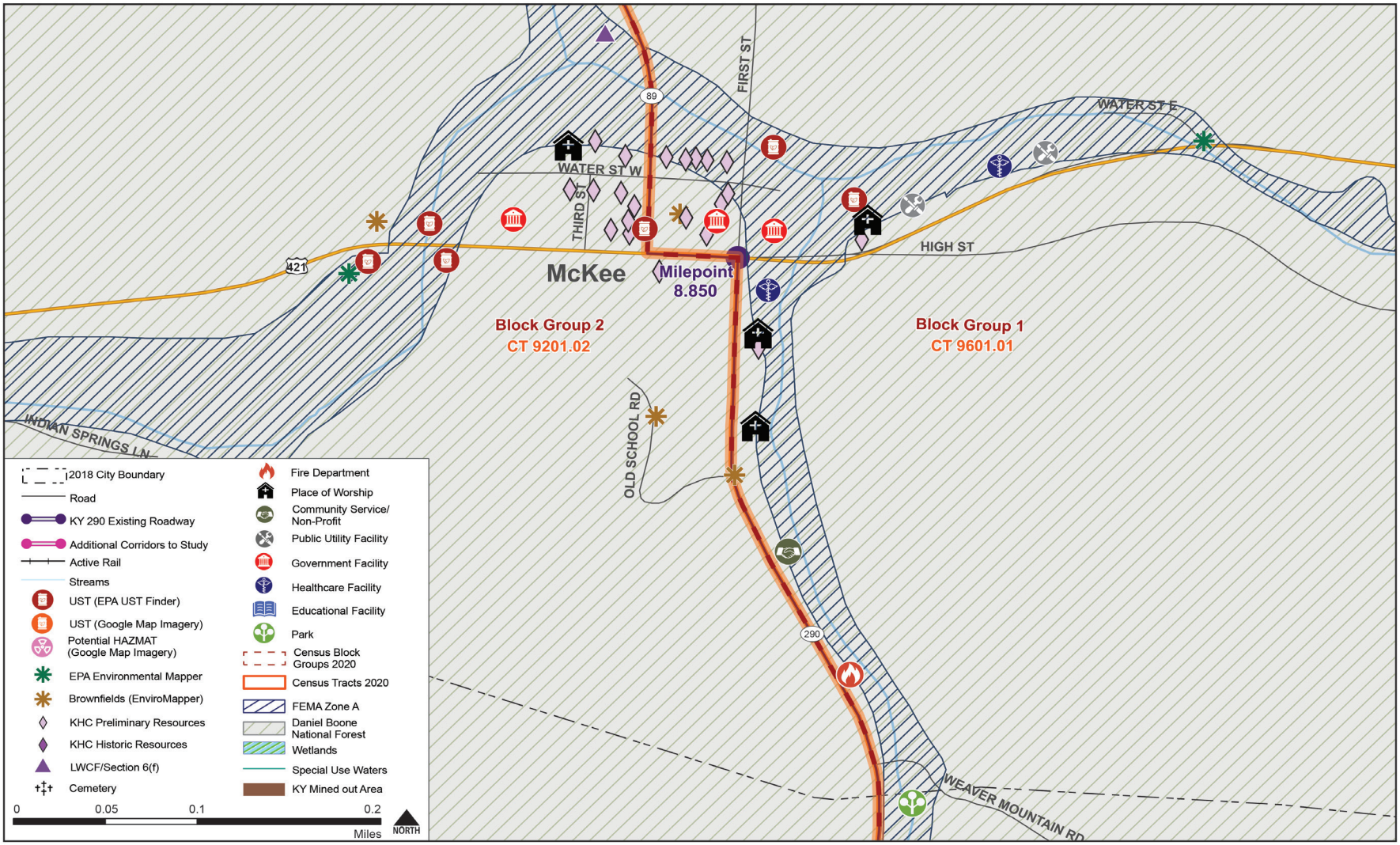
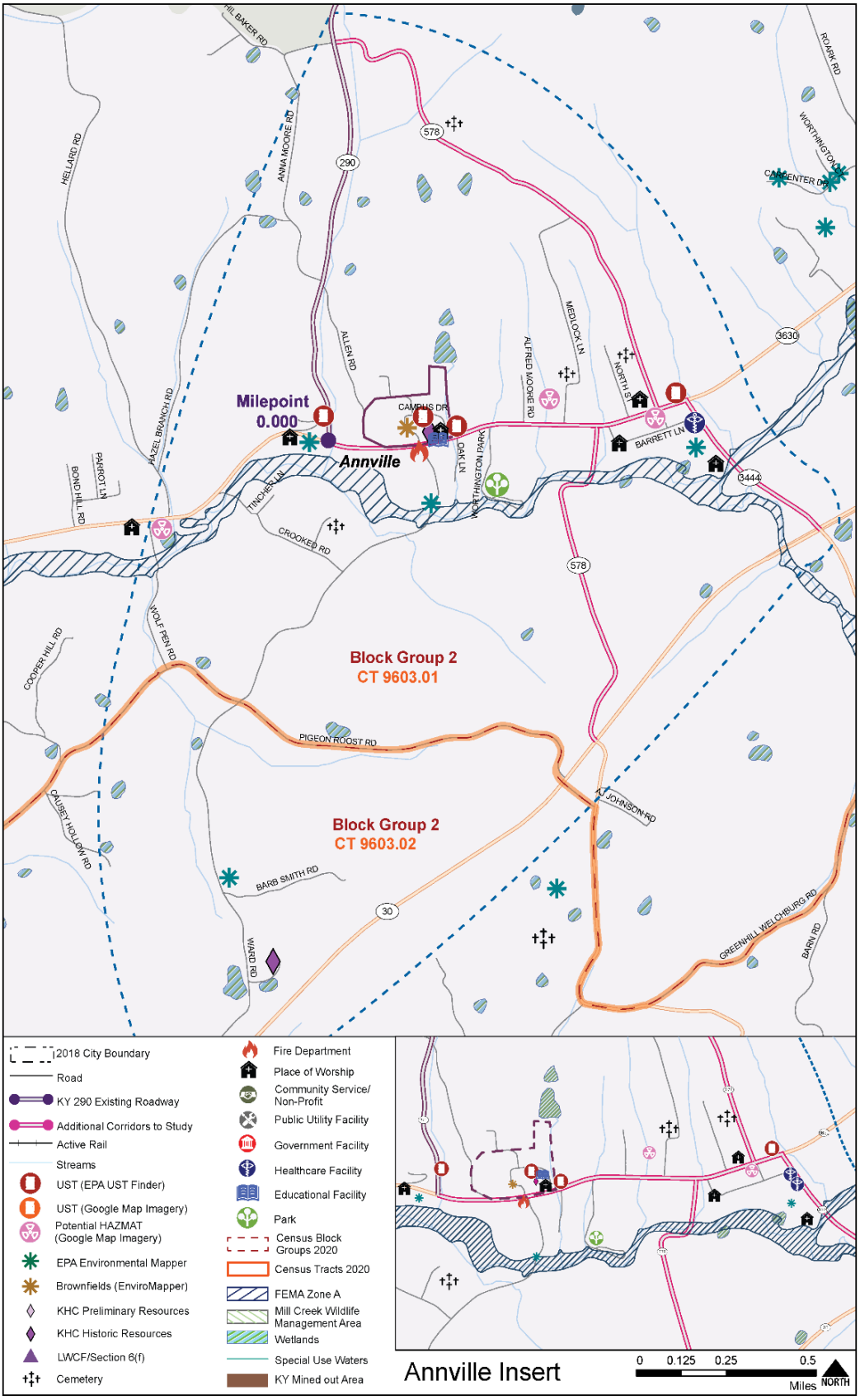


Figure 29: Annville Area Existing Environmental Conditions



5.2 Human Environment

AIR QUALITY

The study area is in attainment for all criteria pollutants and as such, a project in the study area would not require any comprehensive air quality review. A project in the study area would also be considered "Lower Potential for Meaningful MSAT (Mobile Source Air Toxics) Effects" since the design year traffic would be less than 140,000 to 150,000 AADT. As such, a qualitative assessment of the emissions projections should be included in any future NEPA document.

TRAFFIC NOISE

Alignment changes which move the roadway off existing alignment and to a new location meet Type I criteria per the Kentucky Transportation Cabinet's 2020 Noise Analysis and Abatement Policy (2022 Update). Similarly, alterations to the existing alignment could also meet Type I criteria. Such alterations could include the addition of turn lanes with which the distance between a noise receptor and the traffic noise source is halved or the shielding between a receptor and the traffic noise source is removed exposing the line of sight between the two. In such cases, the entire study area would be considered a Type I project and a noise analysis, which at minimum may require utilization of the Traffic Noise Impact Screening Tool, would be required for the entire project per KYTC policy.

ENVIRONMENTAL JUSTICE

The Cumberland Valley Area Development District (CVADD) prepared the Jackson County Highway 290 Socioeconomic Report (December 2023) to assess the project's potential to encounter Environmental Justice (EJ) populations within the study area. Any future NEPA documentation would need to consider potential to disproportionately impact identified EJ populations.

CVADD reported data for the United States, Kentucky, Jackson County, the three census tracts (CTs) that include the study area, and the three block groups (BGs) that include the study area. Specifically, the CT BGs included in the analysis were CT 9601.01 BG 1, CT 9601.02 BG 2, and 9603.01 BG 2. CVADD's analysis used the county as the threshold for all EJ criteria. Based on the data obtained from the U.S. Census Bureau American Community Survey (ACS) estimates, CVADD reported the percentages shown in **Table 10** below for race, poverty, age, disability, and English proficiency. Detailed estimates comprising these percentages are in the Environmental Overview in **Appendix D**, Attachment B.

Table 11: Environmental Justice Population Percentages

Census Boundary	Minority	Below Poverty Level	Limited English Proficiency	Age 65 Years and Older*	With Disability (18 Years and Older) *
	Percentage				
United States	37.38	12.63	8.23	16.04	11.63
Kentucky	13.74	16.27	2.41	16.35	16.03
Jackson County	0.80	28.29	0.64	17.39	25.39
CT 9601.01 BG 1	1.46	43.03	0.00	17.07	31.74
CT 9601.02 BG 2	3.57	51.04	0.00	24.17	30.12
CT 9603.01 BG 2	0.14	20.04	3.44	15.91	19.10

Source: Jackson County Highway 290 Study Socioeconomic Report, December 2023, Prepared by CVADD; See Appendix D.

**Due to limited availability of data, CVADD presented estimates for the census tract as a whole for this population.*

As the table denotes, estimates at the block group level were available only for minority populations, populations below the poverty level, and for those with limited English proficiency (LEP). The estimates show that both CT 9601.01 BG 1 and CT 9601.02 BG 2's percentages of minority population and of those below the poverty level exceed those of Jackson County. In turn, CT 9603.01 BG 2's percentages of those below poverty level and with LEP exceed that of the county.

ACS Estimates for populations age 65 years and older and for populations with a disability were available at the census tract level only. For the age 65 years and older population, only CT 9601.02's percentage exceeded that of the county, although CT 9601.02's percentage was within one-third of one percentage point. For the population with disability, both CT 9601.01 and CT 9601.02 exceeded that of Jackson County.

Generally, the ACS estimates suggest that EJ populations are of concern for all census boundaries overlapping the study area, but with a higher potential for EJ populations to occur in the northern half of the study area. As noted above, future NEPA documentation would need to consider the potential for any proposed improvement to disproportionately impact identified EJ populations.

FARMLAND

Prime farmland soils exist throughout the study area, although a large portion of the study area, particularly where these farmland soils occur, has been previously developed as right-of-way or is in an urban area and no longer qualifies as farmland. The linear portion of the study area extending from McKee southward toward Annville contains locations of farmland soils, most of which are immediately adjacent to the roadway. In the expanded area surrounding Annville, farmland soils by type are very limited with most prime farmland soils being in areas adjacent to Pond Creek and its tributaries. Other areas of prime farmland or farmland of statewide importance are located along the roadways within Annville where non-farmland uses have already occurred. While impacts to farmland would be expected to be minor, any future NEPA documentation would need to consider potential impacts to farmland and particularly so if improvements are proposed outside of existing highway right-of-way.

LAND USE

Based on a review of available online resources, Jackson County does not have a planning and zoning entity. A mix of land uses occur in the study area, with the highest concentrations of developed areas, i.e., residences, businesses, community facilities and services, located in McKee and Annville. Along KY 290, proceeding southward from McKee, Mill Creek WMA is adjacent to both sides of KY 290, extending for approximately 4.5 miles along the route. Continuing from the WMA southward into Annville, KY 290 is abutted by sporadic rural residences, small businesses, places of worship, cemeteries, pastureland, and small areas of agricultural land, primarily in pasture or hayfields. The expanded portion of the study area outside of Annville is primarily rural residential. Community facilities identified in the study area include one school, six cemeteries, 11 places of worship, two parks, two fire departments, three government buildings, and four small healthcare facilities.

SECTION 4(F) AND SECTION 6(F) RESOURCES

Section 4(f) properties are publicly owned parks, WMAs, historic resources that are listed on or eligible for listing on the National Register of Historic Places (NRHP) and archaeological sites that are listed on or eligible for listing on the NRHP and warrant preservation in place. Mill Creek WMA is a Section 4(f) resource because of its status as a WMA. Worthington Community Park in Annville, as a publicly owned park, is a Section 4(f) resource as well. Ownership of an unnamed roadside park at the northernmost intersection of KY 290 and Shakey Lane in McKee is undetermined at present but would need to be investigated further should any proposed improvements impact the park.

Section 6(f) prohibits the conversion of property acquired or developed with Section 6(f) grants to a nonrecreational purpose without the approval of the National Park Service. Worthington Park received Section 6(f) funds for its development. Additionally, Mill Creek WMA is on land that is part of the DBNF administrative boundary. DBNF has received almost $2.3 million from the LWCF. If impacts as a result of any improvements occur to Mill Creek WMA, additional investigation should occur to determine if any portion of the monies DBNF received from the LWCF were used in the development of Mill Creek WMA.

UNDERGROUND STORAGE TANKS (USTS) AND HAZARDOUS MATERIALS

Based on the data review, all but two identified UST and/or hazardous materials sites in the study area are in McKee or Annville. A supplemental aerial imagery review indicated the presence of two potentially active gas stations in the study area – one in Annville and one along KY 290 north of Annville. These identified sites, if encroached upon or impacted directly, may require additional assessment during any future design phase for potential to encounter hazardous materials and/or USTs.

CULTURAL RESOURCES

Historic and archaeological resources exist in the study area (i.e., within one-quarter mile either side of the existing roadway). One property in the study area, Annville Institute, is listed in the NRHP, both as an individual structure and as a NRHP District comprised of 11 contributing buildings/structures. Jackson County Courthouse in McKee is identified as meeting NRHP criteria and an additional 19 sites have an undetermined status. Two identified archeological sites occur within the study area, one of which has not been assessed for NRHP eligibility and the other is listed as an inventory site (does not presently meet NRHP criteria). Any future project would likely require a phase I archaeology survey during NEPA documentation, especially if it exists outside of the existing right-of-way.

(This page intentionally left blank)

6 Stakeholder Outreach

In addition to Project Team meetings between the Consultant Team, KYTC, and the CVADD, outreach for this project included a public survey and two meetings with local elected officials. Meeting minutes for meetings can be found in **Appendix E**, along with summarized results from the public survey.

6.1 Project Team Meeting #1

The first Project Team Meeting was held on May 22, 2023, at 1:00 PM. This was a hybrid virtual (MS Teams) and in-person meeting (District 11 office). The Consultant Team presented the study area existing conditions, including roadway geometrics, a crash analysis, existing traffic data, speed data, and origin and destination data showing travel patterns between McKee and KY 30 to the south. Improving the existing routes from KY 290 to KY 30, as well as a potential new route were discussed as the direction for potential improvement concepts. Based on the existing geometrics, the Project Team decided not to evaluate improving KY 578, but to move forward with the route along KY 3630 from KY 290 to KY 3444 and KY 3444 to KY 30. The Project Team decided not to look at KY 30. The Project Team also planned for the first local elected officials and stakeholders (LO/S) meeting and the public survey.

6.2 Local Elected Officials & Stakeholders Meeting #1

The Project Team reached out to LO/S to obtain feedback about known issues along the corridor at the beginning of the project. The first LO/S meeting was held at the Jackson County Fiscal Court Building on May 31, 2023, at 10:30 AM. Attendees included the Mayor of McKee, the State Representative, and leaders from engineering, the county bus garage, Jackson Energy, the Jacson County-McKee Industrial Development Authority, and JC Tec Industries. The Project Team shared an overview of existing conditions throughout the study area. Attendees were able to identify areas of concern as well as potential opportunities and solutions in an interactive discussion with the Project Team.

6.3 Public Survey

A public survey was created using MetroQuest to obtain feedback from users and nearby residents regarding priorities and concerns in the study area, as well as ideas and opportunities for improvement. The survey was open for responses between June 27 and August 1, 2023, and was posted on the District 11 website and distributed by postcard to area residences and shared on social media. There were 310 responses to the survey.

Respondents identified safety as the top priority, and many of the safety concerns were identified around two main hot spots at the Laurel Creek Road and Laurel Fork Road intersections with KY 290. Sharp curves and narrow lanes were the main types of safety concerns in these locations. Major identified roadway needs included added shoulders and passing lanes.

Detailed results from the survey can be found in the Public Survey Memo in **Appendix E**. The Project Team used information gathered from the survey to develop potential improvement concepts.

6.4 Project Team Meeting #2

A second Project Team Meeting was held on August 9, 2023, at 10:30 AM. This was a hybrid virtual and in person meeting. The purpose of this meeting was to present the initial list of potential improvement concepts. The Project Team provided feedback on which concepts to advance for further detailed evaluation and which to remove from consideration.

6.5 Project Team Meeting #3

The third Project Team Meeting was held on October 4, 2023, at 8:30 AM. This was a hybrid virtual and in person meeting. The Consultant Team presented the findings of the detailed evaluation of potential improvement concepts, which included a safety analysis, environmental and right-of-way impacts, as well as cost estimates and a benefit-cost analysis. Potential improvements included spot improvement concepts, full corridor concepts, and a comparison of a new route from KY 3630 to KY 30 with improving existing routes. The Project Team decided which concepts to remove from further consideration and which to present at the second LO/S meeting.

6.6 Local Elected Officials & Stakeholders Meeting #2

The second LO/S meeting was held on November 13, 2023, at 10:30 AM. at the Jackson County Courthouse. Attendees included the Judge Executive, representatives of the Jackson County Schools Transportation Department, Kentucky District 89 Representative, Jackson Energy, and the Jackson County/McKee Industrial Development Authority. The Project Team presented the final list of potential improvement concepts, along with information about safety benefits, environmental and right-of-way impacts, and cost estimates.

Concepts were divided into Short-Term, Long-Term, Full Corridor and New Connections, and attendees were invited to participate in a "dot exercise" in which attendees placed colored dots on images of preferred short- and long-term concepts. Green dots indicated top priority projects, blue dots indicated second priority projects, yellow dots indicated third priority projects, and red dots indicated projects that should be removed from consideration. The Project Team used the feedback to decide the final list of improvement concepts to recommend in the report, as well as the prioritization of those concepts.

7 Development of Potential Improvement Concepts

Using the existing conditions, safety analysis, input from LO/S, and the public survey, an initial list of potential improvement concepts was developed. A high-level analysis of each concept was performed, determining the following:

1. **Time Frame:** Short-term or long-term
2. **Cost:** Low, medium, or high
3. **Safety:** Existing safety concerns
4. **Right-of-Way:** Potential need for right-of-way – low, medium, or high
5. **Stakeholder Input:** Location of concern identified by stakeholders
6. **Environment:** Potential environmental issues

During Project Team Meeting #2, the Project Team decided not to move forward with certain options based on the information presented and discussed (meeting minutes are included in **Appendix E**). This list is shown in **Table 12**. Concepts highlighted in red were those that the Project Team decided not to evaluate further. Following the initial screening by the Project Team, the concept designations and nomenclature were revised for future evaluation.

In addition to potential improvement concepts along the KY 290 corridor, the Consultant Team also presented improvements to the existing routes (KY 3630 to KY 3444) that are used to connect to KY 30, as well as three options for a new corridor between KY 3630 and KY 30. The initial analysis of these options is shown in **Table 13**.

The three concepts for a new corridor are shown in **Figures 30** through **32**. Each of the concepts is illustrative to study the feasibility and do not represent a proposed alignment. The Project Team decided not to move forward with Option 3 of the new potential routes since it was the longest of the routes and would be the most expensive. A roundabout at the intersection of KY 290 and KY 3630 was also presented as a potential improvement concept with the new corridor, which the Project Team decided to keep for further evaluation.

Table 12: Initial List of Potential Improvement Concepts

MP	Location	Description	Short-Term	Long-Term	Cost	ROW Req'd	Safety Issues
8.85	US 421 intersection	Convert to 4-way stop or mini roundabout, or continuous right turns (consider peds - Australian RT)?	X	X	Medium Low	Low	1 Opposing left turn - PDO 1 Rear end - PDO Wet Pavement Crashes = 2
8.85	US 421 intersection	Crosswalks at intersection, including ramps and curbing at the crossing location	X		low	N/A	No reported pedestrian crashes
8.83-8.85	Just south of US 421	Change parking to parallel and connect sidewalk on east side	X		low	N/A	1 Backing - PDO
8.726	Old School Road	Bump out at Old School Road to tighten up intersection / thermo striping	X		Low	N/A	No reported crashes
8.545-8.6	Park	Curb and gutter at the park (on east side) / shave hill back on west side / connect side walk up to Fire Station, vehicular traversable sidewalk across fire department entrances	X		Medium	Low	No reported crashes
8.4		Transverse rumble strips approaching McKee / congested area adivsory speed to 25 mph	X		low	N/A	1 Single Vehicle - PDO Wet Pavement Crashes = 1
8.0-8.4		Widen road and straighten out/level road		X	High	High	1 Angle - Severe Injury 1 Sideswipe Opposite Direction - PDO 9 Single Vehicle (1 animal) - 1 B, 8 PDO Wet Pavement Crashes = 9
7.5-7.85	Option 1	New alignment to go around curvature - south of Tower Road to the north above curves - make local road for bike/ped connectivity		X	High	High	1 Sideswipe Opposite Direction - C 3 Single Vehicle - 2 C, 1 PDO Wet Pavement Crashes = 4
7.4-8.2	Option 2			X	High	High	
7.5-7.85		Widen road and straighten out/level road		X	High	High	1 Sideswipe Opposite Direction - C 3 Single Vehicle - 2 C, 1 PDO Wet Pavement Crashes = 4
6.35-7.0	North of Indian Ridge	Add passing lanes		X	Medium High	Medium	1 Rear End - PDO 1 Sideswipe Opposite Direction - PDO 1 Sideswipe Same Direction - PDO 1 Opposing Left Turn - PDO 3 Single Vehicle - 1 B, 2 PDO Wet Pavement Crashes = 1
~6.3		Improve pull-off for school bus	X		Low	Low	No reported crashes
6.255		Realign Indian Ridge Road intersection / add signage	X		Low	Low	No reported crashes
6.19-6.26		Straighten out curves at Indian Ridge Road		X	Medium	Medium	1 Single Vehicle - PDO Wet Pavement Crashes = 1

Table 12 Cont'd: Initial List of Potential Improvement Concepts

MP	Location	Description	Short-Term	Long-Term	Cost	ROW Req'd	Safety Issues
4.71-6.22		Realign curves in high crash cluster area / curve widening, high friction surface treatment		X	High	High	1 Angle - K 1 Sideswipe Opposite Direction - PDO 10 Single Vehicle (1 animal) - 2 B, 1 C, 7 PDO Wet Pavement Crashes = 4
4.711-4.757		Shave back hillside and cut vegetation @ Mill Creek and Lower Atkinstown	X		Medium	Medium	3 Single Vehicle (2 animal) - 1 C, 2 PDO
4.711-4.757		Intersection warning signage @ Mill Creek and Lower Atkinstown	X		low	N/A	No intersection related crashes at either intersection
4.699		Add end treatments to bridge	X		low	Low	No reported crashes at bridge
4.699		Replace bridge with a wider one		X	High	Medium	No reported crashes at bridge
4.699		New bridge on new alignement and split lanes		X	Medium	Medium	No reported crashes at bridge
4.65-6.1 or 4.2-6.25		Full new alignment from North of bridge to south of Indian Ridge		X	High	High	1 Angle - K 1 Sideswipe Opposite Direction - PDO 12 Single Vehicle (2 animal) - 2 B, 2 C, 8 PDO Wet Pavement Crashes = 4
4.65-6.1 or 4.2-6.26		Full new alignment from south of bridge to south of Indian Ridge		X	Very High	High	2 Angle - K 1 Sideswipe Opposite Direction - PDO 12 Single Vehicle (2 animal) - 2 B, 2 C, 8 PDO Wet Pavement Crashes = 4
2.6-3.589		TWLTL through the section / curb and gutter		X	High	High	3 Angle - 1 C, 2 PDO 7 Single Vehicle (5 animal) - 1 B, 1 C, 5 PDO
2.6		Mildred Road intersection (remove access point? Anything else?)	X		Low	N/A	No reported crashes at intersection or access point to cemetary
1.941		Ridgewood Drive - improve skew (N) and sight distance (S)	X		Low	Low	No reported crashes at intersection
1.524-1.551		Improve sight distance @ Bailey and KY 2003 via mainline improvements / vegetation control		X	HIgh	High	No reported crsahes at intersections
1.1-1.7		Realign 290 @ Bailey / combine KY 2003 and Alum Branch together for 1 access point / Continue south past KY 578		X	High	High	1 angle - PDO 1 Head On - C 1 Rear End - PDO 8 Single Vehicle (1 animal) - 1 B, 1 C, 6 PDO Wet Pavement Crashes = 2
1.114-1.6		Realign KY 290 between KY 578 and Bailey / keep Bailey and KY 2003 separate but realign each intersection		X	High	High	
1.1-1.7		Realign KY 290 @ Bailey / T-intersection at KY 2003 separat from Bailey / realign KY 290 @ KY 578		X	High	High	
0.0-0.2	KY 3630	Transverse rumbles thermo restriping, HFST, solar powered warning signage approaching KY 3630	X		low	N/A	No reported crashes at intersection
0-8.85	Full Corridor	11' lanes, 2' shoulders, 45 mph design speed, update signing, striping, guardrail, etc.		X	High	High	
0-8.85	Full Corridor	11' lanes, 2' shoulders, 55 mph design speed, update signing, striping, guardrail, etc.		X	Very High	High	

Table 13: Initial List of Improvements to Existing Routes and New Routes from KY 290 to KY 330

Roadway	Location	Description	Cost	ROW Req'd	Safety Issues
KY 3630	KY 290 to KY 3444	Add TWLTL / Access control	High	Medium	1 Sideswipe Same Direction - PDO 2 Sideswipe Opposite Direction - 1 B, 1 PDO 1 Opposing Left Turn - PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2
KY 3444		Improve to match KY 290 typical	Medium	Medium	5 Angle (4 at KY 30 intersection) - 1 B, 4 PDO 1 Sideswipe Opposite Direction - 1 PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2
KY 290		Roundabout @ KY 290 / KY 3630	Medium	Low	2 Single Vehicle - 2 PDO KY 3630 approaches
New Alignment	KY 3630 to KY 30	Option 1	High	High	
New Alignment	KY 3630 to KY 30	Option 2	High	High	
New Alignment	KY 3630 to KY 30	Option 3	High	High	

Figure 30: Potential New Route from KY 290 to KY 30 – Option 1

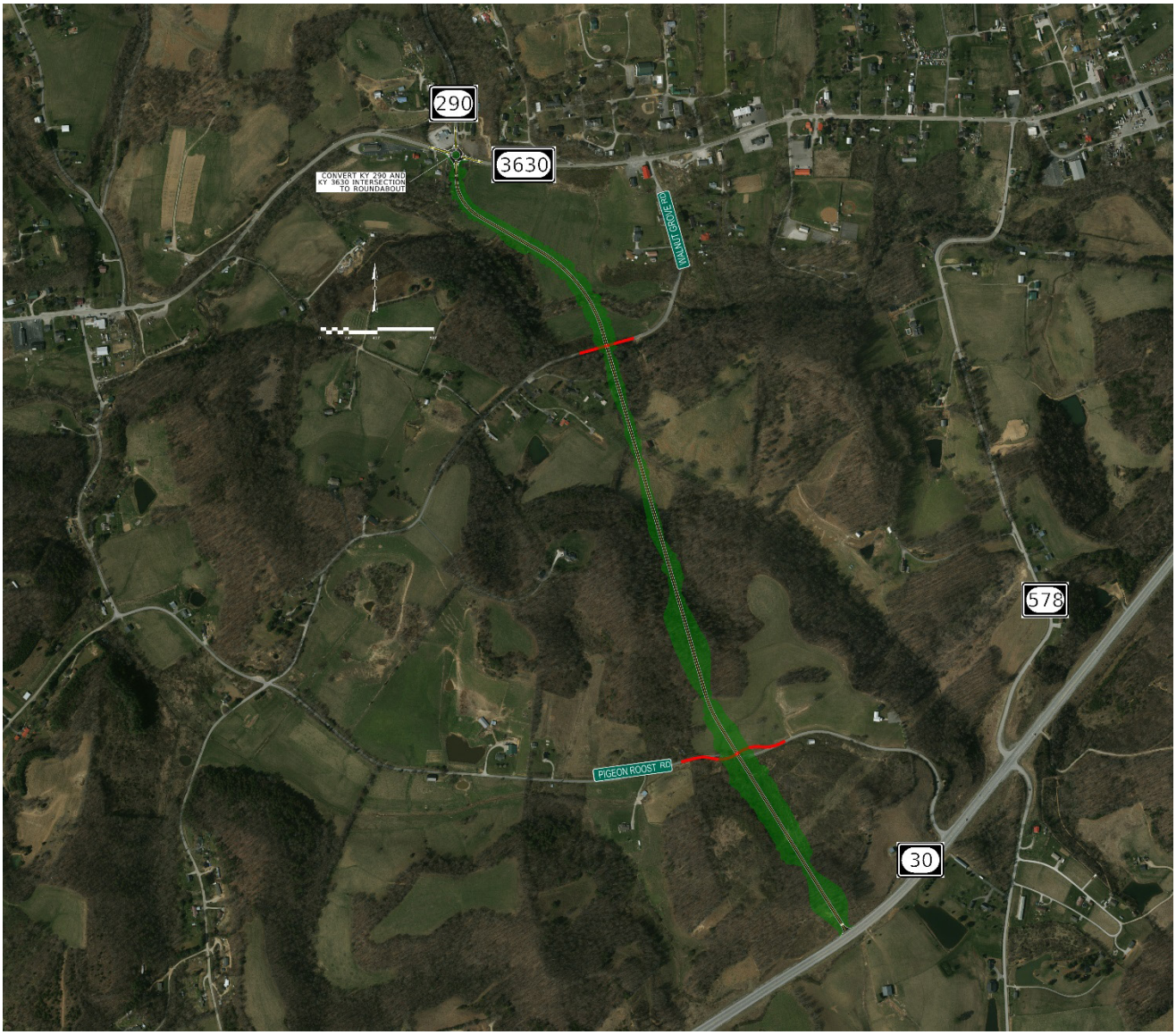


Figure 31: Potential New Route from KY 290 to KY 30 – Option 2

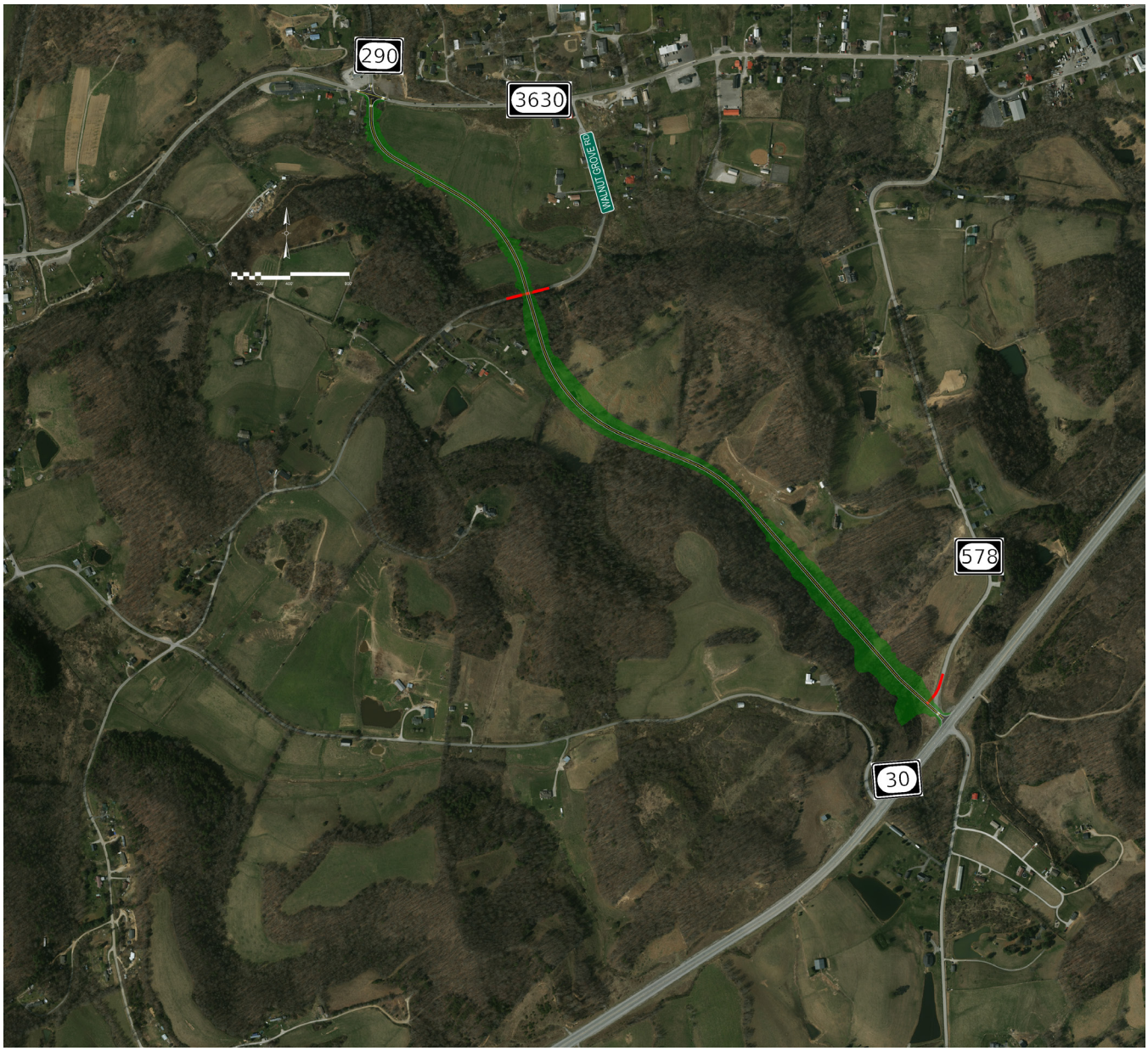
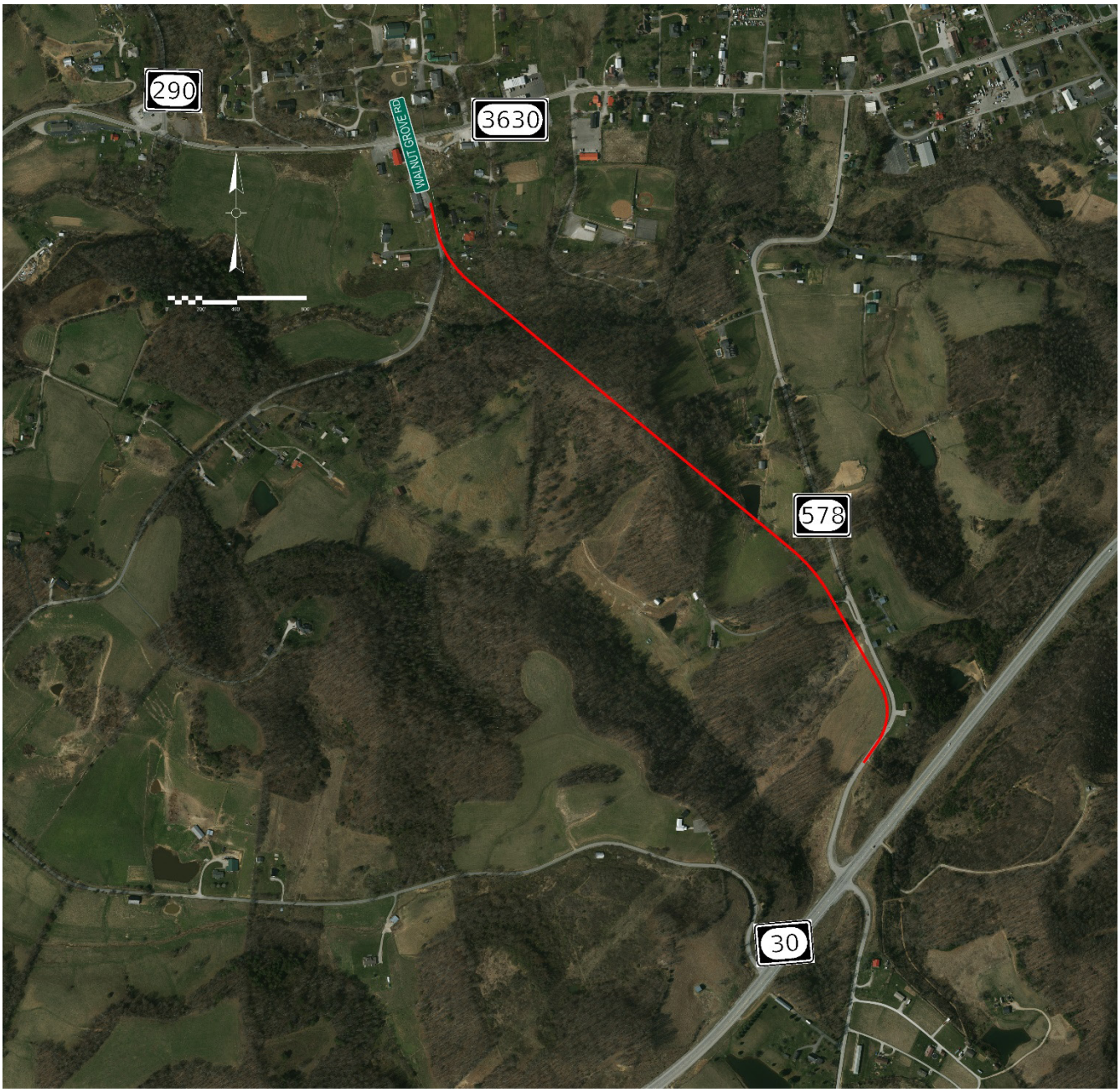


*Figure 32: **Potential New Route from KY 290 to KY 30 – Option 3***



(This page intentionally left blank)

8 Evaluation of Potential Improvement Strategies

8.1 KY 290 Potential Improvement Concepts

The initial list of improvement concepts was shortened based on the feedback from the Project Team to a more refined list for a detailed evaluation. Each potential improvement concept was evaluated with respect to safety, right-of-way impacts, environmental impacts, and cost estimates. This included Design, Right-of-Way, Utility, and Construction cost estimates (in 2023 dollars), as well as an escalated cost in 2033 dollars for longer-term projects. A predictive safety analysis was performed to estimate the potential reduction in crashes over a 20-year period that each improvement concept could provide. This analysis used Crash Modification Factors (CMFs) that were directly applied to applicable historic crashes. Applicable CMFs were identified from the Highway Safety Manual or the CMF Clearinghouse[3] and were used to estimate the number of crashes prevented over a 20-year period. A planning-level benefit-cost analysis was conducted to determine the value each improvement concept provided. This analysis used the predicted 20-year crash reduction, and the construction cost estimates. The value of crashes prevented were based on United States Department of Transportation (USDOT) average crash cost (in 2021 dollars) by crash severity. The final safety benefit was discounted to account for the present value of future dollars (7% per year for 20 years).

This information was presented at Project Team Meeting #3, along with conceptual drawings for each, and a summary table, all of which are provided in **Appendix F**.

8.2 Potential Improvement Concepts from KY 290 to KY 30

In addition to evaluating improvement concepts along KY 290, a detailed evaluation was performed to compare the cost and benefits of improving the existing route from the southern end of KY 290 to KY 30 via KY 3630 and KY 3444, as well as a new corridor. Two concepts for the new corridor were examined to explore feasibility.

Each of the concepts was evaluated based on estimated costs, right-of-way impacts, environmental impacts, and estimated travel times. The safety benefit of improving the existing route was also evaluated. A roundabout at KY 290 and KY 3630 was included as its own item so that the costs and benefits could be evaluated independently, and the Project Team could decide if the roundabout should be included in either the existing route improvements or the new corridor options. **Figures 33** and **34** show the potential improvements along KY 3630 and KY 3444 respectively. **Figures 35** and **36** show the two potential new corridors.

3 http://www.cmfclearinghouse.org/

Figure 33: Potential Improvements to KY 3630

Figure 34: Potential Improvements to KY 3444

Figure 35: New Route Option 1 – Western Corridor Concept

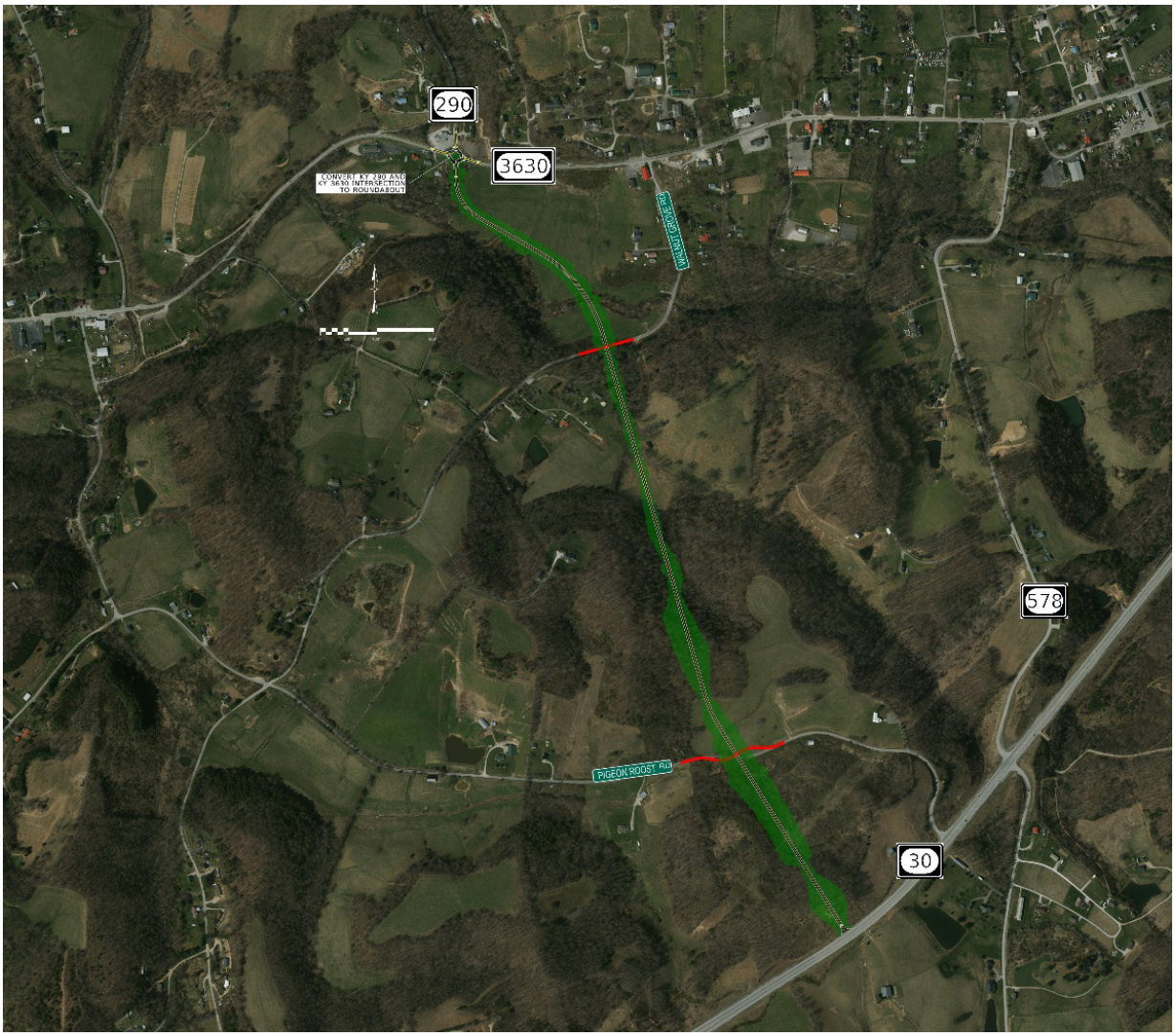
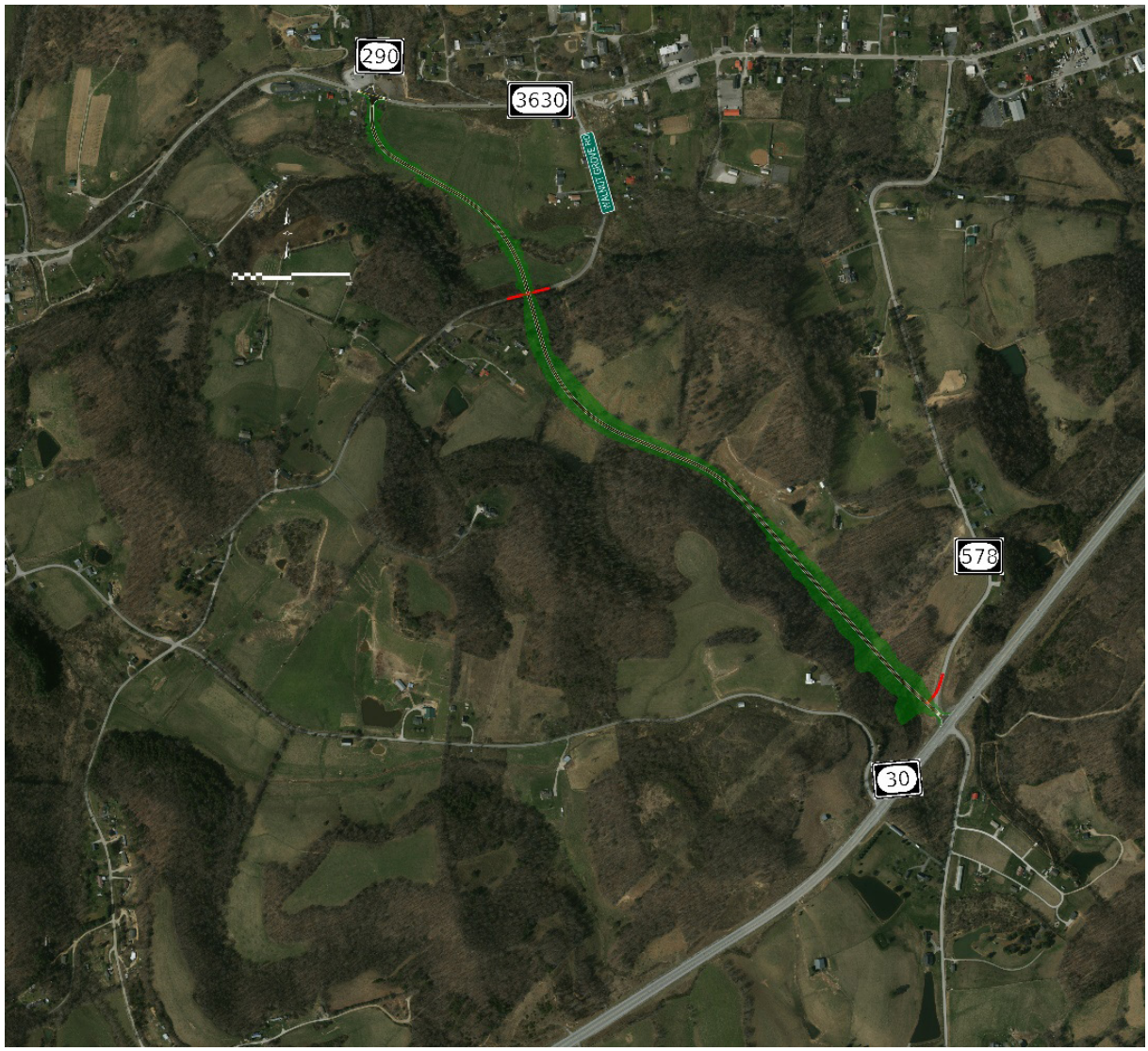


Figure 36: New Route Option 2 – Eastern Corridor Concept



8.3 Refinement of Improvement Concepts

The Project Team decided to remove from further consideration cost prohibitive concepts that would not provide significant benefit. The remaining concepts were separated into short-term and long-term categories to present to the LO/S, and some concepts were combined. The short-term concepts were considered those that could be funded through mechanisms other than Kentucky's Enacted Highway Plan (Highway Plan). The long-term improvement concepts that were sub-sections of the full-corridor concept were updated to include an evaluation for both a 45 mph and 55 mph design speed. **Table 14** shows the list of short-term improvement concepts that were presented to the stakeholders, **Table 15** shows the list of long-term improvement concepts, **Table 16** shows the two full-corridor improvement concepts, and **Table 17** shows the comparison of improving the existing routes of KY 3630 and KY 3444 between KY 290 and KY 30 to the new corridor option.

Table 14: KY 290 Short-Term Potential Improvement Concepts

Priority	Number	MP	Location	Description	2023 Cost ($) Total	2023 Cost ($) Design	2023 Cost ($) ROW	2023 Cost ($) Utilities	2023 Cost ($) Construction	ROW req'd	Safety Benefit	Discounted Crash Cost ($)	B/C	Environmental	CMF / Severity	Overall Crash Reduction %	Total 20-Year Reduction
Medium	ST-1	8.85	US 421 intersection	Convert intersection to a mini roundabout	$735,000	$60,000	$0	$75,000	$600,000	Low	KY 290 Only: 2 total (2O) 1 Opposing left turn - PDO 1 Rear end - PDO Wet Pavement Crashes = 2 Whole Intersection: 7 total (1C, 6O) 3 Angle, 2 Rear End, 1 Opp LT, 1 Backing	$660,815	0.90	Possible Historic, Floodplain, UST/ HAZ	0.65 / All	35%	9.80
Medium	ST-2	8.85	US 421 intersection	Crosswalks at intersection, including ramps, curbing, and pedestrian signals at the crossing location	$19,910	$1,810	$0	$0	$18,100	N/A	No reported pedestrian crashes	$0	0.00	Possible Historic, Floodplain	None	0%	0.00
Low	ST-3	8.83-8.85	Just south of US 421	Add sidewalk between parking and KY 290 (see example from Frankfort).	$9,020	$820	$0	$0	$8,200	N/A	No reported pedestrian crashes	$0		NONE	None	0%	0.00
Low	ST-4	8.726	Old School Road	Bump out at Old School Road to tighten up intersection / thermo striping	$42,100	$3,800	$0	$0	$38,300	N/A	No reported crashes	$0	0.00	UST/HAZ (Brownfields), Place of Worship	None	0%	0.00
Medium	ST-5	8.545-8.6	Park	Curb and gutter at the park (on east side) / shave hill back on west side / connect side walk up to Fire Station, vehicular traversable sidewalk across fire department entrances	$636,000	$47,000	$80,000	$35,000	$474,000	Low	No reported crashes	$0	0.00	Archaeology (ROW), Section 4(f) (Park), Tree Removal (Bats),	0.59 / All	0%	0.00
Medium	ST-6	8.4		Transverse rumble strips approaching McKee / congested area advisory speed to 25 mph	$8,250	$750	$0	$0	$7,500	N/A	1 Single Vehicle - PDO Wet Pavement Crashes = 1	$50,301	6.10	NONE	0.785 / KAB	20%	0.81
Medium	ST-7	~6.3		Improve pull-off for school bus	$31,900	$2,900	$0	$0	$29,000	Low	No reported crashes	$0	0.00	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	None	0%	0.00
Low	ST-8	6.255		Realign Indian Ridge Road intersection / add signage	$308,000	$28,000	$0	$0	$280,000	Low	No reported crashes	$0	0.00	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	0.90 / All	0%	0.00
High	ST-9	5.2-5.55		Add High Friction Surface Treatment to Existing Curves	$978,000	$89,000	$0	$0	$889,000	N/A	5 Crashes	$1,015,875	1.04	NONE	0.584 / All	42%	8.32
High	ST-10	4.711-4.757		Shave back hillside and cut vegetation @ Mill Creek and Lower Adkinstown / Intersection warning signage @ Mill Creek and Lower Adkinstown / Add end treatments to bridge	$397,000	$31,000	$52,000	$0	$314,000	Medium	1 Single Vehicle (animal, PDO)	$179,290	0.45	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats), Cemetery, Special Use Water	0.28 / All	72%	2.88
Low	ST-11	2.6		Mildred Road intersection (remove access point)	$8,200	$800	$0	$0	$7,400	N/A	No reported crashes at intersection or access point to cemetary	$0	0.00	Cemetery	0.76/ All	0%	0.00
Low	ST-12	1.941		Ridgewood Drive - improve sight distance (S)	$29,600	$1,200	$16,000	$0	$12,400	N/A	No reported crashes at intersection	$0	0.00	Archaeology (ROW)	0.57 / All	0%	0.00
High	ST-13	0.0-0.2	KY 3630	Transverse rumbles thermo restriping, HFST, solar powered warning signage approaching KY 3630	$80,300	$7,300	$0	$0	$73,000	N/A	No reported crashes approaching intersection 2 SV PDO crashes on KY 3630 near intersection	$0	0.00	NONE	"0.798 / KAB 0.76 / All 0.95 / All"	0%	0.00

Table 15: KY 290 Long-Term Potential Improvement Concepts

ID	MP	Description	2033 Cost ($) Total	2023 Cost ($) Total	2023 Cost ($) Design	2023 Cost ($) ROW	2023 Cost ($) Utilities	2023 Cost ($) Construction	ROW req'd	Safety Benefit	Discounted Crash Cost ($)	B/C	Environmental	CMF / Severity	Overall Crash Reduction %	Total 20-Year Reduction
LT-1A	8.0-8.4	Widen road and straighten out/level road - 55 mph design speed	$3,270,000	$2,370,000	$170,000	$200,000	$300,000	$1,700,000	High	1 Angle - Severe Injury 1 Sideswipe Opposite Direction - PDO 9 Single Vehicle (1 animal) - 1 B, 8 PDO Wet Pavement Crashes = 9	$20,418,749	8.62	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	varies	39%	16.94
LT-1B	8.0-8.4	Widen road and straighten out/level road - 45 mph design speed	$2,600,000	$1,900,000	$140,000	$160,000	$200,000	$1,400,000	High	1 Angle - Severe Injury 1 Sideswipe Opposite Direction - PDO 9 Single Vehicle (1 animal) - 1 B, 8 PDO Wet Pavement Crashes = 9	$20,091,820	10.57	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	varies	39%	17.37
LT-2A	7.5-7.85	Widen road and straighten out/level road - 55 mph design speed	$5,260,000	$4,060,000	$240,000	$920,000	$500,000	$2,400,000	High	1 Sideswipe Opposite Direction - C 3 Single Vehicle - 2 C, 1 PDO Wet Pavement Crashes = 4	$730,186	0.18	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	varies	52%	8.25
LT-2B	7.5-7.85	Widen road and straighten out/level road - 45 mph design speed	$3,780,000	$2,780,000	$190,000	$390,000	$300,000	$1,900,000	High	1 Sideswipe Opposite Direction - C 3 Single Vehicle - 2 C, 1 PDO Wet Pavement Crashes = 4	$682,393	0.25	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	varies	46%	7.43
LT-3	6.35-7.0	Add passing lanes	$5,730,000	$3,610,000	$300,000	$160,000	$150,000	$3,000,000	Medium	1 Rear End - PDO 1 Sideswipe Opposite Direction - PDO 1 Sideswipe Same Direction - PDO 1 Opposing Left Turn - PDO 2 Single Vehicle - 1 B, 1 PDO Wet Pavement Crashes = 1	$546,423	0.15	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats),	0.58 / KABC	8%	1.68
LT-4A	4.71-6.22	Realign curves in high crash cluster area / curve widening, high friction surface treatment - 55 mph design speed	$7,430,000	$5,330,000	$410,000	$520,000	$300,000	$4,100,000	High	1 Angle - K 1 Sideswipe Opposite Direction - PDO 9 Single Vehicle - 2 B, 1 C, 7 PDO Wet Pavement Crashes = 4	$1,195,505	0.22	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats), Special Use Water	varies	32%	14.18
LT-4B	4.71-6.22	Realign curves in high crash cluster area / curve widening, high friction surface treatment - 45 mph design speed	$6,820,000	$4,920,000	$380,000	$440,000	$300,000	$3,800,000	High	1 Angle - K 1 Sideswipe Opposite Direction - PDO 9 Single Vehicle - 2 B, 1 C, 7 PDO Wet Pavement Crashes = 4	$1,123,622	0.23	Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats), Special Use Water	varies	27%	11.84
LT-5	2.6-3.589	TWLTL through the section / curb and gutter	$10,120,000	$7,420,000	$530,000	$840,000	$750,000	$5,300,000	High	3 Angle - 1 C, 2 PDO 7 Single Vehicle (5 animal) - 1 B, 1 C, 5 PDO	$1,379,528	0.19	Archaeology (ROW), Places of Worship, Tree Removal (Bats), UST/HAZ, Cemetery	0.64 / All	36%	14.40
LT-6A	1.524-1.551	Improve sight distance @ Bailey and KY 2003 via mainline improvements / vegetation control	$4,990,000	$3,590,000	$270,000	$320,000	$300,000	$2,700,000	High	No reported crsahes at intersections	$737,128	0.21	Archaeology (ROW), Tree Removal (bats), Stream Crossing,	varies	45%	3.62
LT-6B	1.1-1.7	Realign 290 @ Bailey / combine KY 2003 and Alum Branch together for 1 access point / Continue south past KY 578	$16,700,000	$11,800,000	$1,000,000	$800,000	$300,000	$9,700,000	High	1 angle - PDO 1 Head On - C 1 Rear End - PDO 8 Single Vehicle (1 animal) - 1 B, 1 C, 6 PDO Wet Pavement Crashes = 2	$1,649,677	0.14	Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands	varies	36%	15.86
LT-6C	1.1-1.7	Realign KY 290 @ Bailey / T-intersection at KY 2003 separat from Bailey / realign KY 290 @ KY 578	$20,130,000	$9,130,000	$730,000	$800,000	$300,000	$7,300,000	High		$2,090,645	0.23	Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands	varies	49%	21.44
LT-6D	1.1-1.7	Improve KY 290 to 11-foot lanes, 2-foot shoulders, and 45-mph design speed	$18,740,000	$13,240,000	$1,100,000	$640,000	$500,000	$11,000,000	High	3 SV ROR (1B, 1C, 1 PDO) 1 Head On (C) 3 Sideswipe Opp (PDO) 1 SV Fixed Obj (PDO) 1 Rear End (PDO) 1 Angle at KY 578 (PDO) Wet Pavement Crashes = 2	$2,021,742	0.15	Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands	varies	52%	20.88

Table 16: KY 290 Full-Corridor Improvement Concepts

MP	Description	2033 Cost ($) Total	2023 Cost ($) Total	2023 Cost ($) Design	2023 Cost ($) ROW	2023 Cost ($) Utilities	2023 Cost ($) Construction	ROW req'd (acres)	Discounted Crash Cost ($)	B/C	Environmental	CMF / Severity	Overall Crash Reduction %	Total 20-Year Reduction
0-8.85	11' lanes, 2' shoulders, 45 mph design speed, update signing, striping, guardrail, etc.	$66,200,000	$44,100,000	$3,800,000	$1,200,000	$1,000,000	$38,100,000	30	$19,816,757	0.30	Archaeology (ROW), Tree Removal (bats), Stream Crossing, Floodplain, Possible Historic UST/HAZ, Special Use Water, Places of Worship, Cemetery, Section 4(f) (Park, WMA), Wetlands,	0.835 / All Varies	37%	122.62
0-8.85	11' lanes, 2' shoulders, 55 mph design speed, update signing, striping, guardrail, etc.	$83,100,000	$55,400,000	$4,800,000	$1,600,000	$1,000,000	$48,000,000	40	$20,138,874	0.28	Archaeology (ROW), Tree Removal (bats), Stream Crossing, Floodplain, Possible Historic UST/HAZ, Special Use Water, Places of Worship, Cemetery, Section 4(f) (Park, WMA), Wetlands,	0.835 / All Varies	40%	134.29

Table 17: Comparison of Improving Existing Route to New Corridor between KY 290 and KY 30

Route	Description	2033 Cost ($)	2023 Cost ($)	2023 Cost ($) Design	2023 Cost ($) ROW	2023 Cost ($) Utilities	2023 Cost ($) Construction	ROW req'd (acres)	Property Takes	Safety Benefit	Discounted Crash Cost ($)	B/C	Environmental	CMF / Severity	Overall Crash Reduction %	Total 20-Year Reduction
KY 3630	Add TWLTL / Access control	$10,400,000	$6,900,000	$660,000	$640,000	$1,200,000	$4,400,000	8		1 Sideswipe Same Direction - PDO 2 Sideswipe Opposite Direction - 1 B, 1 PDO 1 Opposing Left Turn - PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2	$175,211	0.03	Archaeology (ROW), Tree Removal (bats), UST/HAZ, Stream Crossings, Places of Worship, Possible Historic,	0.686 / All	31%	10.05
KY 3444	Improve to match KY 290 typical	$3,130,000	$2,090,000	$170,000	$320,000	$500,000	$1,100,000	8		5 Angle (4 at KY 30 intersection) - 1 B, 4 PDO 1 Sideswipe Opposite Direction - 1 PDO 4 Single Vehicle - 4 PDO Wet Pavement Crashes = 2	$23,200	0.01	Archaeology (ROW), Tree Removal (bats), Floodplain, UST/HAZ, Stream Crossings, Places of Worship	"1.00 / KAB 0.89 / CO"	10%	3.96
KY 290	Roundabout @ KY 290 / KY 3630	$1,980,000	$1,320,000	$140,000	$80,000	$200,000	$900,000	2		2 Single Vehicle - 2 PDO KY 3630 approaches 1 Backing/Parking Lot PDO	$27,183	0.02	Archaeology (ROW), Tree Removal (bats), UST/HAZ	0.42 / All	58%	4.64
New Alignment	Option 1	$42,500,000	$28,300,000	$3,400,000	$1,600,000	$500,000	$22,800,000	40	2				Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands, Floodplain, UST/HAZ			
New Alignment	Option 2	$27,500,000	$18,300,000	$2,200,000	$1,200,000	$500,000	$14,400,000	30	1				Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands, Floodplain, UST/HAZ			

The project team presented the refined list of improvement concepts to the LO/S. The stakeholders were given the opportunity to rank the concepts and give them a high, medium, and low priority ranking, as well as indicate if there were any concepts they did not want to see move forward. The feedback from the stakeholders along with the detailed analysis were used to make a prioritized list of recommendations to move forward in the project development process.

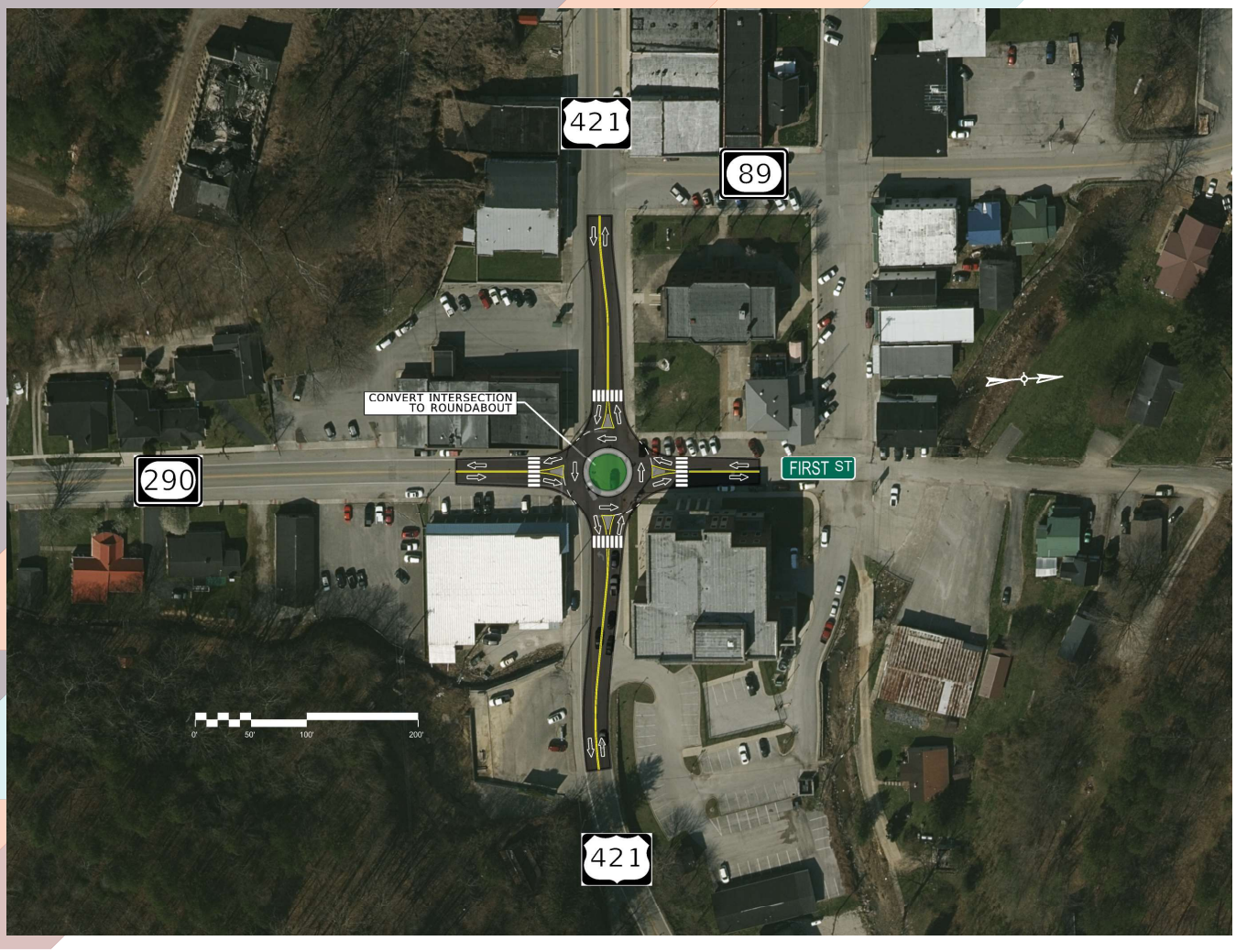
9 Study Recommendations

Using the feedback from the stakeholders along with the detailed evaluation of the potential improvement concepts, the project team prioritized the short-term and long-term potential improvement concepts. The project team agreed that the full-corridor projects would be cost prohibitive, and that moving the spot improvements forward would provide the greatest benefit to the corridor. Project sheets were created for each improvement concept that was recommended for future project development. Project sheets provide information on the issue identified, the improvement concept, the safety benefits and a cost estimate that includes Design, Right-of-Way, Utilities and Construction (DRUC) costs, as well the priority. Project sheets are included on the following pages.

A new route between KY 290 and KY 30 was supported by stakeholders, however the cost of constructing a new route is dramatically higher than improving the existing routes. Therefore, the Project Team recommends evaluating both a new corridor, and improving KY 3630 and KY 3444 in the future Phase I Design, allowing for more detailed evaluation and design to make the final decision. Based on LO/S feedback and the detailed evaluation, the Project Team determined that corridor to evaluate in Phase I Design is Option 2, the Eastern Corridor, shown in **Figure 36** (p.65).

ST-1

MEDIUM PRIORITY



ACTION

Convert intersection to a mini roundabout.

D: $60,000

R: $0

U: $75,000

C: $600,000

TOTAL COST (2023) **$735,000**

PURPOSE

Reduce crashes and improve operations at the US 421 and KY 290 intersection.

NEED

There have been seven crashes at the intersection in the past five years. The traffic signal causes delay due to the low volume of the intersection.

BENEFIT/COST RATIO: 0.88

RIGHT-OF-WAY REQUIRED: Low

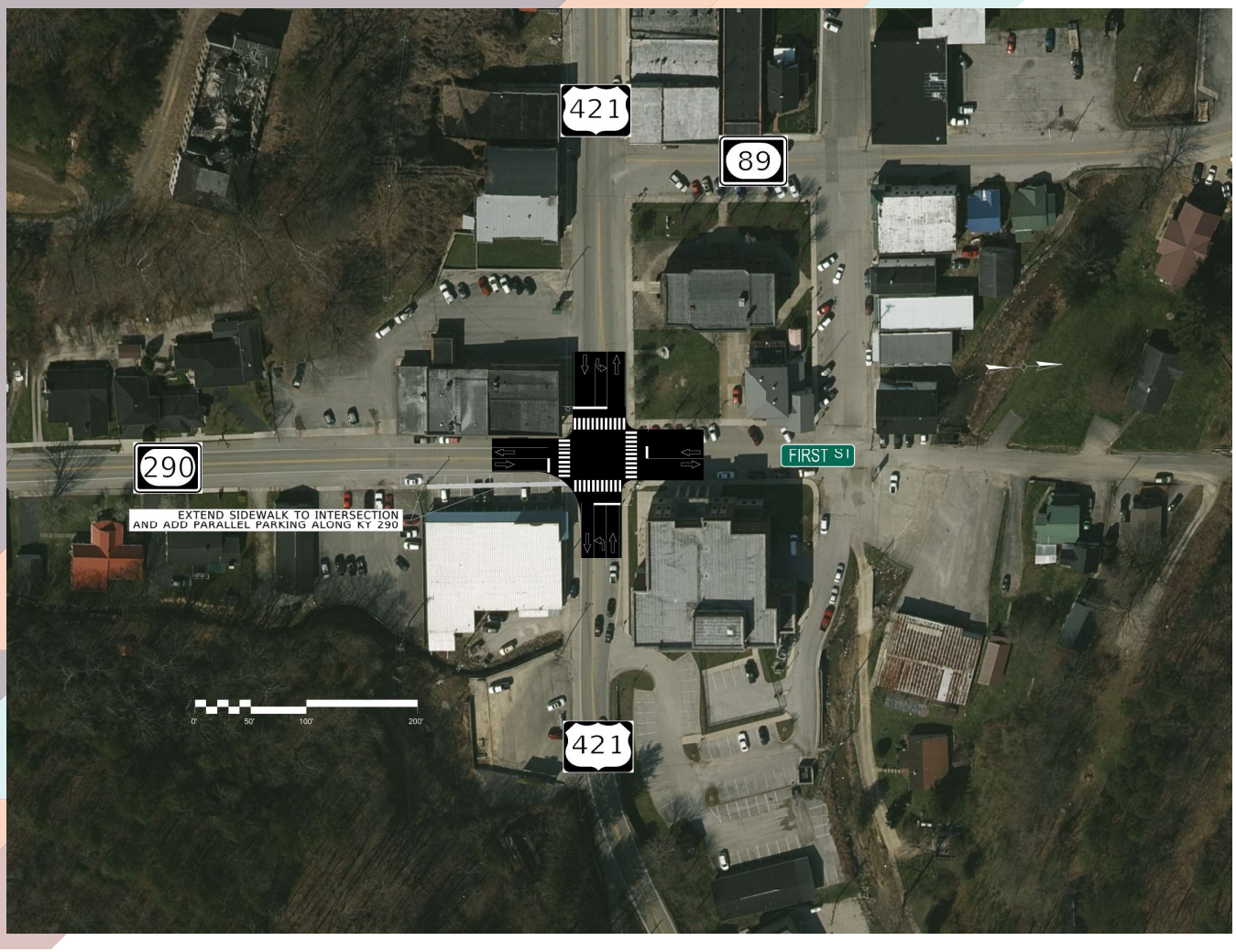
CRASH REDUCTION: 35.0%

TOTAL 20-YEAR REDUCTION: 9.8 Crashes

ENVIRONMENTAL CONSIDERATIONS: Possible Historic, Floodplain, UST/HAZ

ST-2

MEDIUM PRIORITY



ACTION

Construct crosswalks at intersection, including ramps, curbing, and pedestrian signals at the crossing location.

D: $1,800

R: $0

U: $0

C: $18,100

TOTAL COST (2023) **$19,900**

PURPOSE

Improve pedestrian safety at the US 421 and KY 290 intersection.

NEED

With on-street parking and retail and government buildings surrounding the intersection, there is high pedestrian activity.

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Possible Historic, Floodplain

ST-3

LOW PRIORITY

Action

Add sidewalk between parking and KY 290.

D: $820

R: $0

U: $0

C: $8,200

TOTAL COST (2023) **$9,020**

PURPOSE

Improve pedestrian safety along KY 290 approaching the US 421 intersection.

NEED

On street parking creates a gap in the sidewalk network.

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

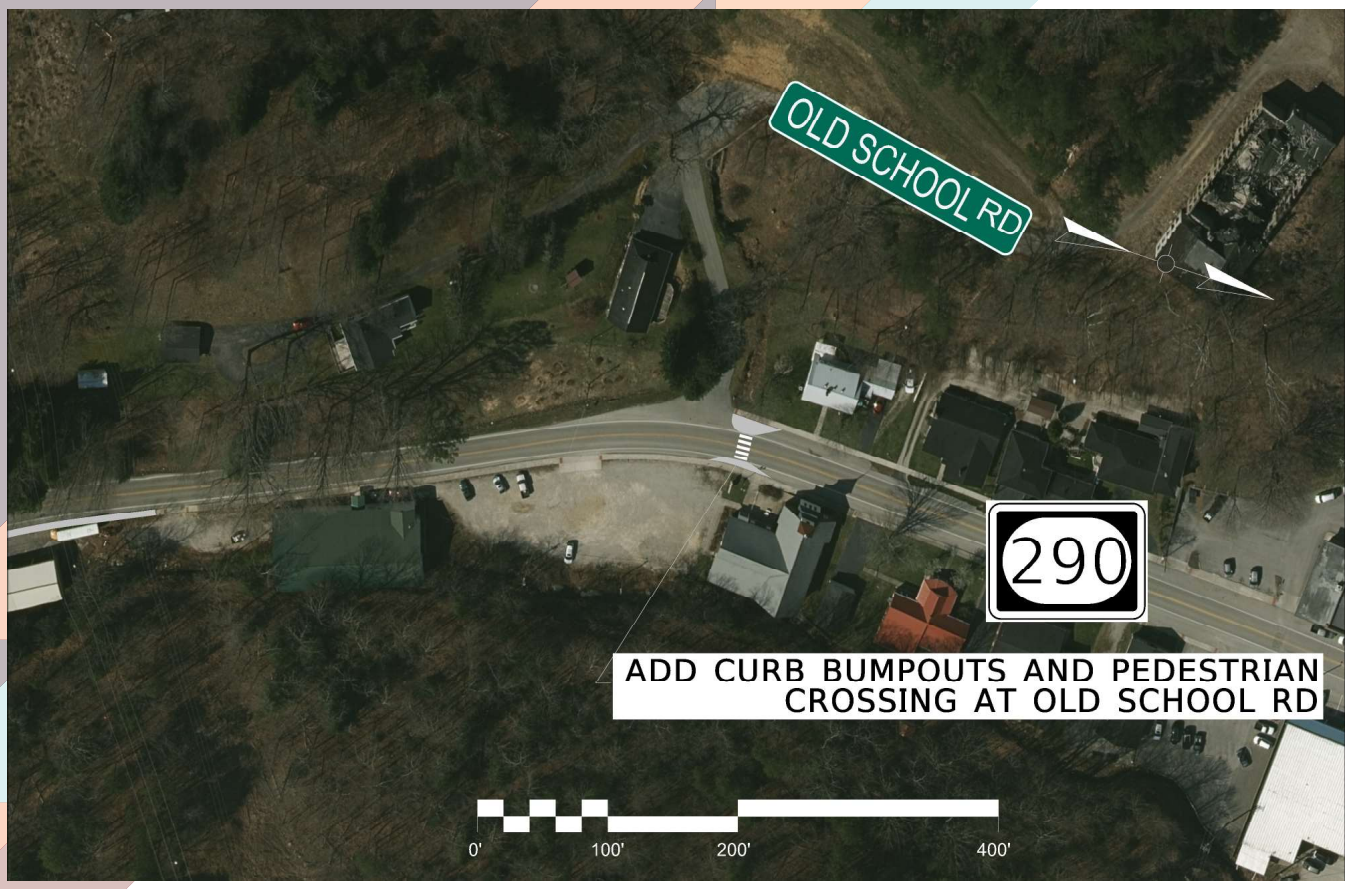
CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: N/A

ST-4

LOW PRIORITY



Action

Construct bump out at Old School Road to reduce crossing distance and add thermoplastic striping.

PURPOSE

Add traffic calming measures and improve pedestrian safety at MP 8.726 on KY 290 approaching McKee.

NEED

Visual queues to slow traffic and alert drivers to the presence of pedestrians will improve safety in the area.

D: $3,800

R: $0

U: $0

C: $38,300

TOTAL COST (2023) **$42,100**

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

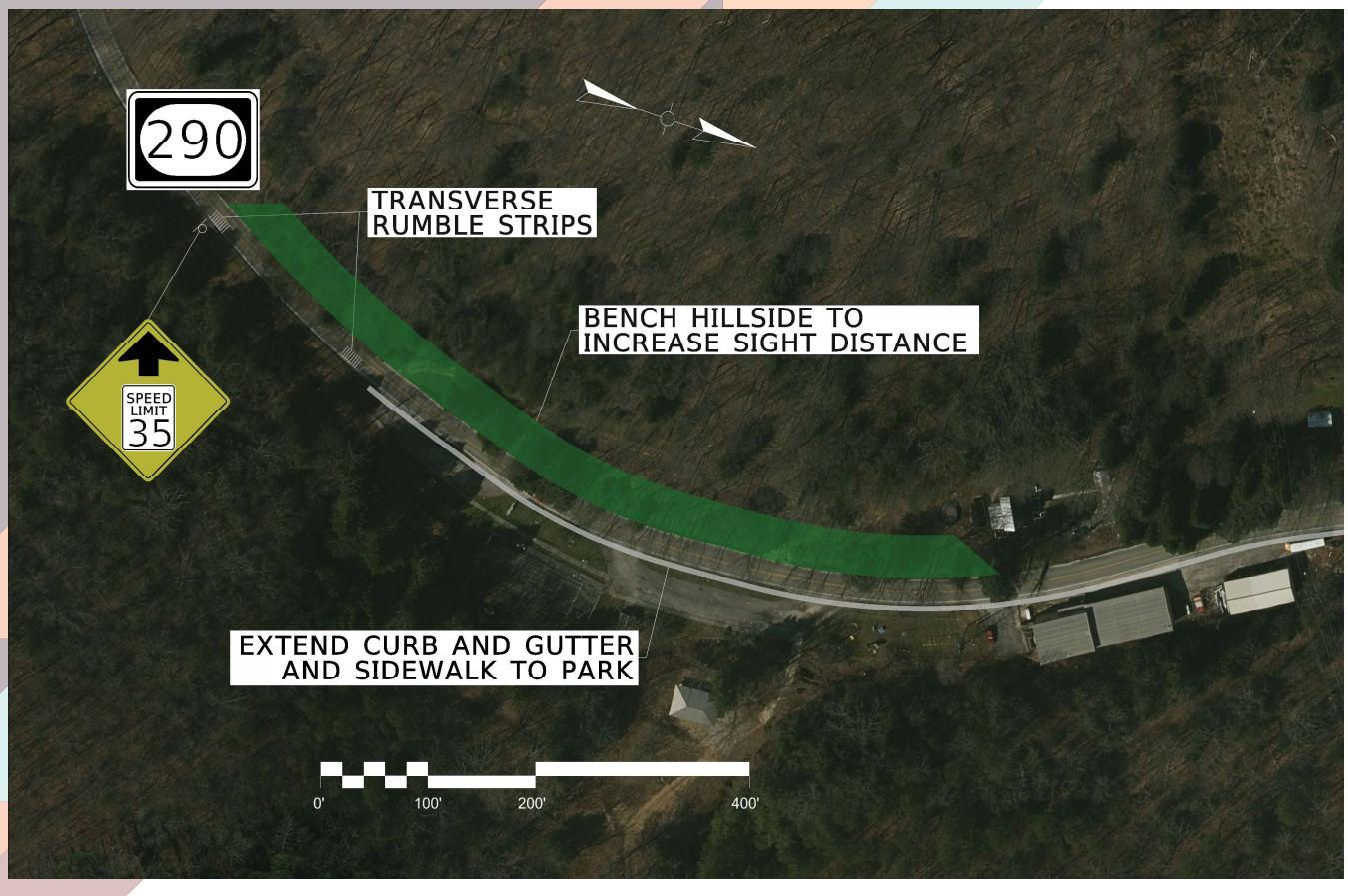
CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: UST/HAZ (Brownfields), Place of Worship

ST-5

MEDIUM PRIORITY



ACTION

Construct curb and gutter at the park along the east side of the road; shave hill back on west side; and connect sidewalk to the fire station, with vehicular traversable sidewalk across fire station entrances.

PURPOSE

Improve safety along KY 290 from MP 8.545 to 8.6 by improving sight distance and pedestrian facilities.

NEED

Roadway curvature reduces sight distance for drivers, and there is a park that is not accesible via sidewalk.

D: $47,000

R: $80,000

U: $35,000

C: $474,000

TOTAL COST (2023) **$636,000**

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: Low

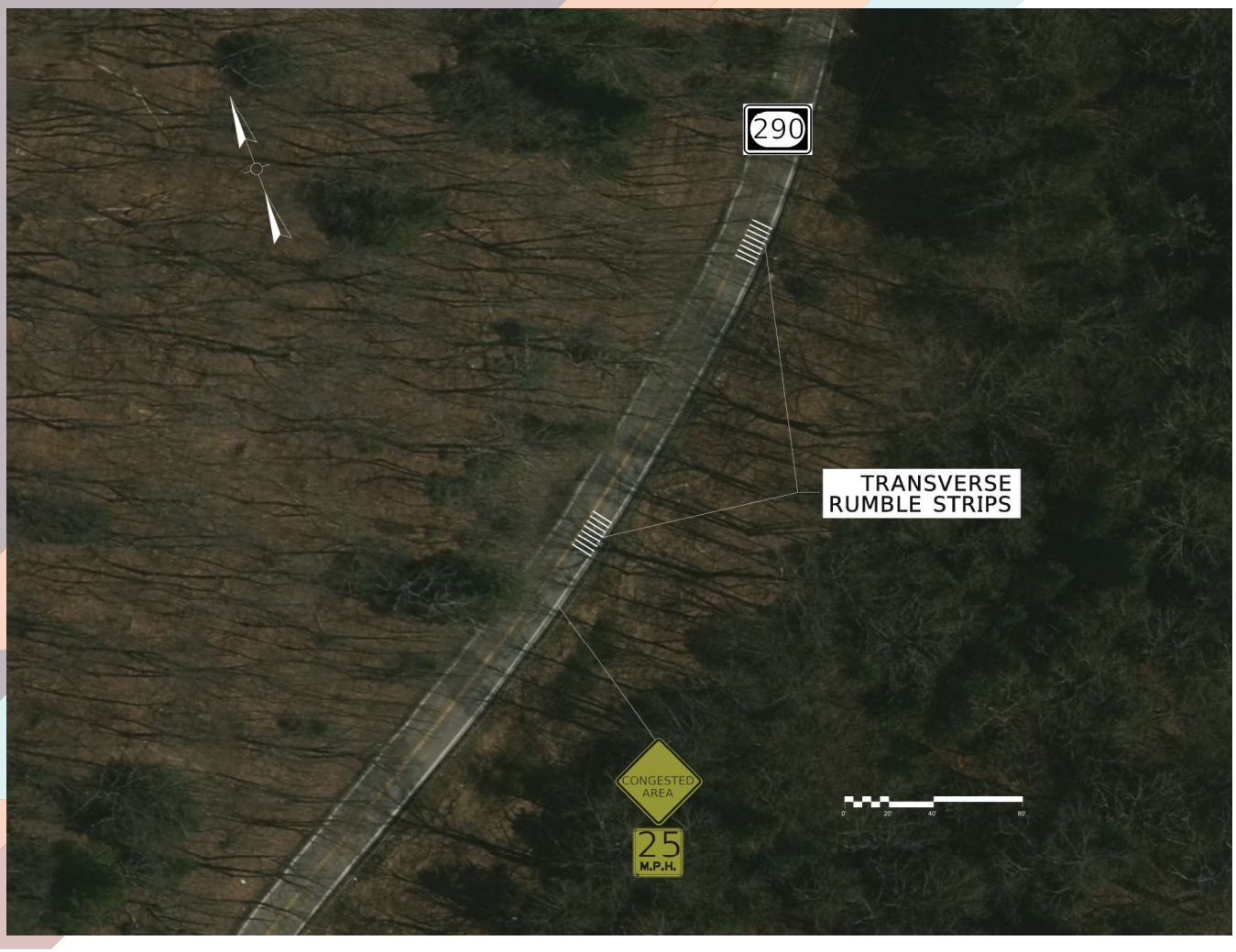
CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (Park), Tree Removal (Bats)

ST-6

MEDIUM PRIORITY



ACTION

Add traffic calming measures along KY 290 at MP 8.4 approaching McKee.

PURPOSE

KY 290 transitions from a rural road through a national forest to a rural town approaching McKee, and visual queues will alert drivers of the upcoming change.

NEED

Add transverse rumble strips approaching McKee and change congested area advisory speed to 25 mph.

D: $750

R: $0

U: $0

C: $7,500

TOTAL COST (2023) **$8,250**

BENEFIT/COST RATIO: 6.1

RIGHT-OF-WAY REQUIRED: N/A

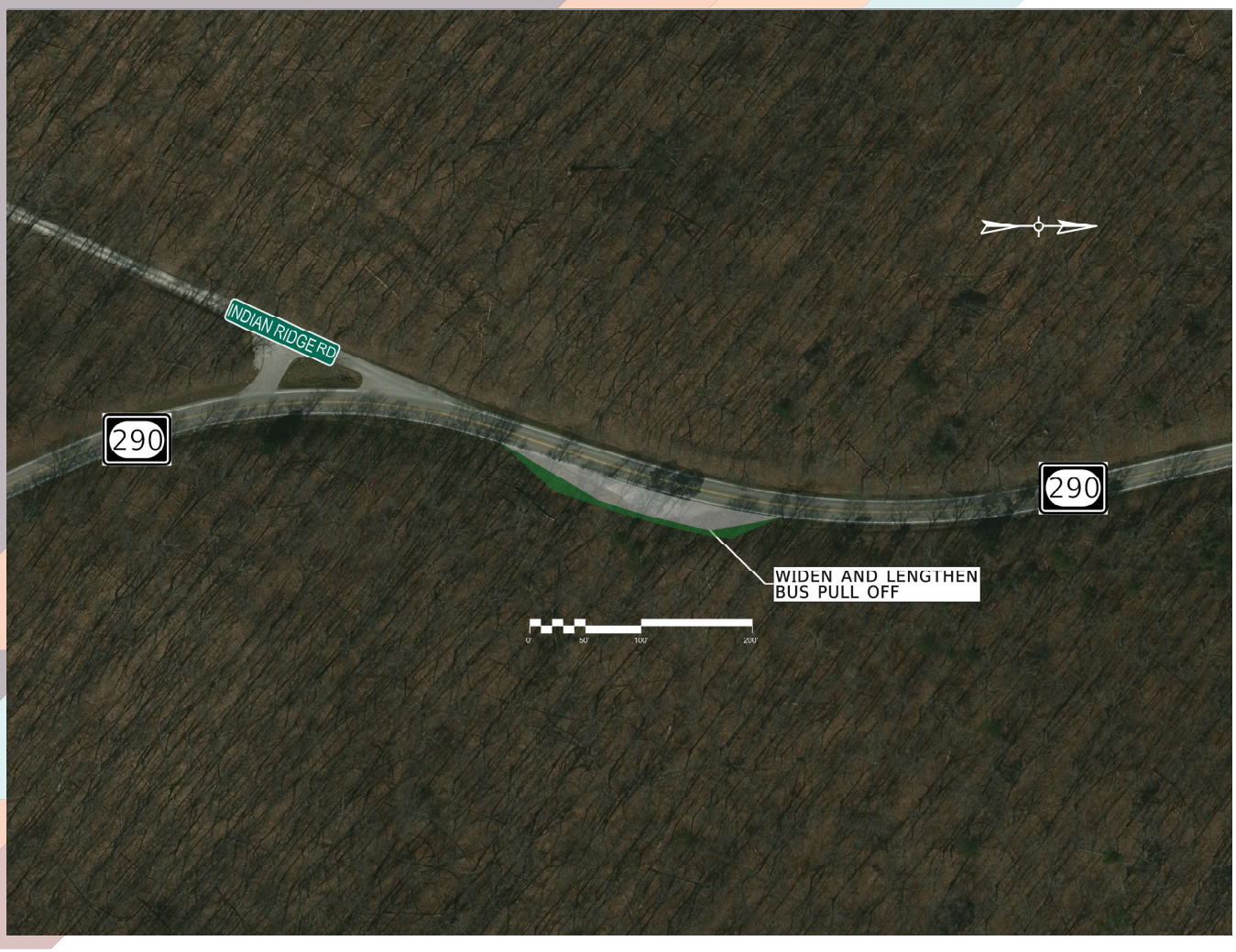
CRASH REDUCTION: 20.0%

TOTAL 20-YEAR REDUCTION: 0.81 Crashes

ENVIRONMENTAL CONSIDERATIONS: None

ST-7

MEDIUM PRIORITY



ACTION

Improve safety for students using the bus stop along KY 290.

PURPOSE

The current bus stop area is not large enough for students to safely exit the bus.

NEED

Improve pull-off area for school bus.

D: $2,900

R: $0

U: $0

C: $29,000

TOTAL COST (2023) **$31,900**

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: Low

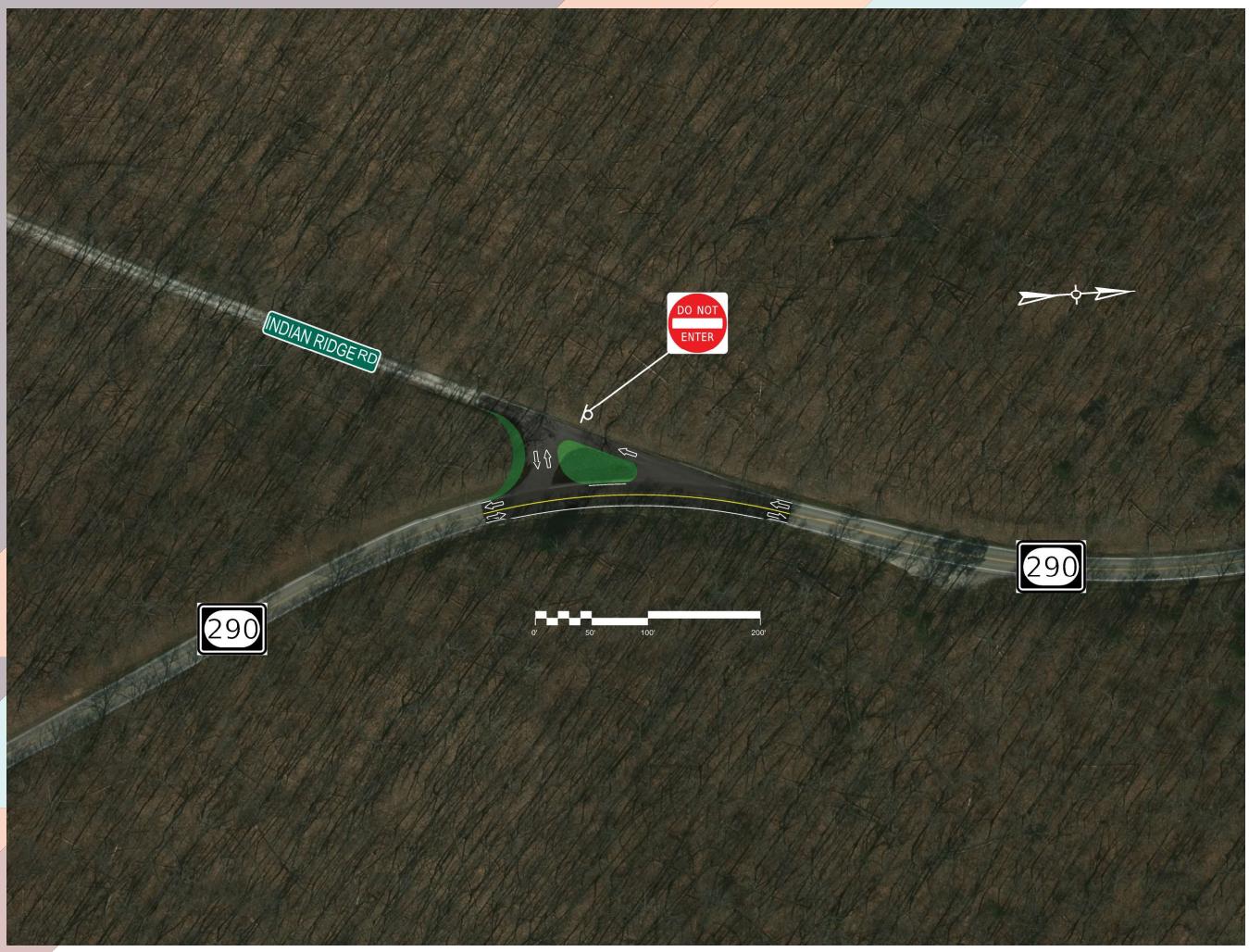
CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats)

ST-8

LOW PRIORITY



Action

Improve safety at the Indian Ridge Road intersection.

PURPOSE

The current skew intersection lacks signage and clear direction for drivers to safely navigate.

NEED

Realign Indian Ridge Road intersection and add signage.

D: $28,000

R: $0

U: $0

C: $280,000

TOTAL COST (2023) **$308,000**

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: Low

CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats)

ST-9

HIGH PRIORITY

ACTION

Add High Friction Surface Treatment to existing curves.

PURPOSE

Improve safety along KY 290 from MP 5.2 to 5.55.

NEED

There are currently insufficient superelevation transitions and horizontal curves that do not meet a 45 mph design speed, and there have been five documented crashes in this location in the past five years.

D: $89,000

R: $0

U: $0

C: $889,000

TOTAL COST (2023) **$978,000**

BENEFIT/COST RATIO: 1.04

RIGHT-OF-WAY REQUIRED: N/A

CRASH REDUCTION: 42.0%

TOTAL 20-YEAR REDUCTION: 8.32 Crashes

ENVIRONMENTAL CONSIDERATIONS: N/A

ST-10

HIGH PRIORITY

ACTION

Shave back hillside and cut vegetation at Mill Creek Road and Lower Adkinstown Road. Install intersection warning signage at Mill Creek and Lower Adkinstown Roads. Add end treatments to bridge.

PURPOSE

Improve safety along KY 290 from MP 4.711 to 4.757.

NEED

There is insufficient sight distance between the Mill Creek Road and Lower Adkinstown Road intersections and the bridge end treatments do not meet current guidance.

D: $31,000

R: $52,000

U: $0

C: $314,000

TOTAL COST (2023) **$397,000**

BENEFIT/COST RATIO: 0.04

RIGHT-OF-WAY REQUIRED: Medium

CRASH REDUCTION: 72%

TOTAL 20-YEAR REDUCTION: 2.9 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats), Cemetery, Special Use Water

ST-11

LOW PRIORITY

Action

Remove access point near Mildred Road intersection.

D: $800

R: $0

U: $0

C: $7,400

TOTAL COST (2023) **$8,200**

PURPOSE

Improve safety at the Mildred Road intersection.

NEED

The entrance to Jackson Energy is less than 50 feet off of KY 290, which could create potential conflicts for vehicles turning onto Mildred Road from KY 290 and vehicles entering and exiting Jackson Energy.

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Cemetery

ST-12

LOW PRIORITY

Action

Improve sight distance by clearing back the brush at the southern Ridgewood Drive intersection.

D: $0

R: $0

U: $0

C: $12,000

TOTAL COST (2023) **$12,000**

PURPOSE

Improve safety at the southern Ridgewood Drive intersection.

NEED

The southern Ridgewood Drive approach has limited sight distance due to overgrown brush within the intersection line of sight.

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW)

ST-13

HIGH PRIORITY

ACTION

Add transverse rumble strips, thermo restriping, High Friction Surface Treatment, and solar powered warning signage approaching KY 3630.

PURPOSE

Improve safety along KY 290 approaching KY 3630.

NEED

The approach to KY 3630 is on a steep grade. Additionally, drivers along KY 3630 may not know to anticipate drivers entering from KY 290.

D: $7,000

R: $0

U: $0

C: $73,000

TOTAL COST (2023) **$80,000**

BENEFIT/COST RATIO: 0.0

RIGHT-OF-WAY REQUIRED: N/A

CRASH REDUCTION: 0.0%

TOTAL 20-YEAR REDUCTION: 0.0 Crashes

ENVIRONMENTAL CONSIDERATIONS: None

LT-1B

HIGH PRIORITY

ACTION

Widen and straighten out/level road to meet 45 mph design speed.

D: $140,000

R: $160,000

U: $200,000

C: $1,400,000

TOTAL COST: $1,900,000

PURPOSE

Improve safety along KY 290 from MP 8.0 to 8.4.

BENEFIT/COST RATIO: 10.57

RIGHT-OF-WAY REQUIRED: High

CRASH REDUCTION: 39.0%

TOTAL 20-YEAR REDUCTION: 17.37 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats)

NEED

Insufficient superelevation transitions, vertical and horizontal curves that do not meet a 45 mph design speed and 11 crashes in the past five years.

LT-2B

HIGH PRIORITY

ACTION

Widen and straighten out/level road to meet 45 mph design speed.

D: $190,000

R: $390,000

U: $300,000

C: $1,900,000

TOTAL COST: $2,780,000

PURPOSE

Improve safety along KY 290 from MP 7.5 to 7.85.

BENEFIT/COST RATIO: 0.25

RIGHT-OF-WAY REQUIRED: High

CRASH REDUCTION: 46.0%

TOTAL 20-YEAR REDUCTION: 7.43 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats)

NEED

Insufficient superelevation transitions, vertical and horizontal curves that do not meet a 45 mph design speed and four crashes in the past five years.

LT-3

LOW PRIORITY

ACTION

Add passing lanes on KY 290 from MP 6.35 to 7.0.

D: $300,000

R: $160,000

U: $150,000

C: $3,000,000

TOTAL COST: $3,610,000

PURPOSE

Provide a safe passing zone along KY 290 between Annville and McKee.

NEED

There are currently no passing opportunities on KY 290 between Annville and McKee.

BENEFIT/COST RATIO: 0.15

RIGHT-OF-WAY REQUIRED: Medium

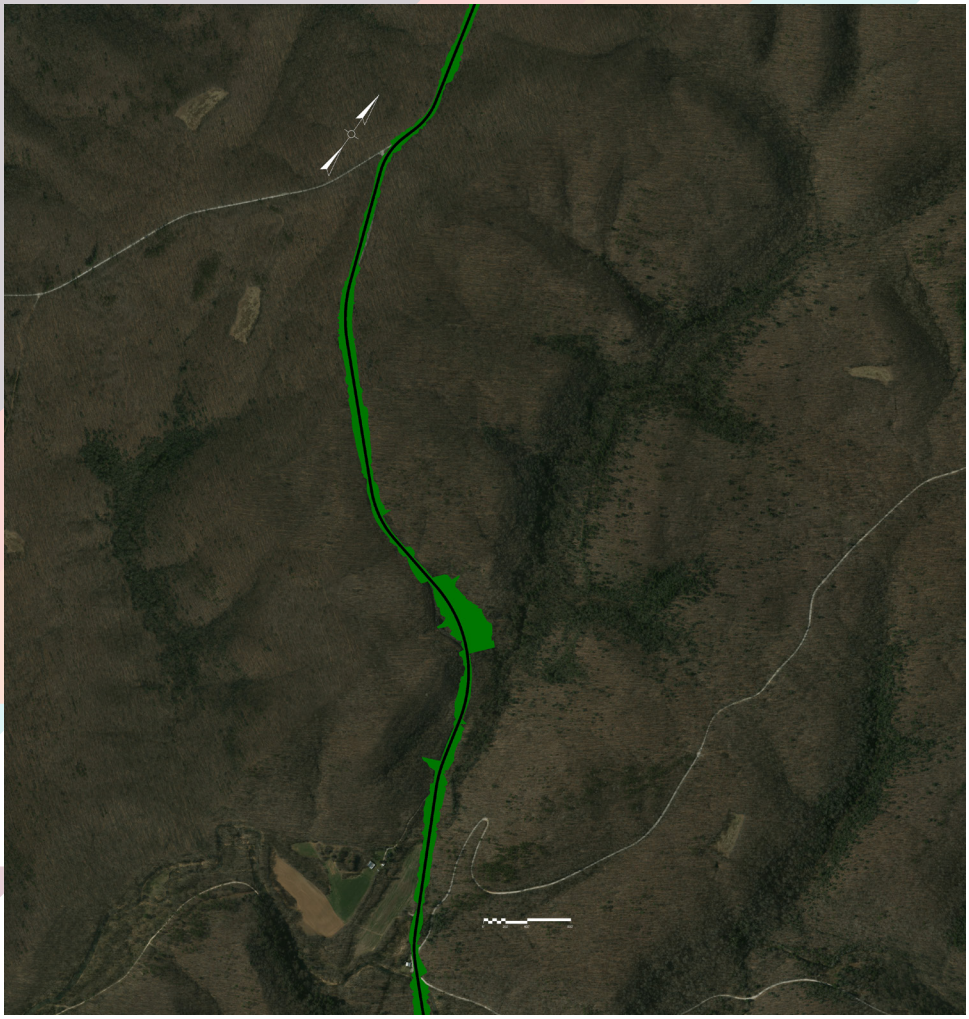
CRASH REDUCTION: 8.0%

TOTAL 20-YEAR REDUCTION: 1.68 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats)

LT-4B

HIGH PRIORITY



ACTION

Realign curves in high crash cluster area; widen curves to meet 45 mph design speed; and install High Friction Surface Treatment.

PURPOSE

Improve safety along KY 290 from MP 4.71 to 6.22

NEED

Insufficient superelevation transitions, vertical and horizontal curves that do not meet a 45 mph design speed and four crashes in the past five years.

D: $380,000

R: $440,000

U: $300,000

C: $3,800,000

TOTAL COST: $4,920,000

BENEFIT/COST RATIO: 0.23

RIGHT-OF-WAY REQUIRED: High

CRASH REDUCTION: 27.0%

TOTAL 20-YEAR REDUCTION: 11.84 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Section 4(f) (WMA), Tree Removal (Bats), Special Use Water

LT-5

MEDIUM PRIORITY

ACTION

Construct a Two-Way-Left-Turn-Lane (TWLTL) through the section and add curb and gutter.

D: $530,000

R: $840,000

U: $750,000

C: $5,300,000

TOTAL COST: $7,420,000

PURPOSE

Improve safety along KY 290 from MP 2.6 to 3.589.

BENEFIT/COST RATIO: 0.19

RIGHT-OF-WAY REQUIRED: High

CRASH REDUCTION: 36.0%

TOTAL 20-YEAR REDUCTION: 14.4 Crashes

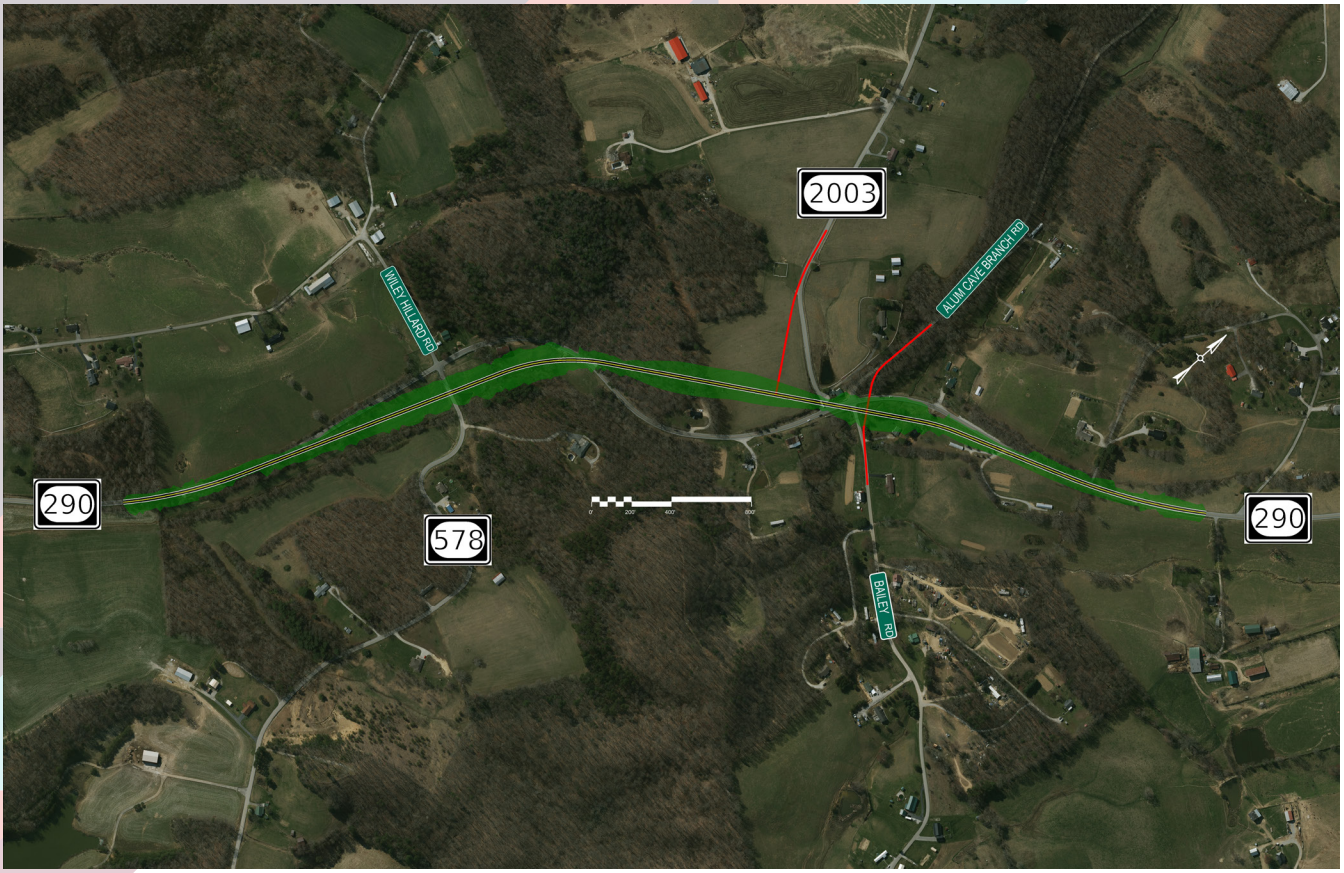
NEED

There are numerous driveways and access points as well as high speeds through this section of KY 290.

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Places of Worship, Tree Removal (Bats), UST/HAZ, Cemetery

LT-6C

MEDIUM PRIORITY



ACTION

Realign intersections at Bailey Road and KY 578. Reconstuct the KY 2003 at KY 290 with a T-intersection separate from Bailey Road.

PURPOSE

Improve the sight distance at the Bailey Road and KY 290 intersection and improve safety along KY 290 from MP 1.1 to 1.7.

NEED

Insufficient sight distance from Bailey Road to KY 290, insufficient superelevation transitions, vertical and horizontal curves that do not meet a 45 mph design speed and 11 crashes in the past five years.

D: $730,000

R: $630,000

U: $300,000

C: $7,300,000

TOTAL COST: $8,960,000

BENEFIT/COST RATIO: 0.23

RIGHT-OF-WAY REQUIRED: High

CRASH REDUCTION: 49.0%

TOTAL 20-YEAR REDUCTION: 29.44 Crashes

ENVIRONMENTAL CONSIDERATIONS: Archaeology (ROW), Tree Removal (bats), Stream Crossing, Wetlands

10 Next Steps

KYTC District 11 will use the recommendations from this report to move forward with the improvement concepts. The District will identify potential funding sources for short-term improvement concepts and will enter the long-term improvement concepts into the Strategic Highway Investment Formula for Tomorrow (SHIFT) process to try and get funding through the *Highway Plan*.

10.1 Contacts

Written requests for additional information should be sent to the KYTC Division of Planning Director, 200 Mero Street, Frankfort, Kentucky 40622.

TEAM KENTUCKY®
TRANSPORTATION CABINET

WSP HDR TAYLOR SIEFKER WILLIAMS design group