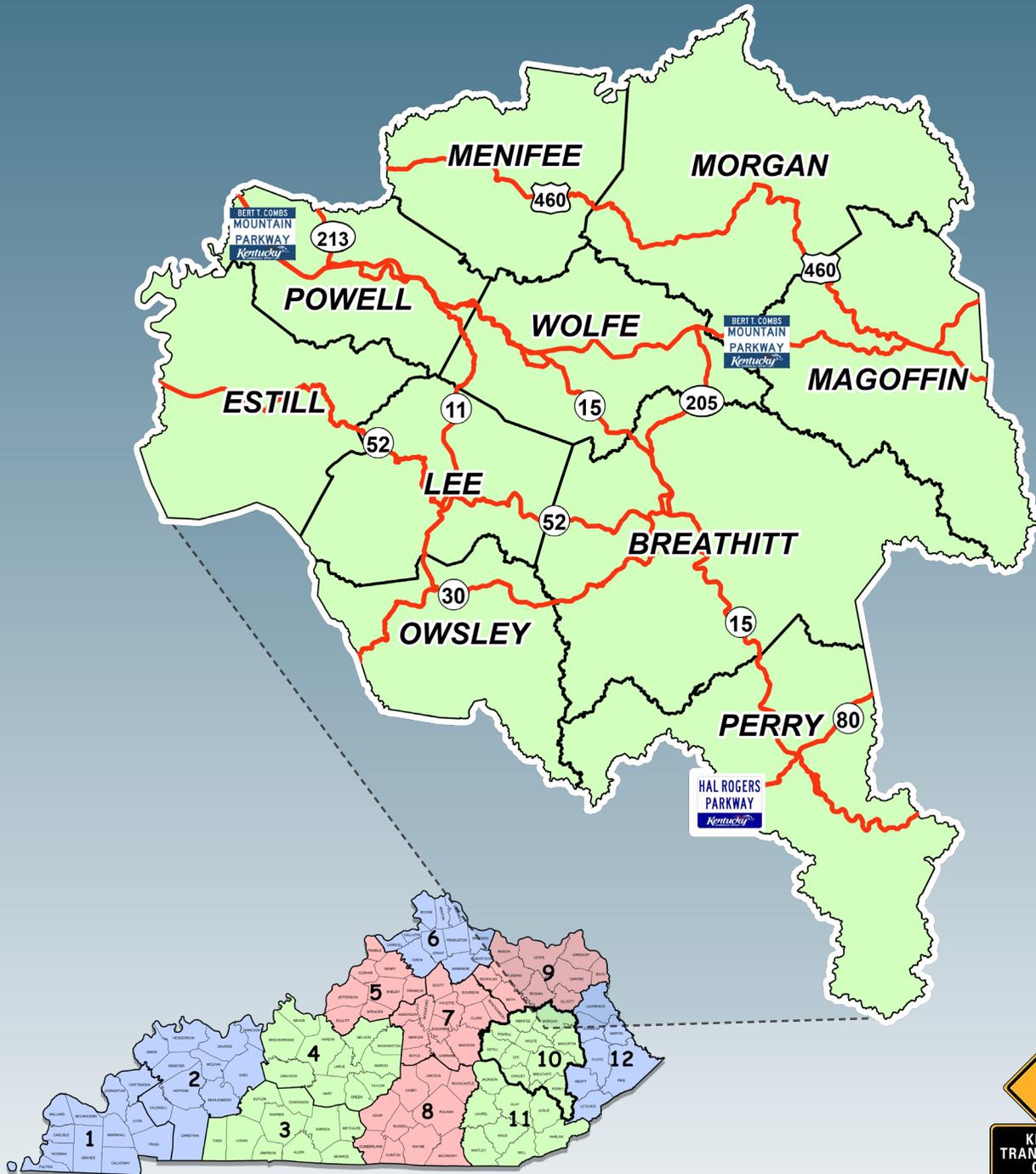
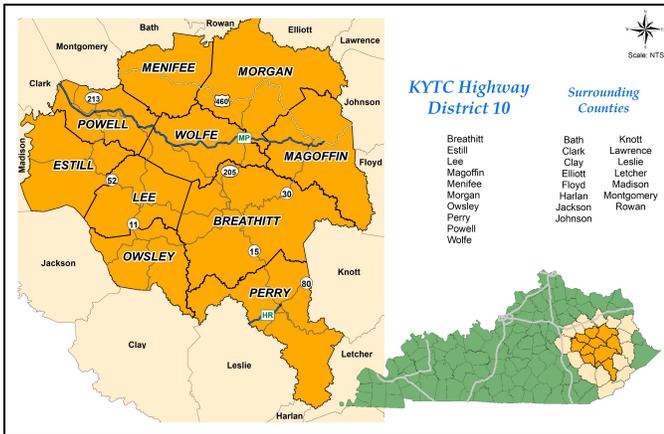


District 10

Accessibility & Connectivity Study

July 2019





FINAL REPORT

District 10 Accessibility and Connectivity Study
 Various Counties
 KYTC Item No. N/A



Kentucky Transportation Cabinet
 Central Office, Division of Planning
 Highway District 10, Jackson

In partnership with:



July 2019

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DISTRICT 10 ACCESSIBILITY AND CONNECTIVITY STUDY – DRAFT REPORT

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1.0 INTRODUCTION

As part of a review of its statewide planning process, the Kentucky Transportation Cabinet (KYTC) Division of Planning directed Stantec Consulting Services Inc. (Stantec) to perform a pilot study to evaluate the accessibility and connectivity of KYTC District 10 counties, with an emphasis on strategies to improve safety and mobility within and around the district.

1.1 STUDY AREA

The study area includes the 10 counties that comprise District 10 plus the 15 surrounding counties, as shown in **Figure 1**.

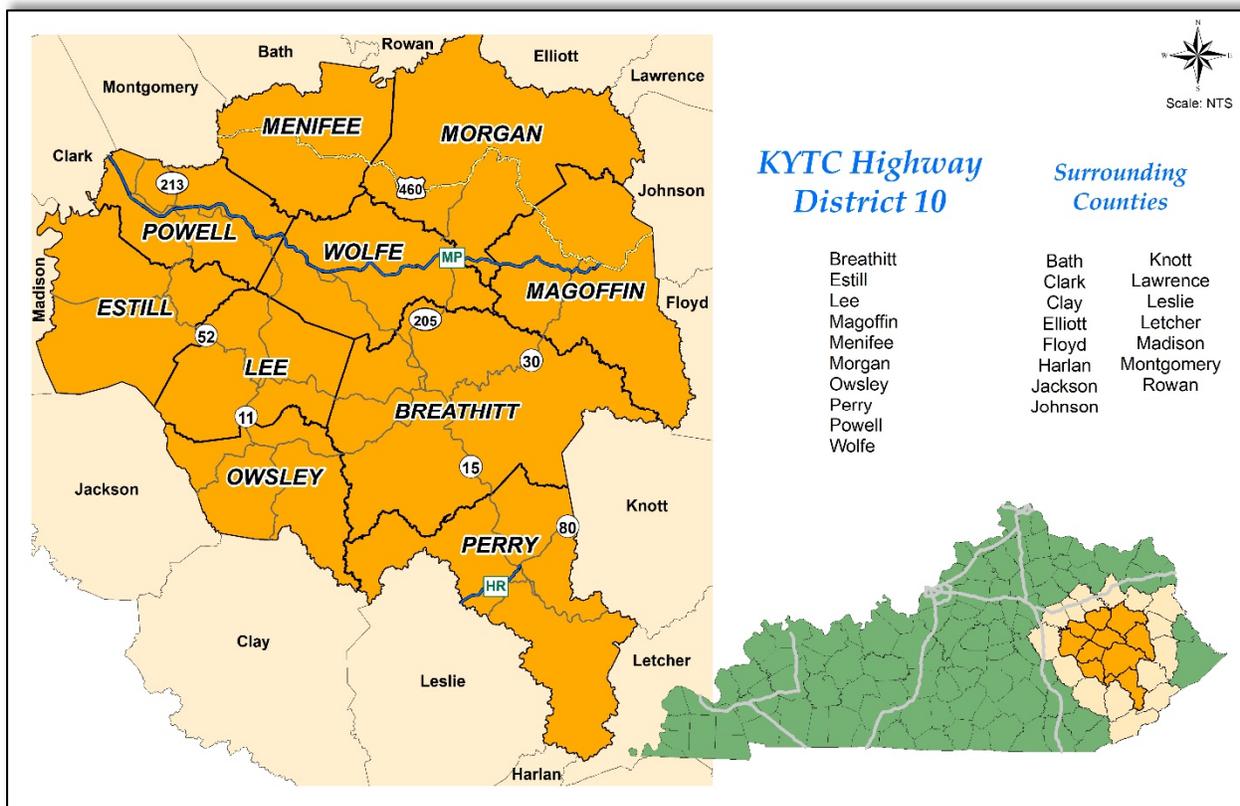


Figure 1: Study Area – District 10 Accessibility and Connectivity Study

1.2 STUDY OVERVIEW

The goal of the District 10 Accessibility and Connectivity Study is to assess the current state of the District, with a focus on determining which corridor improvements would most improve accessibility and connectivity for District 10 and the surrounding counties. Accessibility reflects residents' ability to reach employment opportunities and essential services such as groceries, household items, hospitals, and post-secondary education within a reasonable commuting time.

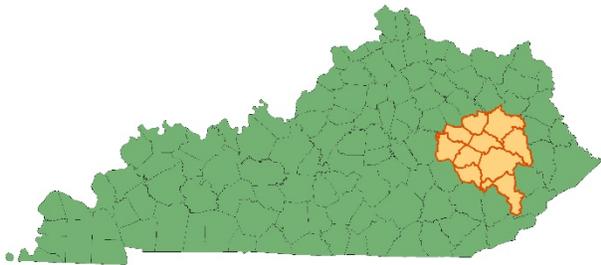
Connectivity reflects the scope, reliability, and safety of the transportation system used by residents to access those locations.

To accomplish this goal, several tasks were completed:

- Existing conditions analysis;
- Discussion with local officials to determine where District 10 residents are going for jobs, healthcare, shopping, etc. These discussions also helped refine land use and growth assumptions in the Kentucky Statewide Travel Demand Model (KYSTMv17);
- Identification of regionally impactful corridors;
- Identification of recurring maintenance issues based on a review of KYTC's Operations Management Systems (OMS) maintenance activity;
- Identification of potential improvement projects for the regionally impactful corridors; and
- County-level travel time analyses to evaluate accessibility.

2.0 COUNTY MEETINGS

KYTC and Stantec organized individual meetings with officials from each county within District 10 to solicit input on potential growth areas and determine local issues. The focus of the county



meetings was to talk in general about transportation issues and concerns within the individual counties. Four primary topics were discussed during the meetings:

1. **The general travel destinations of county residents** for jobs, healthcare, shopping, recreation, etc.
2. **The location of job growth, if any**, occurring in the county. A map from the KYSTM depicting the projected change in employment between 2017 and 2040 was presented to facilitate discussion.
3. **The location of population growth, if any**, occurring in the county. A map from the KYSTM depicting the projected change in population between 2017 and 2040 was presented to facilitate discussion.
4. **The top priorities, opportunities, or issues** each county has in terms of its accessibility and connectivity with its surrounding area.

Based on the input gathered from local officials at these meetings, corridors with regional significance were identified and analyzed. Potential growth areas or other areas for

redistribution were also identified to establish population, households, and jobs in the 2040 socioeconomic data within the KYSTM Traffic Analysis Zone (TAZ) file.

The county meetings are summarized below. Detailed meeting summaries can be found in **Appendix A**.

Breathitt County:

- Breathitt County residents are going to Winchester, Georgetown, Lexington, Mt. Sterling, Cincinnati, and Hazard for jobs, healthcare, shopping, and recreation.
- Completion of the KY 15 corridor was the main point of focus with KY 30 and KY 205 improvements being the next priorities.

Estill County:

- Estill County residents are going to Mt. Sterling, Winchester, Lexington, and Richmond for jobs, healthcare, shopping, and recreation.
- If a proposed automotive plant were to be built near Richmond, KY 52 would see an increase in traffic, which would amplify the existing congestion issues. KY 52 may need safety and capacity improvements to accommodate the higher traffic volumes.

Lee County:

- Lee County residents are going to Winchester, Georgetown, Lexington, Richmond, Jackson, and Irvine for jobs, healthcare, shopping, and recreation.
- Completing the KY 30 corridor is the most important transportation issue in the area with KY 11 and a new alignment at Hat Holler Hill being the next most important.

Popular Destinations for District 10 Citizens

- Lexington
- London
- Morehead
- Mt. Sterling
- Paintsville
- Pikeville
- Prestonsburg
- Richmond
- Winchester

Magoffin County:

- Magoffin County residents are going to Georgetown, Lexington, Paintsville, Ashland, Huntington, Pikeville, and Prestonsburg for jobs, healthcare, shopping, and recreation.
- Completing the Mountain Parkway is the main transportation need in the county, with spot improvements to KY 114 being the second priority.

Menifee County:

- Menifee County residents are going to Mt. Sterling, Morehead, West Liberty, Georgetown, and Lexington for jobs, healthcare, shopping, and recreation.
- Improved access on KY 36 and KY 211 to Mt. Sterling and I-64 is Menifee County's top transportation priority. The next priority is to improve roadway geometrics on KY 77 providing better access to the Mountain Parkway.

Morgan County:

- Morgan County residents are going to Mt. Sterling, Morehead, Georgetown, Sandy Hook, Paintsville, Hazard, Ashland, and Pikeville for jobs, healthcare, shopping, and recreation.
- The main transportation focus in the area is the need for improved access to I-64 and the Mountain Parkway. Improvements to US 460 in Menifee and Magoffin Counties, KY 172 in Johnson County, and KY 203 in Wolfe County would benefit commuters and travelers in Morgan County.

Owsley County:

- Owsley County residents are going to London, Corbin, Winchester, Mt. Sterling, Georgetown, Lexington, Beattyville, Jackson, Richmond, and Irvine for jobs, shopping, and recreation.
- The main transportation focus in the county is to finish the KY 30 corridor.

Perry County:

- Perry County residents are going to Georgetown, London, Lexington, and Pikeville for jobs, healthcare, shopping, and recreation.
- Completing the KY 15 corridor and widening the Hal Rogers Parkway were identified as the most important transportation projects for Perry County.

Powell County:

- Powell County residents are traveling to Lexington, Winchester, and Mt. Sterling for jobs, healthcare, shopping, and recreation.
- Limited pedestrian accommodations near Stanton and Clay City is a transportation issue in Powell County.

Wolfe County:

- Wolfe County residents are traveling to Mt. Sterling, Jackson, Winchester, Lexington, and Richmond for jobs, healthcare, shopping, and recreation.
- Given the expansion of the Mountain Parkway and recent improvements to KY 205, transportation facilities are not preventing Wolfe County from growing.

3.0 REGIONALLY IMPACTFUL CORRIDORS

After discussion with local officials, District 10 corridors with regional significance were identified by the project team. These corridors, as shown in **Table 1** and **Figure 2**, connect the residents of District 10 to healthcare, shopping, recreation, higher education, and employment opportunities. These routes generally carry the highest volumes of traffic within the District. In some cases, these corridors connect directly to the regional centers mentioned above where residents travel for services or employment. In other cases, these corridors provide connections to the interstate system which connects residents to the larger region. Therefore, improvements to these regionally impactful corridors were believed to have the greatest potential to improve the accessibility and connectivity of the region. Particularly in rural areas, the location of Walmart stores, as shown in **Figure 2**, serves as a proxy for identifying commercial centers of a size sufficient to provide regional retail and commercial services essential to daily household needs.

In the northern portion of the District, Corridor 1, the Bert T. Combs Mountain Parkway (KY 9000/KY 9009), provides a regional east-west connection from I-64 in Winchester to US 460 in Salyersville. Extending the Parkway to US 23 in Prestonsburg is currently the District's highest priority. Fifteen interchanges exist along the Parkway within District 10, beginning with the KY 15/KY 82 (Exit 16) interchange in Clay City and continuing through the KY 7 (Exit 75) interchange in Salyersville. The Mountain Parkway continues for another 0.8 miles east, ending at an at-grade intersection with US 460 in Salyersville.

In the southern portion of the District, Corridor 2, the Hal Rogers Parkway (HR 9006), provides an

east-west connection to I-75. Two interchanges exist along the Parkway in District 10, at KY 451 (Exit 56) and KY 15/KY 80 (Exit 59) in Hazard. At the eastern terminus of the Hal Rogers Parkway, KY 80 continues, connecting Hazard to US 23 in Prestonsburg.

Table 1: District 10 Regionally Impactful Corridors

Corridor	Route	Begin	End	Approximate Length	D10 Counties Directly Served
1	Mountain Parkway	Winchester (I-64)	Prestonsburg (US 23)	95 miles	Magoffin, Morgan, Powell, Wolfe
2	Hal Rogers Parkway	London (I-75)	Hazard (KY 15)	59 miles	Perry
	KY 80	Hazard (KY 15)	Prestonsburg (US 23)	42 miles	Perry
3	US 460	Mount Sterling (I-64)	Paintsville (US 23)	89 miles	Magoffin, Menifee, Morgan
4	KY 11	Booneville (KY 30)	Stanton (KY 213)	38 miles	Lee, Owsley, Powell, Wolfe
	KY 213	Stanton (KY 11)	Jeffersonville (US 460)	10 miles	Powell
5	KY 15	Whitesburg (US 119)	Campton (Mtn. Pkwy)	80 miles	Breathitt, Perry, Wolfe
6	KY 30	London (I-75)	Jackson (KY 15)	61 miles	Breathitt, Owsley
	KY 205	Vancleve (KY 15)	Helechawa (Mtn. Pkwy)	19 miles	Breathitt, Wolfe
7	KY 52	Richmond (I-75)	Jackson (KY 30)	70 miles	Estill, Lee, Breathitt

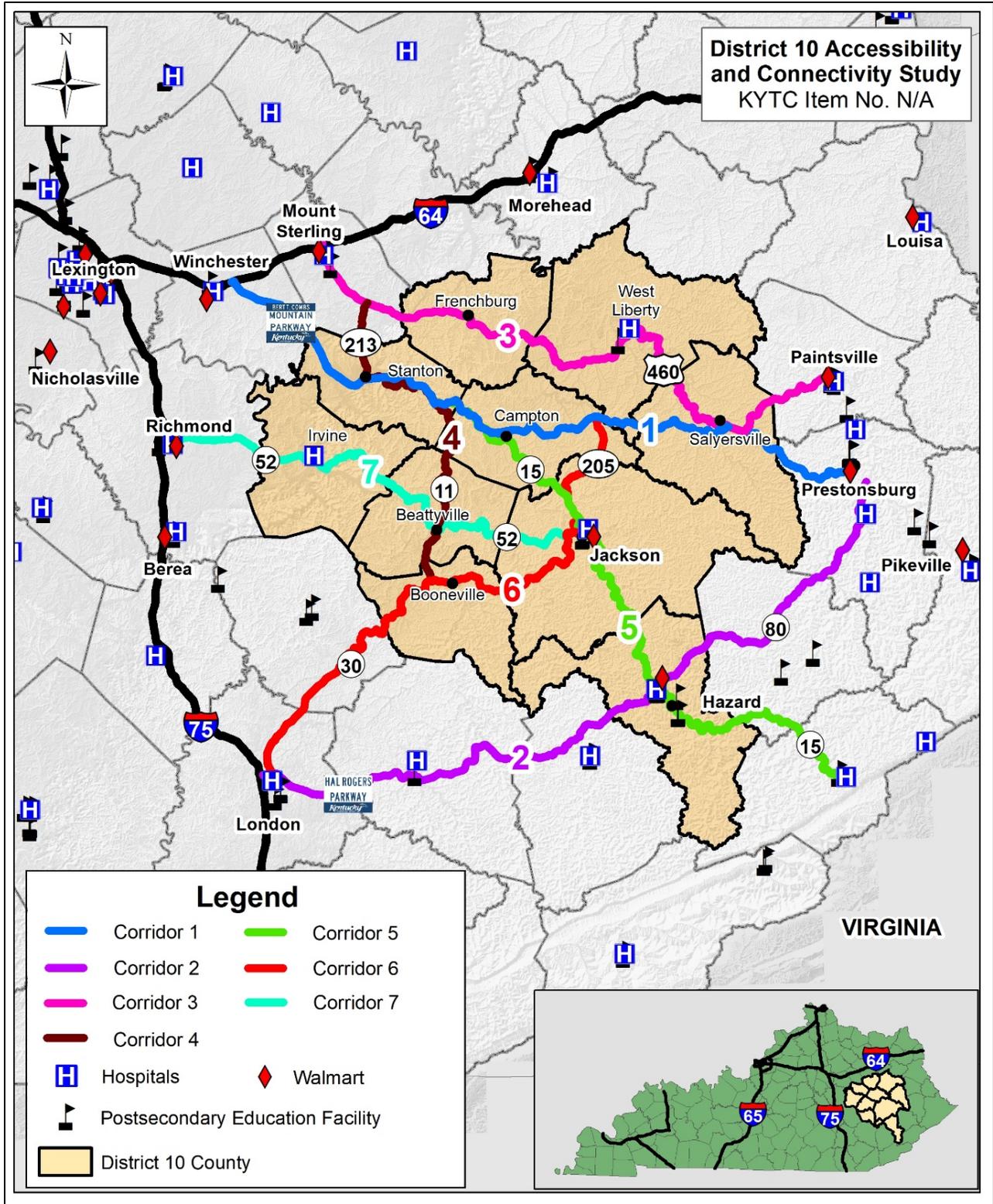


Figure 2: District 10 Regionally Impactful Corridors



US 460 in Menifee County

Corridor 3, US 460, is a two-lane route that runs east-west through Frenchburg, West Liberty, and Salyersville in the northern portion of the District, providing access from I-64 in Mt. Sterling to US 23 in Paintsville.

Corridor 4, KY 11, is a two-lane route that runs north-south through Booneville, Beattyville, and Clay City in the western portion of the District, providing access from KY 30 in Booneville to KY 213 in Stanton. At the northern end of KY 11, KY 213 continues, providing a connection between the Mountain Parkway and US 460.

Corridor 5, KY 15, is a two- to four-lane route that runs north-south through Hazard, Jackson, and Campton in the central portion of the District, providing access from US 119 in Whitesburg to the Mountain Parkway in Campton.

Corridor 6, KY 30, is a two-lane route that runs east-west through Booneville, Jackson, and Salyersville in the central portion of the District, providing a connection from I-75 in London to KY 15 in Jackson. At the northeastern end of KY 30, KY 205 provides a connection between KY 15 and the Mountain Parkway.

Corridor 7, KY 52, is a two-lane route that runs east-west through Irvine, Beattyville, and Jackson in the western part of the District, providing access from I-75 in Richmond to KY 30 in Jackson.

3.1 EXISTING CONDITIONS

Conditions of the existing regionally impactful corridors are examined in the following section. The information compiled includes current roadway classifications and geometrics, crash history, and traffic volumes within the study area. Data for this section were collected from KYTC's Highway Information System (HIS) database, KYTC's Traffic Count Reporting System, aerial photography, and from field inspection. A review of the entire District 10 state-maintained transportation network can be found in **Appendix B**.

3.1.1 Functional Classification

Functional classification is the grouping of roads, streets, and highways into integrated systems ranked by the level of mobility for through movements and access to adjoining land. This grouping acknowledges that roads serve multiple separate functions and it provides a basis for comparing roads. Functional classification can be used for, but is not limited to, the following purposes:

- Provide a framework for roadways that considers mobility and connecting regions and cities within a state.
- Provide a basis for assigning jurisdictional responsibility according to the roadway's importance.

- Provide a basis for development of minimum design standards according to function.
- Provide a basis for evaluating present and future needs.
- Provide a basis for allocation of limited financial resources.



Bert T. Combs Mountain Parkway

Figure 3 shows the functional classification of the District 10 regionally impactful corridors. Interstates (shown in black) are controlled-access highways that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways. These routes are the highest classification of arterials and were designed to connect major metropolitan areas. Principal arterials (shown in red) serve major centers of metropolitan areas and provide a high level of mobility for substantial statewide travel. Minor arterials (shown in blue) serve trips of moderate length to smaller geographic areas and provide connections between principal arterials. Major collectors (shown in green) facilitate trips between local roads and the arterial network¹.

Figure 4 depicts the truck weight classifications of the regionally impactful corridors. The Mountain Parkway, the Hal Rogers Parkway, US 460, KY 11, KY 15, KY 30, KY 52, KY 80, KY 205, and KY 213 are classified as AAA and permit gross vehicle weight up to 80,000 pounds. Only KY 30 through Owsley and western Breathitt County and KY 205 through Wolfe County are listed as AA routes with maximum weights of 62,000 pounds.

In compliance with the Surface Transportation Assistance Act of 1982 (STAA), Kentucky has established a network of highways on which commercial vehicles with increased dimensions may operate. These STAA vehicles include semi-tractor trailers with 53-foot-long trailers and single-unit trucks with a total length of 45 feet. These designated truck routes are shown on **Figure 5**. The Mountain Parkway, the Hal Rogers Parkway, KY 15, and KY 80 are federally-designated truck routes. KY 52 west of Irvine is a state-designated route.

¹ *Highway Functional Classification Concepts, Criteria and Procedures*. U.S. Department of Transportation/Federal Highway Administration.
https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm#Toc336872985

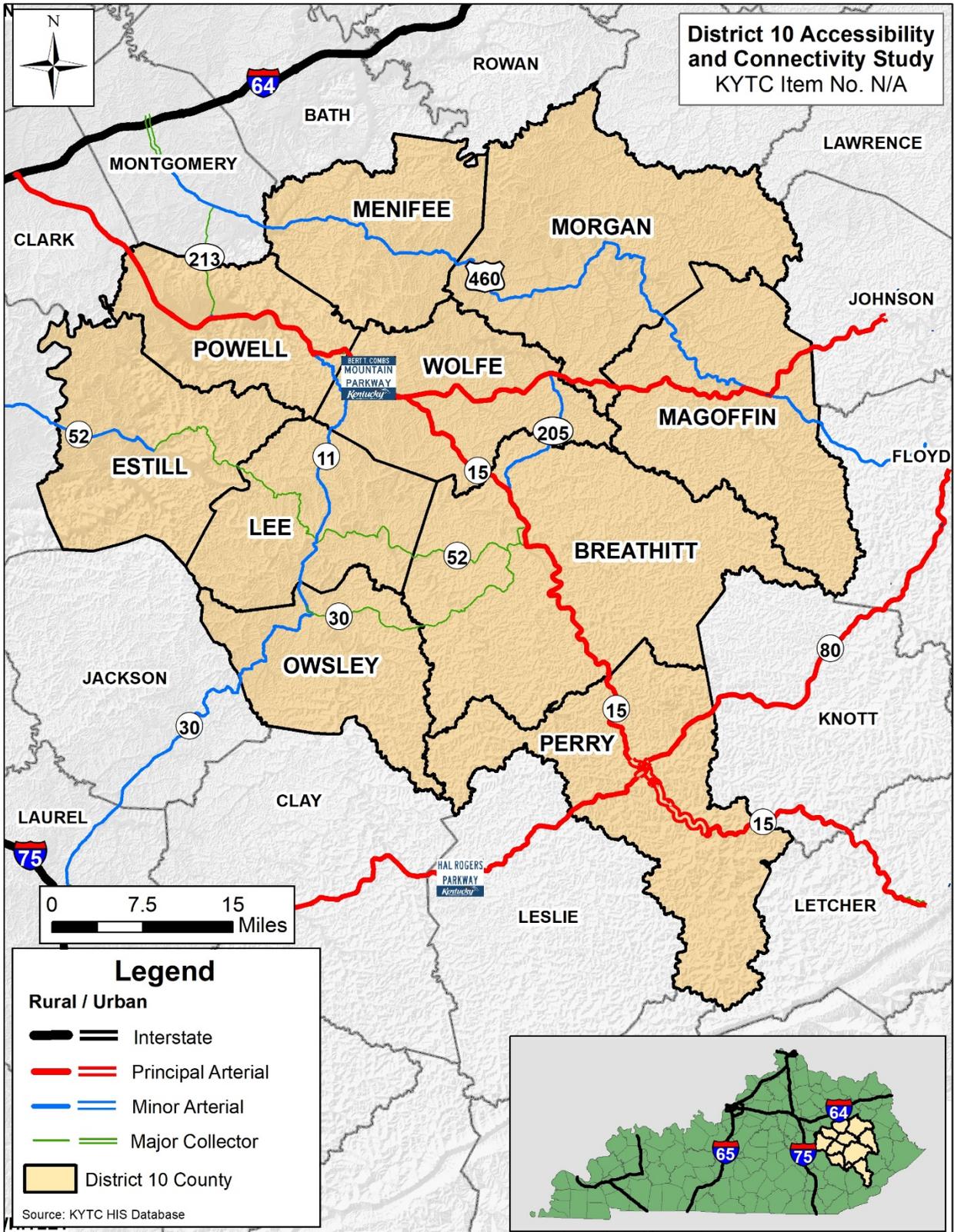


Figure 3: Functional Classification

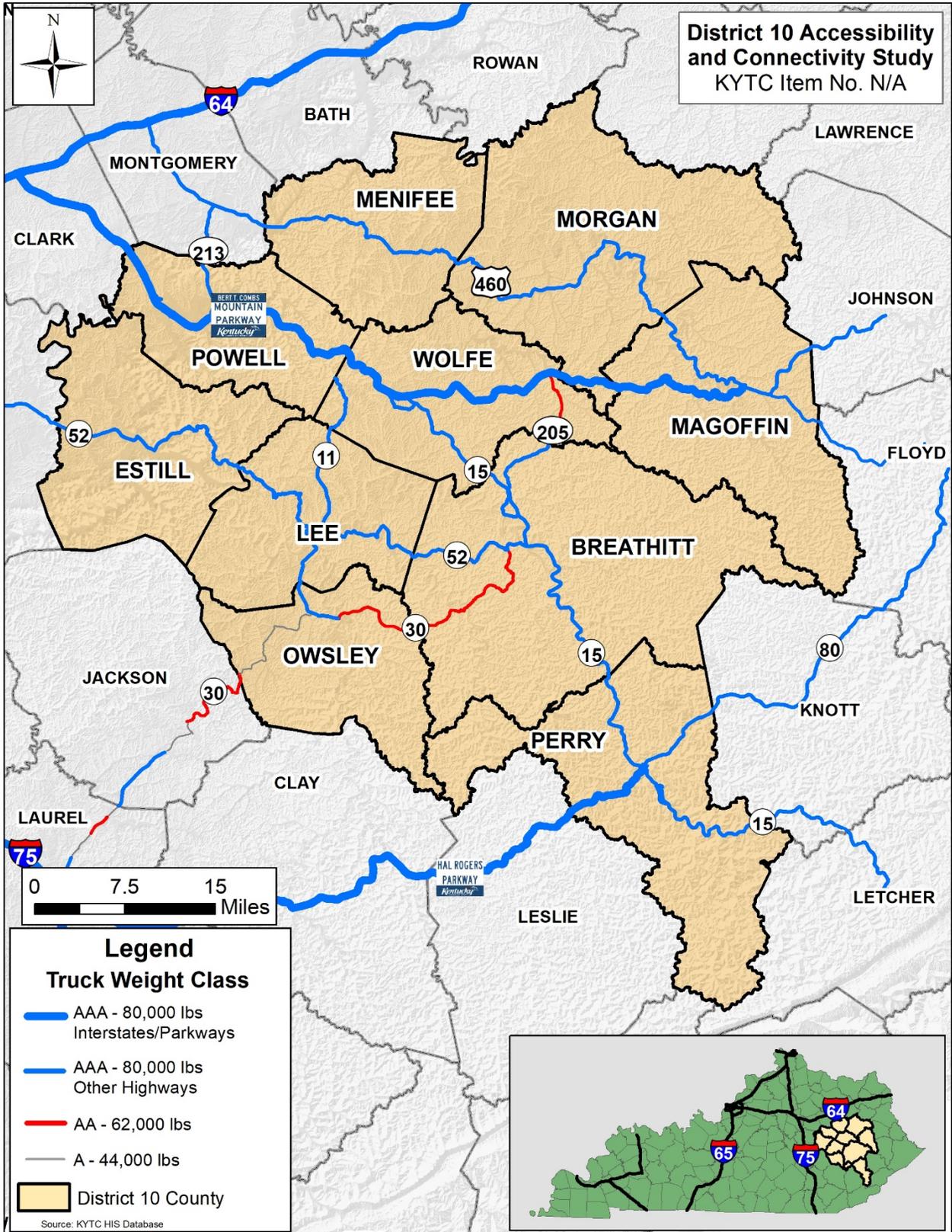


Figure 4: Truck Weight Classification

3.1.2 Roadway Geometrics

The current number of lanes and lane widths along the regionally impactful corridors in District 10 are shown on **Figure 6**. Multi-lane highways in District 10 include portions of the Mountain Parkway, US 460, KY 15, and KY 80. Current KYTC design guidelines suggest a minimum of 11-foot-wide lanes on arterials and collector roadways. Several arterials, including portions of KY 11, KY 30, KY 52, KY 205, and US 460 have lane widths less than 11 feet.

Shoulder widths for the regionally impactful corridors are shown on **Figure 7**. Many of the arterial routes have shoulders less than four feet wide, while the recommended shoulder width for such roadways is eight feet. Most of these are rural two-lane routes, such as KY 11 and KY 15, are relied on heavily for regional connectivity.

3.1.3 Traffic Analysis

The most recent average annual daily traffic (AADT) volumes from KYTC's traffic count stations are shown on **Figure 8**. ADT volumes on the regionally impactful corridors in District 10 range from under 100 vehicles per day (VPD) on KY 52 to 24,100 VPD on KY 15 near Hazard.

To evaluate the adequacy of roadway segments, existing ADT volumes were compared to the road's theoretical capacity. This is the preferred KYTC methodology for evaluating the adequacy of roadway segments. A volume-to-capacity ratio (V/C) represents proportion of traffic demand for using the roadway for the designated time-period in relation to its capacity to serve the demand.

The Volume to Capacity (V/C) Ratio
reflects the percentage of a road's carrying capacity that is currently utilized.

	Rural	Urban	
0.9 <	A V/C Ratio over 0.9 indicates that the roadway is carrying more traffic than it is designated to carry	A V/C Ratio over 1.0 indicates that the roadway is carrying more traffic than it is designated to carry	1.0 <
0.9 >			1.0 >

Estimated 2018 daily traffic volumes developed from the updated KYSTM were used along with Highway Capacity Manual (HCM) procedures to develop V/C ratios, as shown on **Figure 9**. The desired V/C threshold is 0.9 for rural areas and 1.0 for urban areas. A V/C greater than this indicates the road is congested. Portions of KY 15 and the Hal Rogers Parkway in Perry County have a V/C greater than 0.9, which indicates that mitigation measures (including additional lanes) may be warranted based on current traffic demand. These segments are shown on **Table 2** and **Figure 9**. All other regionally impactful corridor segments in District 10 operate under their intended design capacity with a V/C less than 0.9.

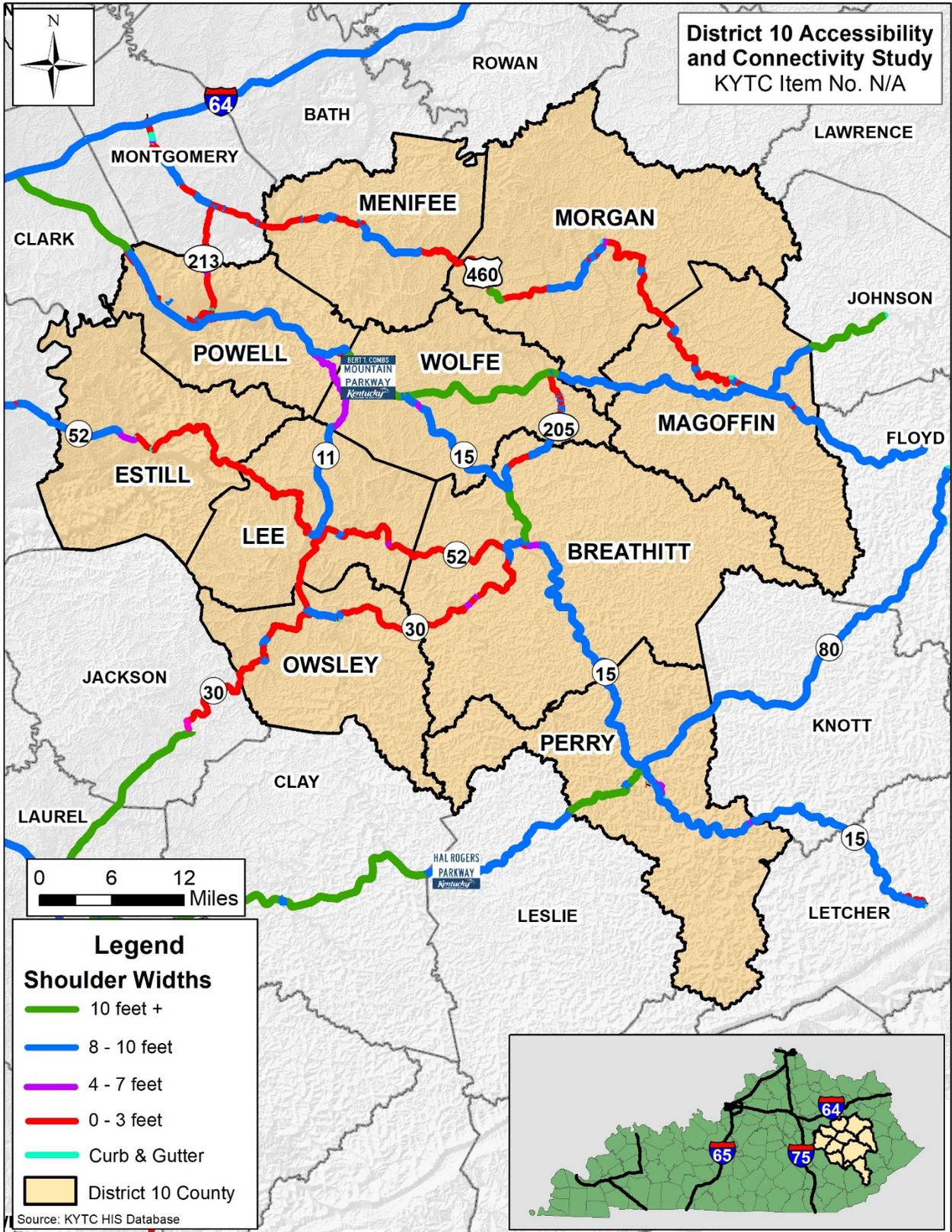


Figure 7: Shoulder Width

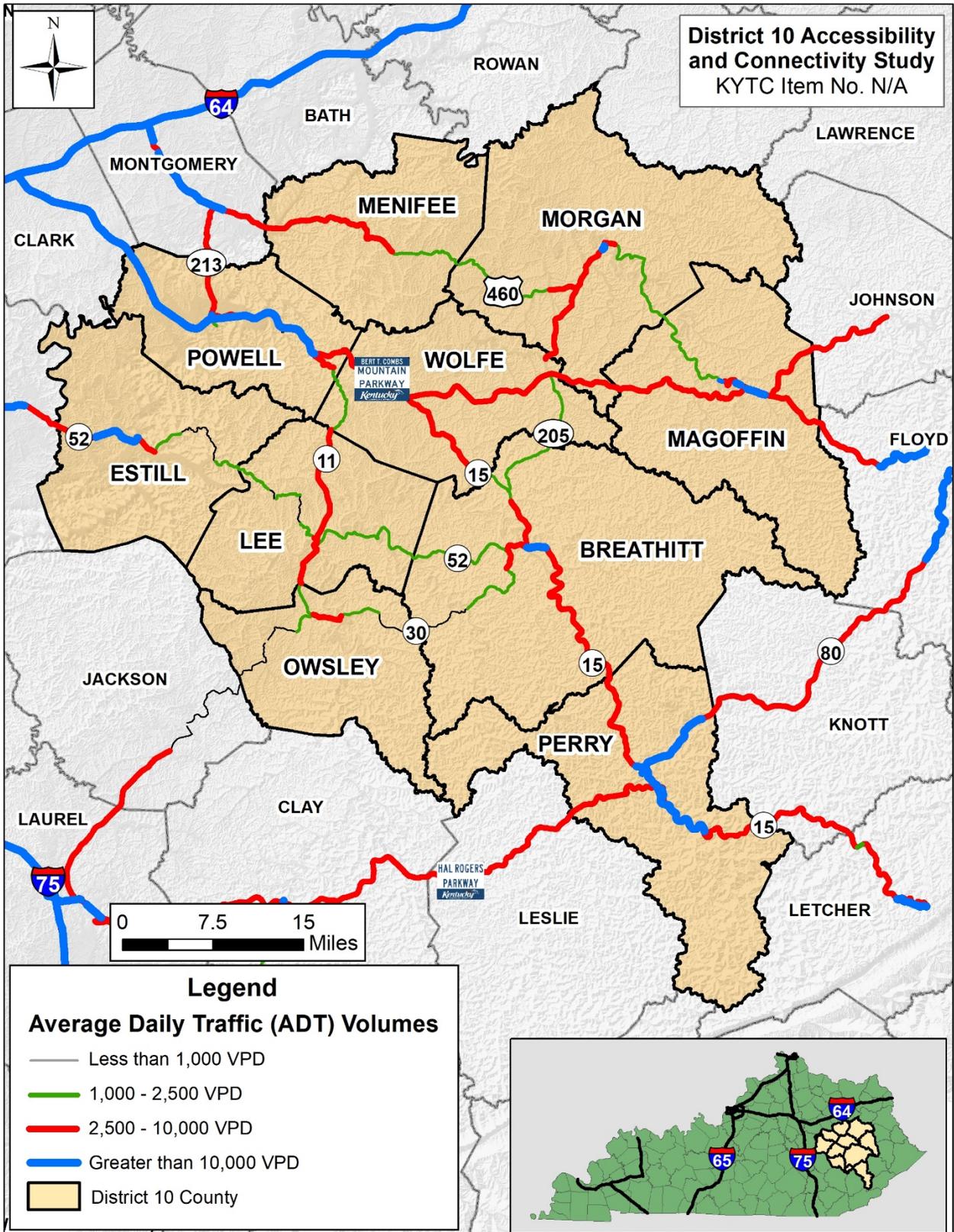


Figure 8: Average Daily Traffic (ADT) Volumes

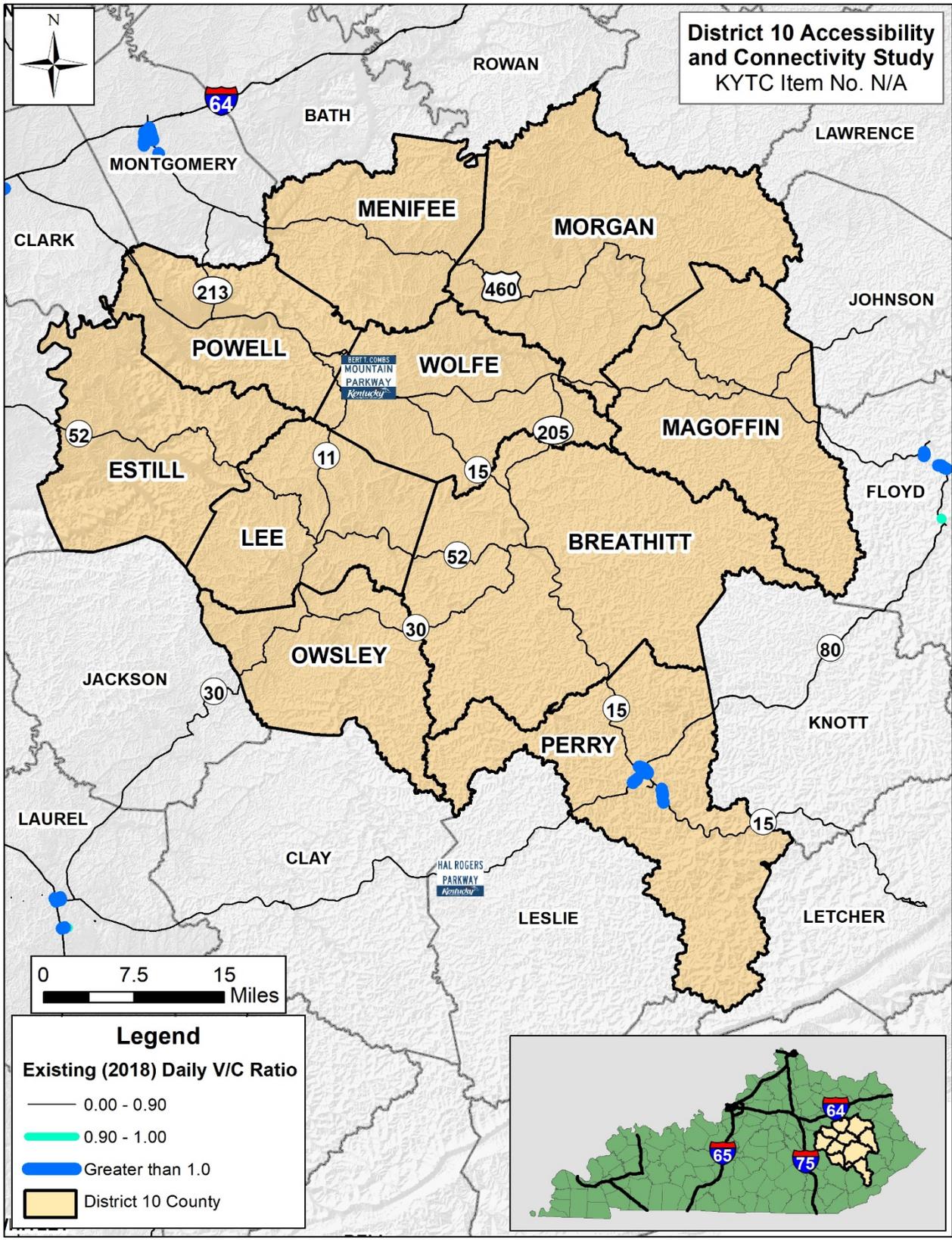


Figure 9: KYSTM Existing (2018) Daily Volume-to-Capacity Ratios

Table 2: KYSTM Existing (2018) Daily V/C Ratios > 0.9 in District 10

Route	County	Start MP	End MP	V/C Ratio
KY 15	Perry	15.038	15.46	1.6
HR 9006	Perry	58.655	59.088	1.45
HR 9006	Perry	58.232	58.676	1.18
HR 9006	Perry	58.051	58.232	1.18
KY 451	Perry	3.84	3.907	1.08
HR 9006	Perry	57.761	58.051	1.05
HR 9006	Perry	56.771	57.761	1.05
KY 15	Perry	6.023	14.849	0.93

3.1.4 Crash Analysis

To quantify safety concerns, a crash analysis was performed from 2011 to 2015 for the regionally impactful corridors within District 10. Crashes were geospatially referenced and compared to statewide data to identify locations experiencing above-average crash rates. The methodology

High CRF Locations

- CRF > 1.0 indicates crashes are likely not occurring at random
- 44 segments with a CRF > 1.0

is defined in the Kentucky Transportation Center research report *Analysis of Traffic Crash Data in Kentucky (2012-2016)*². As defined in the methodology report, segments vary in length and are divided along roadways where geometry or traffic volumes change. For each segment, analysts examined the number of crashes, traffic volume, rural/urban, number of lanes, and segment length to determine the critical rate factor (CRF). The CRF is one measure of the safety of a

road, expressed as a ratio of the crash rate at the location compared to the critical crash rate for similar roadways throughout the state. A CRF of 1.00 or greater may indicate that crashes are occurring due to circumstances not attributed to random occurrence.

Segment locations with CRF values between 1.0 and 2.0 are shown in **Figure 10** and **Table 3** with CRF values greater than 2.0 shown in blue on the figure. A detailed CRF summary table is included in **Appendix C**.

² Green, E. R., et al. *Analysis of Traffic Crash Data in Kentucky*. KTC-15-21, September 2017.

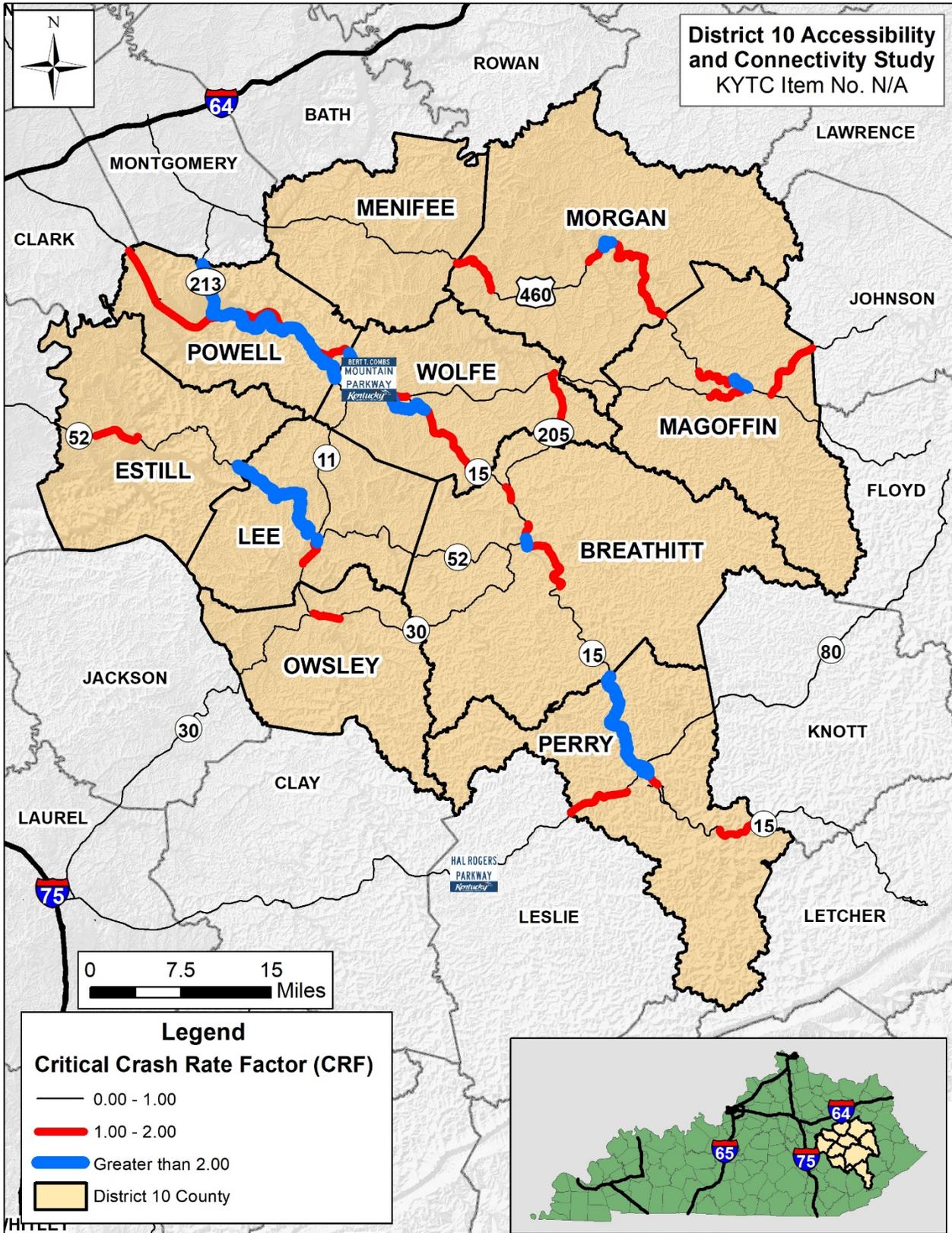


Figure 10: Critical Crash Rate Factors (CRFs)

Table 3: Regionally Impactful Corridor Segments with CRF above 1.0 (2011 - 2015)

County	Route	Begin	End	Crashes	CRF
Breathitt	KY 15	17.897	18.538	76	4.91
Powell	KY 213	8.14	12.076	107	3.80
Wolfe	KY 15	9.515	18.704	46	3.56
Magoffin	US 460	11.138	12.486	95	3.07
Perry	Hal Rogers Pkwy	58.676	59.088	70	2.74
Powell	KY 11	14.344	15.638	66	2.71
Perry	KY 15	16.52	25.179	158	2.47
Powell	KY 11	0	3.598	72	2.43
Perry	KY 15	14.512	15.944	171	2.39
Powell	KY 11	3.598	14.344	100	2.34
Morgan	US 460	17.119	18.08	55	2.26
Lee	KY 11	4.148	4.456	23	2.13
Wolfe	KY 15	8.692	9.515	48	2.11
Powell	KY 213	7.595	8.14	38	2.08
Lee	KY 52	0	11.843	48	2.00
Breathitt	KY 15	16.329	16.97	54	1.94
Powell	Mountain Pkwy	11.913	22.307	149	1.89
Wolfe	Mountain Pkwy	40.468	42.853	39	1.74
Breathitt	KY 15	16.97	17.446	73	1.64
Breathitt	KY 15	11.845	16.329	107	1.59
Morgan	US 460	15.247	17.119	62	1.59
Wolfe	KY 205	0	6.436	38	1.53
Lee	KY 52	11.843	12.756	18	1.52
Morgan	US 460	18.434	28.565	55	1.48
Powell	Mountain Pkwy	22.307	36	183	1.39
Breathitt	KY 15	17.446	17.897	67	1.39
Perry	KY 15	13.269	14.512	143	1.34
Estill	KY 52	6.748	7.638	93	1.30
Magoffin	US 460	6.76	8.92	34	1.24
Estill	KY 52	3.694	5.922	63	1.22
Perry	Hal Rogers Pkwy	51.026	56.428	46	1.19
Morgan	US 460	18.08	18.434	11	1.18
Magoffin	Mountain Pkwy	71.786	75.666	38	1.18
Owsley	KY 30	11.121	11.181	4	1.17
Wolfe	KY 15	1.732	8.692	47	1.16
Magoffin	US 460	8.92	11.138	29	1.16
Breathitt	KY 15	22.321	23.578	11	1.15
Breathitt	KY 15	18.538	19.856	27	1.13
Lee	KY 11	1.59	4.148	51	1.12
Owsley	KY 11	12.114	14.343	29	1.10
Morgan	US 460	0	4.844	25	1.05
Magoffin	US 460	14.566	20.366	37	1.02
Perry	KY 15	0	3.902	81	1.02
Estill	KY 52	5.922	6.748	64	1.00

3.1.5 Operations Management Systems (OMS) Review

As part of the existing data review process, KYTC provided Stantec with OMS maintenance activity data for District 10 from January 2012 to July 2017 with the objective of identifying large, persistent maintenance issues.

The data included the following maintenance activity types:

- Pavement repair (pothole patching)
- Shoulder repair
- General roadside repair (rock falls & landslides)
- Bridge maintenance
- Roadway drainage repair (culvert & pipe repair)
- Emergency repairs



This data was sorted by route and cost-per-mile, then analyzed for recurring patterns. Through this process, locations with maintenance costs greater than \$25,000 per mile were identified to potentially have recurring maintenance issues along the regionally impactful corridors.

After analyzing the maintenance activities with the data-driven approach, individual meetings with maintenance staff from each of the District 10 counties were organized to discuss the identified roadway segments and any other locations with potential recurring maintenance issues. The goal of the meetings was to solicit input from the maintenance staff and compare to the results of the data-driven OMS approach. The OMS meeting summaries are included in the OMS Review in **Appendix D**.

Based on input gathered from the county maintenance meetings, locations identified by the data-driven approach were confirmed and new locations were identified as having recurring maintenance issues. The OMS data at these new locations were analyzed using the data-driven approach. The remaining locations were not identified as having recurring maintenance issues for various reasons. Currently, OMS data does not always capture Federal funding. It is possible that maintenance activities for some of the roadway segments identified were paid for with Federal funds and did not show up in the OMS data (i.e., Federal Emergency Management Agency (FEMA) projects). It is also possible that maintenance activities mentioned by KYTC staff date farther back than the five years of data used for this analysis.

Table 4 and **Figure 11** present a summary of the four locations on District 10 regionally impactful corridors that were identified as having recurring maintenance issues and having five-year maintenance costs greater than \$25,000 per mile. A complete review of District 10 locations with recurring maintenance issues can be found in **Appendix D**.

Table 4: District 10 Locations with Recurring Maintenance Issues

Location	County	Route	Begin MP	End MP	Maintenance Issue	Notes	Total Cost
1	Breathitt	KY 15	14.0	15.0	Rock Falls	Identified through data-driven process	\$52,358
2	Breathitt	KY 30	3.0	4.0	Rock Falls, Slides & Sinkholes	Identified through data-driven process	\$51,214
3	Owsley	KY 11	10.0	11.0	Rock Falls, Slides & Sinkholes	Identified through data-driven process	\$47,654
4	Breathitt	KY 15	16.0	17.0	Rock Falls	Identified through data-driven process	\$41,163
5	Owsley	KY 11	13.0	14.0	Rock Falls, Slides & Sinkholes	Identified through data-driven process	\$32,548

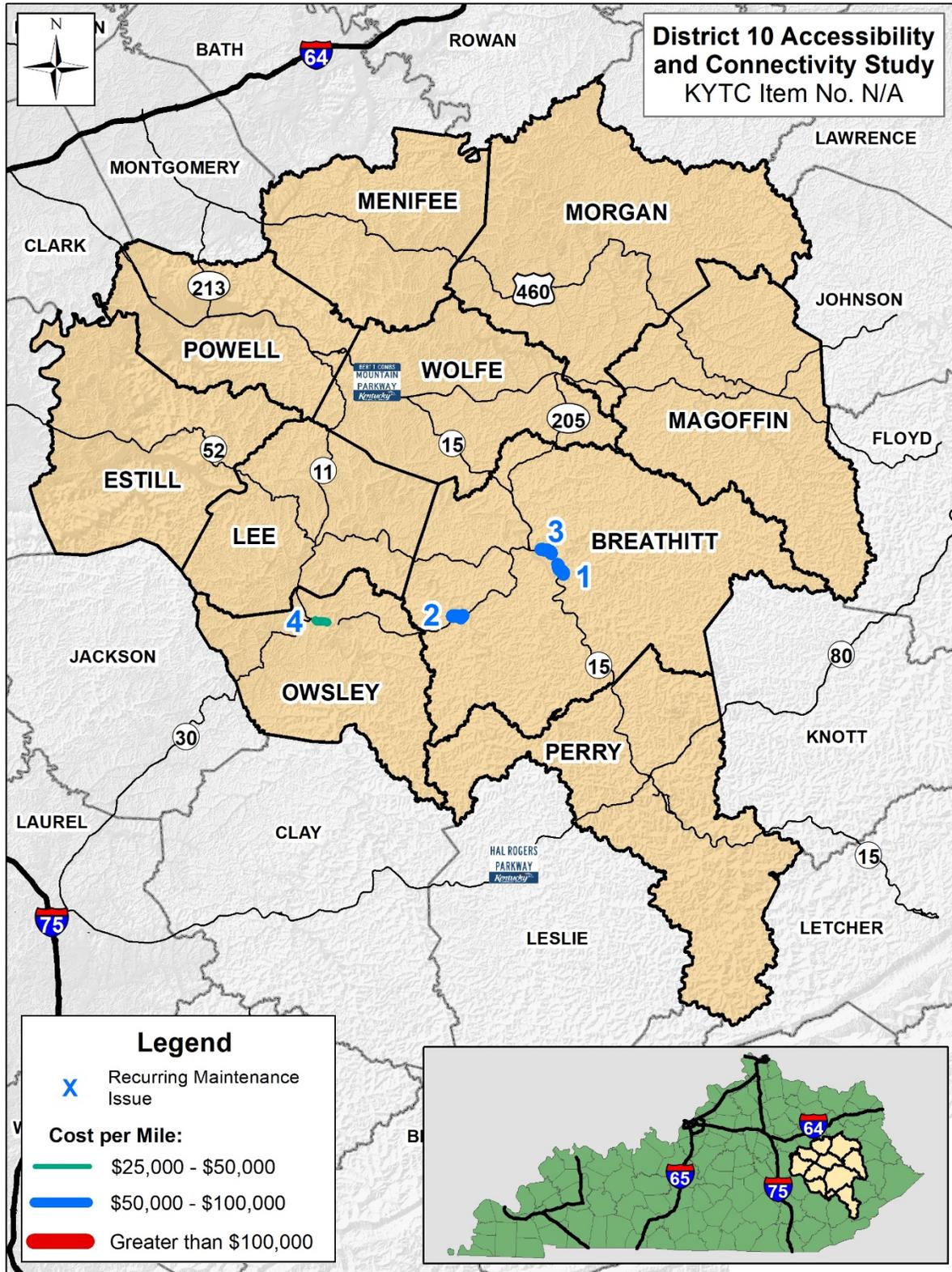


Figure 11: District 10 Recurring Maintenance Locations

3.2 EXISTING HIGHWAY PLAN PROJECTS

The Continuous Highways Analysis Framework (CHAF) is a KYTC application that collects, tracks, and analyzes transportation needs across the state. It provides a means to sponsor, score, and rank projects as a part of the Strategic Highway Investment Formula for Tomorrow (SHIFT) process. **Figure 12** presents the existing CHAF projects on the District 10 regionally impactful corridors along with all projects currently included in Kentucky's FY 2018 – FY 2024 Highway Plan. Only widening and/or reconstruction projects are shown.

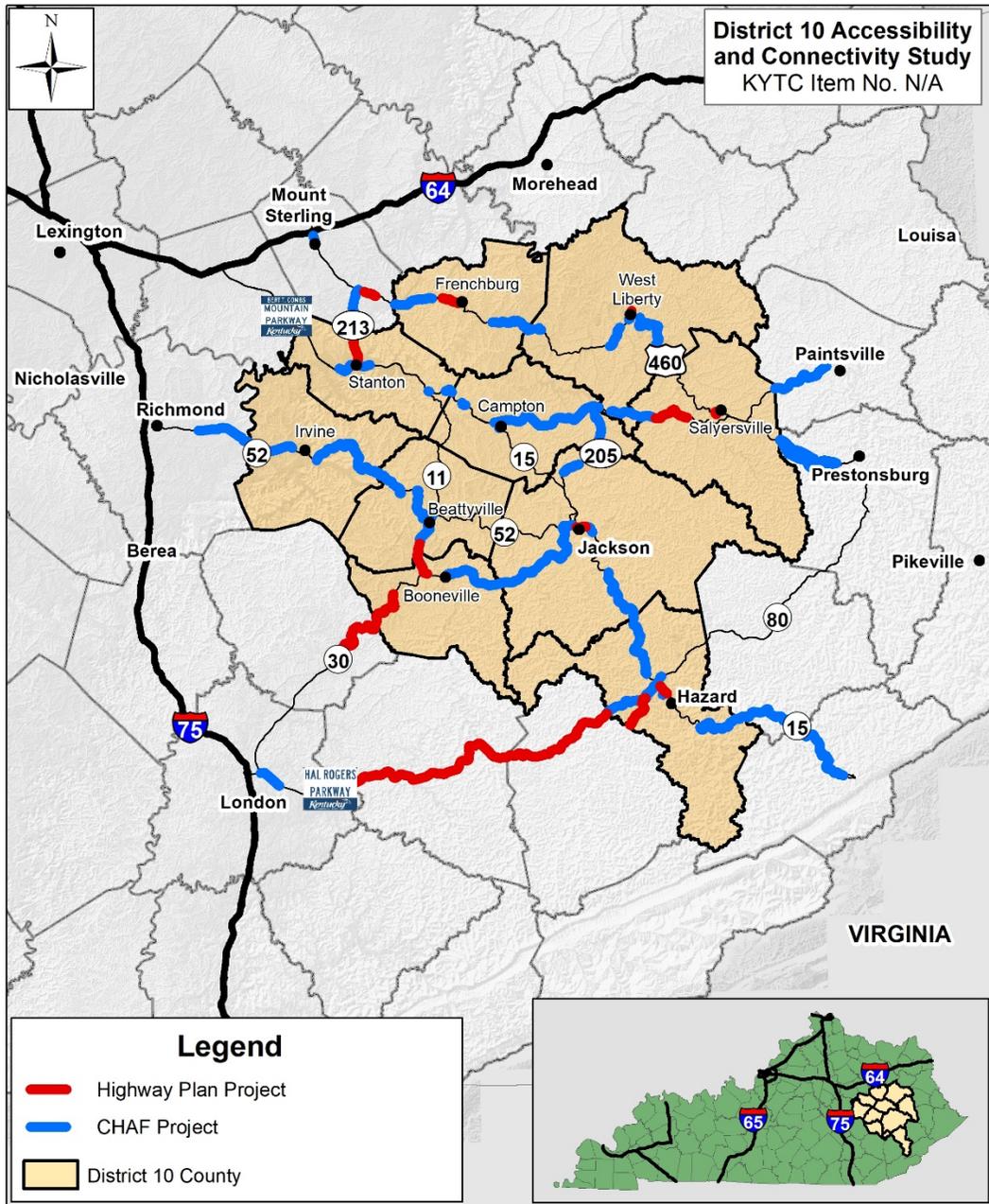


Figure 12: Regionally Impactful Corridor Highway Plan Projects and CHAFs

4.0 TRAVEL TIME ANALYSIS

The primary analytical tool used to evaluate potential improvements and strategies is the 17th version of the Kentucky Statewide Travel Demand Model (KYSTMv17). An initial task of the analysis was a review of the KYSTM's road network and socioeconomic data for the counties within the study area. The full KYSTM review and updates summary is in **Appendix E**. Nineteen counties outside of Kentucky, found to be within a 180-minute travel time from Jackson, were also updated as part of the review. The full review of the process for updating the KYSTM for counties outside Kentucky can be found in **Appendix F**.

To analyze and prioritize potential improvement projects along the regionally impactful corridors, the TransCAD travel time analysis tool was used with the KYSTM to create 40- and 90-minute travel time contours centered on each county seat. The contours were used to estimate the number of 2040 households and non-retail jobs accessible within each travel shed for the No-Build scenario, the Existing + Committed Tier 1 and Tier 2 Projects scenario (as explained in **Section 4.1.2**), and for improvements on regionally impactful corridors. The number of households within a 40-minute drive or a 90-minute drive estimates the workforce for existing and prospective employers/businesses. The number of non-retail jobs estimates the economic opportunity available to county residents within a 40-minute drive and a 90-minute drive.

4.1 REGIONALLY IMPACTFUL CORRIDOR IMPROVEMENTS

4.1.1 No-Build

The No-Build scenario includes no additional transportation improvements. This scenario was carried forward as a basis of comparison.

4.1.2 Tier 1 & Tier 2 Projects

The Existing + Committed scenario included District 10 Tier 1 and Tier 2 projects from Kentucky's Enacted FY 2018 – FY 2024 Highway Plan, as seen in **Table 5**. The tiers were calculated as follows:

- Tier 1: Project is in the 1st Biennium in both Kentucky's Enacted FY 2018 – FY 2024 Highway Plan and KYTC's Recommended Highway Plan.
- Tier 2: Project is in the 1st Biennium in Kentucky's Enacted FY 2018 – FY 2024 Highway Plan and outside the 1st Biennium in KYTC's Recommended Highway Plan.

Table 5: District 10 Tier 1 & Tier 2 Projects

County	Item No.	Tier	Route	Begin MP	End MP	Description	Funding Year(s)*	Cost
Breathitt	376	1	KY-15	16.75	17.9	Improve KY 15	2019 - 2023	\$13,500,000
Estill	208	1	KY-1645	1.7	2.1	Improve safety and mobility	2019 & 2020	\$570,000
Estill	206	2	KY-2459	0	0.373	Improve safety	2021 & 2023	\$250,000
Magoffin	126.4	1	KY-9009	65	69.6	Widen to 4 lanes	2019	\$15,000,000
Magoffin	126.41	1	KY-9009	65	69.6	Widen to 4 lanes	2020	\$10,000,000
Menifee	8802	1	US-460	6.2	8.5	Improve safety and geometrics	2020 - 2023	\$9,200,000
Morgan	293.1	1	KY-7	0.134	0.5	Reconstruction	2018	\$3,300,000
Owsley	279.61	1	KY-30	0	5.166	Improve KY 30	2018	\$14,500,000
Perry	158	1	KY-15	13.269	14.512	Improve safety, upgrade geometrics, address capacity issues	2018	\$47,000,000
Perry	8906	1	KY-80	0	4.6	Safety improvements	2019 - 2022	\$6,730,000
Powell	163	1	KY-213	7.595	11.271	Improve safety and geometrics, and reduce congestion	2019 & 2020	\$7,100,000
Powell	211	1	KY-2026	0	0.381	Correct flooding issues	2019 - 2021	\$850,000

*Funding years as shown in the Enacted FY 2018 – FY2024 Highway Plan

4.1.3 Proposed Corridor Improvements

Corridor 1 (Mountain Parkway): The Bert T. Combs Mountain Parkway (KY 9000/KY 9009) is a two-to four-lane principal arterial with 12-foot lanes, shoulder widths ranging from 0 – 16 feet, and speed limits ranging from 55 – 70 mph. The parkway stretches from I-64 in Winchester to US 460 in Salyersville, traveling through Powell, Wolfe, Morgan, and Magoffin Counties in District 10.

Corridor 1 improvements include extending the Mountain Parkway from its current terminus at US 460 in Salyersville to US 23 in Prestonsburg. It also includes widening the

entire parkway to four lanes and upgrading the roadway geometrics to 70 mph, as currently proposed in the Highway Plan. A significant amount of the widening is already funded, much of which is currently under construction. The exception being the KY 114 piece between Salyersville and



**Corridor 1 Improvements
Estimated Benefits**

In 2040, from Magoffin County seat, within 90-Minute Drive:

- 97,000 Additional Households
- 32,000 Additional Non-Retail Jobs

Prestonsburg. This project would substantially increase the number of jobs and households available for all District 10 counties, with the exception of Perry County. The counties most impacted by these improvements would be the counties in the northern portion of the district. Most impacted would be Magoffin County, where residents would have access to 32,000 additional non-retail jobs and employers would have access to 97,000 additional households in a 90-minute travel shed from the county seat compared to the Existing plus Committed network in the year 2040.

Corridor 2 (Hal Rogers Parkway & KY 80): The Hal Rogers Parkway (HR 9006) is a two-lane principal arterial with 12-foot lanes, shoulder widths ranging from 3 – 11 feet, and a 55 mph speed limit. The parkway stretches from I-75 in London to KY 15/KY 80 in Hazard, only traveling through Perry County in District 10. KY 80 between Hazard and Prestonsburg is a four-lane facility and does not require any additional

improvements. Corridor 2 improvements include widening the Hal Rogers Parkway to four lanes and upgrading the roadway geometrics to 70 mph.

These improvements would significantly increase the number of jobs and households available for southern District 10 counties. This is especially true for Perry County, where residents would have access to 11,000 additional non-retail jobs and employers would have access to 27,000 additional households in a 90-minute travel shed from the county seat compared to the Existing plus Committed network in the year 2040.



**Corridor 2 Improvements
Estimated Benefits**

In 2040, from Perry County seat, within 90-Minute Drive:

- 27,000 Additional Households
- 11,000 Additional Non-Retail Jobs

Corridor 3 (US 460): US 460 crosses through the northeast portion of District 10 in Menifee, Morgan, and Magoffin Counties. This two-lane rural minor arterial has 9- to 12-foot lanes, 0- to 12-

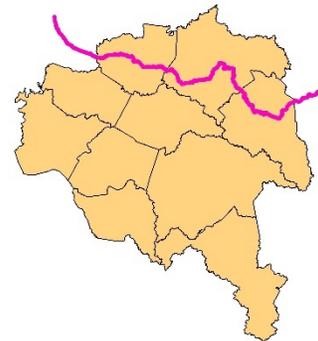
foot shoulders, and speed limits ranging from 25 to 55 mph. Corridor 3 improvements include reconstructing US 460 to at least 11-foot lanes, 8-foot shoulders, and upgrading the roadway geometrics to 55 mph from I-64 in Mt. Sterling to US 23 in Paintsville. This project would mainly affect the number of jobs and households available to northern District 10 counties. In a 90-minute travel shed from the county seats, Menifee County

**Corridor 3 Improvements
Estimated Benefits**

In 2040, from Morgan County seat, within 90-Minute Drive:

- 32,000 Additional Households
- 4,000 Additional Non-Retail Jobs

employers would have access to 19,000 additional households and residents would have access to 7,000 additional non-retail jobs, Morgan County employers would have access to 32,000 additional households and residents would have access to 4,000 additional non-retail jobs, and Magoffin County employers would



have access to 16,000 additional households and residents would have access to 19,000 additional non-retail jobs when compared to the Existing plus Committed network in the year 2040.

Corridor 4 (KY 11 & KY 213): In the western portion of District 10, KY 11 provides a north-south connection from Owsley County to Stanton. In Stanton, KY 213 continues north to Jeffersonville in Montgomery County. KY 11 is a two-lane roadway with 9- to 12-foot lanes, 0- to 11-foot shoulders, and speed limits ranging from 25 to 55 mph. KY 213 is a two-lane roadway with 9- to 11-foot lanes, 2- to 8-



foot shoulders, and speed limits ranging from 35 to 55 mph. Corridor 4 improvements involve reconstructing KY 11 and KY 213 to at least 11-foot lanes, 8-foot shoulders, and upgrading the roadway geometrics to 55 mph from KY 30 in Booneville to US 460 in Jeffersonville. This project would increase the number of jobs and households available for western District 10 counties. This is especially true for Owsley County, where employers would have access to 14,000 additional households and residents would have access to 6,000 additional non-retail jobs in a 90-minute travel shed from the county seat when compared to the Existing plus Committed network in the year 2040.

**Corridor 4 Improvements
Estimated Benefits**

In 2040, from Owsley County seat, within 90-Minute Drive:

- 14,000 Additional Households
- 6,000 Additional Non-Retail Jobs

Corridor 5 (KY 15): KY 15 provides a north-south connection through the central portion of District 10. This two- to four-lane principal arterial carries the heaviest traffic in the district with 24,100 VPD near Hazard. Currently, KY 15 has 11- to 12-foot lanes, 0- to 11-foot shoulders, and speed limits

**Corridor 5 Improvements
Estimated Benefits**

In 2040, from Breathitt County seat, within 90-Minute Drive:

- 28,000 Additional Households
- 14,000 Additional Non-Retail Jobs

ranging from 45 to 55 mph. Corridor 5 improvements include reconstruction and widening to four lanes and upgrading the roadway geometrics to 55 mph from US 119 in Whitesburg to the Mountain Parkway in Campton. This project would significantly increase the number of jobs and households available for Perry and Breathitt Counties. In a 90-



minute travel shed from the county seats, Perry County residents would have access to 8,000 additional non-retail jobs and employers would have access to 30,000 additional households, and Breathitt County residents would have access to 14,000 additional non-retail jobs and employers would have access to 28,000 additional households when compared to the Existing plus Committed network in the year 2040.

Corridor 6 (KY 30 & KY 205): KY 30 travels through the southwestern portion of District 10, crossing through Owsley and Breathitt Counties. In Breathitt County, near Vancleve, KY 205 continues this connection to the Mountain Parkway in Helechawa. KY 30 is currently a two-lane roadway with 9- to 12-foot lanes, 0- to 11-foot shoulders, and speed limits ranging from 35 to 55 mph.



Corridor 6 improvements involve reconstructing KY 30 from the Hal Rogers Parkway in London to KY 15 in Jackson and KY 205 from KY 15 in Vancleve to the Mountain Parkway in Helechawa to at least 11-foot lanes, 8-foot shoulders, and upgrading the roadway geometrics to 55 mph. This project would have the largest impact in central District 10. In a 90-minute travel band from the county seat, residents in Breathitt County would have access to 5,000 additional non-retail jobs and employers would have access to 8,000 additional households when compared to the Existing plus Committed network in the year 2040.

**Corridor 6 Improvements
Estimated Benefits**

In 2040, from Breathitt County seat, within 90-Minute Drive:

- 8,000 Additional Households
- 5,000 Additional Non-Retail Jobs

Corridor 7 (KY 52): KY 52 provides an east-west connection in the western portion of District 10, traveling through Estill, Lee, and Breathitt Counties. This two-lane roadway currently has 9- to 13-foot lanes, 0- to 10-foot shoulders, and speed limits ranging from 25 to 55 mph. Corridor 7 improvements include reconstruction and widening to at least 11-foot lanes, 8-foot shoulders, and upgrading the roadway geometrics to 55 mph. This project would have the largest impact in Estill County, where residents

**Corridor 7 Improvements
Estimated Benefits**

In 2040, from Estill County seat, within 90-Minute Drive:

- 3,000 Additional Households
- 1,000 Additional Non-Retail Jobs

would have access to 1,000 additional non-retail jobs and employers would have access to 3,000 additional households from the county seat compared to the Existing plus Committed network in the year 2040.



4.1.4 County-Level Travel Time Summary

Results from the travel time analysis are shown in **Table 6**. The total number of households and non-retail jobs available within a 90-minute drive from the county seat are shown for the Existing plus Committed network. The number of households and non-retail jobs added by the corridor improvements are also shown. These values are shown for the year 2040.

Table 6: Year 2040 County-Level Travel Time Summary

Scenario			Existing + Committed*	Increase (Δ) from Existing + Committed						
				Corridor 1	Corridor 2	Corridor 3	Corridor 4	Corridor 5	Corridor 6	Corridor 7
Breathitt County	90-Minute	Households	453,995	5,610	4,733	3,745	943	28,266	8,302	2,162
		Non-Retail Jobs	560,009	5,122	2,587	2,206	213	13,969	4,534	482
Estill County	90-Minute	Households	610,009	8,782	106	837	58	1,383	2,303	3,164
		Non-Retail Jobs	775,665	4,624	7	215	23	547	913	1,012
Lee County	90-Minute	Households	567,112	5,984	0	1,502	812	2,368	2,909	1,490
		Non-Retail Jobs	718,274	2,086	0	131	398	1,566	1,037	544
Magoffin County	90-Minute	Households	288,710	97,484	533	16,236	22	1,102	120	59
		Non-Retail Jobs	316,874	32,009	283	5,488	27	335	32	47
Menifee County	90-Minute	Households	577,442	4,915	324	18,554	592	4,718	1,017	213
		Non-Retail Jobs	693,910	2,254	46	7,111	217	1,129	668	63
Morgan County	90-Minute	Households	417,494	15,777	349	31,969	38	2,497	902	787
		Non-Retail Jobs	530,351	1,778	28	4,429	33	500	59	37
Owsley County	90-Minute	Households	503,187	6,496	489	1,265	13,881	1,962	6,275	960
		Non-Retail Jobs	645,798	2,333	297	0	5,875	873	2,765	552
Perry County	90-Minute	Households	206,340	171	27,371	658	538	29,577	1,014	1,039
		Non-Retail Jobs	246,244	82	11,034	48	46	8,294	95	98
Powell County	90-Minute	Households	620,059	6,804	907	1,598	1,475	4,565	1,949	173
		Non-Retail Jobs	757,335	2,866	708	188	894	1,240	491	121
Wolfe County	90-Minute	Households	561,747	8,469	259	3,261	1,257	4,054	2,767	449
		Non-Retail Jobs	696,467	3,666	75	1,052	798	1,310	2,122	269

* Number of Households & Non-Retail jobs within 90-minute travel shed as calculated in KYSTM existing network with committed projects.

It is evident that improvements to any of the seven regionally impactful corridors would provide significant travel-time savings for residents of District 10. However, while improving a corridor may benefit the residents of the surrounding area, residents in distant counties will not receive the same travel time savings. Improvements to Corridor 2, which is located in the southern part of the District, include widening the Hal Rogers Parkway to four lanes and increasing the speed limit to 70 mph from I-75 in London to KY 15 in Hazard. At the KY 15 junction in Hazard, the route becomes KY 80 which is already a four-lane facility with a 55-mph speed limit. No additional improvements were assumed to KY 80 from Hazard to US 23 in Prestonsburg. This project greatly increases the number of households (+27,371) and non-retail jobs (+32,783) available to Perry County residents within a 90-minute travel shed but does not have the same effect in counties to the north, such as Estill County, where only 106 additional households and 64 additional jobs are made available within a 90-minute drive.

Conversely, improvements to Corridor 1, which is centrally located in the District and involves widening the entire Mountain Parkway to four lanes and extending it to US 23 in Prestonsburg, greatly increases the number of households and jobs available to residents in central District 10 counties. This is especially true for Magoffin County, where 96,484 additional households and 166,151 non-retail jobs are available within a 90-minute travel shed. However, Corridor 1 improvements do not have the same effect in counties to the south, such as Perry County, where only 171 additional households and 202 additional non-retail jobs are available within a 90-minute travel shed.

4.2 COST ESTIMATES

Cost estimates were prepared for improvements on the regionally impactful corridors, shown in **Table 7**. These planning-level estimates are based on the cost estimates from *Kentucky's Enacted FY 2018 – FY 2024 Highway Plan* and the CHAFs for projects along the corridors.

The improvements identified in this study were limited to roadway widening or roadway reconstruction, and the estimated costs (including all project phases) are based on average, per-mile costs included in the current CHAFs for the routes. Future efforts ought to examine broader types of improvements that should be considered in more detail. It would be beneficial to narrow improvement categories to a manageable list of strategies, considering such items as (but certainly not limited to) the following:

- Safety improvements
- Congestion relief
- Economic development
- Freight movement
- Other multimodal considerations

In future efforts, categorizing improvement strategies could help with evaluating improvement impacts and benefits and ultimately result in better information for inclusion in CHAFs.

Table 7: Cost Estimates (All Phases)

Corridor	Route	Total Length (miles)	Length Needing Funding (miles)*	Potential Improvement	District 10 Cost Estimate (millions)*	Non-D10 Cost Estimate (millions)*	Total Cost Estimate (millions)*
1	Mountain Parkway	95	14	Major Widening to 4 Lanes	\$71	\$222	\$293
2	Hal Rogers Parkway	59	8	Major Widening to 4 Lanes	\$104	\$15	\$119
	KY 80	42	0	Already a 4 lane Facility**	N/A	N/A	N/A
3	US 460	89	34	Reconstruction/ Realignment	\$299	\$106	\$405
4	KY 11	38	16	Reconstruction	\$148	\$0	\$148
	KY 213	10	1	Reconstruction	\$5	\$0	\$5
5	KY 15	80	61	Major Widening to 4 Lanes	\$619	\$283	\$902
6	KY 30	61	7	Reconstruction	\$111	\$31	\$142
	KY 205	19	11	Reconstruction	\$69	\$0	\$69
7	KY 52	70	32	Reconstruction	\$195	\$48	\$243

*Does not include segments already constructed, under construction, or in 2018 Enacted Highway Plan.

**KY 80 east of Hazard is currently a four-lane facility. No additional improvements were assumed.

5.0 CONCLUSIONS

Improvements to the seven regionally impactful corridors significantly improve the accessibility and connectivity in District 10. It is evident, however, that each corridor improvement provides the most benefit to residents of counties directly served by the corridor. Overall, improvements to Corridors 1, 3, and 5 would have the largest impact to the accessibility and connectivity of the entire region.

Corridor 1 improvements, which include extending the Mountain Parkway, widening to four lanes, and upgrading the roadway geometrics to 70 mph, traverses four District 10 counties and provides the best east-west connection to I-64. A significant amount of the widening is already funded, much of which is currently under construction. The exception being the KY 114 piece

between Salyersville and Prestonsburg. Completing this interstate-like facility would not only provide District 10 residents with better access to I-64, but also to the hospitals, post-secondary education facilities, and shopping opportunities located in Paintsville, Prestonsburg, and Pikeville. Powell, Wolfe, Morgan, and Magoffin Counties receive the most travel time benefit from improvements on the Mountain Parkway, with Magoffin County residents gaining access 32,000 additional non-retail jobs and employers gaining access to 97,000 additional households within a 90-minute travel shed from the county seat. For nine of the ten District 10 counties, improvements to Corridor 1 provide access to at least 1,000 additional households and 1,000 additional non-retail jobs within a 90-minute travel shed from the county seat. Extending and widening the 14 remaining miles of the Mountain Parkway has an estimated cost of \$293 million, \$71 million of which is needed in District 10.

Corridor 3 improvements, which include reconstruction of US 460 to at least 11-foot lanes, 8-foot shoulders, and upgrading the roadway geometrics to 55 mph, crosses through three counties in the northeast portion of District 10, providing access to I-64 to the north. Upgrading US 460 would provide District 10 residents with better access to the hospitals, post-secondary education facilities, and shopping in Mt. Sterling, West Liberty, and Paintsville. Menifee, Morgan, and Magoffin Counties would receive the most travel time benefits from improvements to US 460, with Morgan County residents having access to 4,000 additional non-retail jobs and employers gaining access to 32,000 additional households within a 90-minute travel shed from the county seat. For six of the ten District 10 counties, improvements to Corridor 3 provide access to at least 1,000 additional households and 1,000 additional non-retail jobs from the county seats. Reconstruction of the 34 remaining miles of US 460 has an estimated cost of \$405 million, \$299 million of which is needed in District 10.

Corridor 5 improvements, which include reconstruction of KY 15, traverses three District 10 counties and provides a north-south connection for the region. Portions of KY 15 have the highest ADTs in the district, with over 24,000 vehicles per day near Hazard. Along with providing better connectivity to both the Hal Rogers and Mountain Parkways, improvements to KY 15 would provide District 10 residents with better access to hospitals, post-secondary education facilities, and shopping in Hazard and Jackson. Breathitt County would receive the most travel time benefit from these improvements, providing residents with access to 14,000 additional non-retail jobs and employers with access to 28,000 additional households within a 90-minute travel shed from the county seat. Because of its centralized location, improving KY 15 provides access to at least 1,000 additional households and 1,000 additional jobs within a 90-minute travel shed from the county seat for residents and employers in six of the ten counties in District 10. Reconstruction of the remaining 61 miles of KY 15 has an estimated total cost of \$902 million, \$619 million of which is needed in District 10.

6.0 CONTACTS/ADDITIONAL INFORMATION

Written requests for additional information should be sent to Amanda Spencer, Director, KYTC Division of Planning, 200 Mero Street, Frankfort, KY 40622. Additional information regarding this study can also be obtained from the District 10 Project Manager, Jason Blackburn, at (606) 666-8841 (email at Jason.Blackburn@ky.gov).