



KENTUCKY TRANSPORTATION CABINET

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# STATEWIDE PLANNING KY 290 CORRIDOR STUDY

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ITEM NO. 11-80202

Executive Summary | July 2024



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# 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 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.

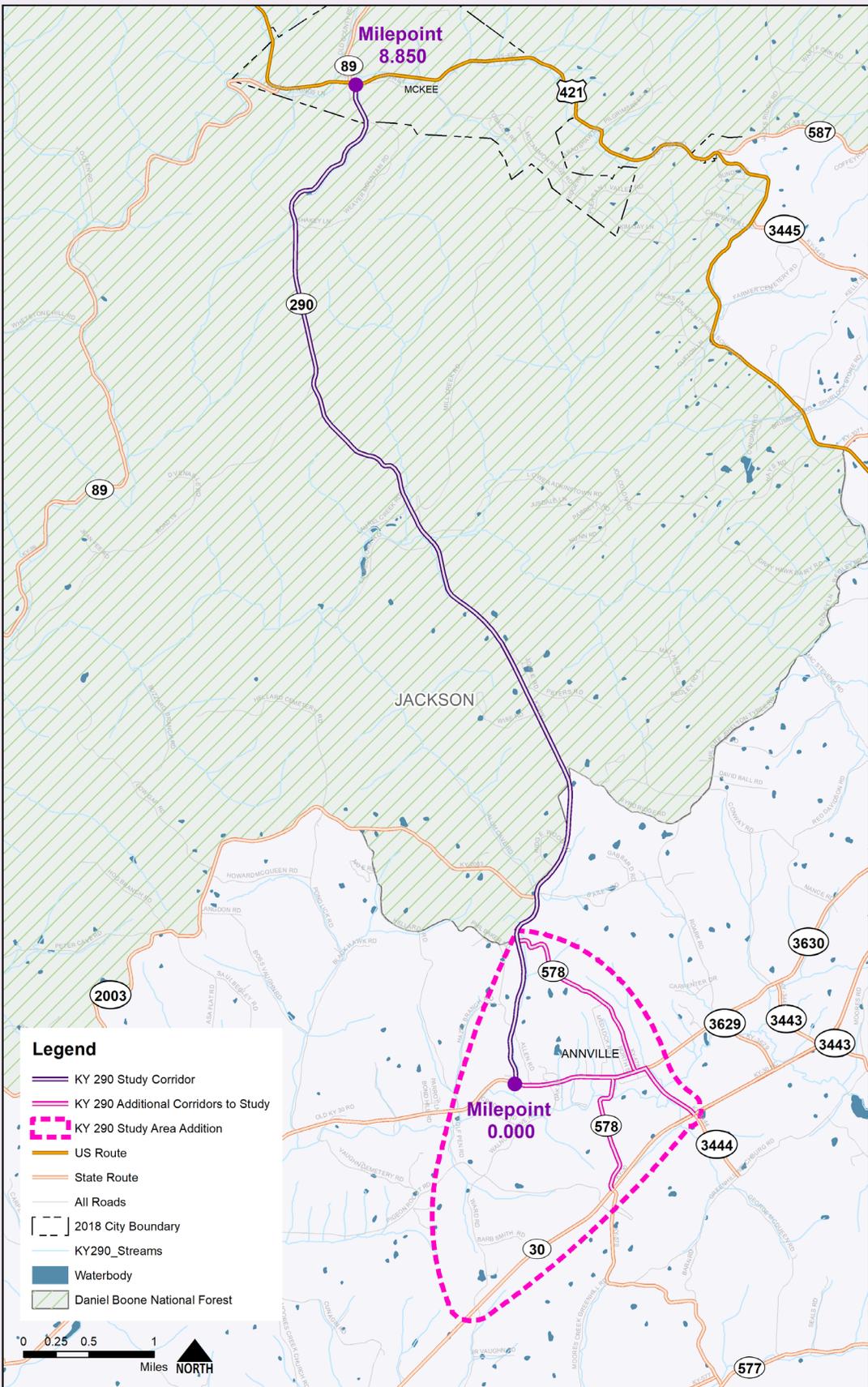
KY 290 has 41 horizontal curves in the study area. Of these, 27 do not meet the design criteria for horizontal curves for the design speed and there are 28 superelevation transition overlaps. There are 74 total vertical curves, 36 of which do not meet the minimum stopping sight distance or headlight 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

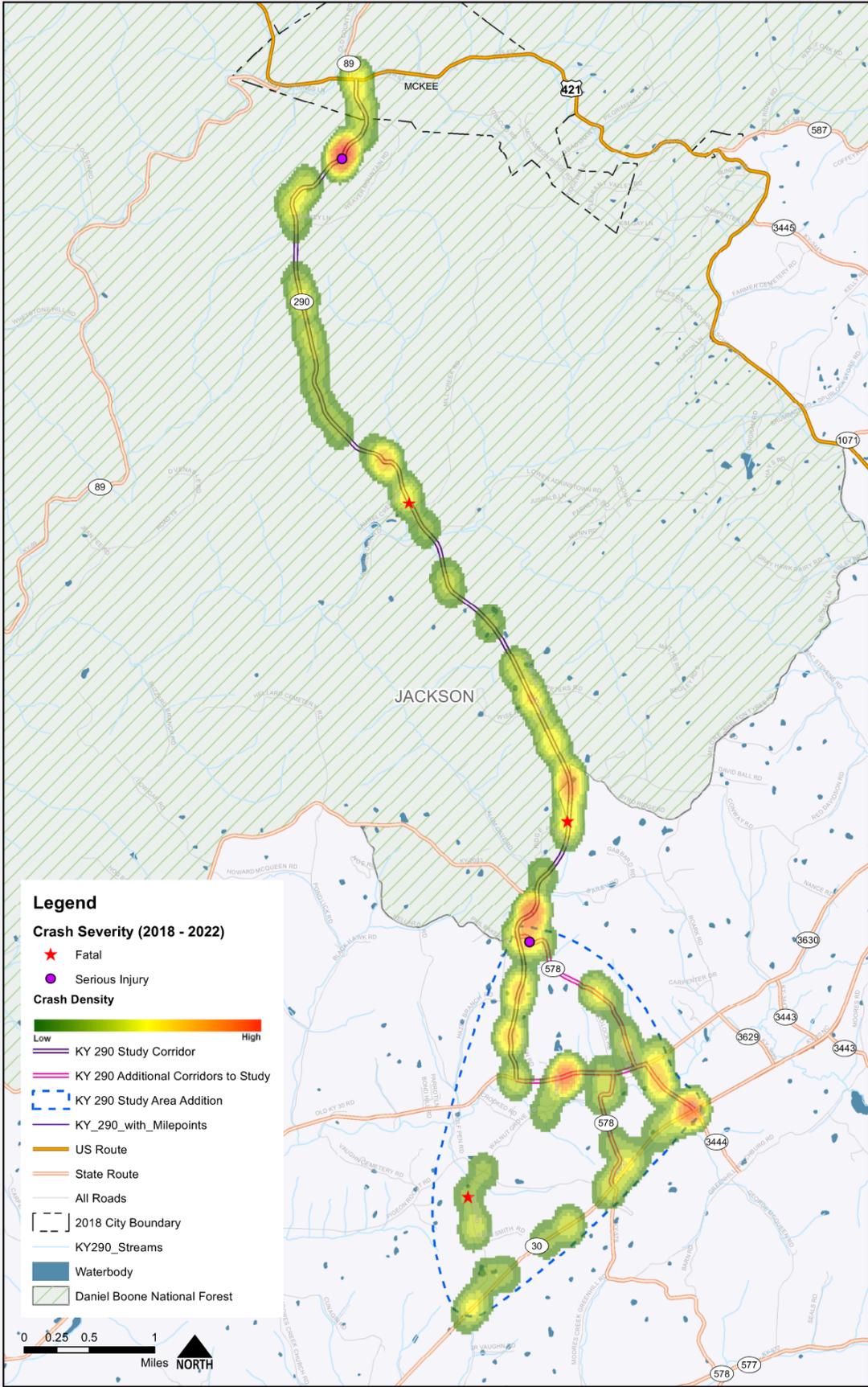
other rural two-lane roadways in the state. The review of historic crashes has shown that relationships exist between high crash segments / intersections and locations with geometric deficiencies and potentially limited sight distance. The review of speed data has yielded a relationship between locations 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

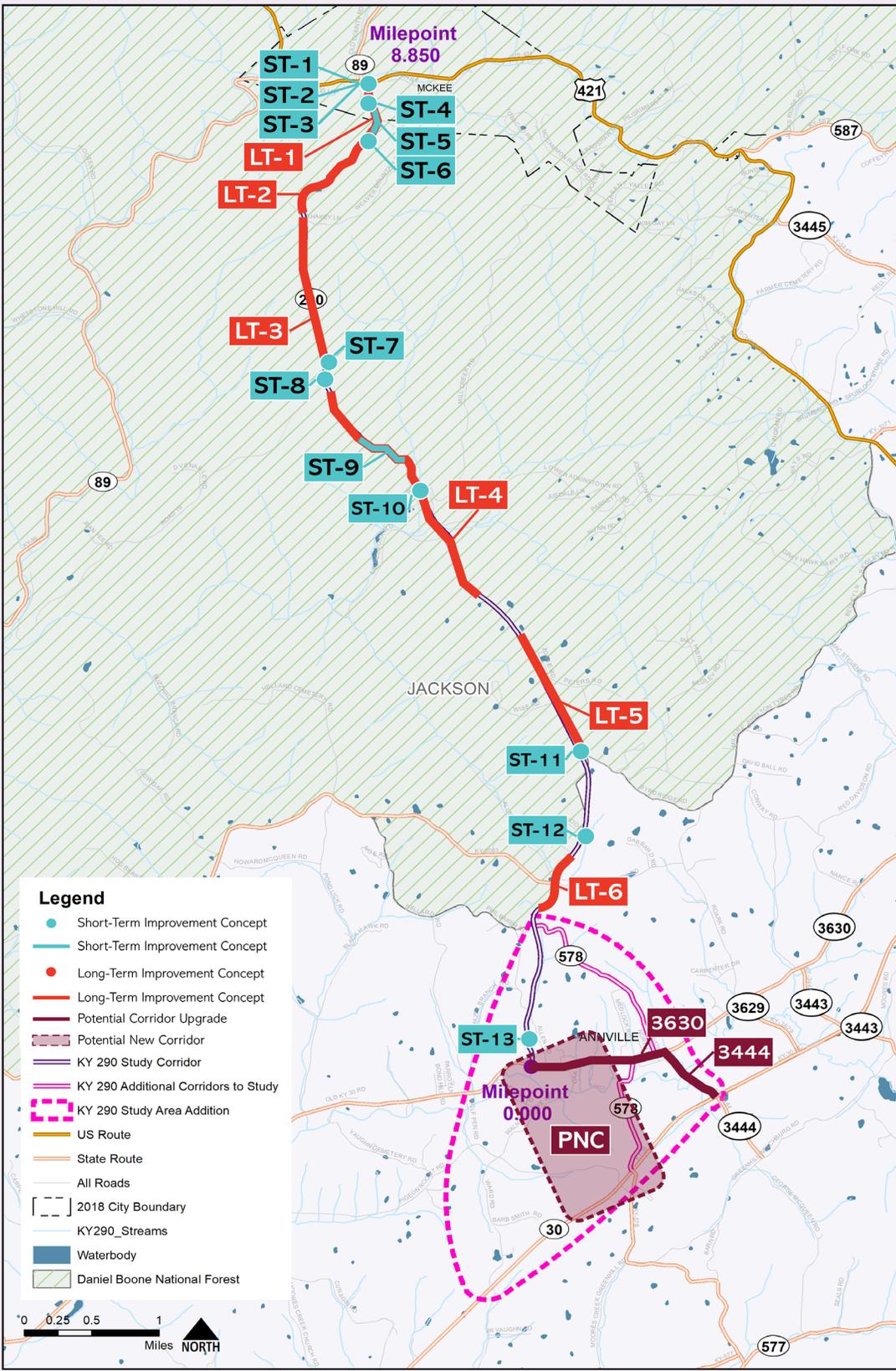


Table ES-3: Comparison of Improving Existing Route to New Connection between KY 290 and KY 30

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		



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