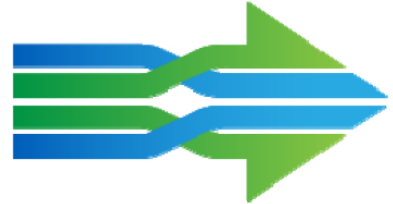


# JESSAMINE/FAYETTE CONNECTIVITY STUDY



Fayette & Jessamine Counties

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June 2022

**Final Report**



## Executive Summary

Jessamine/Fayette Connectivity Study, Item No. 7-445

## Introduction

The *Jessamine/Fayette Connectivity Study* was initiated by the Kentucky Transportation Cabinet (KYTC) to identify and evaluate potential improvement options to increase mobility and connectivity in northeast Jessamine County and southeast Fayette County by improving safety and reducing congestion. Future phases are not funded in Kentucky's FY 2020 - FY 2026 Highway Plan.

## Study Area

In lieu of the traditional "study area," this study includes a project focus area, an area in which transportation improvement concepts and strategies will be considered, and an area of influence, a larger area within which traffic could potentially be affected by improvements in the focus area. The area of influence includes portions of northern Jessamine County and southeast Fayette County bounded to the east by I-75, to the south by the Kentucky River, to the west by US 68, and to the north by Man O' War Boulevard, as shown in **Figure ES-1**.

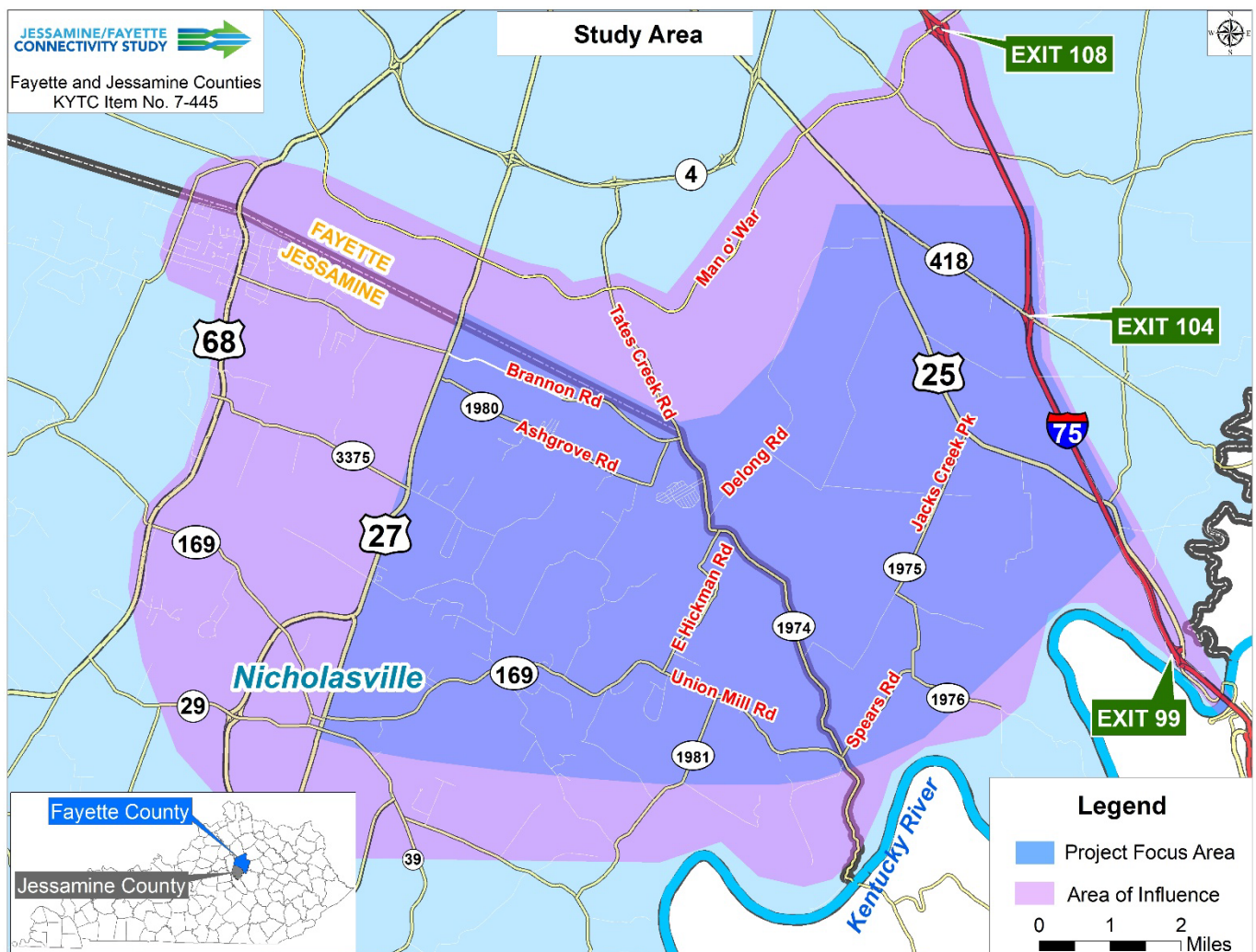


Figure ES-1: Focus Area and Area of Influence



## Study Goals and Objectives

The primary goals and objectives of the *Jessamine/Fayette Connectivity Study* are to identify safety and congestion related transportation issues affecting mobility and to examine short-term, long-term, and local improvement concepts and strategies to address the identified issues. Southeast Fayette County and Northeast Jessamine County have experienced significant population growth in recent years, and projections provided by the Kentucky State Data Center suggest this growth will continue for the foreseeable future. A lack of adequate east-west connectivity south of Man O' War Boulevard has been an increasing concern of the traveling public and local officials. With the impending completion of the East Nicholasville Bypass and an increasing demand for travel between Jessamine County and Fayette County, geometrically undesirable roadways will be expected to handle high traffic volumes acting as "shortcuts" between US 27 and I-75. This study examined options to provide better, safer connections in the area.

While previous studies (*US 27 to I-75 Corridor Study* and *I-75 Connector Preliminary Design and Environmental Study*) have explored options to provide an east-west connector between US 27 and I-75, this study is not an extension of those studies. Instead, the project team took a different approach and looked at improvement options along existing roadways, where feasible, that do not cross the Kentucky River.

## Project Needs

Conditions of the existing transportation network were examined, including roadway facilities and geometrics, crash history, and traffic volumes within the study area. Current KYTC design guidelines recommend a minimum of 11-foot-wide lanes on rural arterials and collector roadways like the 45 to 55-mph routes in the focus area. Several of the roadways in the focus area, such as KY 169 (Union Mill Road), KY 1981 (E Hickman Road), and KY 1975 (Jacks Creek Pike), have less than 11-foot travel lanes. Most of the east-west connections in the focus area also have narrow shoulders. Deficient roadway geometrics, however, were not a sole consideration for roadway improvements. Additional factors, such as crash history and traffic volumes, were also considered. A crash analysis was performed for the three-year period between July 1, 2016 and June 20, 2019. Excluding US 27, I-75, and parking lot collisions, there were 1,583 crashes in the focus area, 624 (40 percent) of which were single vehicle collisions (i.e., run off the road crashes) where narrow shoulders and sharp curves are present. High crash roadway segments were identified using both critical rate factor (CRF) and excess expected crash (EEC) analyses. KY 169 (Union Mill Road), KY 1981 (E Hickman Road), KY 1974 (Tates Creek Road), KY 1975 (Spears Road and Jacks Creek Pike), and DeLong Road all had higher than expected crashes.

The Lexington Area Metropolitan Planning Organization (LAMPO) Travel Demand Model (TDM) was used to develop traffic forecasts for the year 2045. With major routes in the area at or near capacity today and with additional traffic demand resulting from growth in both counties, rural two-lane roads are expected to see a significant increase in daily traffic by 2045. For example, with its proximity to the East Nicholasville Bypass, daily traffic on KY 169 (Union Mill Road) is

expected to more than double by 2045. Other routes expected to see significant growth include Delong Road, KY 1981 (E Hickman Road), Brannon Road, KY 1975 (Jacks Creek Pike), KY 1974 (Tates Creek Road), and Armstrong Mill Road.

## Environmental Overview

An Environmental Overview was completed to identify environmental resources of significance, potential jurisdictional features, and other environmental areas of concern that should be considered during project development. Natural and human environmental resources within the study area were identified from a literature/database review, as well as a windshield survey. One particular noteworthy resource within the study area is the prevalence of Purchase of Development Rights (PDR)<sup>1</sup> properties. The PDR program, an Agricultural Conservation Easement program, serves to protect farmland. A goal of the study was to develop improvement concepts that would avoid directly impacting such properties, if possible.

## Project Team Coordination

Over the course of the study, the project team, including representatives from KYTC Central Office, KYTC District 7, the Lexington Area MPO (LAMPO), the Bluegrass Area Development District (BGADD), Rasor Marketing and the consultant Stantec, held three virtual meetings to coordinate on key issues. These meetings are summarized in **Table ES-1**.

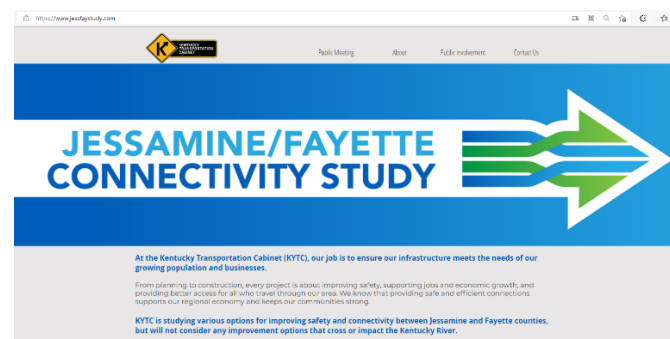
**Table ES-1: Project Team Meetings**

Project Team Meeting	Date	Meeting Purpose
#1	May 1, 2020	Discuss results from the existing conditions analysis, preliminary traffic forecasts, and public outreach strategies during Covid-19 pandemic.
#2	March 12, 2021	Discuss results from the first round of public involvement, preliminary improvement concepts, and plans for the second round of public outreach.
#3	October 18, 2021	Discuss results of the second round of public involvement and study conclusions.

## Community Engagement

The project team also reached out to stakeholders, local officials, and the general public for input throughout in the study process to learn about transportation issues and needs affecting mobility within the study area. These meetings and engagement opportunities are summarized in **Table ES-2**.

<sup>1</sup> <http://www.lexingtonky.gov/pdr>



As the Covid-19 pandemic affected opportunities for in-person meetings, the project team used virtual options for community engagement, including a study website: <http://www.jessfaystudy.com>

Table ES-2: Community Engagement Activities

Community Outreach	Date	Purpose
<b>Local Officials/ Stakeholders Meeting #1</b>	September 17, 2020	Present the results from the existing conditions analysis and initiate the first round of public outreach.
<b>Public Outreach Round #1</b>	October 9 - December 11, 2020	Launch of study website with ArcGIS StoryMap and online mapping exercise and survey. Over 4,300 postcards were mailed to addresses within the study focus area, providing links to the online materials.
<b>Local Officials/ Stakeholders Meeting #2</b>	June 16, 2021	Present conceptual improvement strategies, solicit feedback from local officials and stakeholders, and discuss the upcoming second round of public outreach.
<b>Public Outreach Round #2</b>	July 22 - September 3, 2021	Present results from the first round of public involvement and solicit feedback on preliminary improvement concepts through a survey. Postcards were again mailed to all addresses within the study focus area. Updated study materials, including a video presentation, were made available on the study website after the July 22 in-person public meeting which was held at East Jessamine Middle School and broadcasted virtually over Zoom.

## Corridor Improvements

With most of the connecting routes between US 27 and I-75 having less than desirable roadway characteristics for the type and volume of traffic they currently serve, corridor-wide improvements were investigated to improve mobility within the focus area. Based on a combination of project team discussions, a review of existing conditions, public input, travel demand model analyses, and field reconnaissance, the corridor concepts, shown on **Figure ES- 2**, are intended to provide improved, rural two-lane roads as a more consistent and reliable travel option for users. When considering the corridor concepts collectively, they would better serve traffic demand by providing multiple options as opposed to focusing traffic onto one single corridor.

**Concept #1 – KY 169 (Union Mill Road) & KY 1975 (Jacks Creek Pike):** Concept 1 includes upgrading KY 169 and KY 1975 to a more consistent 45-mph design speed by widening lanes/shoulders and improving curvature. In addition to upgrading the existing routes, Concept 1 includes a new connection between KY 169 and KY 1975 through Crawley Lane north of the existing KY 169 intersection with KY 1974. This would provide a safer, more direct east/west connection between Nicholasville and US 25 and would allow through traffic to avoid several of the horizontal curves to the south.



**Concept #2 – New I-75 Interchange at US 25 (Old Richmond Road):** Building upon Concept 1, Concept 2 includes the Concept 1 improvements along with a new I-75 interchange with US 25 at milepoint 101. The combination of these improvements would improve mobility by providing an additional access point to I-75 in southeast Fayette County.

**Concept #3 - Realignment of Tates Creek Road (KY 1974) and East Hickman Road (KY 1981):** Concept 3 realigns Tates Creek Road from Delong Road to East Hickman Road, including the intersections (the latter of which makes East Hickman Road the 'through' movement to Tates Creek Road), and improves horizontal curves on East Hickman Road. These improvements could be a stand-alone improvement or completed in conjunction with Concepts 1 and 2.

**Concept #4 – Brannon Crossing Extension:** Concept 4 would extend Brannon Road east to connect with US 25 as an alternative to Delong Road. This concept has been depicted as a straight line because given the preliminary nature of a planning study such as this, insufficient information is available to show a more specific alignment. Concept 4 could include the other corridor improvements or be completed as a stand-alone project.

## Spot Improvements

In addition to the corridor-wide improvement concepts, spot improvements were developed to address safety issues at specific locations. These locations, shown on **Figure ES-3**, were identified from an analysis of crash and geometric data as well as results from the public outreach survey.

**Spot Improvement 1 – US 25 (Old Richmond Road) at KY 1975 (Jacks Creek Pike):** The US 25 (Old Richmond Road) intersection with KY 1975 (Jacks Creek Pike) is currently unsignalized with the KY 1975 approach stop-controlled. Over the three-year period, there were 12 crashes at this location, five of which resulted in an injury and four of which were rear end collisions. An improvement option is to construct turn lanes on US 25 to reduce the conflict between through traffic and turning vehicles.

**Spot Improvement 2 – US 25 (Old Richmond Road) at Delong Road:** The US 25 (Old Richmond Road) intersection with Delong Road is currently unsignalized with the Delong Road approach stop-controlled. There were 11 crashes at this location over the past three years, eight of which were angle collisions. An improvement option at this intersection is to construct turn lanes on US 25 to reduce the conflict between through traffic and turning vehicles. Like the Jacks Creek Pike intersection, there is currently an HSIP project examining innovative intersection options at this intersection.

**Spot Improvement 3 – Delong Road between Walnut Hill Road and Colliver Lane:** The section of Delong Road between Walnut Hill Road and Colliver Lane has four horizontal curves with 25 mph advisory speeds and carries 1,300 VPD. There were 26 crashes reported on this portion of Delong Road over the past three years, 10 of which resulted in an injury and 17 of which were single vehicle collisions. An improvement option is to realign this portion of Delong Road and eliminate several of the horizontal curves.



## Executive Summary

Jessamine/Fayette Connectivity Study, Item No. 7-445

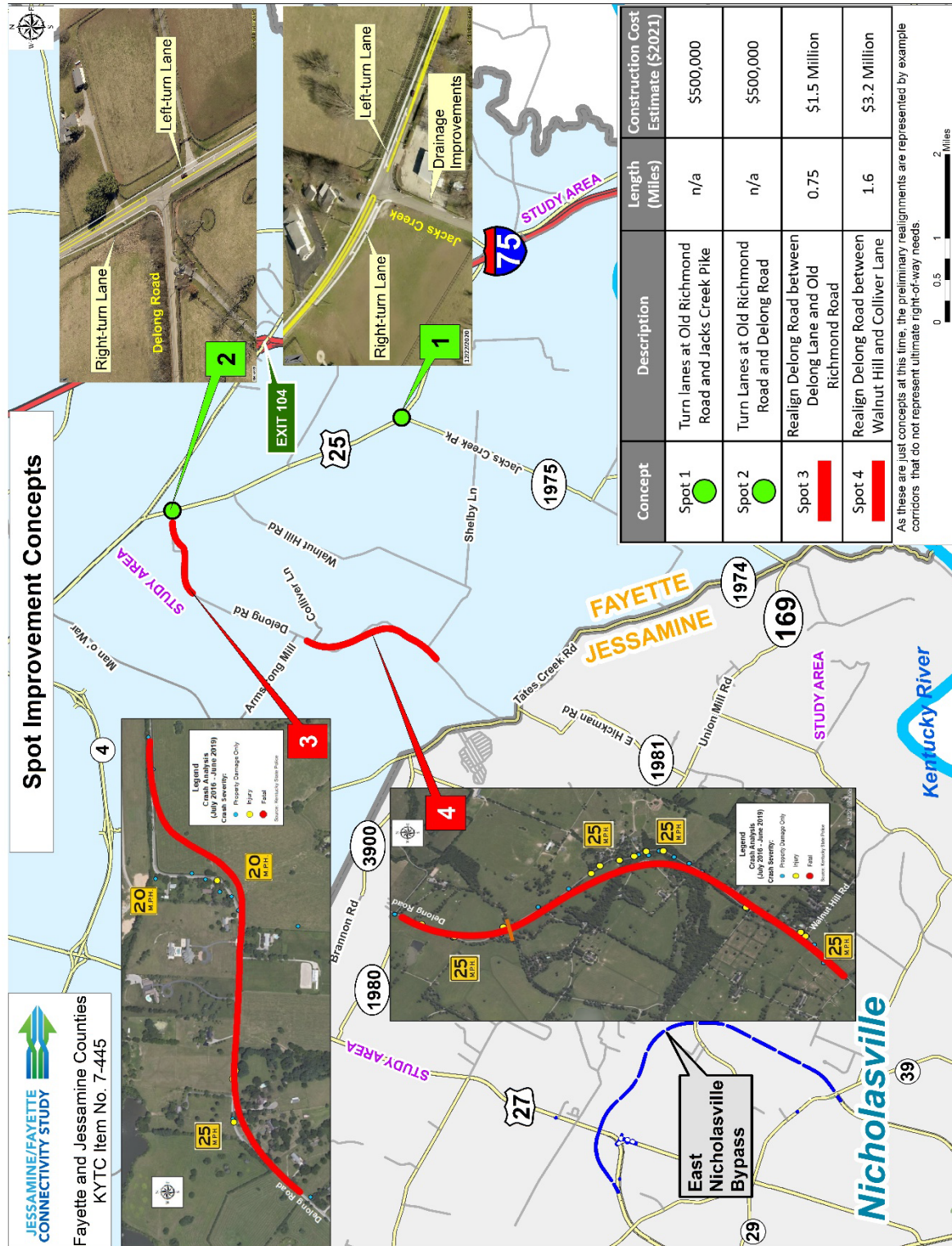


Figure ES-3: Preliminary Spot Improvement Concepts

**Spot Improvement 4 – Delong Road between Delong Lane and US 25 (Old Richmond Road):** The section of Delong Road between Delong Lane and US 25 has three horizontal curves with advisory speeds of 25 mph or slower and carries 3,600 VPD. There were 13 crashes on this portion of Delong Road over the past three years, four of which resulted in an injury. An improvement option is to realign this portion of Delong Road to improve several of the horizontal curves.

## Conclusions

After the second round of public involvement and the final project team meeting, improvement concepts were revised based on feedback from the project team, local officials/stakeholders, and the public. The concepts were then grouped into the following categories: Spot Improvements / Lower-Cost Concepts to Consider as Funding Allows, Concepts for Future Consideration after the East Nicholasville Bypass is completed, and Concepts for Consideration as Part of Future Development. The revised concepts fulfill the study goals and objectives by improving safety and congestion issues affecting mobility in Southeast Fayette and Northeast Jessamine Counties. This study will not be making specific recommendations to advance transportation concepts; however, the following section presents the improvement concepts analyzed in this study that may be further considered under various future conditions.

### Spot Improvements / Lower-Cost Concepts to Consider as Funding Allows

Based on the crash analysis and generally positive public feedback, the following concepts could be considered if funding becomes available:

- **Concept #3 - Realignment of Tates Creek Road (KY 1974) and East Hickman Road (KY 1981)**
- **Spot Improvements #1 - #4:**
  - Construct turn Lanes at the US 25 (Old Richmond Road) intersections with KY 1975 (Jacks Creek Pike) and Delong Road.
  - Realign Delong Road between Delong Lane and US 25 (Old Richmond Road)
  - Realign Delong Road between Walnut Hill and Colliver Lane

### Concepts for Future Consideration after the East Nicholasville Bypass is Completed

The completion of the East Nicholasville Bypass will significantly increase traffic on many of the rural two-lane roadways in the focus area such as KY 169, KY 1974, KY 1975, and KY 1981. Improvements to these routes and better connections to I-75 will be essential to handle this increased traffic. The following concepts could be reevaluated and further considered after the East Nicholasville Bypass is completed:

- **Concept #1 - Improvements to KY 169 (Union Mill Road) and KY 1975 (Jacks Creek Pike)**
- **Concept #2 - New I-75 Interchange at US 25 (Old Richmond Road)**

Concept #1 could be implemented in phases, split into segments of independent utility or spot improvements along the corridor to address safety concerns. A new I-75 interchange at US 25 would improve mobility and allow easier access to I-75 for those who live and work within the eastern portion of the study area. The combination of a new interchange and improvements to KY 169 and KY 1975 would provide better access to I-75 for drivers on US 27 and the East Nicholasville Bypass.

## Concepts for Consideration as Part of Future Development

- **Concept #4B - Bates Creek Road/Delong Road Connector**

At this time, the project team is not considering the need for a new, more direct connection between Bates Creek Road and US 25 as was depicted under Concept #4. However, anticipated growth within nearby portions of the Urban Service Boundary (USB) in Southeastern Fayette County warrant consideration of potential future enhancement, such as a new connection from the east end of Brannon Road at Bates Creek Road to Delong Road near Armstrong Mill, as shown in **Figure ES-4**. Such a concept could be implemented completely within the USB and should only be considered as development within the USB warrants it.

## Next Steps

As the Jessamine/Fayette Connectivity Study did not result in specific recommendations for implementing transportation improvements, there are currently no planned “next steps”. However, should a concept(s) be considered for advancement, the next step would be to include it in the Lexington Area MPO’s Metropolitan Transportation Plan (MTP), further evaluate / refine the concept, and continue public and stakeholder engagement. In particular, Concept #3 and the spot improvements could be further explored in the nearer term as they received generally favorable feedback from the public and would improve safety along segments of two corridors that are anticipated to experience significant growth in traffic demand.

More detailed environmental studies will be required should any conceptual improvements be advanced. If a future project is federally funded, the National Environmental Policy Act (NEPA) requires that potential environmental impacts regarding jurisdictional wetlands and streams, archaeological sites, cultural historic sites, and federally endangered species must be avoided if possible. If not, then impact minimization/mitigation efforts are required.



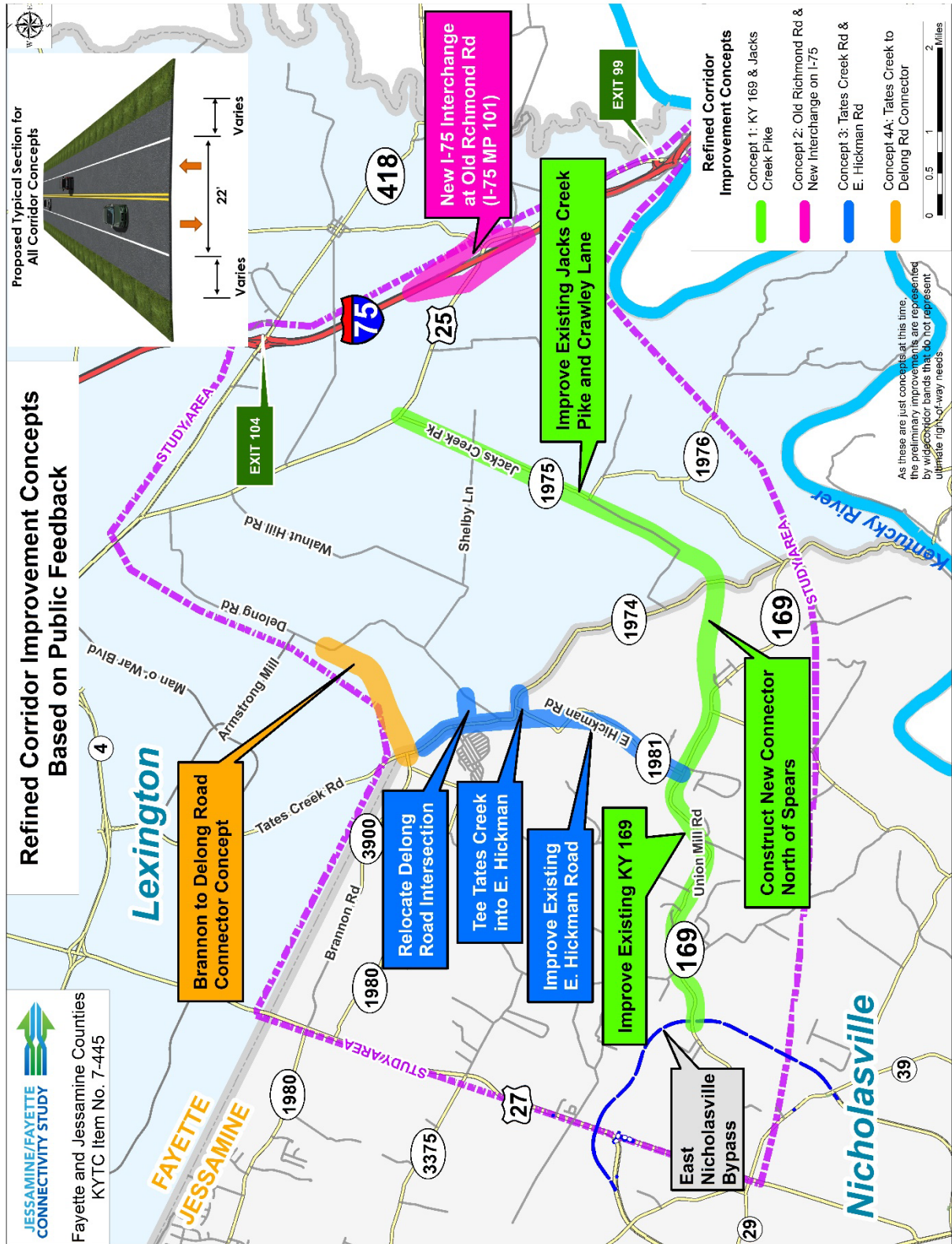


Figure ES-4: Refined Corridor Improvement Concepts Based on Public Feedback

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## 1.0 Introduction

The *Jessamine/Fayette Connectivity Study* was initiated by the Kentucky Transportation Cabinet (KYTC) to identify and evaluate potential improvement options to increase mobility and connectivity in northeast Jessamine County and southeast Fayette County by improving safety and reducing congestion.

Southeast Fayette County and northeast Jessamine County have experienced significant population growth in recent years. A lack of safe and adequate east-west connectivity south of Man O' War Boulevard has been an increasing concern of the traveling public and local officials. With the impending completion of the East Nicholasville Bypass, geometrically undesirable roadways will be expected to handle high traffic volumes acting as "shortcuts" between US 27 and I-75. This study examined options to provide better, safer connections in the area. Section 2.5 presents the study goals and objectives in more detail.

This study was Federally funded with federal Metropolitan Planning (PL) Funds to explore potential project concepts for future Transportation Plan (MTP) and KY State Highway Plan. Future phases of the project concepts are not currently funded in the Lexington Area Metropolitan Organization (LAMPO's) MTP or the *Kentucky's FY 2020 – FY 2026 Highway Plan*.



### 1.1 Focus Area and Area of Influence

In lieu of the traditional "study area," this study includes a project focus area, an area in which transportation improvement concepts and strategies will be considered, and an area of influence, a larger area within which traffic could potentially be affected by improvements in the focus area. The area of influence includes portions of northern Jessamine County and southeast Fayette County bounded to the east by I-75, to the south by the Kentucky River, to the west by US 68, and to the north by Man O' War Boulevard, as shown in **Figure 1**.

### 1.2 Study Goals and Objectives

The primary goals and objectives of the *Jessamine/Fayette Connectivity Study* are to identify safety and congestion related transportation issues affecting mobility and to examine short-term, long-term, and local improvement concepts and strategies to address the identified issues. Southeast Fayette County and northeast Jessamine County have experienced significant population growth in recent years, and projections provided by the Kentucky State Data Center suggest this growth will continue for the foreseeable future. A lack of adequate east-west connectivity south of Man O' War Boulevard has been an increasing concern of the traveling public and local officials. With the impending completion of the East Nicholasville Bypass and an increasing demand for travel between Jessamine County and Fayette County, geometrically undesirable roadways will be required to handle high traffic volumes acting as "shortcuts" between US 27 and I-75. This study examined options to provide better, safer connections in the area.



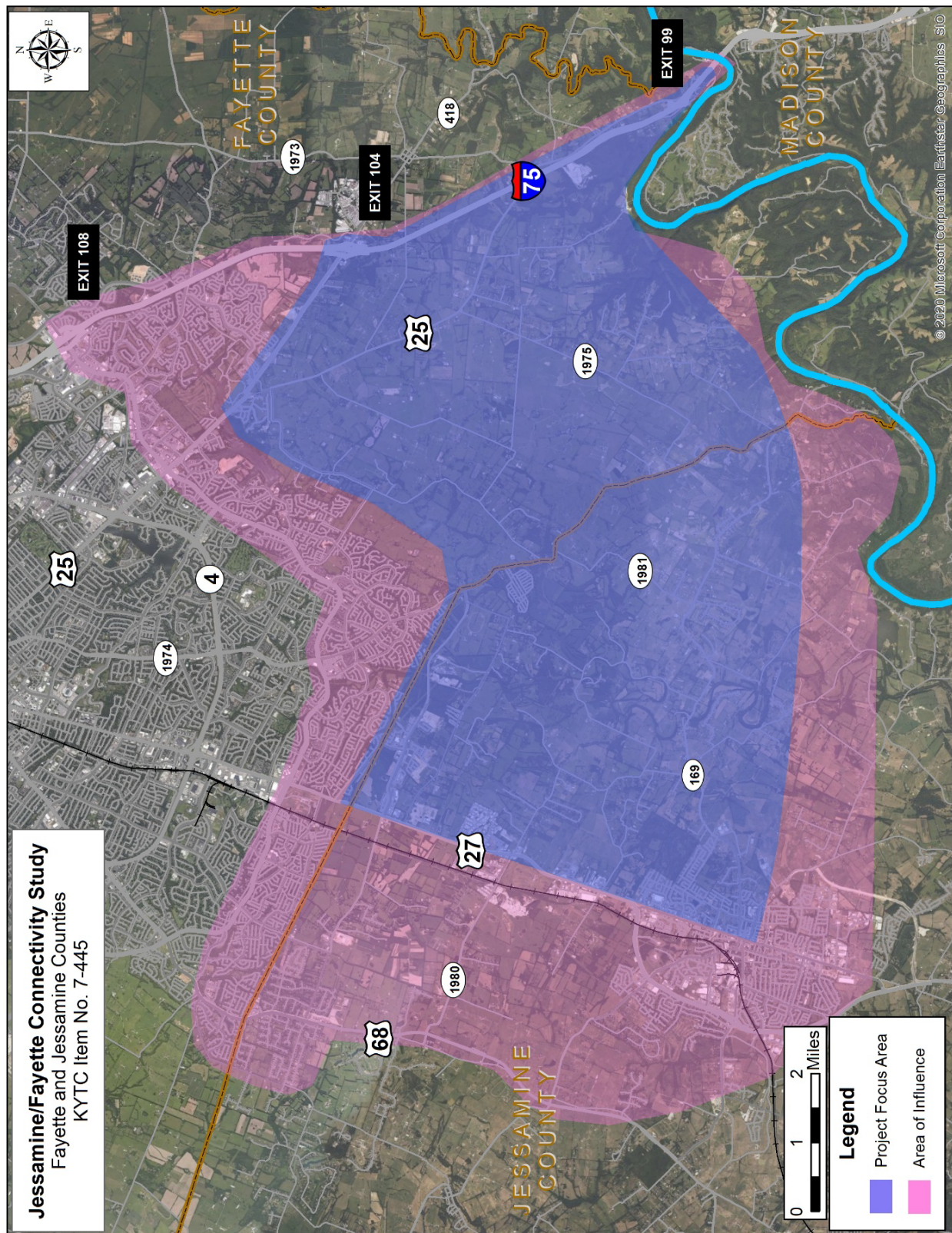


Figure 1: Focus Area and Area of Influence



## 1.3 Planned Projects

There are several other planned and committed projects within the area of influence listed in *Kentucky's FY 2020 – FY 2026 Highway Plan*<sup>1</sup> or previous versions and described below:

- **Item No. 7-430** – First listed in *Kentucky's FY 2014 – 2020 Highway Plan*. Access Management on Nicholasville Road between Nicholasville and Man O' War Boulevard. The purpose of the project is to increase mobility and safety, to preserve the traffic carrying capability of the existing facility, and to provide more efficient access connections between US 27 and the adjacent properties. The preferred alternative for the corridor included the development of a superstreet with Restricted Crossing U-turn (RCUT) intersections. This project was ranked No. 3 in the Strategic Highway Investment Formula for Tomorrow (SHIFT) North Region with a score of 86.5.
- **Item No. 7-87.3** – East Nicholasville Bypass Section 1B. This project was ranked No. 25 in the SHIFT North Region with a score of 71.8.
- **Item No. 7-87.20** – East Nicholasville Bypass Section 1A. The 2020 Highway Plan includes \$7,000,000 in SPP funds for the construction phase in fiscal year 2022 and an additional \$9,900,000 in Federal funds for the construction phase in fiscal year 2023. This project was ranked No. 38 in the SHIFT North Region with a score of 67.3.
- **Item No. 7-87.50** – East Nicholasville Bypass Section 2. The construction letting on occurred on January 26, 2018. This project is complete.
- **Item No. 7-103** – Minor widening of Ashgrove Road (KY 1980) From US 27 to Young Drive to accommodate proposed school site traffic.
- **Item No. 7-414** – West Brannon Road Widening. This project was ranked No. 26 in the SHIFT North Region with a score of 71.6.

There are two bicycle/pedestrian projects in the influence area:

- **Item No. 7-3713** – West Hickman Trail South from Veterans Park to Veterans Park Elementary School. The 2019 Construction cost was \$951,000. This project was completed in 2021.
- **Item No. 7-3214** – East High Trail from Central Avenue to the Eastern Bypass Trail. The 2021 Construction cost is estimated at \$2,680,000.

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<sup>1</sup> <https://transportation.ky.gov/Program-Management/Pages/2020-Highway-Plan.aspx>

## 1.4 Previous Studies

There are two previous studies that explored options to provide an east-west connector from US 27 to I-75 in this area. This study is not an extension of previous studies. Instead, the project team took a fresh look at improvement options that do not cross the Kentucky River.

- *US 27 to I-75 Corridor Scoping Study* – This 2008 KYTC study sought to examine safety, access, mobility, and travel time, and to evaluate long range growth management, environmental and other local/regional issues and concerns with respect to the need for and location of a new connector. The recommended alternative had an estimated cost of \$168,000,000.
- *I-75 Connector Preliminary Design and Environmental Study* – This was a joint effort between KYTC and the Federal Highway Administration (FHWA) to present an overview of the existing needs and deficiencies for the proposed connection between Nicholasville in Jessamine County and I-75 at Exit 95 in Madison County.

## 2.0 Existing Conditions

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

### 2.1 Roadway Systems

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 functions, and it provides a basis for comparing roads fairly. Functional classification can be used for, but is not limited to, the following purposes:

- Provide a framework for highways serving 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.



**Delong Road**

- Provide a basis for allocation of limited financial resources.

**Figure 2** shows the functional classification of roadways within the influence and focus areas. Interstates, shown in black, are fully controlled-access highways. I-75 is the only interstate in the area and provides a connection between Tennessee and Ohio through central Kentucky. 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 network<sup>2</sup>. The roadways within the focus area are mainly collectors or local roadways.



**Hickman Creek Bridge on KY 169**

**Figure 3** depicts the truck weight classifications of the influence and focus area roadways. I-75, US 25, and US 27 are the only roadways rated for loads up to 80,000 pounds in the focus area. To travel between US 27 and I-75, trucks with loads over 44,000 pounds are forced to use New Circle Road (KY 4) in Lexington.

There are 19 bridges in the focus area, all with sufficiency ratings above 50, indicating they are not eligible for federal replacement funds, as shown in **Figure 4**. Many of the bridges are deemed functionally obsolete due to narrow lane widths and lack of shoulders.

## 2.2 Roadway Geometric Conditions

Due to the extent of the study area and the emphasis on traffic operations, as-built plans were not reviewed for all study area roadways. Alternately, KYTC's HIS database was used to identify deficient lane and shoulder widths. The current number of lanes and estimated lane widths along study area roadways are shown on **Figure 5**. Current KYTC design guidelines suggest a minimum of 11-foot-wide lanes on arterials and collector roadways. Several of the roadways in the focus area, such as KY 169, KY 1981, and KY 1975, have less than 11-foot travel lanes.

Estimated shoulder widths are shown on **Figure 6**. Most of the east-west connections in the focus area have narrow shoulders.

<sup>2</sup> *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](https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm#Toc336872985)



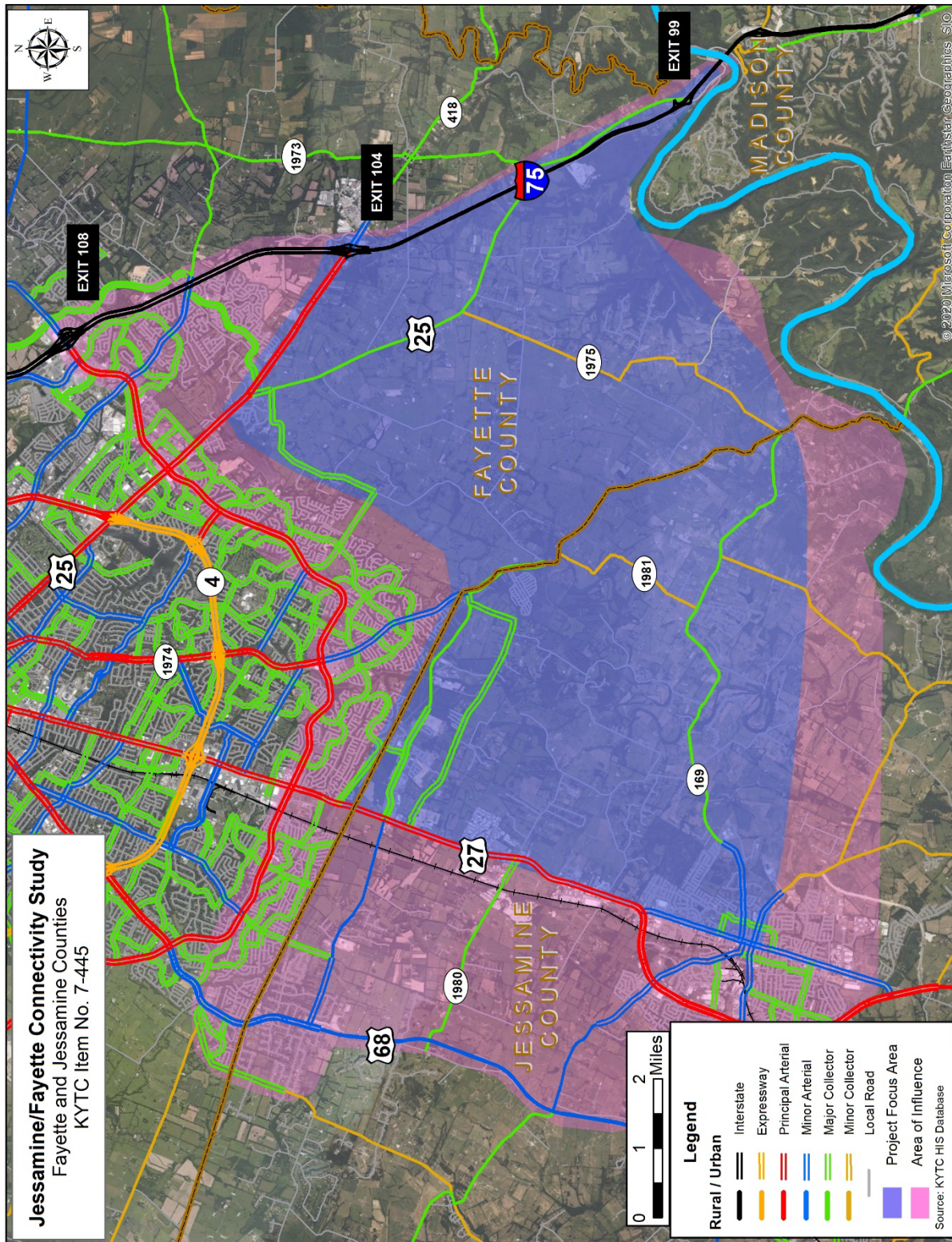


Figure 2: Functional Classification



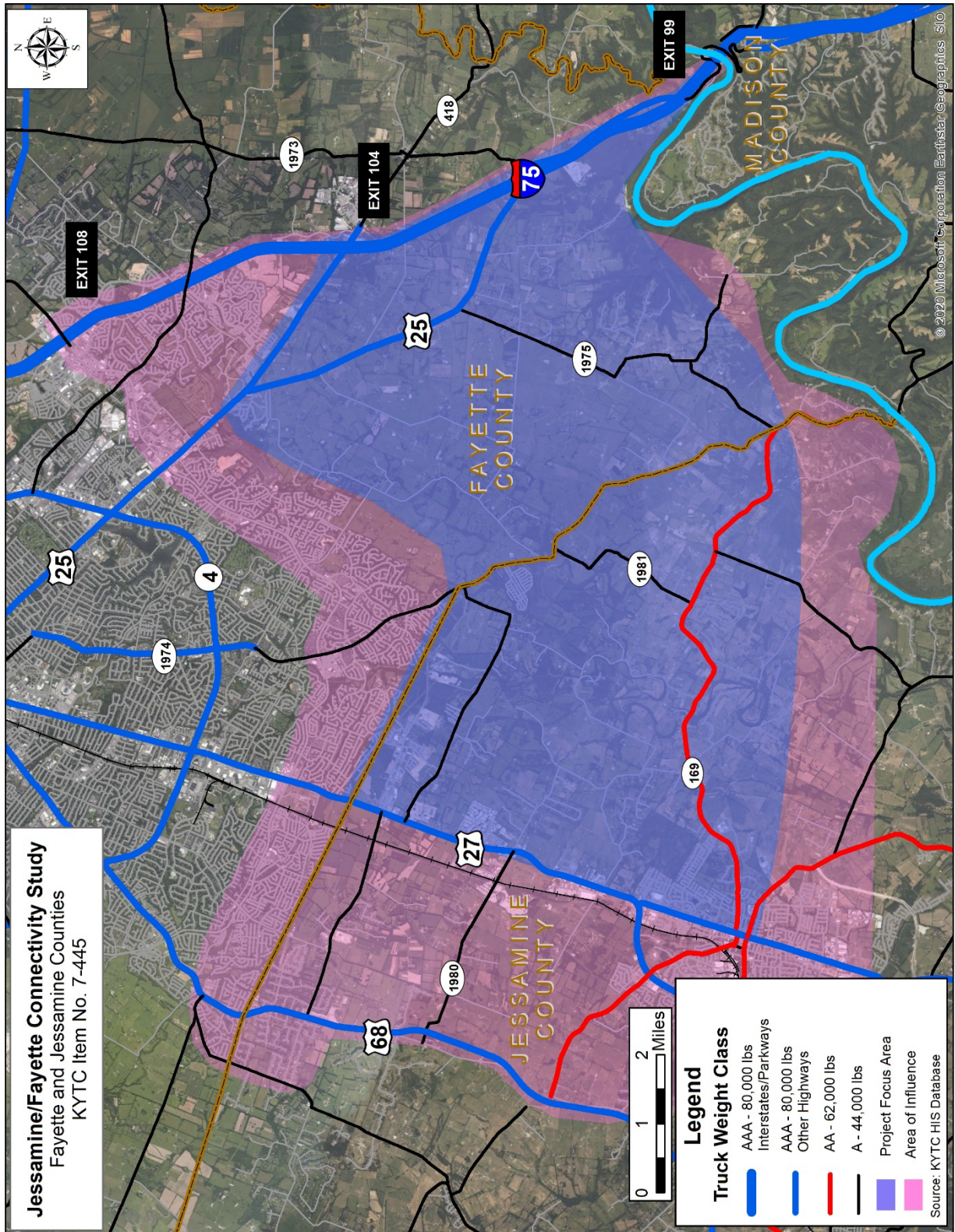


Figure 3: Truck Weight Classification



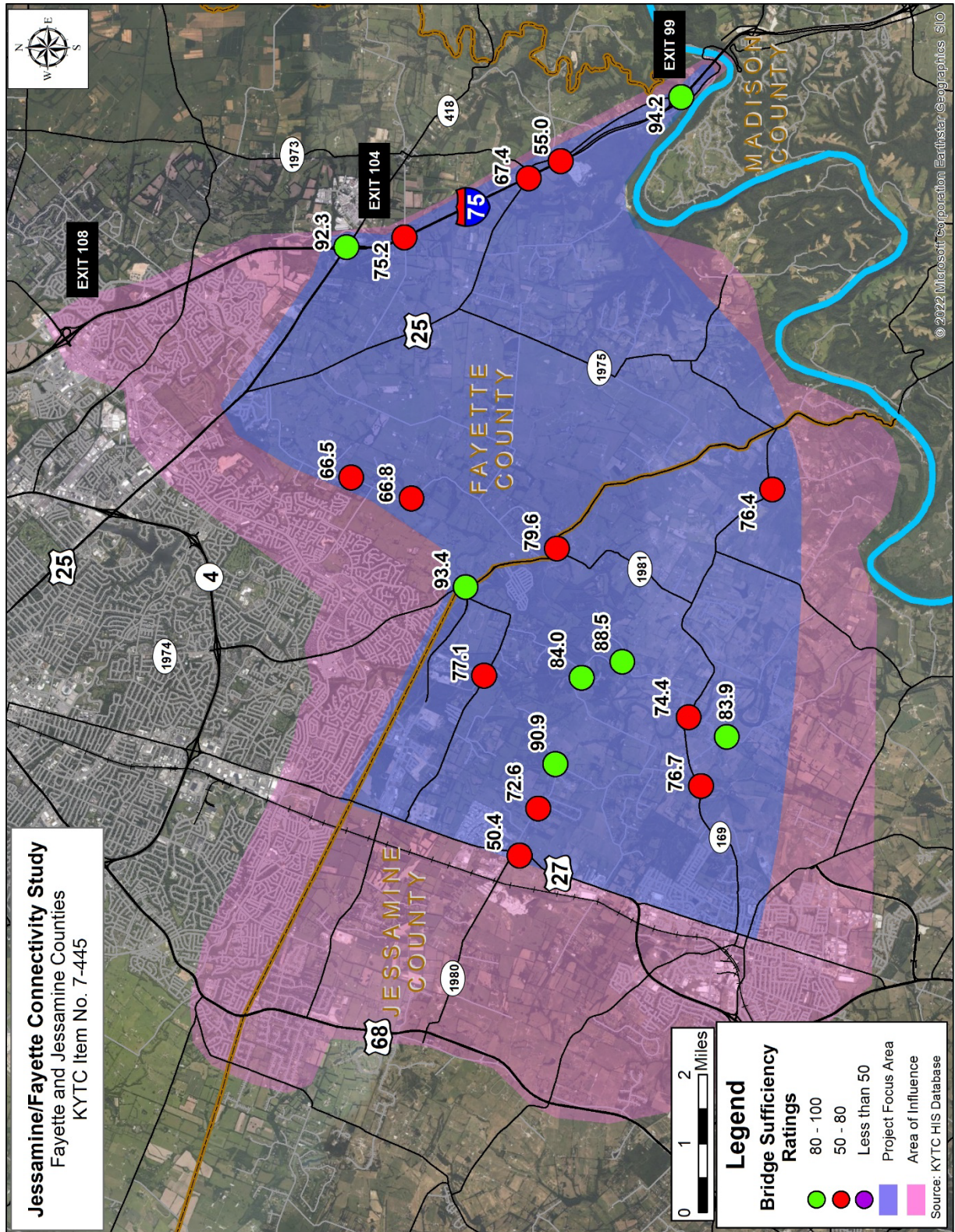


Figure 4: Existing Structures



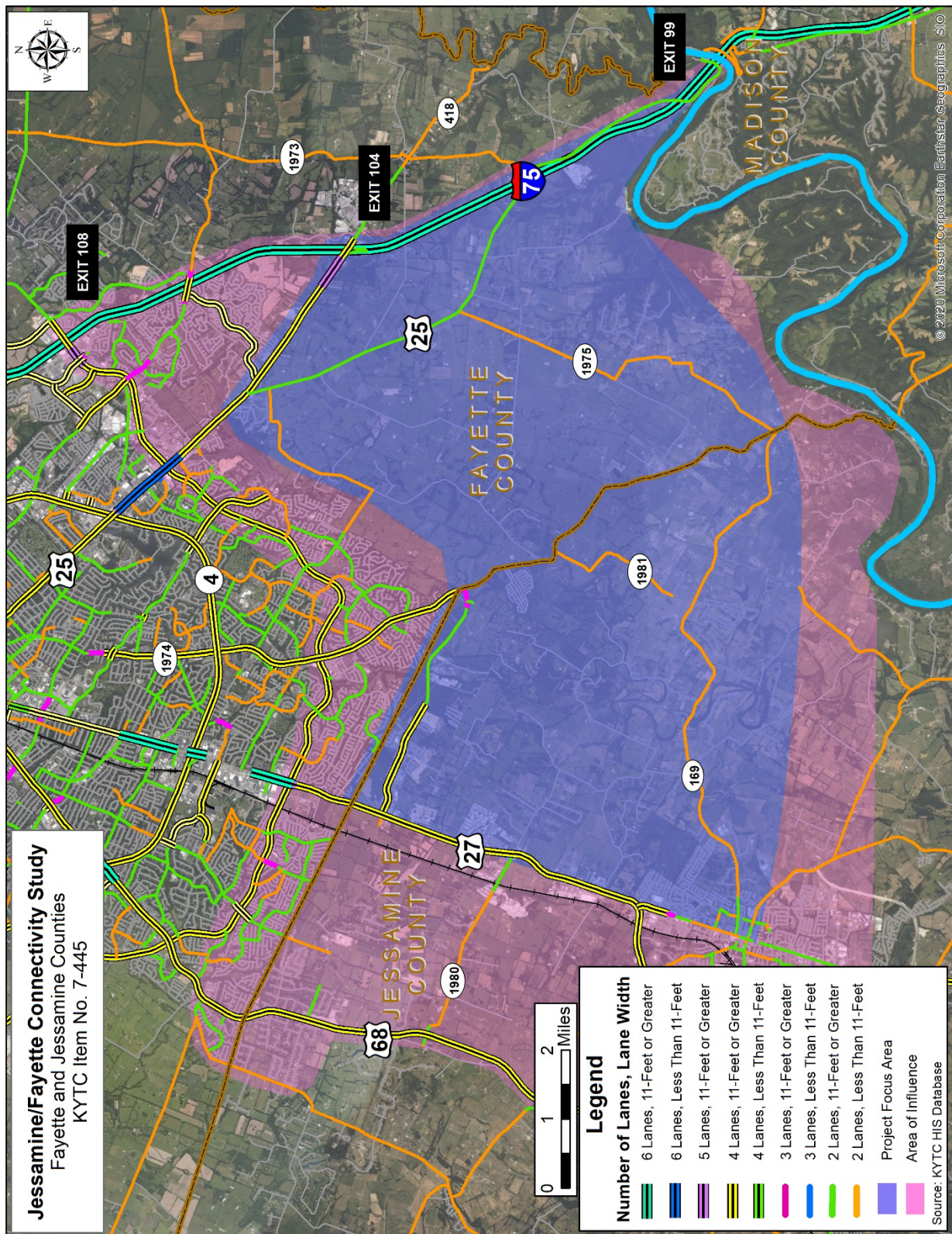


Figure 5: Lane Widths



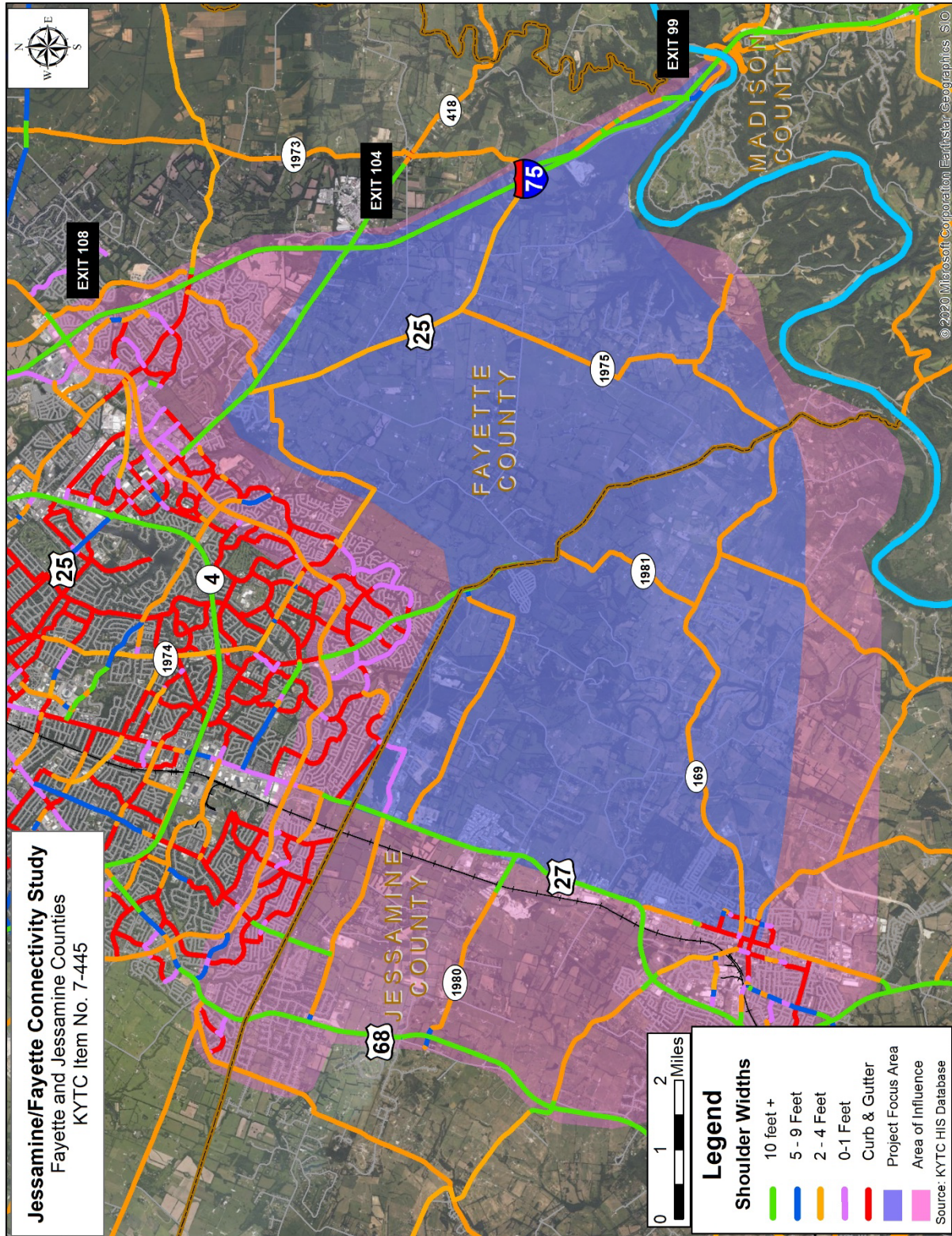


Figure 6: Shoulder Widths

## 2.3 Existing Traffic Analysis

The most current average daily traffic (ADT) volumes from KYTC's traffic count stations are shown on **Figure 7**. Historical KYTC traffic volumes show an Annual Average Daily Traffic (AADT) of 35,900 vehicles per day (VPD) on US 27 and 70,000 VPD on I-75 in the project focus area. Rural east-west connectors have significantly lower traffic volumes, with KY 169 carrying 5,300 VPD, KY 1975 carrying 1,900 VPD, and KY 1980 carrying 3,100 VPD. However, the daily traffic volumes on these corridors do not reflect the congestion drivers experience as typical rural trips mix with commuter traffic during the peak periods due to the lack of major east-west connections in the area.

## 2.4 Crash History

Crash data were collected along existing roadways within the study area for a three-year period between July 1, 2016 and June 30, 2019. The crash records and locations are included in **Appendix A**. Over the three-year period, there were 3,508 collisions, 15 (less than one percent) of which were fatal collisions, 564 (16 percent) resulted in an injury, and 2,929 (84 percent) were property damage only collisions in the focus area. A map depicting the crash analysis is shown in **Figure 8**. Of the 3,508 crashes over this period, rear end (31 percent) and single vehicle (26 percent) were the most common crash types in the focus area, as shown in **Figure 9**.

An additional analysis was performed excluding crashes on US 27 and I-75 (the only arterial roadways within the study focus area) and in parking lots, removing nearly 2,000 crashes from the analysis. Of the 1,583 remaining crashes over the same three-year period, 12 (less than one percent) were fatal, 292 (18 percent) resulted in an injury, and 1,279 (81 percent) were property damage only. The most common crash types were single vehicle with 624 (40 percent) and rear end with 298 (19 percent).

Crashes were geospatially referenced and compared to statewide data to identify locations experiencing above-average crash rates. The methodology is defined in the Kentucky Transportation Center (KTC) research report *Analysis of Traffic Crash Data in Kentucky (2013 - 2017)*<sup>3</sup>. As defined in the methodology report, segments vary in length and are divided along roadways where geometry or traffic volumes change. For each segment, the project team 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 a 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 1.0 or greater may indicate that crashes are occurring due to circumstances not attributed to random occurrence. Segment locations with CRF values greater than 1.0 are shown in **Figure 10** in orange and red.

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<sup>3</sup> Green, E. R., et al. *Analysis of Traffic Crash Data in Kentucky*. KTC-18-17, September 2018.



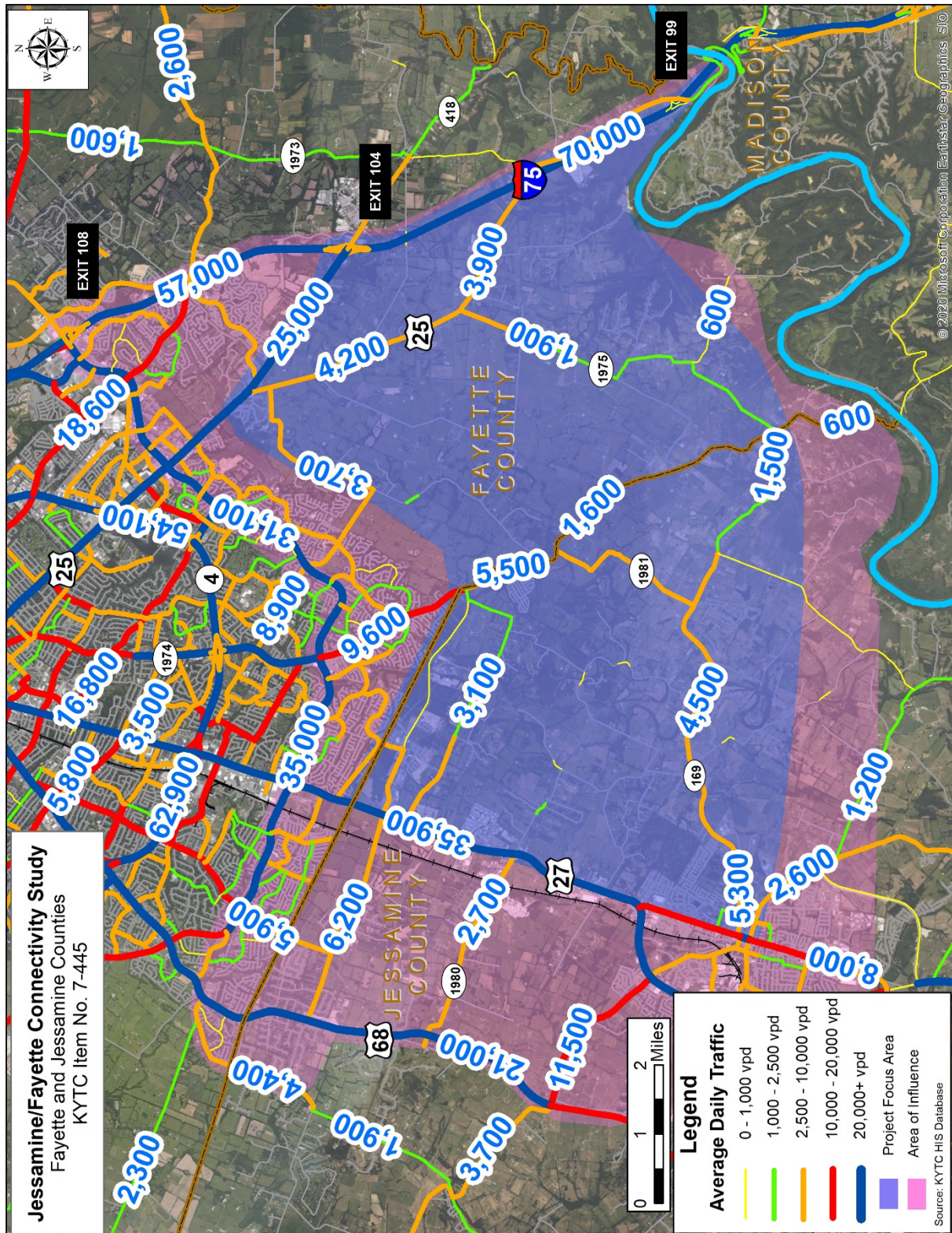


Figure 7: Existing Average Daily Traffic



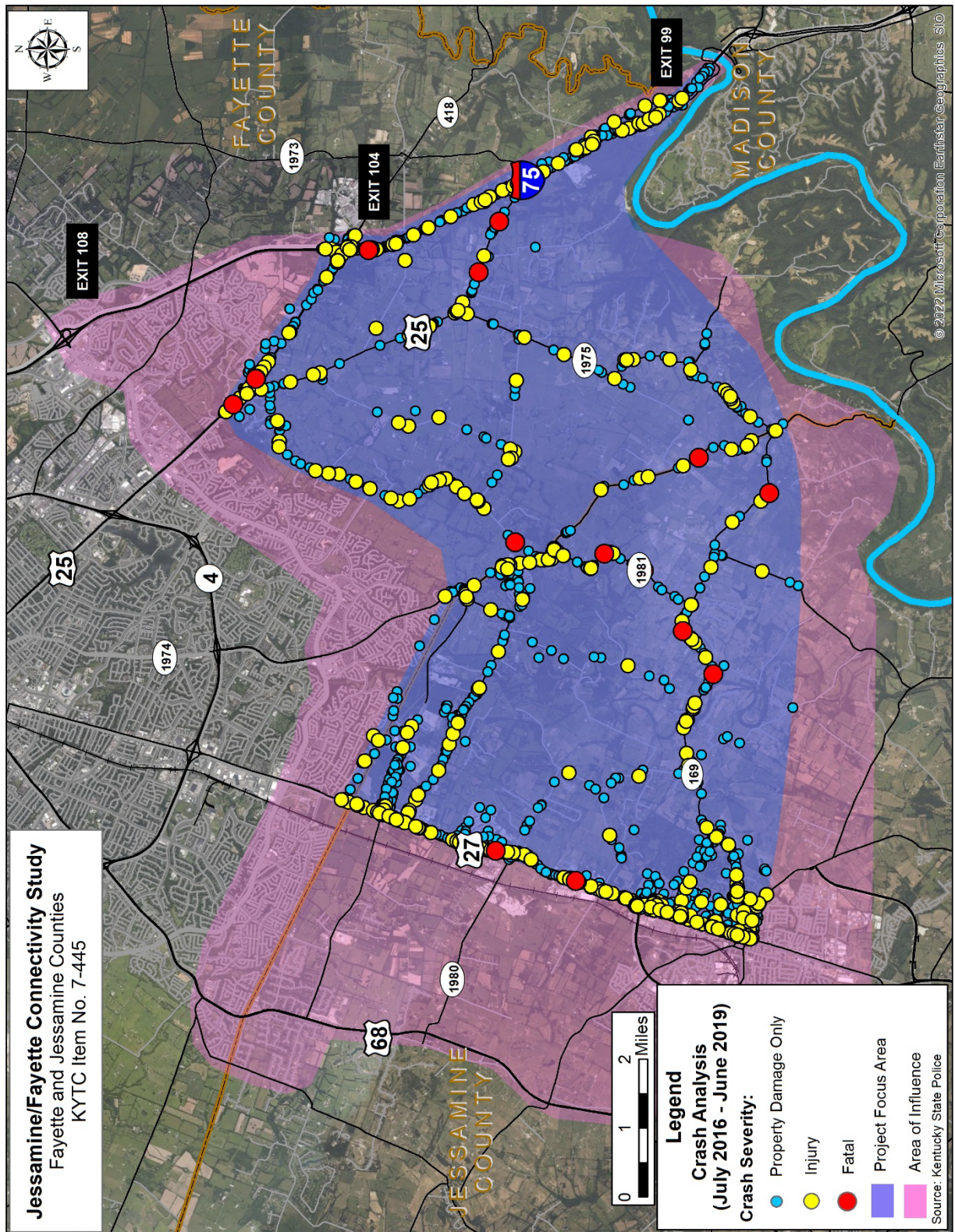


Figure 8: Crash Severity (2016 – 2019)



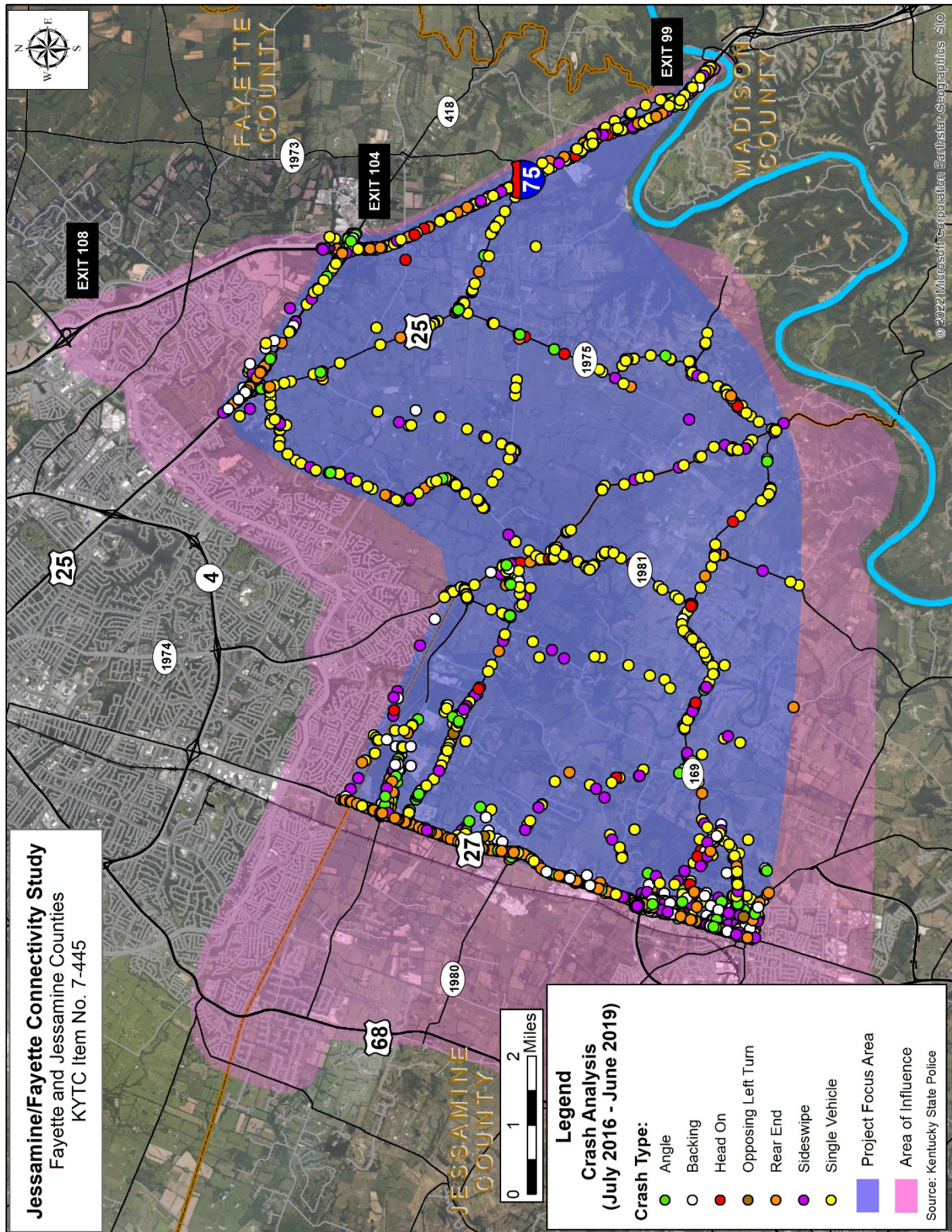


Figure 9: Crash Type (2016 – 2019)



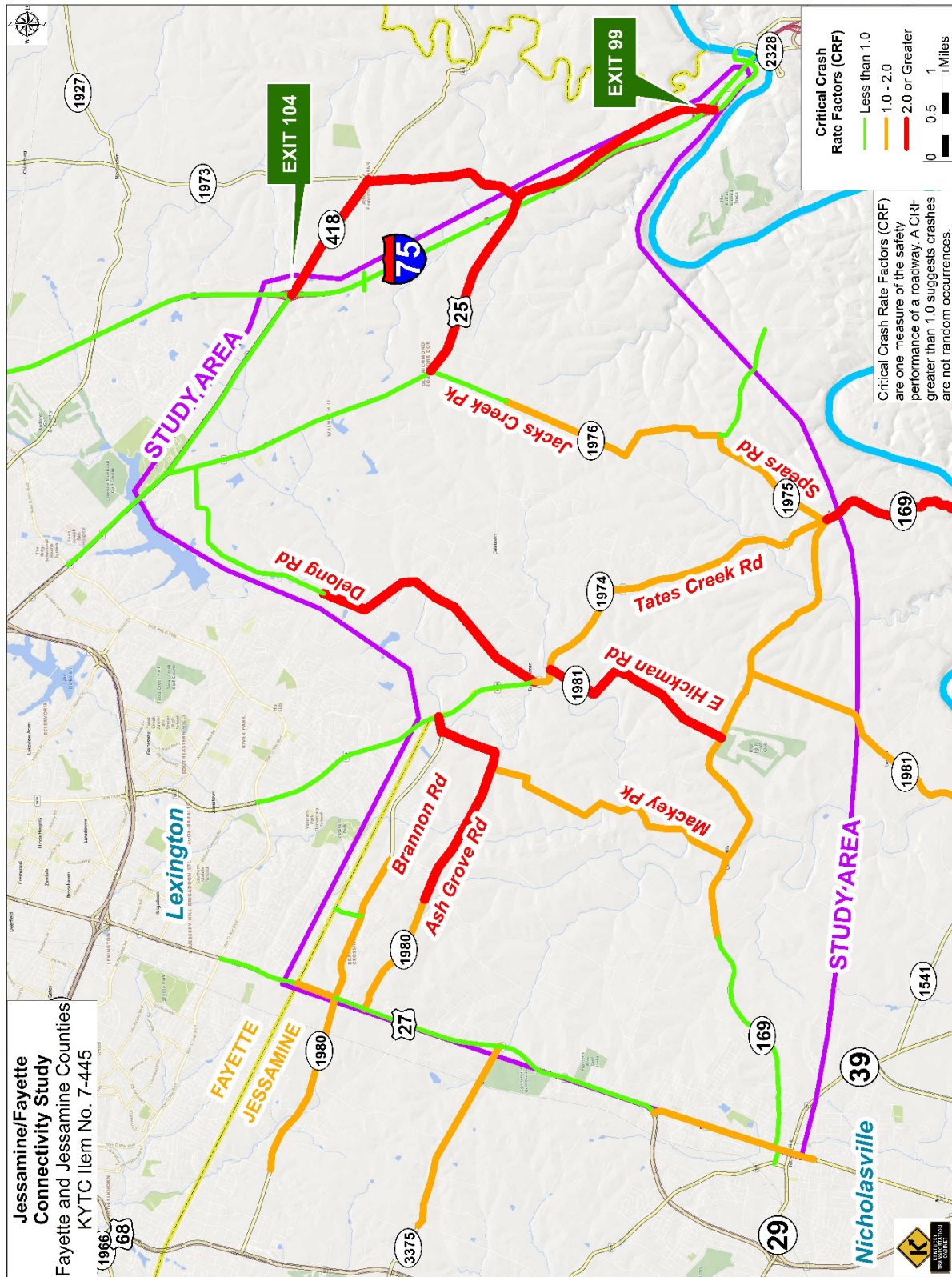


Figure 10: Critical Crash Rate Factors

Working with the Kentucky Transportation Center, the project team evaluated the excess expected crashes (EEC) for focus area roadways. EEC is a measure of crash frequency at a given site compared to what is expected based on current conditions (geometrics, traffic, etc.). A positive EEC indicates more crashes are occurring than would be expected. Numerous roadway segments have positive EECs, as shown in **Figure 11**.

## 3.0 Future Conditions

It is necessary to estimate future conditions to determine the need for, and purpose of, potential transportation improvement concepts. The following chapter summarizes the anticipated future conditions within the study area.

### 3.1 Population Projections

Based on Kentucky State Data Center projections, Fayette County's 2019 population of 323,000 is expected to grow almost 34 percent to a 2040 population of 420,000, as shown in **Figure 12**. Jessamine County's population of 54,000 is expected to see even higher growth, with a 40 percent increase to a 2040 population of 73,000.



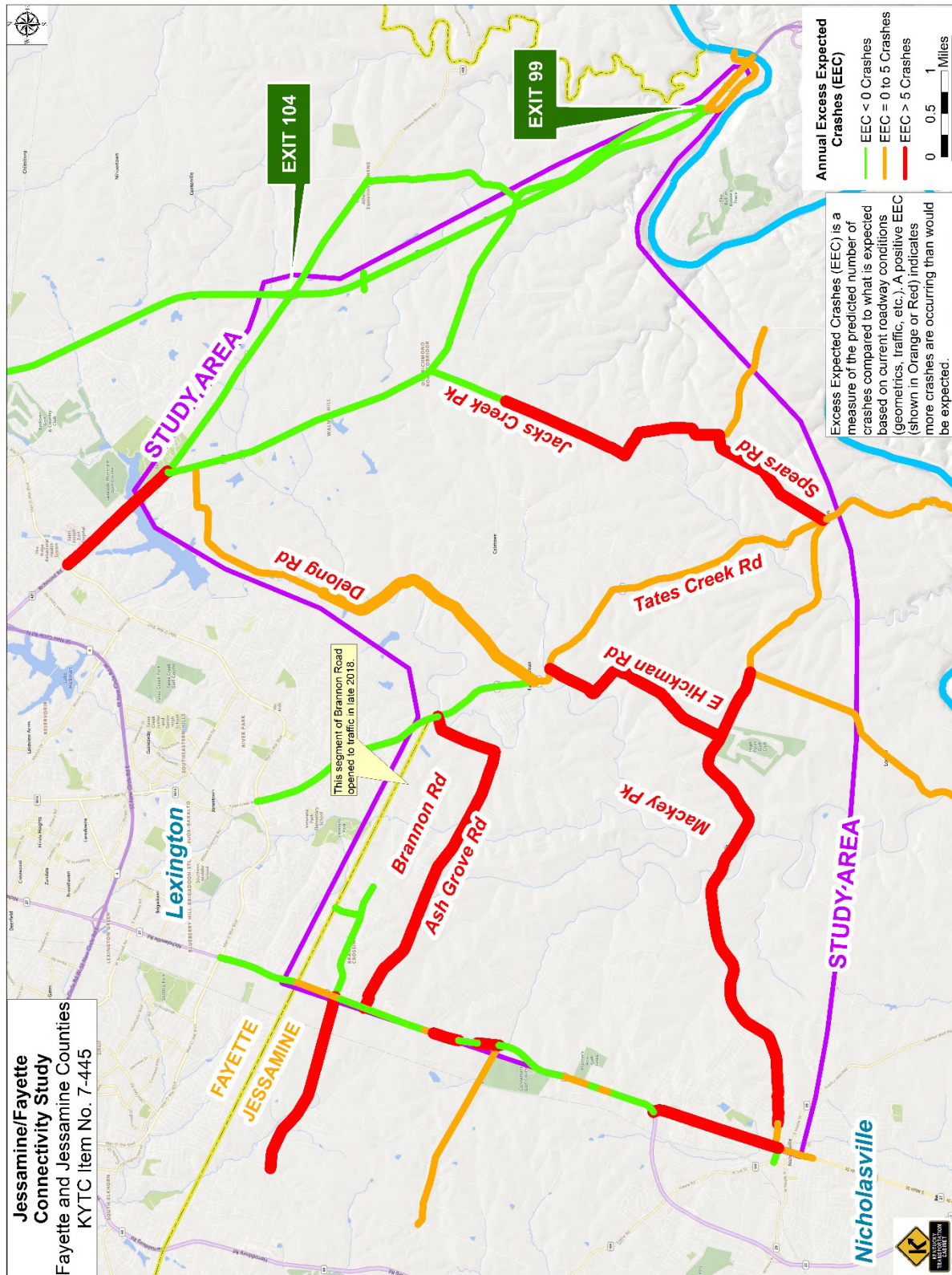
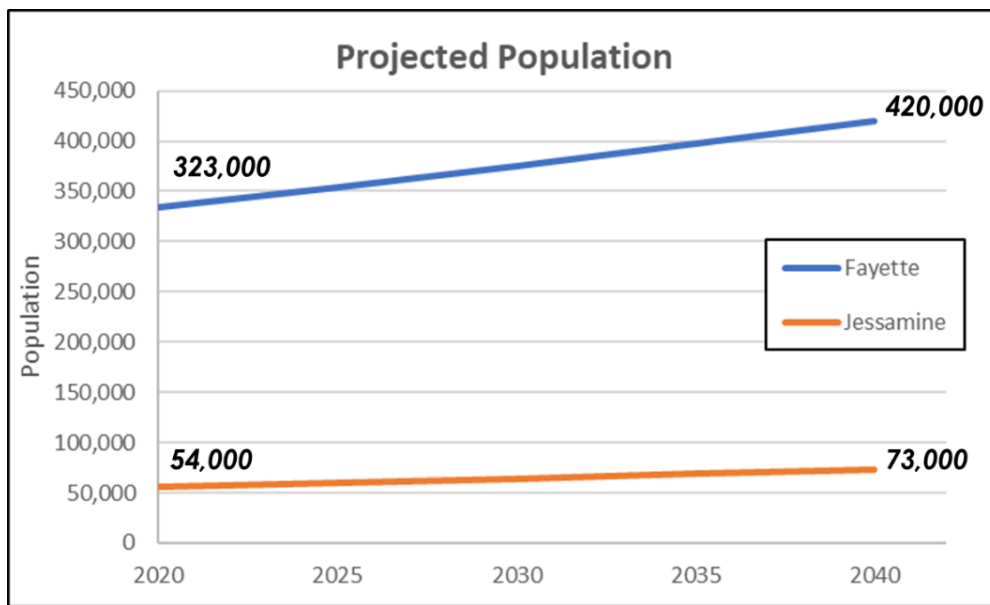


Figure 11: Excess Expected Crashes (EEC)





**Figure 12: Fayette & Jessamine County Population Projections**  
(Source: KY State Data Center)

### 3.2 Traffic Volume Projections

The Lexington Area Metropolitan Planning Organization Travel Demand Model (TDM), which is maintained by the Lexington Fayette Urban County Government (LFUCG), was used to develop traffic forecasts for the year 2045 using a base year of 2020. TransCAD version 8 was used with the model that includes Fayette, Jessamine, Madison, Garrard, Scott, Clark, Bourbon, Woodford, and Mercer Counties. The model was recently updated with the latest employment data from KYTC and the latest population data from LAMPO. In addition to these socioeconomic updates, US 27 and US 68 were reclassified from rural principal highways to urban streets to incorporate delay from signalized intersections and reflect their actual through capacities.

**Figure 13** presents the 2020 daily model assignments and the 2045 'Existing plus Committed' assignments, which includes the completion of the Nicholasville Bypass. With major routes in the area at or near capacity, rural two-lane roads are expected to see a significant increase in daily traffic by 2045. With its proximity to the Nicholasville Bypass, daily traffic on KY 169 (Union Mill Road) is expected to more than double by 2045. Other routes expected to see significant growth include Mackey Pike, KY 1980 (Ashgrove Road), Brannon Road, KY 1975 (Jacks Creek Pike), KY 1974 (Tates Creek Road), and Armstrong Mill, among others.

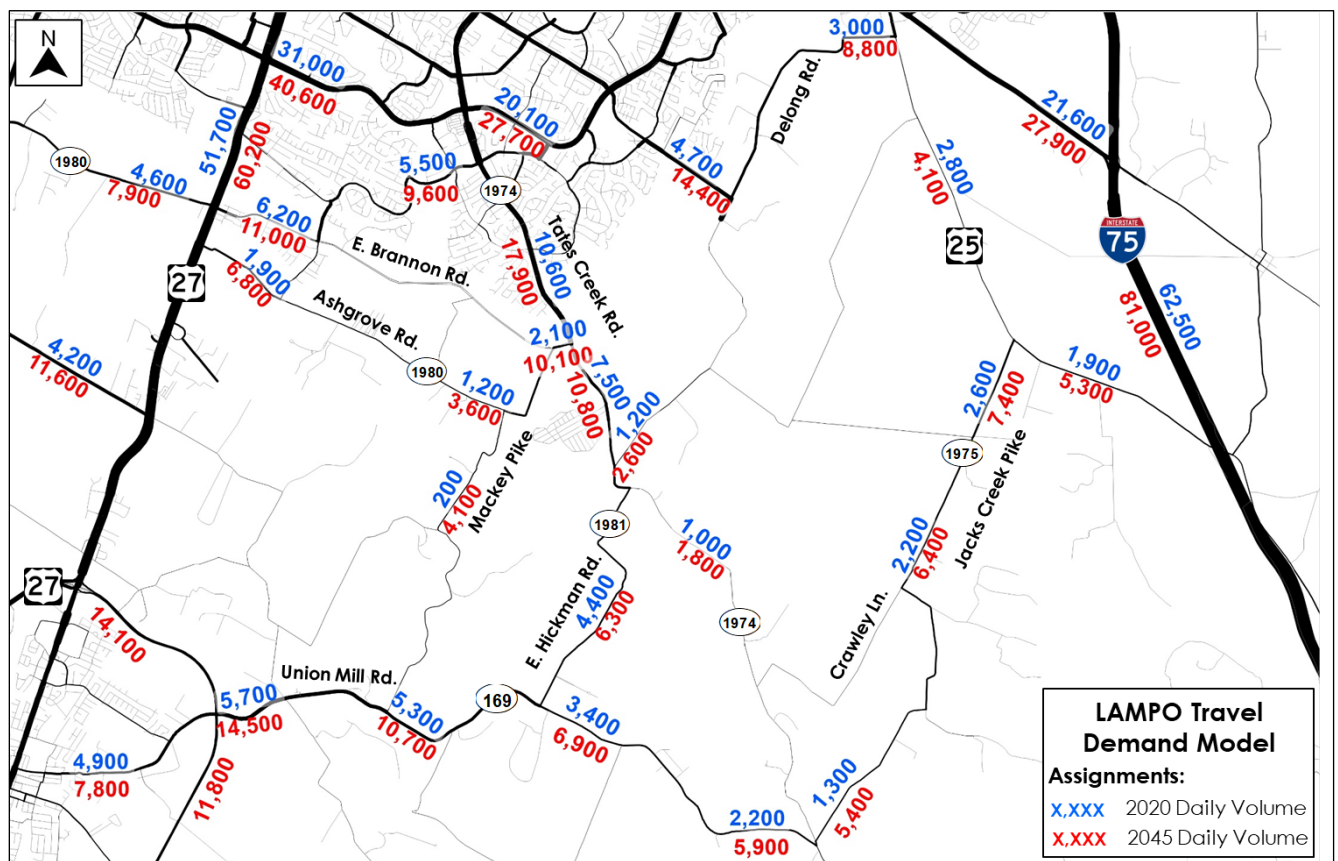


Figure 13: LAMPO TDM 2020/2045 Daily Traffic Forecasts

## 4.0 Environmental Overview

An Environmental Overview was completed to identify environmental resources of significance, potential jurisdictional features, and other environmental areas of concern that should be considered during project development. Natural and human environmental resources within the study area were identified from a literature/database review, as well as a windshield survey. The complete document is included in **Appendix B**.

More detailed environmental studies will be required should any conceptual improvements be advanced. If a future project is Federally funded, the National Environmental Policy Act (NEPA) requires that potential environmental impacts regarding jurisdictional wetlands and streams, archaeological sites, cultural historic sites, noise sensitive receptors, and Federally endangered species must be avoided if possible. If not, then impact minimization efforts are required. Mitigation for unavoidable impacts may also be necessary.

### 4.1 Natural Environment

Natural environment resources include threatened, endangered, and special concern species and habitat, woodland and terrestrial areas, and parks. Through a literature/database review

and field reconnaissance, potentially sensitive resources that affect the natural environment were identified in the study area and are discussed in the following sections and presented in **Figure 14**.

#### 4.1.1 USFWS Species List

There are six United States Fish and Wildlife Service (USFWS) species known or have the potential to occur in the focus and influence area, including:

- Indiana bat, gray bat, and northern long-eared bat.
- One endangered mussel.
- Two endangered plant species (running buffalo clover and Short's bladderpod).

#### 4.1.2 KDFWR Species List

The Kentucky Department of Fish and Wildlife Resources (KDFWR) lists 31 additional State-threatened, Endangered, and Special Concern Species as occurring in Fayette County. These include:

- Seven state-endangered species (six birds, one damselfly).
- Eight state-threatened birds
- Sixteen state-special concern species (eleven birds, two mammals, two insects, and one amphibian).

The Kentucky Department of Fish and Wildlife Resources lists 33 additional State-threatened, Endangered, and Special Concern Species as occurring in Jessamine County. These include:

- Nine state-endangered species (eight birds and one amphibian).
- Eleven state-threatened species (eight birds, one mussel, one mammal, and one insect).
- Thirteen state-special concern species (nine birds, two mammals, one insect, and one amphibian).

#### 4.1.3 Air Quality

The study area is not located in a Nonattainment Area for eight-hour ozone, or a Maintenance area for PM 2.5 for the transportation-related criteria pollutants for which the Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for Transportation Criteria Pollutants.

Eleven EPA permitted air emissions facilities are located within or immediately adjacent to the focus or influence area. The majority are located near urban areas.



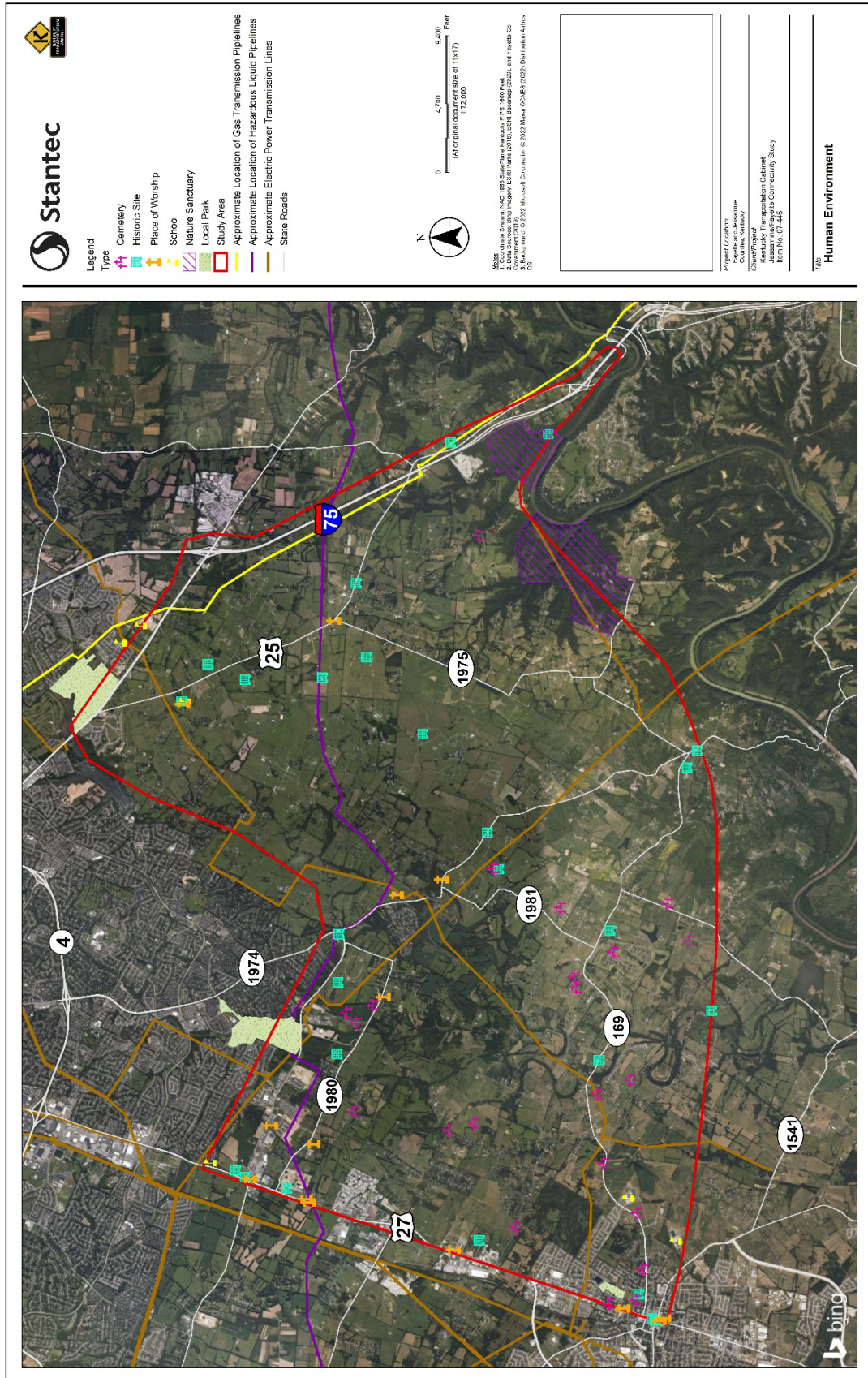


Figure 14: Environmental Overview

#### 4.1.4 Noise

Noise-sensitive land use areas are present throughout the eastern and southern portions of the study area, consisting of the following:

Activity Category "B" land use:

- Two-thirds moderate density residential housing and
- Seven churches.

Activity Category "C" land use (exterior):

- Several outdoor playgrounds and
- Maple Grove Cemetery.

Activity Category "D" land use (interior):

- East and West Jessamine County Schools and
- Several Fayette County Schools (i.e., Millcreek Elementary School, Southern Middle School).

## 4.2 Human Environment

Human environment is defined as what we live in and around and what we have built. Through review of secondary source information and field reconnaissance, potentially sensitive resources that affect the human environment were identified in the study area and are discussed in the following sections.

### 4.2.1 Cultural – Archaeology

Based on a review of the National Register of Historic Places (NRHP) and the Kentucky Office of State Archaeology (OSA) Preliminary Site Check response, 53 archaeological sites are known in or near the focus or influence area.

### 4.2.2 Cultural – Historic

Based on a review of the Kentucky Heritage Council (KHC) Site Check response, there are nine houses with undetermined NRHP status in the study area. Shelby Family Houses and Boone Creek Rural Historic District are both listed as KHC Historic Resources. There is a total of 170 properties that have contributing resources to the historic districts.



**Historic House in the Study Area**



### 4.2.3 Public Services

There are multiple public service facilities located within the focus and influence area including:

- US Post Office
- Detention Center
- Health Department
- Nicholasville Police Department

There are several utility facilities located within the focus and influence area including:

- Two pipeline crossing, one along I-75 and the other near the Lexington city limits.
- Two electrical transmission corridors and a Wastewater Treatment Plant.

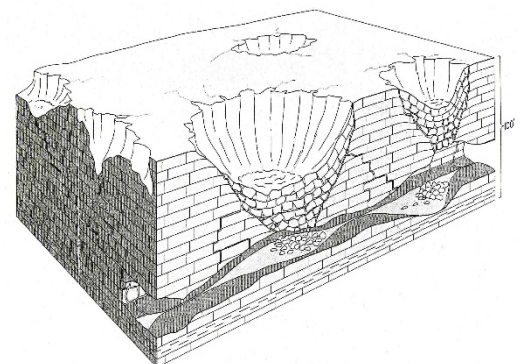
### 4.2.4 Purchase of Development Rights (PDR) Properties

Several Purchase of Development Rights (PDR)<sup>4</sup> properties exist in the eastern portion of the influence and focus area, shown in **Figure 15**. The PDR program is an Agricultural Conservation Easement program wherein the City of Lexington purchases development rights from farm owners (their right to develop the farm commercially), effectively preserving the farmland in perpetuity. A goal of the study was to avoid directly impacting such properties, if possible.

## 4.3 Geotechnical Overview

A geotechnical overview of the study area was completed based upon research of available published data and experience with highway design and construction within the region. Eight of the published reports came from Fayette County and 12 from Jessamine County. The purpose of the overview was to provide a general summary of the bedrock, soil, and geomorphic features likely to be encountered in the study area and to identify geotechnical features that may have an adverse impact on the project alignment. The complete document is included in **Appendix C**. The overview included:

- Karst topography/sinkholes and basins are located within the influence and focus area, shown in **Figure 16**. Sinkholes or solution cavities identified within the vicinity of proposed improvements that are not accepting drainage should be filled and/or capped. Any sinkholes utilized for drainage purposes for roadway construction should incorporate adequate measures to minimize water infiltration into the subgrade and erosion control measures to minimize siltation of open sinkholes.



**Typical Karst Activity Underlain by Limestone**

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<sup>4</sup> <http://www.lexingtonky.gov/pdr>



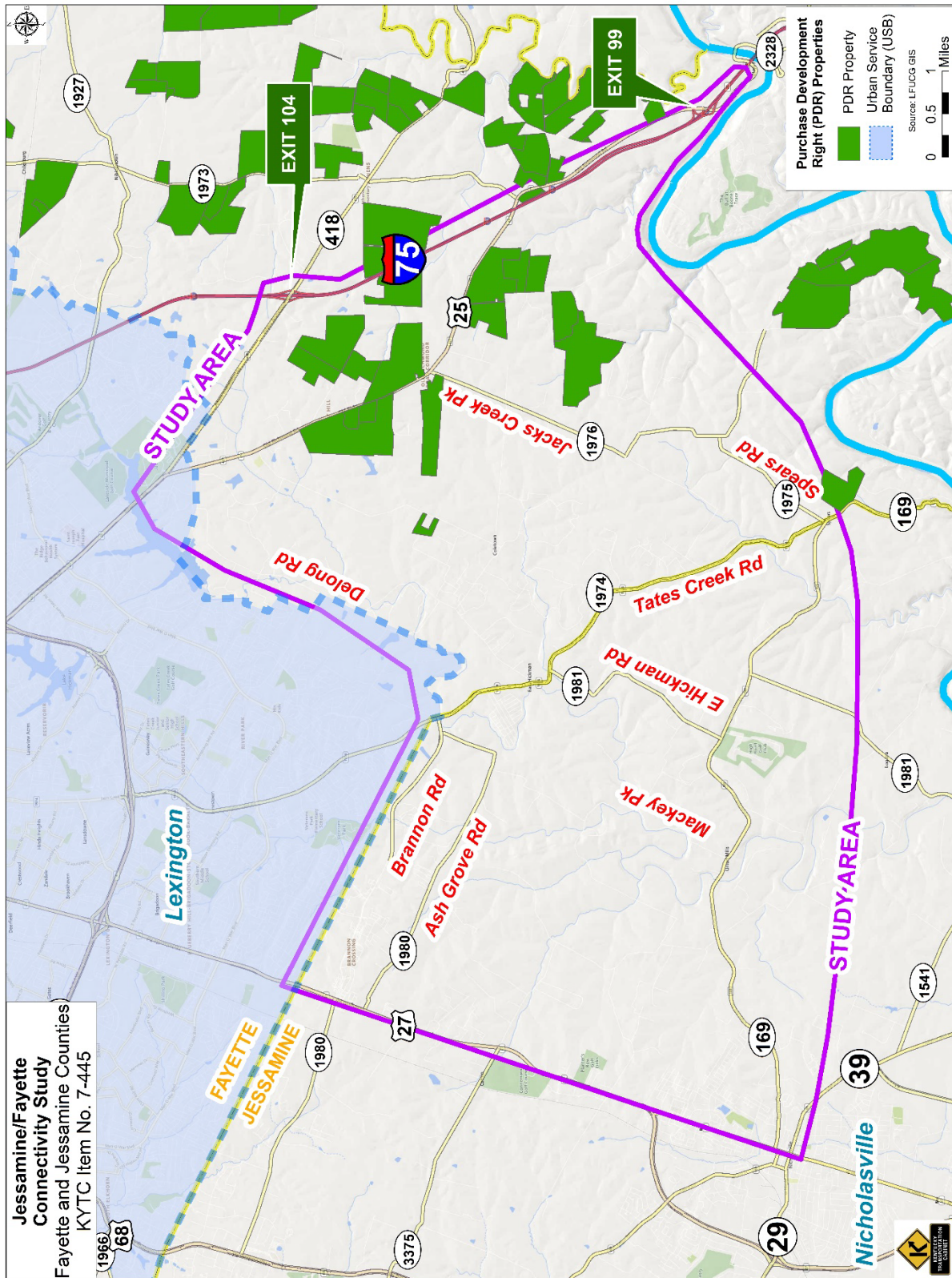


Figure 15: Purchase of Development Rights (PDR) Properties



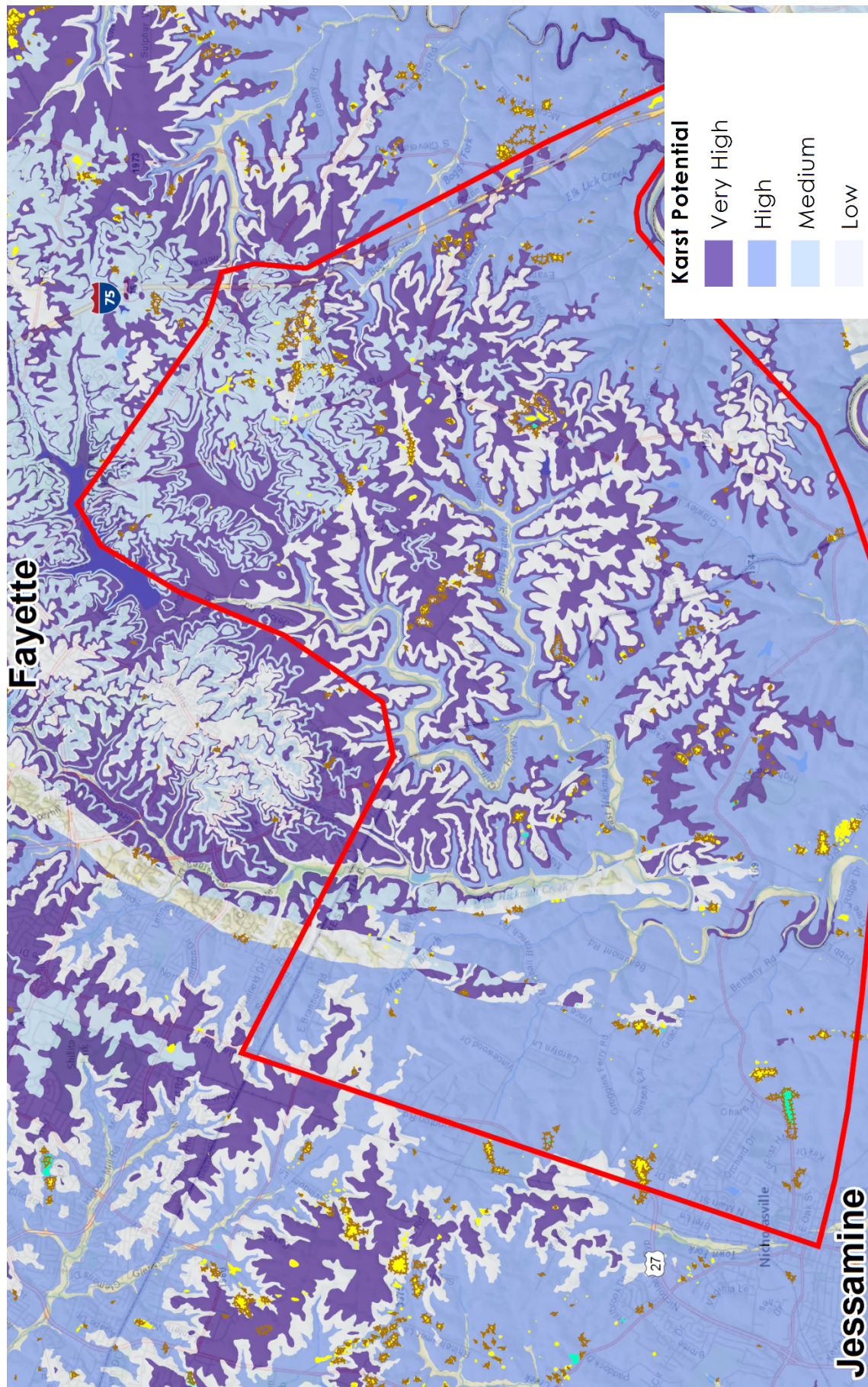


Figure 16: Karst Potential



- Geotechnical drilling will be critical in this region for new, replacement or widened culverts, bridges, retaining walls, and (during project design) due to the karst potential. It is anticipated that conventional spread footing and/or pile foundation systems can be utilized for structures. However, if voids/caves are present, additional costs associated with karst mitigation should be anticipated.
- Because portions of projects may be minor widening projects, information on pavement structure should be obtained to assist the team on pavement structure and California Bearing Ratio (CBR) information. Other projects in the vicinity have utilized mechanical or chemical stabilization and generally yielded CBR values of approximately six or less.
- Once roadway alignment and sections are identified, the open-faced logging of exposed cuts and/or drilling should be performed. Sampling of foundation soils should be performed for embankment situations of sufficient height to evaluate stability. Other projects in the vicinity have had rock cuts between 1:2 and 2:1 and embankments typically at 2:1.

## 5.0 Initial Project Team and Stakeholder Coordination

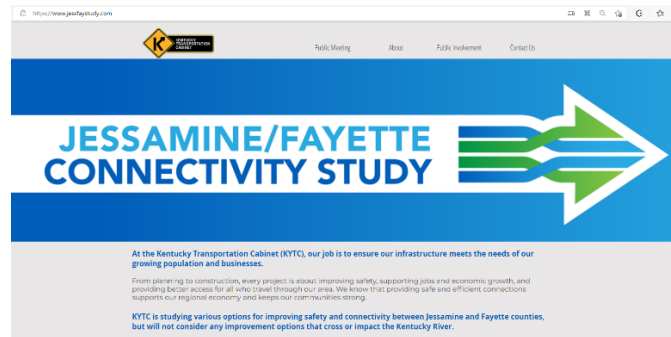
Over the course of the study, the project team had three virtual meetings to coordinate on key issues. The project team consisted of representatives from KYTC Central Office, KYTC District 7, LAMPO, the Bluegrass Area Development District (BGADD), Rasor Marketing and the consultant Stantec. The project team also reached out to stakeholders and local officials for input. Detailed summaries of each meeting are presented in **Appendix D**.

### 5.1 Project Team Meeting No. 1

The project team first met via Bluejeans Teleconference on May 1, 2020. The purpose of the meeting was to present results from the existing conditions analysis and to get feedback from the project team on preliminary traffic forecasts and public outreach strategies. Key discussion items included the following:

- There were seven collisions with bicyclists and 13 collisions with pedestrians in the focus area over the past three years.
- Several of the high crash spots are in locations that often have excessive speeding.
- There was a discussion on the LAMPO TDM. Major arterials US 27 and US 68 were reclassified in the model to better incorporate delay from signalized intersections and to better reflect their actual capacities.
- There was a discussion of the study title and logo. The title changed from the *Southeast Lexington Connectivity Study* to the *Jessamine/Fayette Connectivity Study*.

- The project team created a study website (<http://www.jessfaystudy.com>) and an ArcGIS Story Map to communicate basic study information and provide survey and mapping exercises for the public. These tools were used throughout the study to help facilitate community engagement.



**Study Website and Logo**

## 5.2 Meeting with Jessamine County Transportation Task Force

In October 2019, the project team was invited to a meeting with the Jessamine County Transportation Task Force to discuss “trouble” spots and potential areas to improve. The Task Force identified several concerns, including high crash spots on KY 169, horizontal curves on KY 1981, drop offs on the southern portion of KY 1974, and narrow pavement on DeLong Road. Potential areas to improve included a potential connector from KY 169 to KY 1975 and a potential I-75 interchange with US 25, as shown in **Figure 17**.

## 5.3 Local Officials/Stakeholders Meeting No. 1

The project team reached out to local government representatives and other community groups early in the planning process. The first local officials/stakeholder meeting was held on September 17, 2020 via Bluejeans Teleconference. In addition to the project team, representatives from the Lexington Fayette Urban County Government, Nicholasville Police, Jessamine County Schools, Kentucky State Legislature, Fayette Alliance, Windstream, and Lexington Police were in attendance. The purpose of the meeting was to present the results from the existing conditions analysis and to solicit feedback from local officials and stakeholders on the upcoming public outreach strategies. Key discussion items included the following:

- KYTC Item No. 7-87.20 includes the construction of Section 1A of the East Nicholasville Bypass. *Kentucky's FY 2020-2026 Highway Plan* includes \$7 million in SPP funds for 2022 and an additional \$9 million in Federal funds for 2023. Traffic forecasts are being developed in coordination with this project.
- There are several PDR properties in the eastern portion of the study area. These properties are protected and would need to be avoided during the design phase of any potential future projects.
- The first in-person public meeting was replaced with virtual engagement opportunities due to the COVID-19 pandemic. An ArcGIS Story Map was developed and made available on a project website to help communicate basic study information, and a survey and mapping exercise was prepared to collect feedback from stakeholders and the general public.





## 6.0 First Round of Public Outreach

Due to COVID-19 restrictions, the project team was unable to host an in-person public meeting. Instead, other means of communication were used, including a project website, a project email address, an online Story Map, an online survey, an online mapping exercise, a press release, social media posts, and 4,300 postcards directly mailed to addresses in southeast Fayette and northeast Jessamine Counties.

### 6.1 Online Survey

The online Story Map with survey and mapping exercise was open to the public between September 14 and December 11, 2020. The following is a summary of the results from the survey.

There were 379 participants who fully or partially completed the survey. When asked how they heard about the study, 136 (53 percent) respondents chose 'other' which likely means they learned about the study from the postcard. Other news media (newspaper, radio, etc.) was the second highest with 54 responses (21 percent).

The next question asked if participants live or work within the study area. 302 (83 percent) responded that they live and/or work within the study area. The highest reported zip codes were 40356 (Jessamine County) and 40515 (southeast Fayette County), accounting for nearly 85 percent of the write in zip codes. When asked how often they drive routes within the study area (other than US 27 and I-75), the majority (85 percent) of respondents indicated that they drive through the area daily or several times per week.

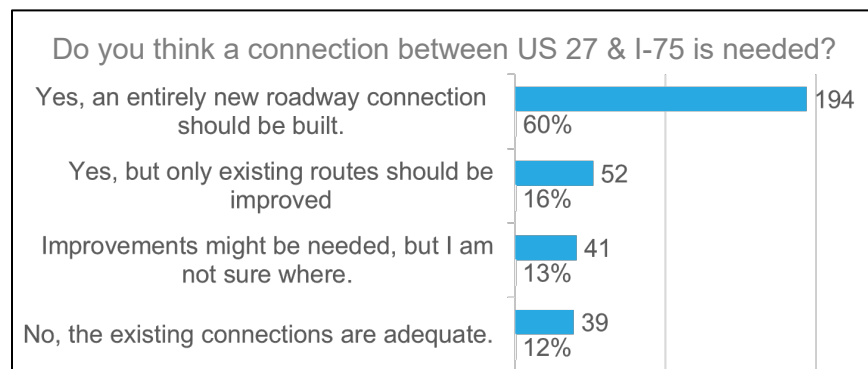
Respondents were then asked to rank the top three transportation issues in the study area. Increasing congestion, narrow travel lanes and shoulders, and too much traffic on local roads were the highest priorities, as shown in **Figure 18**.

High Priority	Medium Priority	Low Priority
<ul style="list-style-type: none"><li>• Increasing congestion</li><li>• Narrow travel lanes and shoulders</li><li>• Too much traffic using local roads (and too many trucks on local roads)</li></ul>	<ul style="list-style-type: none"><li>• Poor connectivity to the interstate</li><li>• Speeding</li><li>• Can't easily see what's up ahead/around the corner</li></ul>	<ul style="list-style-type: none"><li>• High crash rates</li><li>• Safety for bicyclists and pedestrians</li><li>• Can't easily pass slower vehicles</li><li>• Narrow bridges</li></ul>

**Figure 18: Public Survey No. 1 – Prioritization of Transportation Issues**

When asked if transportation improvements are needed within the study area, 269 (76 percent) respondents indicated that improvements are needed now and 49 (13 percent) indicated improvements will be needed in the next five to 10 years. Respondents were then asked if a better connection is needed between US 27 and I-75. 194 respondents (60 percent) indicated an entirely new roadway connection should be built, as shown in **Figure 19**.

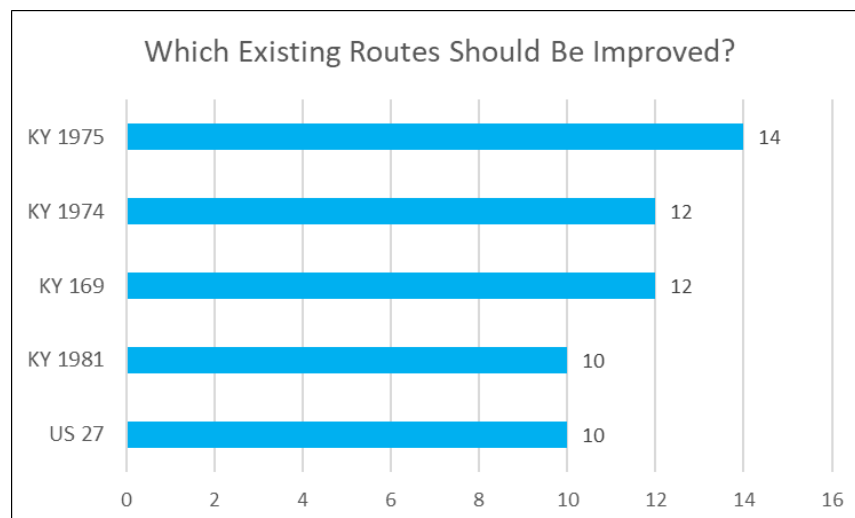




**Figure 19: Public Survey No. 1 – Is a Better Connection Between US 27 & I-75 Needed?**

When asked where the new connection should be built, the most common responses included: the eastern portion of the US 27 bypass in Nicholasville, Brannon Road, Exit 99 on I-75, and a connection between Tates Creek Road and I-75.

When asked which (if any) existing routes should be improved, the most common roads cited in the 87 written responses were Jacks Creek Pike (KY 1975) and Tates Creek Road (KY 1974), as shown in **Figure 20**. Other routes, such as Delong Road, Brannon Road, Ashgrove Road, and US 25 were also mentioned.



**Figure 20: Public Survey No. 1 - Which Existing Routes Should Be Improved?**

## 6.2 Mapping Exercise

Participants were then asked to indicate the location of transportation issues in the focus area. **Figure 21** presents the results from the mapping exercise, color-coded based on the general type of concern that was noted. As shown, clusters depicting locations of concern (primarily related to narrow lanes and shoulders or other roadway geometric issues) are concentrated on Tates Creek Road north of the KY 169 intersection (and the community of Spears) and near the Delong Road intersection. Additional clusters are located on Jacks Creek Pike, Spears Road, and Ash Grove Road.

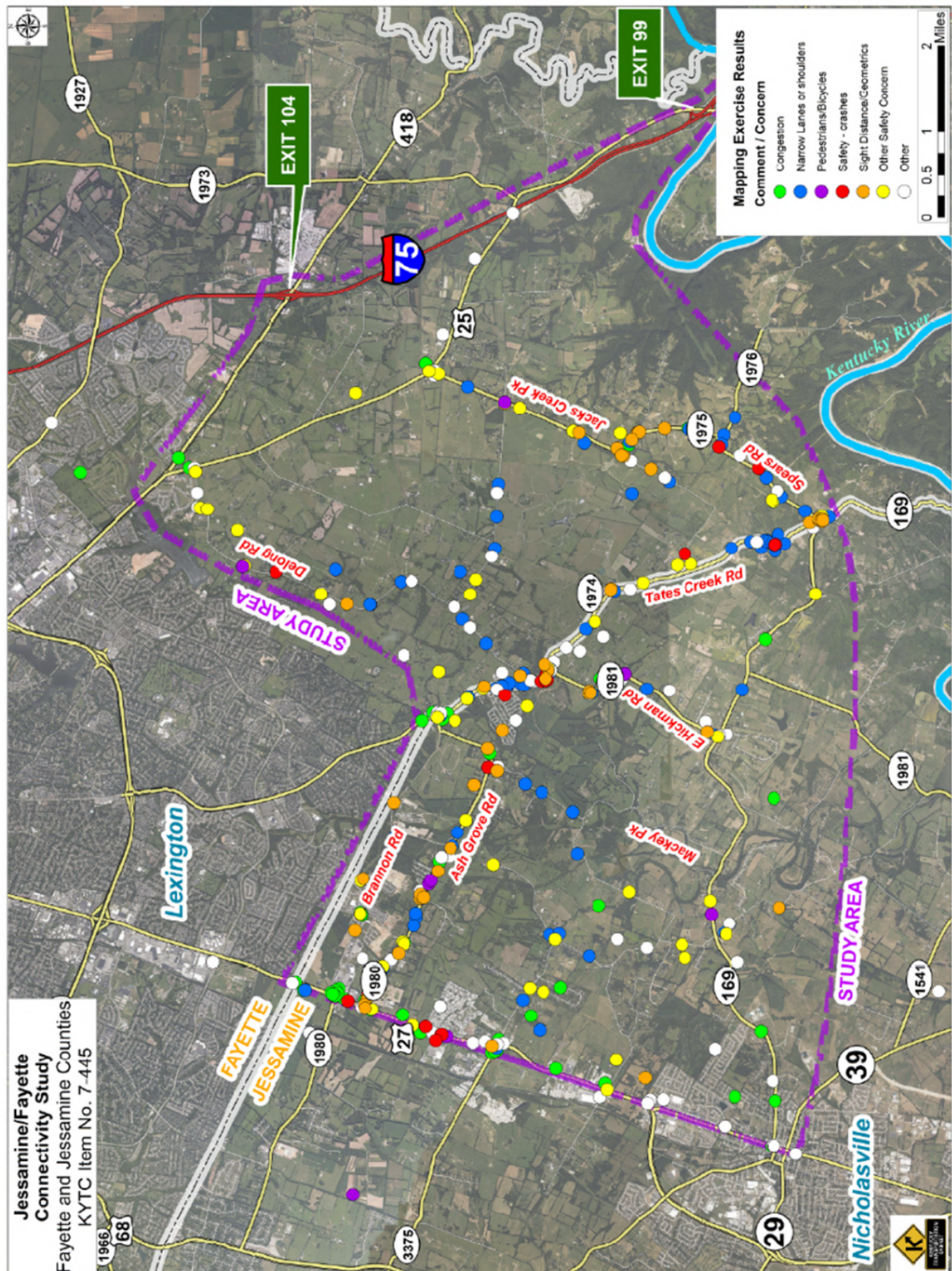


Figure 21: Public Survey No. 1 – Mapping Exercise

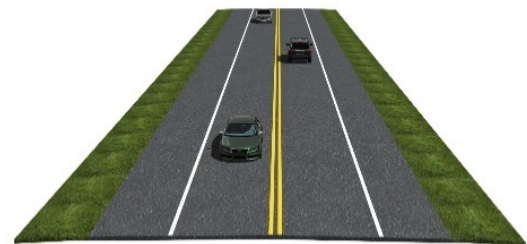


## 7.0 Initial Improvement Concept Development

The project team developed preliminary transportation improvement concepts based on a combination of project team discussions, a review of existing conditions, public input, travel demand model analyses, and field reconnaissance. Over the course of the study, the project team worked to determine which improvement concepts would best enhance mobility by improving safety and reducing congestion (where appropriate for the future conditions). Along with the No-Build concept, the project team examined several other improvements discussed below.

### 7.1 Corridor Improvement Concepts

With most of the connecting routes between US 27 and I-75 having less than desirable geometric characteristics for the type and volume of traffic they currently serve, corridor-wide improvements were investigated to improve mobility and safety within the focus area, as shown in **Figure 22**. The corridor concepts are not intended to upgrade existing routes to accommodate high-speed travel, nor function as high-capacity arterial corridors, but instead intend to improve the existing rural two-lane roads to increase safety for users that are currently using the roadways, as well as future travelers, whose numbers continues to grow. Generally speaking, such concepts include 11-foot lanes and paved / usable shoulder widths ranging from two to 10 feet depending on the terrain. The intent is to develop a slate of corridor improvements that would collectively better serve and disperse traffic demand as opposed to focusing traffic onto one single corridor. This would better fit within the rural, agrarian context that characterizes much of the study area and would not concentrate traffic at individual intersections along US 27 which may already suffer from recurring congestion.



**Typical Section for All Corridor Improvement Concepts**

#### **Concept 1 – KY 169 (Union Mill Road) & KY 1975 (Jacks Creek Pike)**

KY 169 (Union Mill Rd Road) provides the most direct east/west access between US 27 and KY 1974 (Tates Creek Road). It currently has two 10-foot lanes, speed limits ranging from 35 to 55 mph, and several horizontal curves rated as curve class D or worse (greater than 8.5 degrees) which result in reduced operating speeds. Over the June 2017 – June 2019 crash study period, there have been 196 crashes on this section of KY 169, three of which were fatal, with a majority (56 percent) being single vehicle collisions. Daily traffic on this portion of KY 169 is around 4,500 VPD, with an expected increase in traffic once the eastern section of the Nicholasville Bypass is completed. To the east, KY 1975 (Jacks Creek Pike) continues the east/west connection from Tates Creek Road to US 25 (Old Richmond Road). It is also a two-lane route with nine-foot lanes, minimal shoulder, and sharp horizontal curves.

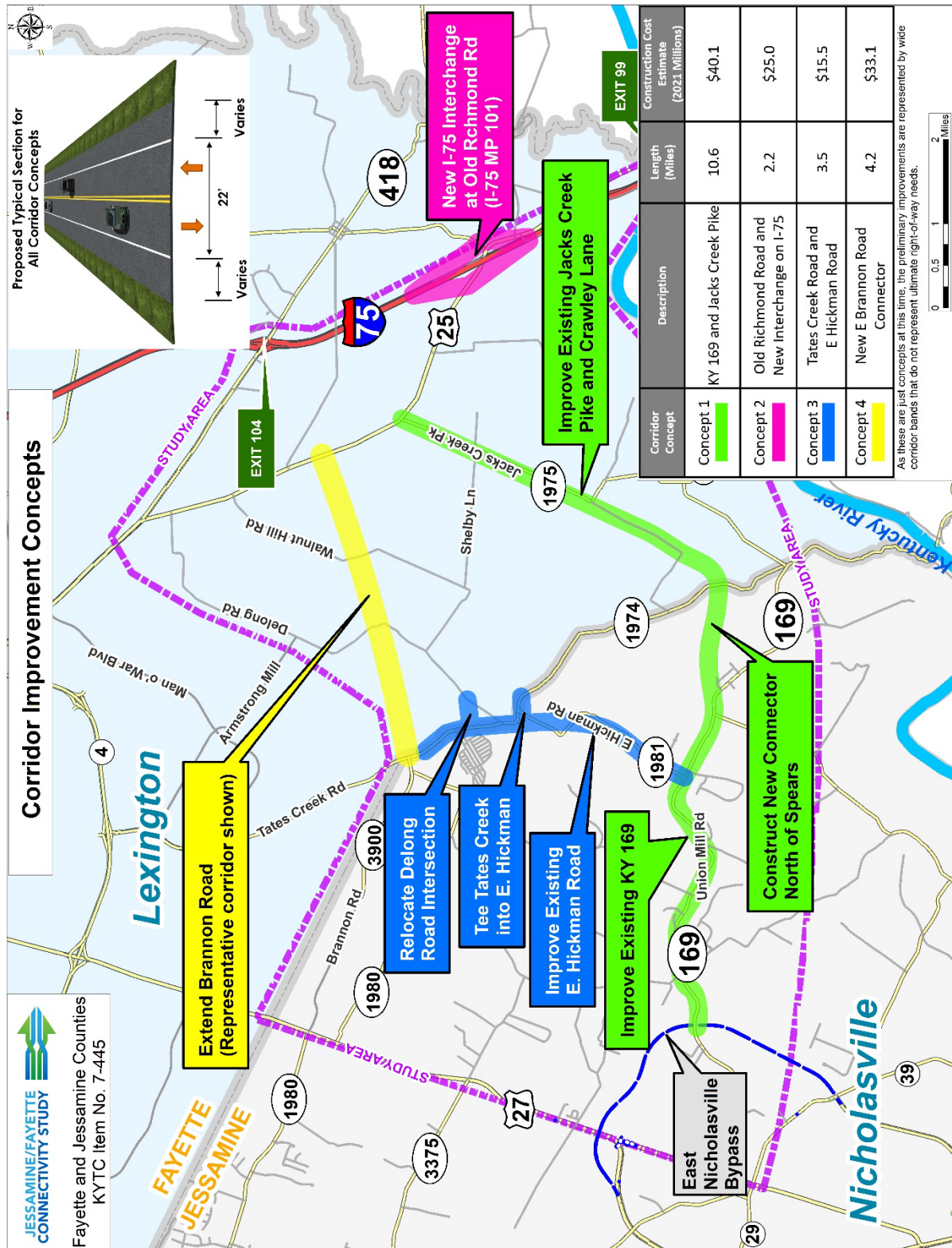
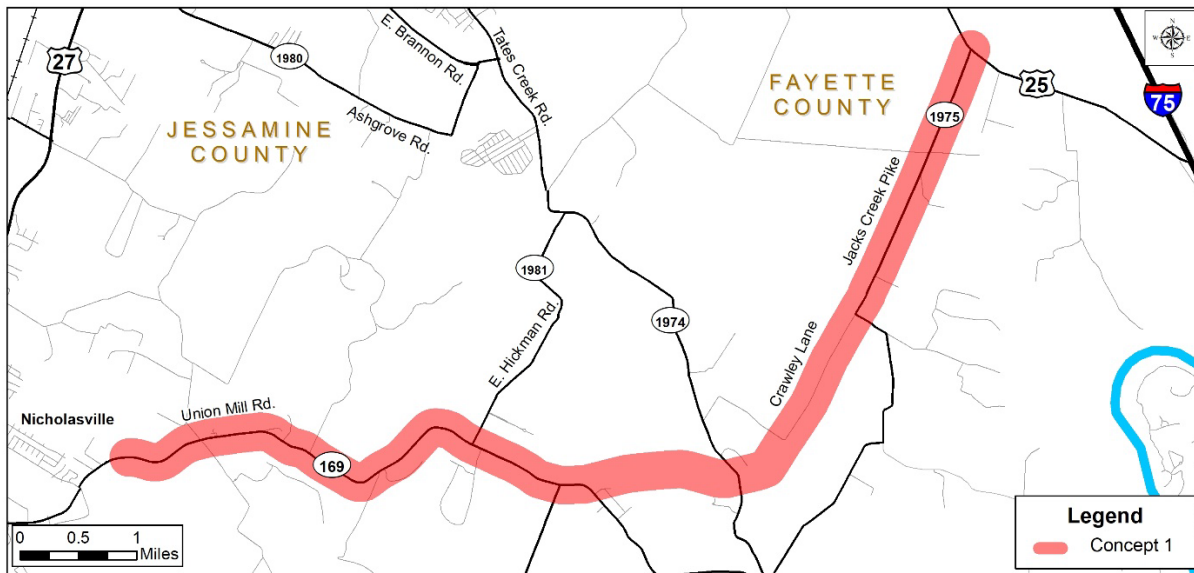


Figure 22: Preliminary Corridor Improvement Concepts



Concept 1 includes upgrading KY 169 and KY 1975 to a more consistent 45-mph design speed by widening lanes/shoulders and improving curvature. In addition to upgrading the existing routes, Concept 1 includes a new connection between KY 169 and KY 1975 through Crawley Lane north of the existing KY 169 intersection with KY 1974, as shown in **Figure 23**. This would provide a safer, more direct east/west connection between Nicholasville and US 25 and would allow through traffic to avoid several of the horizontal curves to the south. This new connection would also avoid adverse terrain issues and right-of-way / community impacts surrounding the Spears area. The new alignment could be implemented with partial control of access, improving safety, and ensuring mobility by limiting the number of driveways with direct access.



**Figure 23: Concept 1 – KY 169 (Union Mill Road) & KY 1975 (Jacks Creek Pike)**

Based on results from the 2045 LAMPO TDM, daily traffic on Concept 1 roadways is expected to range between 13,200 VPD east of East Hickman Road and 18,400 VPD near the East Nicholasville Bypass, as shown in **Figure 24**. This expected increase is significant, with 13,900 VPD compared to the 4,500 VPD currently using this selection of roadway. Results from the model also show a reduction in traffic on KY 1981 (East Hickman Road) by 2,600 VPD and an increase traffic on US 25 (Old Richmond Road) by 3,600 VPD. With this concept, traffic demand would also decrease on KY 169, KY 1974, and KY 1975 near Spears.

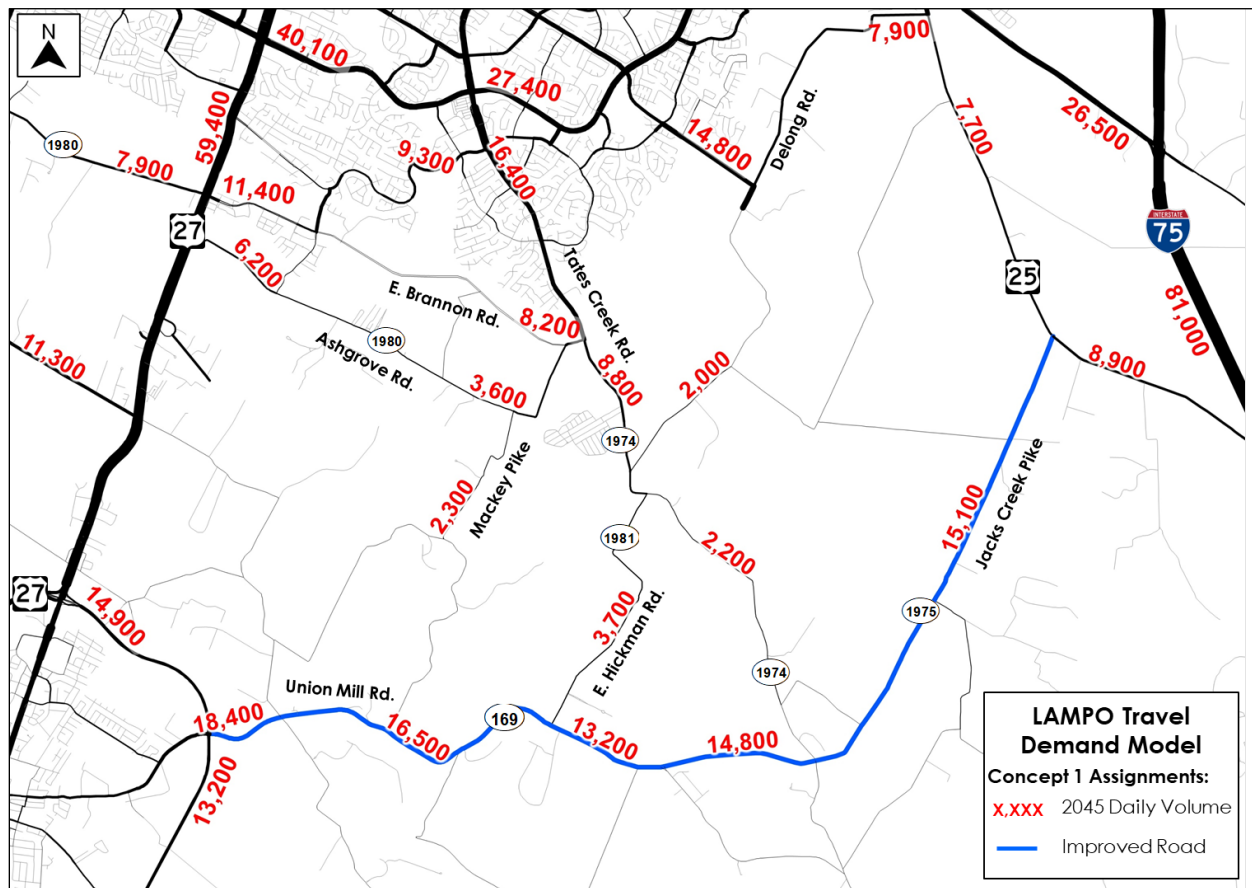
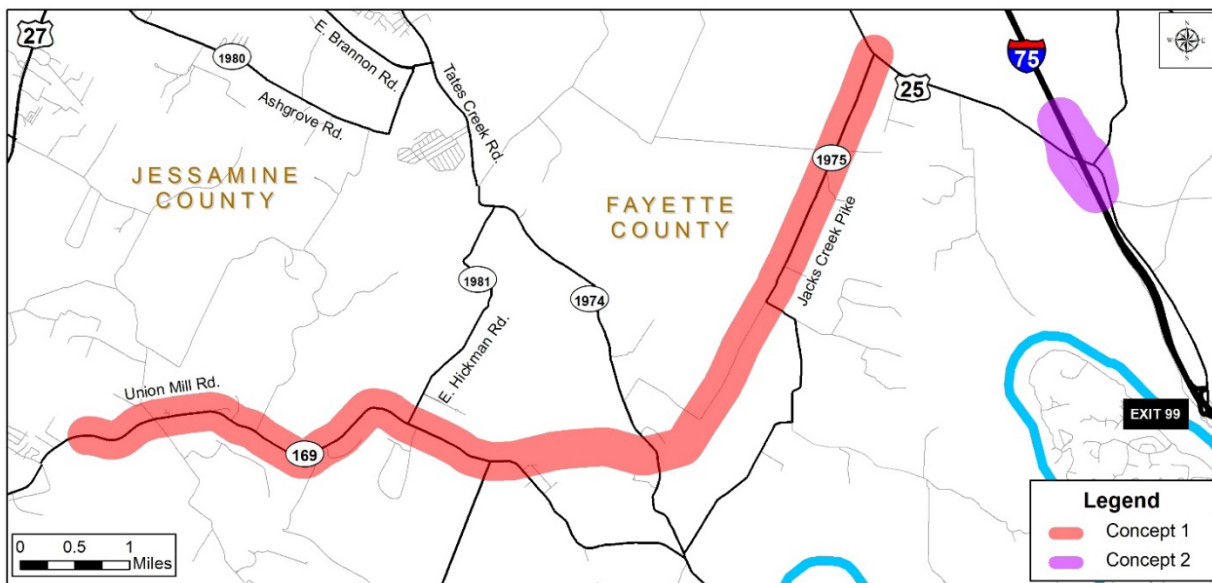


Figure 24: LAMPO 2045 Daily Traffic Assignments – Concept 1

### Concept 2 – New I-75 Interchange at US 25 (Old Richmond Road)

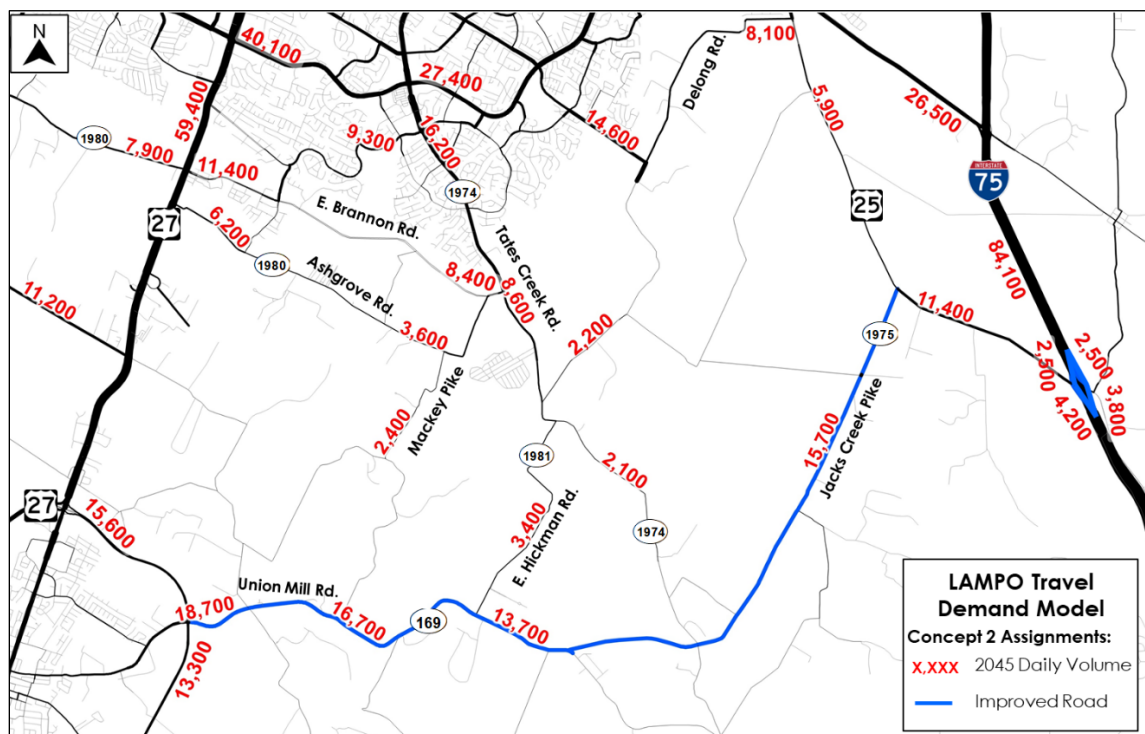
I-75 currently has two interchanges in the study area – Exit 99 at Clays Ferry just north of the Kentucky River and Exit 104 at Athens Boonesboro Road (KY 418). Neither of these interstate access points directly serves the study area. The Clays Ferry interchange is on a relatively steep grade on I-75 and the Athens Boonesboro interchange already experiences recurring periods of congestion as it serves about 25,000 VPD. Building upon Concept 1, Concept 2 includes the Concept 1 improvements along with a new I-75 interchange with US 25 at milepoint 101, as shown in **Figure 25**. The combination of these improvements would improve mobility by providing an additional access point to I-75 for those in southeast Fayette County.





**Figure 25: Concept 2 – New I-75 Interchange at Old Richmond Road**

Based on results from the 2045 LAMPO TDM, ramps on the new interchange are expected to carry 2,300 to 4,100 VPD, as shown in **Figure 26**, with traffic on the improved portions of KY 169 and KY 175 slightly higher than in Concept 1. Daily traffic on adjacent roadways will be impacted similarly to Concept 1, except on the portion of US 25 between KY 175 and the new interchange, where 3,000 additional VPD are expected. Improvements to US 25 would also be considered to handle the additional traffic.



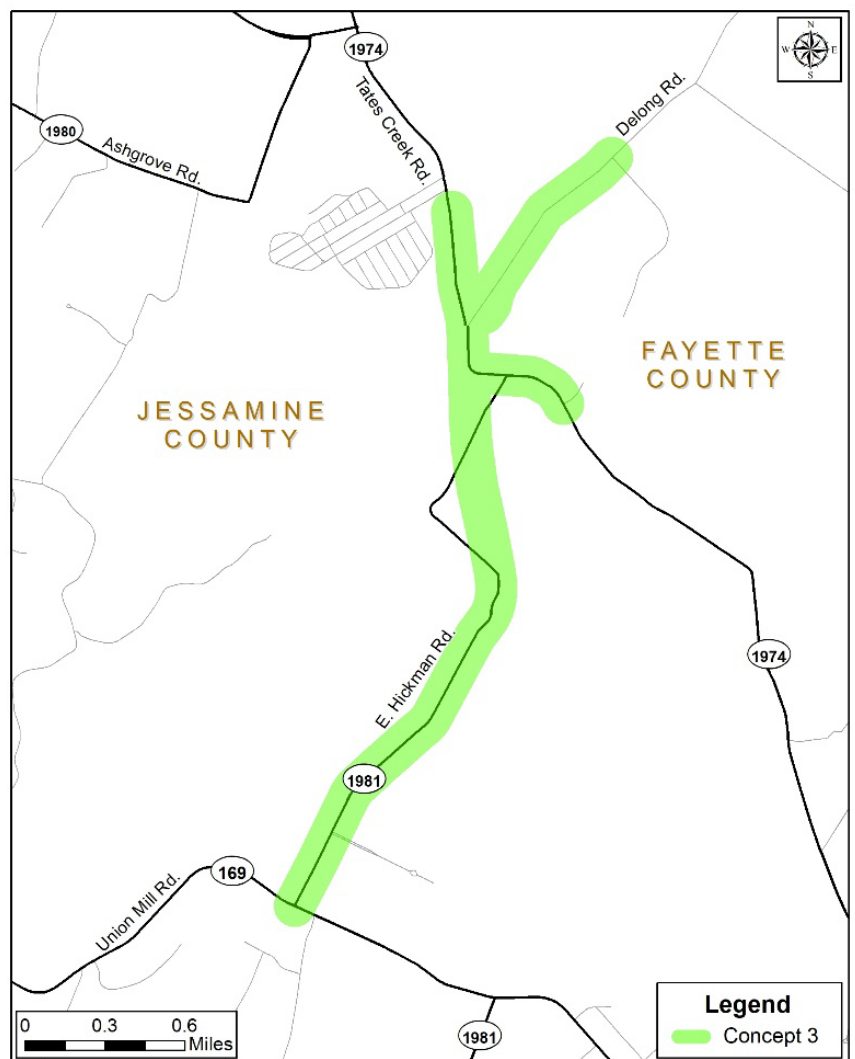
**Figure 26: LAMPO Daily Traffic Assignments – Concept 2**

### Concept 3 – KY 1974 (Tates Creek Road) and KY 1981 (East Hickman Road) Realignment

South of the KY 1980 intersection, KY 1974 (Tates Creek Road) is reduced to two nine-foot lanes and provides a north/south connection along the Fayette/Jessamine County border. Delong Road intersects Tates Creek Road at a skewed angle, causing poor sight distance and unideal conditions for drivers turning onto Tates Creek Road. Over the past three years, there were 17 reported crashes at this intersection, four of which resulted in an injury. Moving south, the 90-degree horizontal curve west of the KY 1981 (East Hickman Road) intersection was identified as a high crash spot, with 12 crashes reported over the past three years. The skewed East Hickman Road intersection is also a high crash spot, with 23 crashes reported over the past three years.

East Hickman Road is a rural two-lane road with narrow lanes and shoulders that provides a north/south connection between Tates Creek Road and KY 169. There are two 90-degree horizontal curves south of Tates Creek Road, at milepoints 5.15 and 5.55, that were identified as high crash locations, with four (one fatal) and 18 crashes reported over the past three years, respectively.

Concept 3 improves both east/west and north/south mobility and includes the realignment of Tates Creek Road from just north of Delong Road to just south of East Hickman Road, including the intersections with Delong Road and East Hickman Road (the latter of which makes East Hickman Road the 'through' movement to Tates Creek Road). It also includes the realignment of the horizontal curves on East Hickman Road, as shown in **Figure 27**. These improvements could be a stand-alone improvement or completed in conjunction with Concepts 1 and 2. If completed with Concepts 1 and 2, traffic on the realigned portions of Tates Creek Road and East Hickman Road is expected to increase by 3,500 VPD, as shown in **Figure 28**.



**Figure 27: Concept 3 – KY 1974 and KY 1981 Improvements**



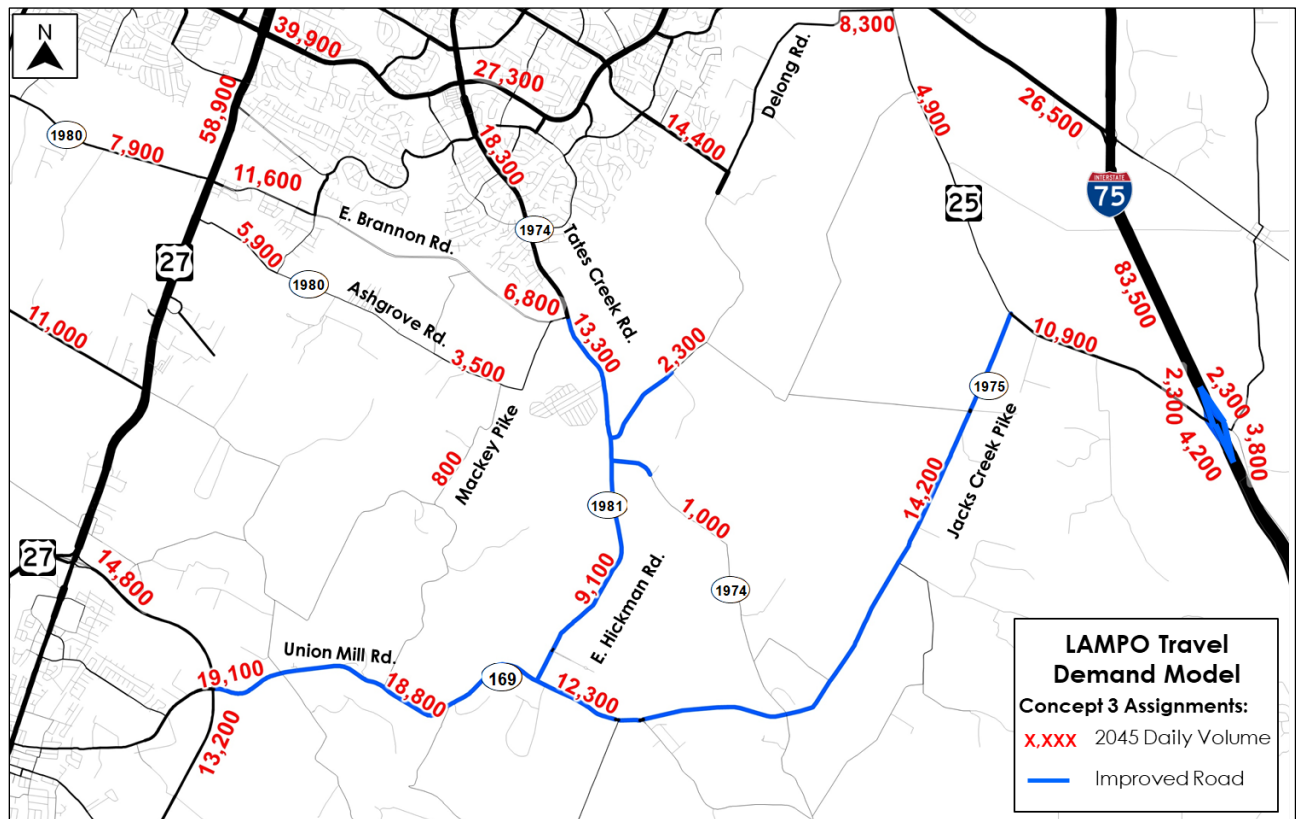
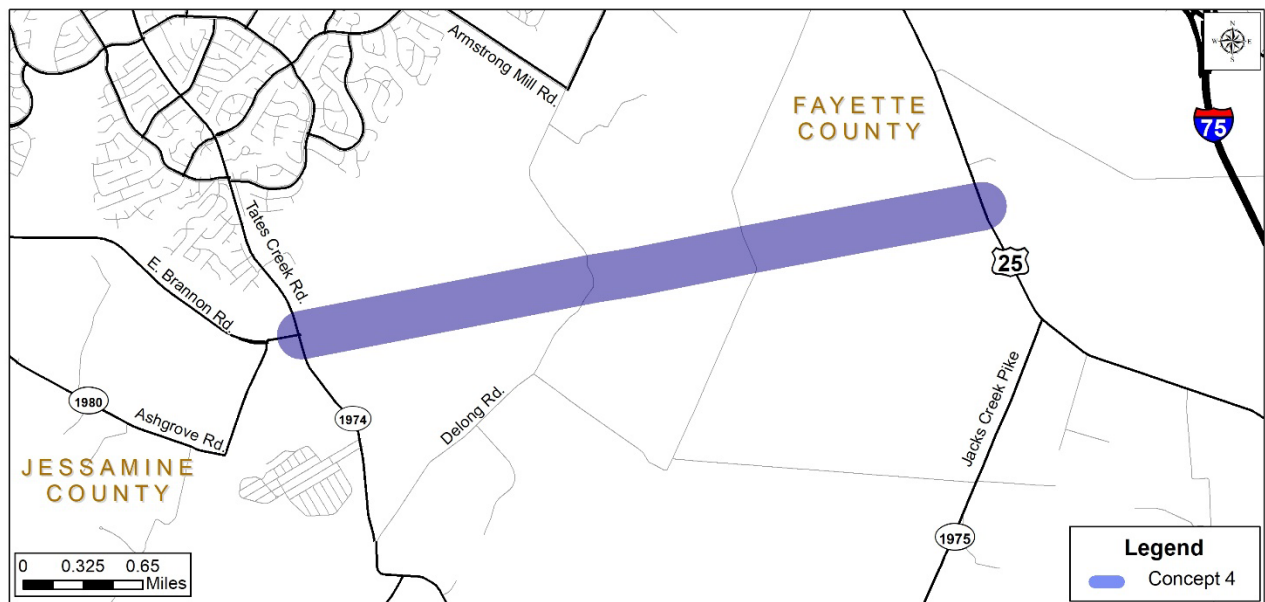


Figure 28: LAMPO 2045 Daily Traffic Assignments – Concept 3

#### Concept 4 – Brannon Crossing Extension

Delong Road currently provides the only east/west connection between Tates Creek Road and US 25 in the northern portion of the focus area. Its poor connection with Tates Creek Road, sharp curves, narrow lanes, and narrow shoulders, however, are not suitable for the level of traffic that currently use the corridor. An option to improve mobility in this area is to extend Brannon Road east to connect with US 25 north of Jacks Creek Pike. **Figure 29** presents a representative, straight-line visually depicting this concept. This depiction should not be interpreted as an “alignment”, for reasons described below.

Given the sensitive land uses within the area, the potential for redevelopment especially within the Fayette County Urban Service boundary, and parcels with PDR easements, the project team examined a number of widely varied options that could provide a connection between Tates Creek Road and US 25. However, given the conceptual nature of a planning study such as this, insufficient information is available to show a more specific conceptual alignment. In addition, the project team acknowledges the need for additional coordination with stakeholders / property owners should a concept such as this move forward. Such input would be critical during the environmental and preliminary design phase, with a focus to minimize environmental and right-of-way impacts.



**Figure 29: Concept 4 – Representative Example for a Brannon Road Extension**

Concept 4 could include the other corridor improvements or be completed as a stand-alone project. If constructed with the other improvements, the Brannon Road extension is expected to carry over 11,000 VPD, while also increasing traffic on East Brannon Road and Tate's Creek Road north of the new intersection, as shown in **Figure 30**. This concept is expected to significantly decrease traffic on Delong Road. As a stand-alone project, the Brannon Road extension is expected to carry up to 14,100 VPD, as shown in **Figure 31**. A discussion of the public feedback regarding Concept 4's impact to farmland can be found in Section 9.1.2.





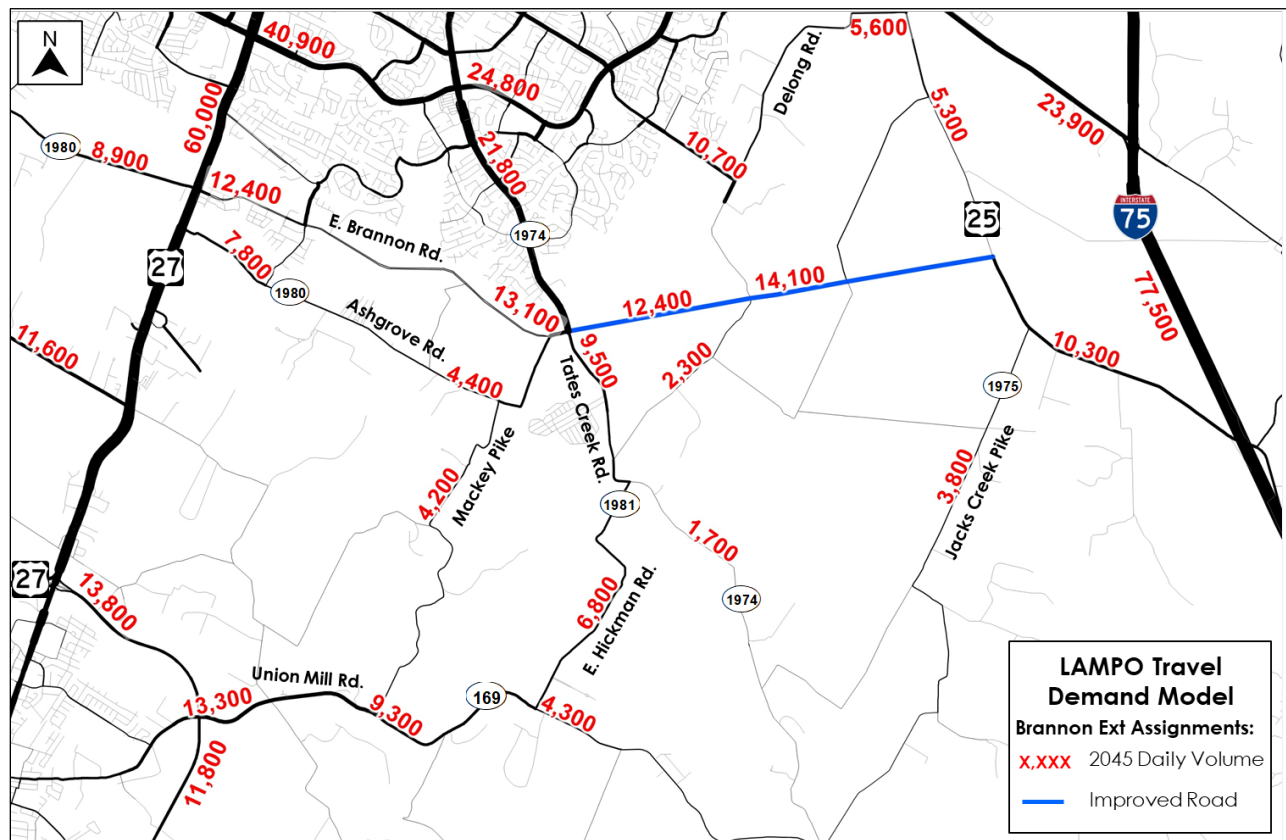


Figure 31: LAMPO 2045 Daily Traffic Assignments – Brannon Road Extension Concept Only

## 7.2 Cost Estimates

Construction cost estimates were developed for the four corridor improvement concepts, as shown in **Table 1**. Right-of-way and utility costs will be determined by the alignments, which will be developed during the design phase.



Table 1: Construction Cost Estimates

Construction Cost Estimates			
Concept	Description	Length (Miles)	Construction Cost Estimate (Millions)
Concept 1	KY 169 and KY 1975	10.63	\$40.1
Concept 2	US 25 Improvements and a New Interchange on I-75	2.24	\$25.0
Concept 3	Tates Creek Road and East Hickman Road	3.45	\$15.5
Concept 4	New E. Brannon Road Connector	4.2	\$33.1

### 7.3 Spot Improvements

In addition to the corridor-wide improvement concepts, spot improvements were developed to address safety issues at specific locations, as shown in **Figure 32**. These locations were identified from an analysis of crash and geometric data as well as results from the public outreach survey. Spot improvements along short sections of a roadway are not being considered for this study. Improving small portions of rural two-lane roads can cause safety issues because drivers will increase speeds on the improved sections and maintain these higher speeds on unimproved sections with poor geometrics. The recommended spot improvements are instead focused on intersections and longer roadway segments.

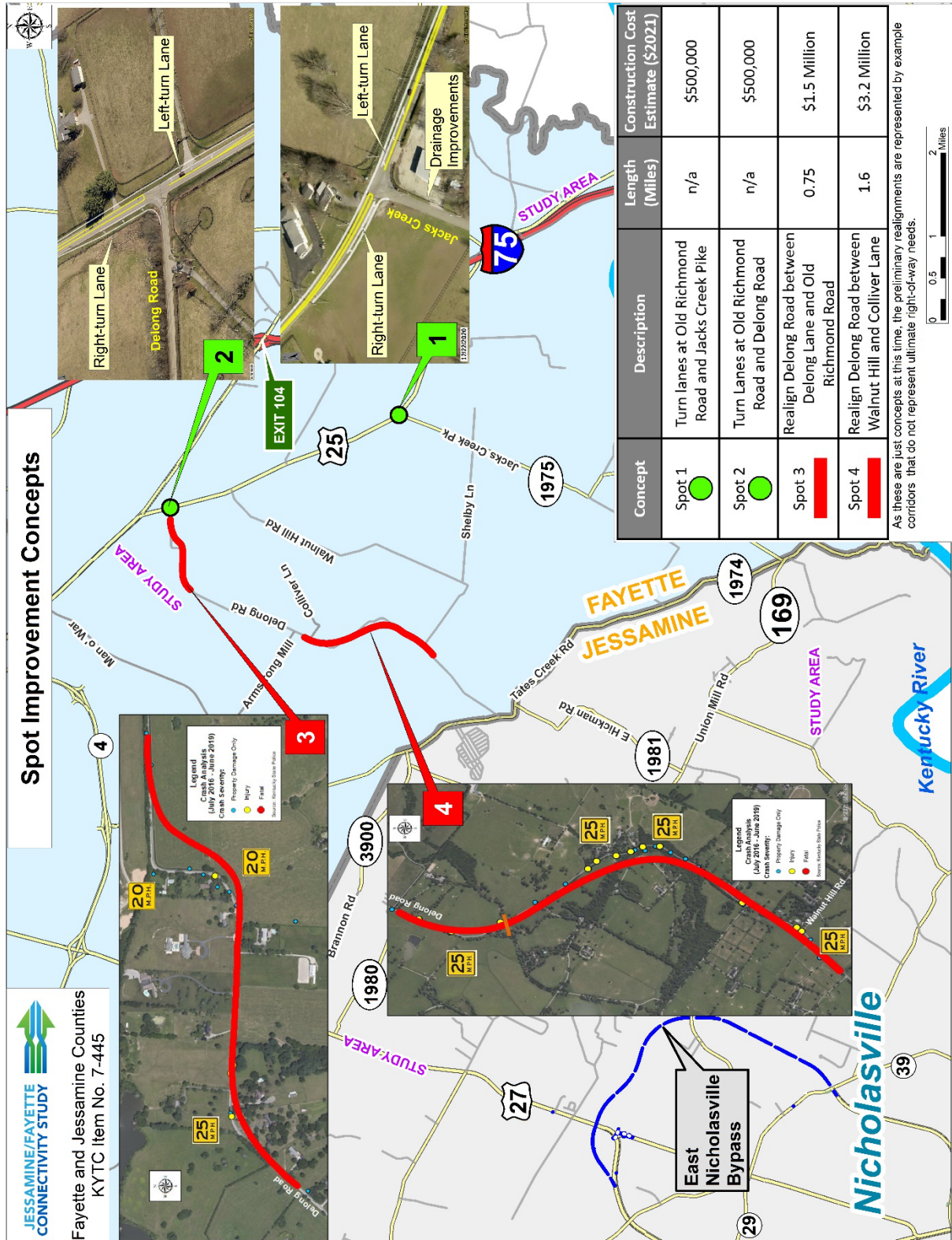


Figure 32: Preliminary Spot Improvement Concepts



**Spot Improvement 1 – US 25 (Old Richmond Road) at KY 1975 (Jacks Creek Pike)**

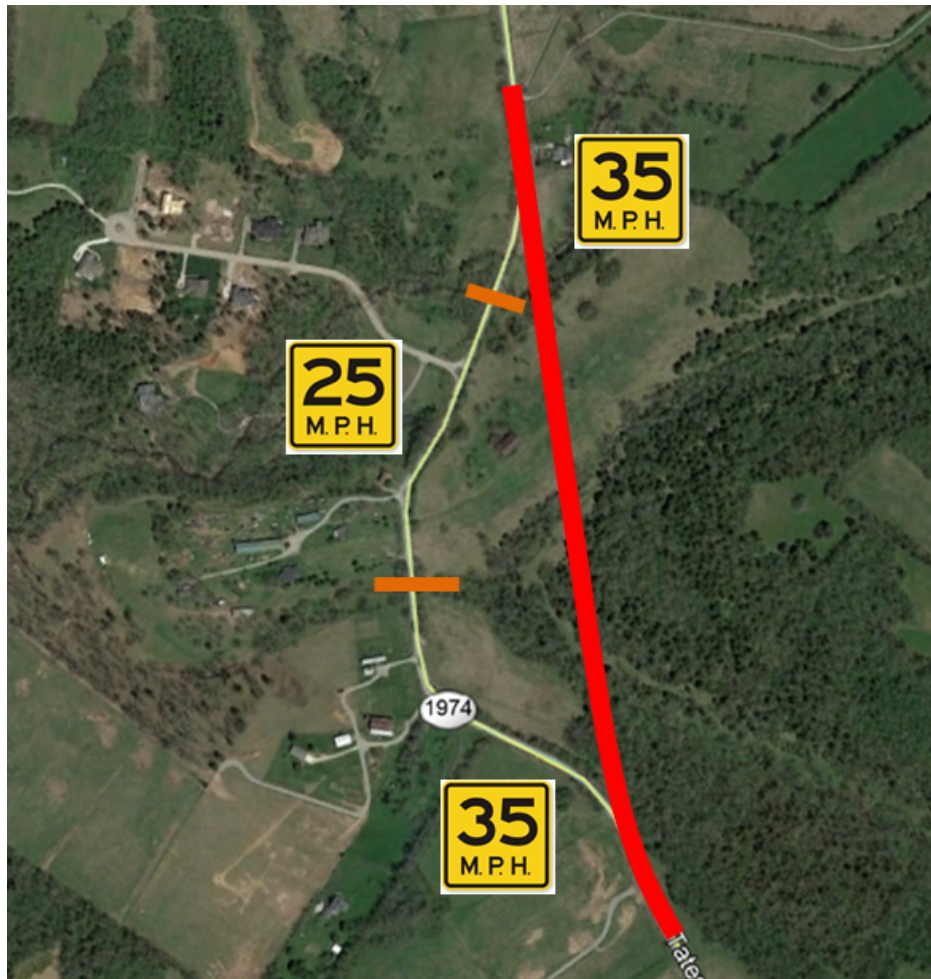
The US 25 (Old Richmond Road) intersection with KY 1975 (Jacks Creek Pike) is currently unsignalized with the KY 1975 approach stop-controlled. This section of US 25 carries 4,200 VPD and has a speed limit of 55 mph. There were 12 crashes at this location over the past three years, five of which involved an injury. Four of these crashes were rear ends, two were angle, and two were opposing left-turn collisions. An improvement option at this intersection, as shown on **Figure 33**, is to construct turn lanes on US 25 to reduce the conflict between through traffic and turning vehicles.

**Figure 33: Spot 1 – US 25 at Jacks Creek****Spot Improvement 2 – US 25 (Old Richmond Road) at Delong Road**

The US 25 (Old Richmond Road) intersection with Delong Road is currently unsignalized with the Delong Road approach stop-controlled. This section of US 25 carries 4,200 VPD and has a speed limit of 55 mph. There were 11 crashes at this location over the past three years, eight of which were angle collisions. An improvement option at this intersection, as shown on **Figure 34**, is to construct turn lanes on US 25 to reduce the conflict between through traffic and turning vehicles. There is currently an HSIP project examining innovative intersections on US 25, including at the Delong Road intersection.

**Figure 34: Spot 2 – US 25 at Delong Road****Spot Improvement 3 – KY 1974 (Tates Creek Road) between Crawley Lane and KY 169 (Union Mill Road)**

South of Crawley Lane, Tates Creek Road (KY 1974) has three horizontal curves with advisory speeds 35 mph or lower. There were 15 reported crashes on this portion of Tates Creek Road over the past three years, with three involving an injury and 11 being single vehicle. An improvement option is to realign Tates Creek Road east of the three horizontal curves and bring the roadway up to a 45-mph design speed, as shown in **Figure 35**.



**Figure 35: Spot Improvement 3**

**Spot Improvement 4 –Delong Road between Walnut Hill Road and Colliver Lane**

The section of Delong Road between Walnut Hill Road and Colliver Lane has four horizontal curves with 25 mph advisory speeds and carries 1,300 VPD. There were 26 crashes reported on this portion of Delong Road over the past three years, 10 of which resulted in an injury and 17 of which were single vehicle collisions. An improvement option is to realign this portion of Delong Road and eliminate several of the horizontal curves, as shown in **Figure 36**.



Figure 36: Spot Improvement 4

#### Spot Improvement 5 – Delong Road between Delong Lane and US 25 (Old Richmond Road)

The section of Delong Road between Delong Lane and US 25 has three horizontal curves with advisory speeds of 25 mph or slower and carries 3,600 VPD. There were 13 crashes on this portion of Delong Road over the past three years, four of which resulted in an injury and 10 of which were single vehicle. An improvement option is to realign this portion of Delong Road and remove several of the horizontal curves, as shown in **Figure 37**.



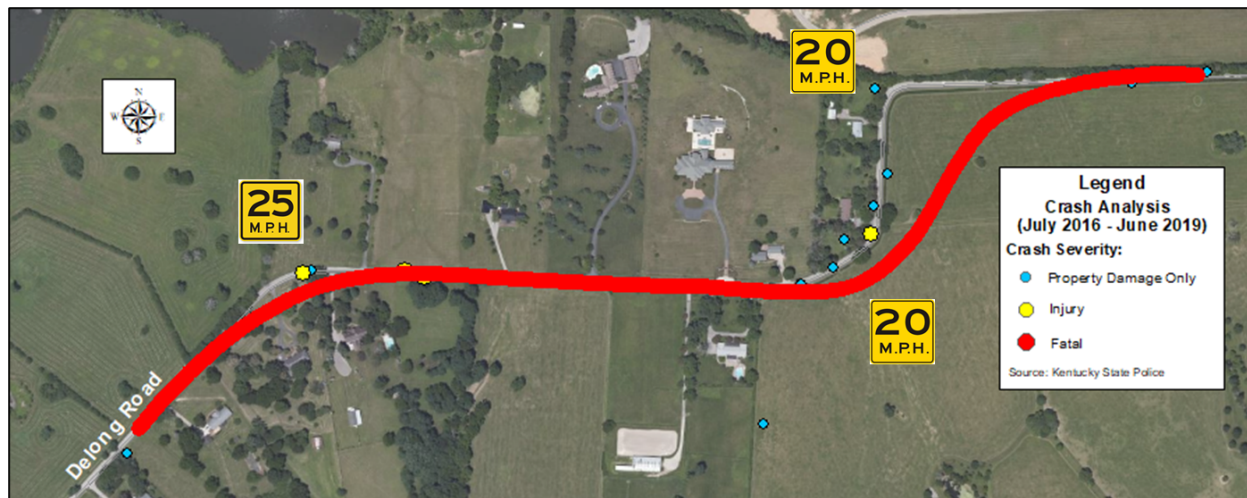


Figure 37: Spot Improvement 5

## 8.0 Second Project Team and Stakeholder Meetings

Following the development of the initial improvement concepts, the project team met for the second time. During the meeting, improvement concepts were presented, and attendees were asked to provide feedback regarding their concerns and priorities. Summaries for all meetings are found in **Appendix D**.

### 8.1 Project Team Meeting No. 2

The second project team meeting was held via Microsoft Teams on March 12, 2021. The purpose of the meeting was to present the results from the first round of public involvement and to get feedback on preliminary improvement concepts. Key discussion items included the following:

- There was discussion on the anticipated developments within the Lexington Urban Service Boundary (USB). Areas along Armstrong Mill Road south of Delong Road are expected to develop with single- and multi-family housing at some point in the future, with initial developments north of Armstrong Mill near Squires Hill Lane being implemented within five years. Trips were added to the Armstrong Mill/Delong Road area for the 2045 model to account for the anticipated developments.
- Concept 1 (KY 169 & KY 1974) is not intended to be a major highway and will not induce additional development in the area. Consistent with the other corridor concepts, the new connection will be a rural two-lane road that fits in with the current roadway network. The project team will continue to keep existing land-use in mind while developing improvement concepts.
- The alignments presented are planning level and do not indicate exact locations of improvement concepts. Corridor buffers were widened to 2,000 feet for display purposes to better convey that specific alignments have yet to be determined.

- It was noted that the horizontal curves on East Hickman Road are under consideration for a HSIP project that could include a high friction surface treatment (HFST).
- It was noted that Concept 4 - Brannon Road extension would likely serve trips originating in southeastern Lexington while Concept 1 improvements would serve trips further to the south in Jessamine County.

## 8.2 Local Officials/Stakeholder Meeting No. 2

The project team met with key stakeholders and local officials for a second time on Zoom on June 16, 2021. The purpose of the meeting was to present the conceptual improvement strategies and solicit feedback from local officials and stakeholders. Key discussion items included the following:

- It was noted that improvements to US 25 (Old Richmond Road) could be considered as part of Concept 4 if increased traffic demand were anticipated.
- It was noted that the corridors shown are preliminary. Should any concept advance, during the preliminary engineering and design phase the KYTC would explore how to minimize impacts to farms/homes. Wide bands representing the corridor improvement concepts will be shown to the public to communicate this point.
- There is currently a HSIP project examining innovative intersection options on Richmond Road. This project may impact the intersection with Old Richmond Road.

## 9.0 Second Round of Public Outreach

A second round of public outreach was held to virtually and in-person solicit feedback on the initial improvement concepts. Postcards were mailed to study area residents and businesses, an in-person public meeting was held, and an online StoryMap and survey were made available between July 22, 2021 and September 3, 2021. The following is a summary of the results.

### 9.1.1 Public Meeting

The in-person public meeting was held at East Jessamine Middle School on July 22, 2021. Exhibits were displayed depicting the focus and influence areas, the crash analysis, existing and future traffic, and the initial improvement concepts. Attendees were encouraged to fill out the online survey but were also provided an opportunity to fill out a hard copy. The project team delivered a brief presentation, which was also broadcasted via Zoom giving an overview of existing conditions and potential improvement concepts.

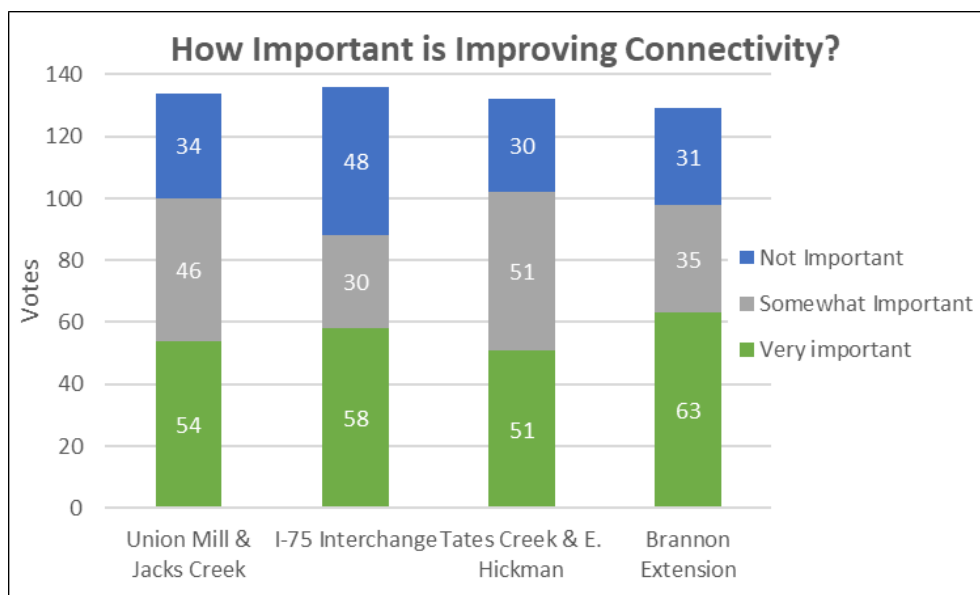
### 9.1.2 Online Survey

While the purpose of the first survey was to solicit feedback from the public regarding transportation issues and trouble spots, the second survey intended to gauge public interest of the four corridor improvement concepts. There were 155 participants who fully or partially

completed the survey. When asked how they heard about the study, 41 (32 percent) respondents indicated social media, 34 (27 percent) from the postcard, and 20 (16 percent) from a friend or neighbor. When asked if they live or work within the study area, 106 (68 percent) indicated they live and/or work in the study area. The highest reported zip codes were 40356 (Jessamine County) and 40515 (southeast Fayette County), accounting for 69 percent of the total zip codes submitted.

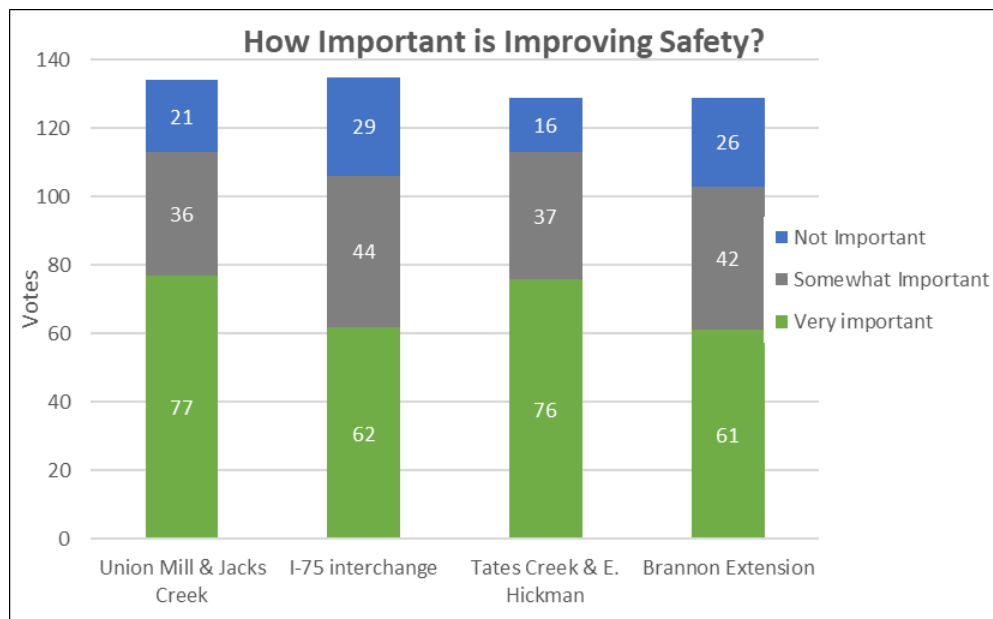
The four corridor improvement concepts were then presented, and questions were asked about each regarding usage, connectivity, safety, and congestion. When asked about the importance of improving connectivity in the project area, the Brannon Extension received the most votes for 'very important' with 63, followed by a new I-75 interchange with 58 votes, as shown in **Figure 38**.

The next question asked about the importance of improving safety in the project area, the improvements to Union Mill Road and Jacks Creek Pike received the most votes for 'very important' with 77, followed by the realignment of Tates Creek Road and East Hickman Road with 76 votes, as shown in **Figure 39**.



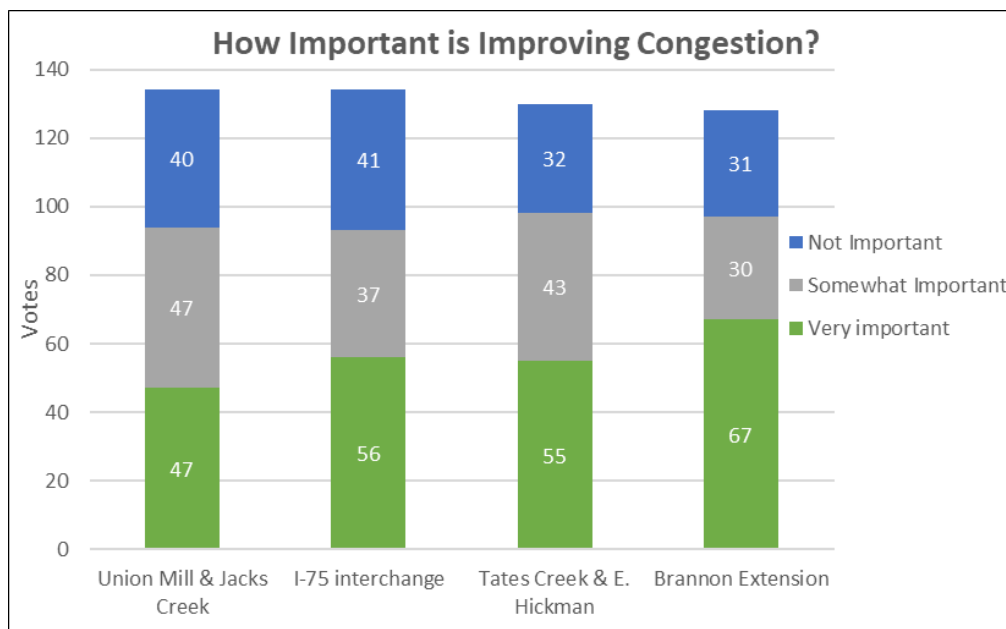
**Figure 38: Public Survey No. 2 – Connectivity**





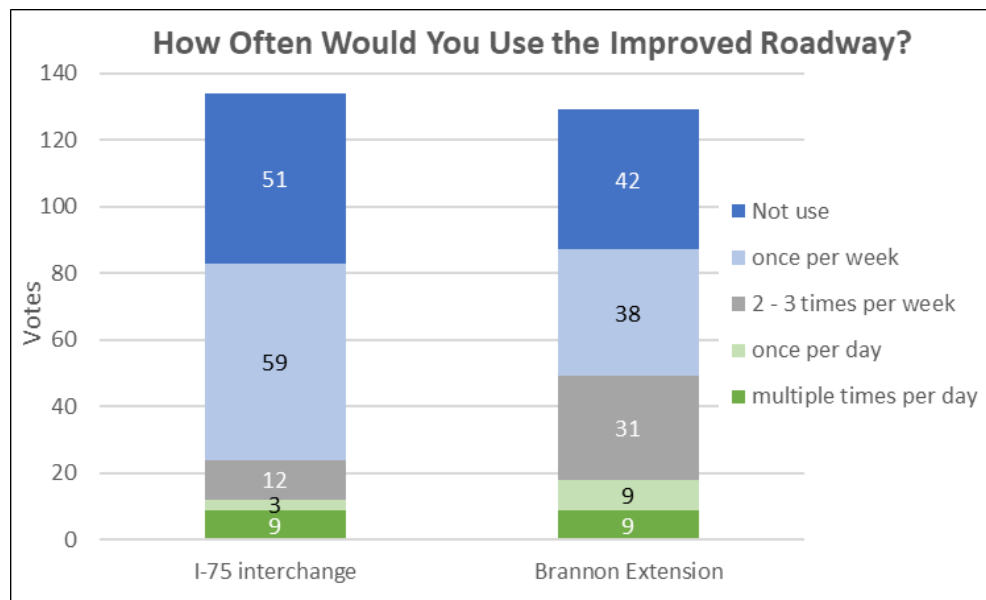
**Figure 39: Public Survey No. 2 – Safety**

When asked about the importance of improving congestion in the project area, the Brannon Extension received the most votes for 'most important' with 67, as shown in **Figure 40**.



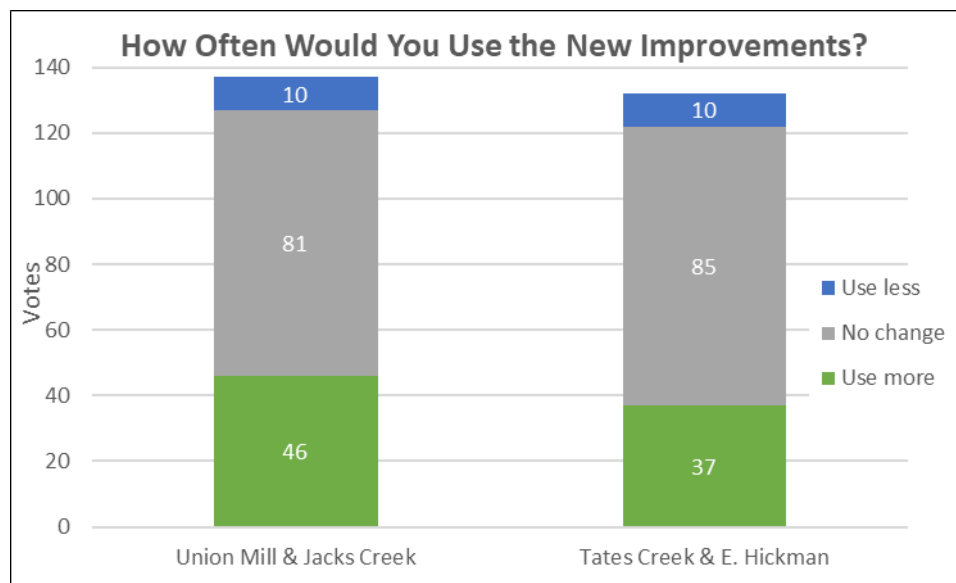
**Figure 40: Public Survey No. 2 – Congestion**

When asked how often they would use the improved roadways, 46 (34 percent) indicated they would use Union Mill and Jacks Creek Pike more than they do today while 37 (28 percent) indicated they would use Tates Creek Road and East Hickman Road more, as shown in **Figure 41**.



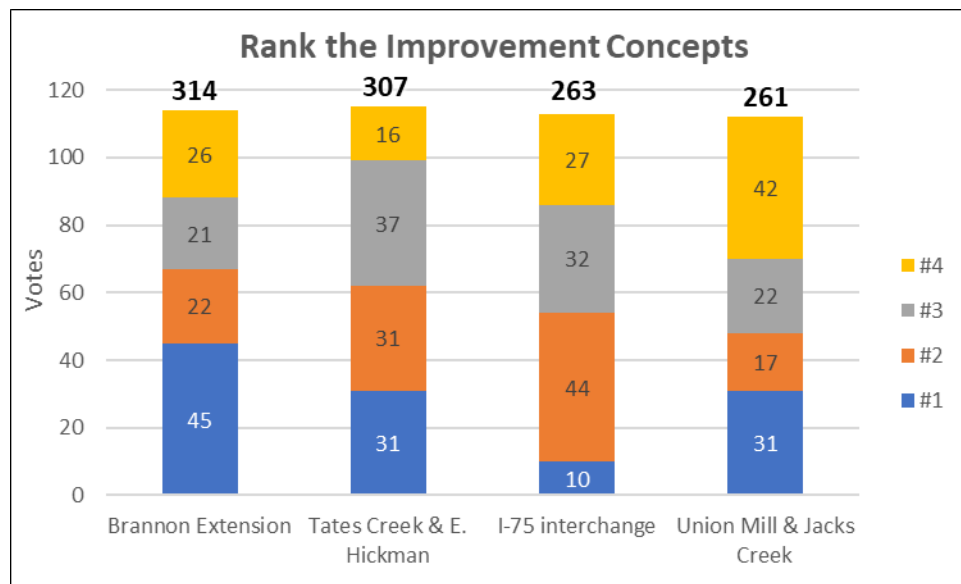
**Figure 41: Public Survey No. 2 – Usage of Improved Roadways**

When asked how often they would use the new improvements, 87 (67 percent) indicated they would use the Brannon Extension at least once per week while 83 (62 percent) indicated they would use a new I-75 interchange weekly, as shown in **Figure 42**.



**Figure 42: Public Survey No. 2 – Usage of New Improvements**

At the end of the survey, respondents were asked to rank the improvement concepts #1 – #4, with #1 being the highest priority. A weighted ranking system was used to summarize the results, with a #1 ranking worth 4 points, a #2 ranking worth 3 points, and so on. As summarized on **Figure 43**, the Brannon Extension received the most points with 314, followed by the realignment of Tates Creek Road and East Hickman Road with 307.



**Figure 43: Public Survey No. 2 – Improvement Concept Ranking**

It should be noted that some concepts received both very positive and very negative feedback from the public. The Brannon Extension, while ranked high by many survey respondents, was also received negatively by many responding to the survey. Much of the negative feedback included discussion of concerns related to farmland impacts. Additionally, letters were received from the Rural Land Management Board and Overbrook Farm asking the KYTC to no longer consider any options that would provide a direct connection from Bates Creek Road to US 25 in the vicinity of Brannon Road.

Of all the corridor improvement concepts, Concept 3 – Improvements to Bates Creek Road and East Hickman Road, received the least amount of negative feedback and was generally well-received by the public. While there was limited negative reaction to this conceptual improvement, much of that was due to concerns over perceived right-of-way and farmland impacts. Generally speaking, most of the feedback received suggests the public supports the idea of implementing safety improvements within the proposed area but may not fully support the concepts as depicted.

With 68 percent of total respondents living and/or working in the study area, it was necessary to geographically separate out results from respondents in the study area. To do so, the survey results were summarized using the zip code of the respondent. The two zip codes in the study area, and the most common zip codes, were 40515, southeast Fayette County, and 40356, northeast Jessamine County.

Based on results from surveys with these two zip codes, respondents from Jessamine County believe that improving connectivity, safety, and congestion in the area is more important than those who live in Fayette County. Respondents from Jessamine County were also more likely to use the improved roadways, with 40 percent indicating higher use of KY 169 and KY 1975 after improvements and 76 percent indicating they would use a Brannon Extension at least once per week. Only 22 percent of Fayette County respondents would use KY 169 and KY 1975 more, and



57 percent indicated they would use the Brannon Extension weekly. When asked to rank the concepts, the realignment of Bates Creek and East Hickman was the highest priority for respondents from both study area zip codes. The Brannon Extension was the second highest priority for respondents from Fayette County, while improvements to KY 169 and KY 1975 was the second priority for respondents from Jessamine County.

Overall, there was no obvious public consensus based on results from the survey. Safety is more of an issue to the public than connectivity and congestion. While many believe these improvements would be beneficial, others are concerned with disrupting farmland and increasing congestion. There were also several comments to consider multimodal accommodations along with any improvement concepts.

## 9.2 Final Project Team Meeting

The third and final project team meeting was held via Microsoft Teams on October 18, 2021. The purpose of the meeting was to present the results of the second round of public involvement and to get feedback from the project team on study conclusions. Detailed summaries of each meeting are presented in **Appendix D**. Key discussion items included the following:

- As an alternative to the Brannon Extension concept, an additional improvement concept was discussed to avoid extending past the USB and impacting horse farms. Should development within the limits of the USB introduce new traffic demand that would adversely affect existing Delong Road, a minor connection could be constructed within the USB (and within the development) to instead connect Brannon Road from Bates Creek Road to Delong Road near Armstrong Mill. This could be implemented in concert with spot improvement #3 and /or spot improvement #4.
- The potential Bates Creek/Delong Road Connector is not intended to spur development, but instead to be prepared for when development occurs.

## 10.0 Conclusions

The objective of the *Jessamine/Fayette Connectivity Study* is to identify and evaluate potential improvement options to increase mobility in northeast Jessamine County and southeast Fayette County by improving safety and reducing congestion. Southeast Fayette County and northeast Jessamine County have experienced significant population growth in recent years. A lack of safe and adequate east-west connectivity south of Man O' War Boulevard has been an increasing concern of the traveling public and local officials. With the impending completion of the East Nicholasville Bypass, geometrically undesirable roadways will be required to handle high traffic volumes acting as "shortcuts" between US 27 and I-75. This study examined options to provide better, safer connections in the area.

## 10.1 Revised Improvement Concepts

After the second round of public involvement and the final project team meeting, improvement concepts were revised based on feedback from the project team, local officials/stakeholders, and the public. The concepts were then grouped into the following categories: Spot Improvements / Lower-Cost Concepts to Consider as Funding Allows, Concepts for Future Consideration after the East Nicholasville Bypass is completed, and Concepts for Consideration as Part of Future Development. The revised concepts fulfill the study goals and objectives by improving safety and congestion issues affecting mobility in Southeast Fayette and Northeast Jessamine Counties. This study will not be making specific recommendations to advance transportation concepts; however, the following section presents the improvement concepts analyzed in this study that may be further considered under various future conditions.

### 10.1.1 Spot Improvements / Lower-Cost Concepts to Consider as Funding Allows

Based on the crash analysis and generally positive public feedback, the following concepts could be considered if funding becomes available.

#### **Concept #3 – Realignment of Tates Creek Road (KY 1974) and East Hickman Road (KY 1981)**

This concept improves both east/west and north/south mobility and includes the realignment of the Tates Creek Road intersections with Delong Road and East Hickman Road and the realignment of horizontal curves on Tates Creek Road and East Hickman Road.

#### **Spot Improvements**

The following spot improvements were identified from an analysis of crash and geometric data as well as results from the public outreach surveys and address safety issues at specific locations. Spot improvements to consider for advancement when funding becomes available include:

- Construct turn lanes at the US 25 (Old Richmond Road) intersections with KY 1975 (Jacks Creek Pike) and Delong Road
- Realign Delong Road between Delong Lane and US 25 (Old Richmond Road)
- Realign Delong Road between Walnut Hill and Colliver Lane

### 10.1.2 Concepts for Future Consideration after the East Nicholasville Bypass is Completed

Based on results from the 2045 Existing plus Committed LAMPO TDM, the completion of the East Nicholasville Bypass will significantly increase traffic on many of the rural two-lane roadways in the focus area. Improvements to these routes and better connections to I-75 will be imperative to handle this increased traffic. The following concepts should be reevaluated and further considered after the East Nicholasville Bypass is completed.

**Concept #1 – Improvements to KY 169 (Union Mill Road) and KY 1975 (Jacks Creek Pike)**

This project includes upgrading KY 169 (Union Mill Road) and KY 1975 (Jacks Creek Pike) to a 45-mph design speed by widening lanes/shoulders and improving geometrics. In addition to upgrading the existing routes, it includes construction of a new connector between KY 169 and KY 1975 through Crawley Lane north of the existing KY 169 intersection with KY 1974 (Tates Creek Road). The new alignment could be implemented with partial control of access, improving safety, and ensuring mobility by limiting the number of driveways with direct access.

This concept could be implemented in phases, split into segments of independent utility. For example, should Concept #3 move forward, it may be desirable to consider improvements along KY 169 only between the East Nicholasville Bypass and East Hickman Road. Additionally, if through further public and stakeholder outreach it is determined corridor-wide improvements are not desirable, there should be some consideration to address spot improvements along the corridor (namely the sharp horizontal curves west of East Hickman Road) to address safety concerns.

**Concept #2 – New I-75 Interchange at US 25 (Old Richmond Road)**

A new I-75 interchange at US 25 would improve mobility and allow easier access to I-75 for those who live and work within the study area. The combination of a new interchange and improvements to KY 169 and KY 1975 would provide better access to I-75 for drivers on US 27 and the East Nicholasville Bypass.

### 10.1.3 Concepts for Consideration as Part of Future Development

**Concept #4B – Tates Creek Road/Delong Road Connector**

At this time, the project team is not considering the need for a new, more direct connection between Tates Creek Road and US 25 as was depicted under Concept #4 – Brannon Road extension. However, anticipated growth within nearby portions of the USB in southeastern Fayette County warrant consideration of potential future enhancements.

As the area within the USB near Armstrong Mill Road and Delong Road develops, these rural routes will experience an increase in traffic. With narrow lanes/shoulders and several horizontal curves with advisory speeds below 30 mph, this increased traffic may worsen already-existing safety concerns along the corridors. To provide a safer east/west connection, a new connection could be implemented from the east end of Brannon Road at Tates Creek Road to Delong Road near Armstrong Mill Road, as shown in **Figure 44**. This concept could be implemented completely within the USB and should only be considered for advancement as development within the USB warrants it. All efforts should be made to implement any such improvements in concert with future development plans and to minimize impacts to farmland.



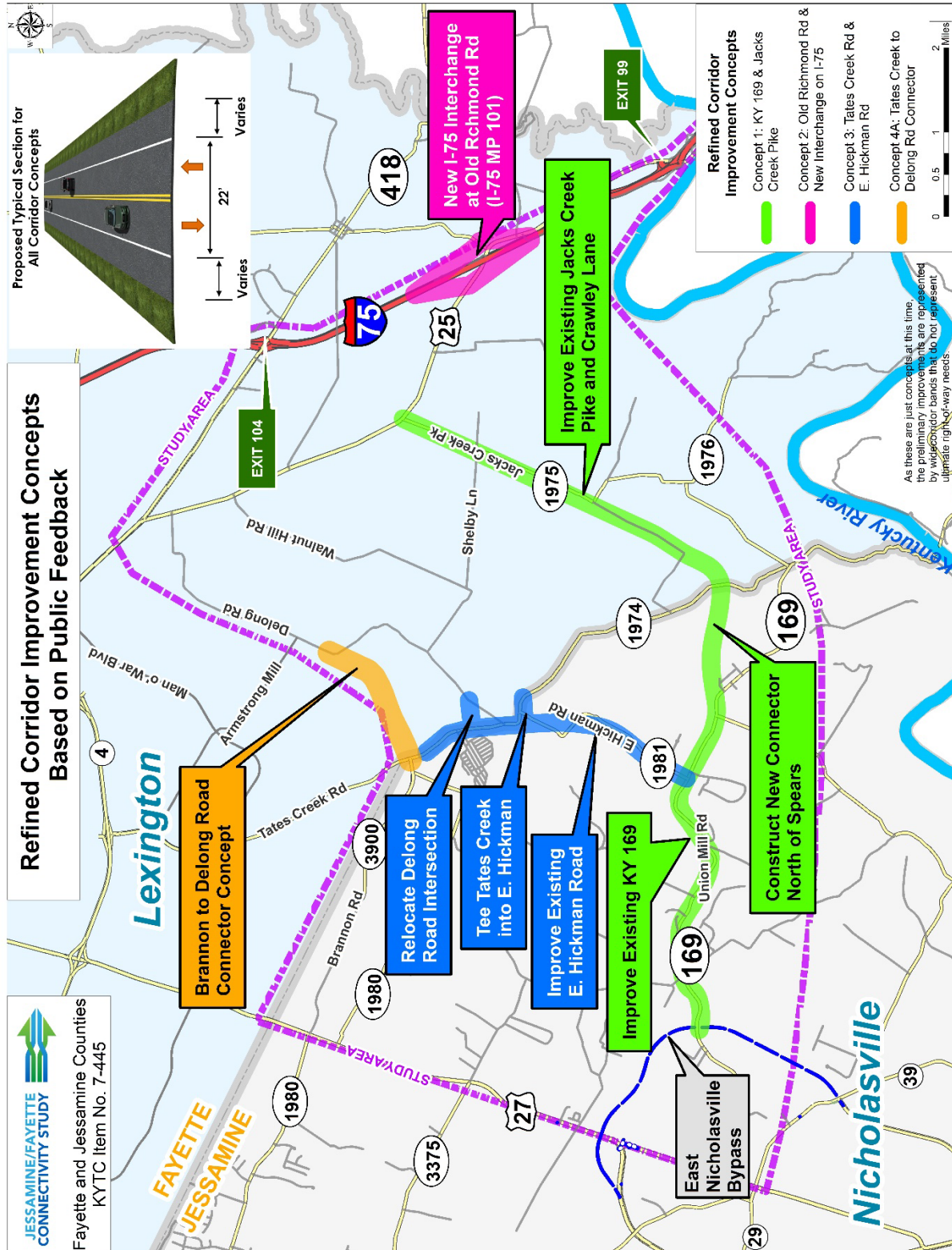


Figure 44: Refined Corridor Improvement Concepts Based on Public Feedback

## 10.2 Next Steps

As the Jessamine/Fayette Connectivity Study did not result in specific recommendations for implementing transportation improvements, there are currently no planned “next steps”. However, should a concept(s) be considered for advancement, the next step would be to include it in the Lexington Area MPO’s Metropolitan Transportation Plan (MTP), further evaluate / refine the concept, and continue public and stakeholder engagement. In particular, Concept #3 and the spot improvements could be further explored in the nearer term as they received generally favorable feedback from the public and would improve safety along two corridors that are anticipated to experience significant growth in traffic demand.

More detailed environmental studies will be required should any conceptual improvements be advanced. If a future project is federally funded, the NEPA requires that potential environmental impacts regarding jurisdictional wetlands and streams, archaeological sites, cultural historic sites, and Federally endangered species must be avoided if possible. If not, then impact minimization/mitigation efforts are required.

## Contacts/Additional Information

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