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## Executive Summary

The Kentucky Transportation Cabinet (KYTC) initiated the *US 150 Corridor Study* in Boyle and Lincoln Counties to identify concepts to improve safety, congestion, and mobility on US 150 and the South Danville Bypass (US 127B and US 150B) from Fireside Drive in Danville to US 27 in Stanford. The study area is shown in **Figure ES-1**.

### Existing Conditions

US 150 is an east-west Principal arterial through central Kentucky, and a regionally important route. Within the Bluegrass Region, US 150 connects communities between the Bluegrass Parkway in Nelson County and I-75 in Rockcastle County. Because of this connectivity, US 150 serves dual roles: it provides access to local businesses / homes and serves as an artery for regional through traffic. The study portion of US 150 and the South Danville Bypass is 10.8 miles and stretches between Danville and Stanford. The study area was divided into three sections based on their distinct land use and roadway characteristics:



**US 150 Near Milepoint 1.0 in Lincoln County**

- **Danville Section (Purple on Study Area Map):** 3.3 miles along the South Danville Bypass from Fireside Drive to US 150 in Danville
- **Rural Section (Blue and Orange on Study Area Map):** 6.2 miles along US 150 from the South Danville Bypass in Boyle County to Frontier Boulevard in Lincoln County
- **Stanford Section (Green on Study Area Map):** 1.3 miles along US 150 from Frontier Boulevard to US 27 in Stanford

Current daily traffic volumes range from 11,100 vehicles per day to just over 23,000 vehicles per day on the South Danville Bypass near the west end of the Danville Section. The study corridor has four travel lanes (two in each direction) and a depressed median, which can sufficiently accommodate existing and future traffic volumes. However, some of the side streets at intersections (such as Skywatch Drive, US 127, KY 300, and US 27) experience control delay due to peak hour congestion.

Crash data were collected for the five-year period from 2017 through 2021. A total of 501 crashes were reported over the nearly 11-mile section during this time. Many of these crashes can be attributed to the abundance of driveways, intersections, and median openings. Of the 501 reported crashes on the study corridor, 306 (61 percent) were at an intersection, four of which resulted in a fatality (1 percent) and 94 resulted in one or more injuries (31 percent). Based on a comprehensive safety analysis, US 150 and the South Danville Bypass have a Level of Service of Safety (LOSS) of 3, which indicates a moderate-to-high potential for crash reduction.



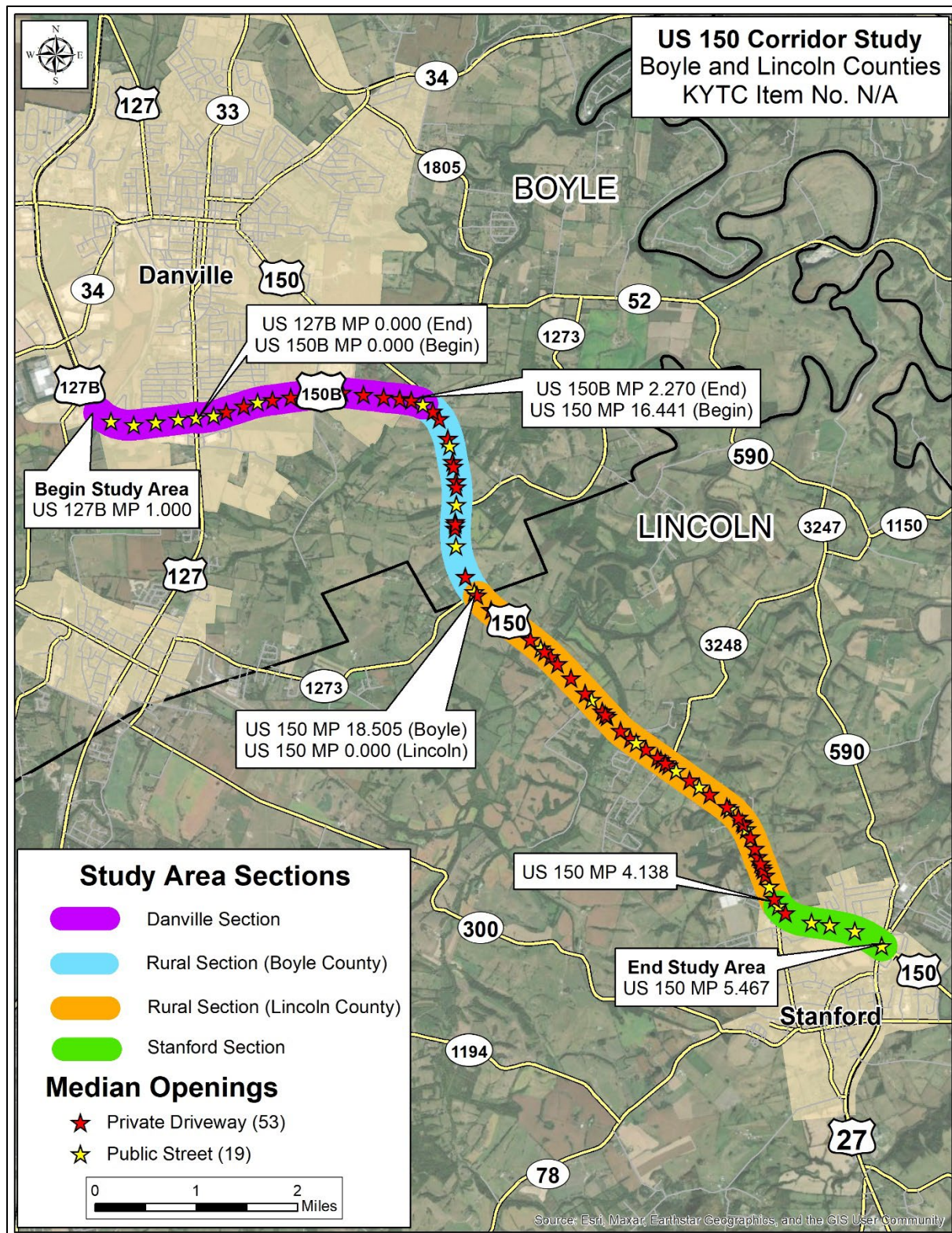


Figure ES-1: Study Area



As shown in **Figure ES-1**, there are currently 72 full access intersections along the study corridor, many of which serve private driveways. Each median opening creates a potential conflict point (i.e., location where vehicle paths cross) between through traffic and turning traffic. The Danville and Stanford Sections were found to have an average spacing of 1,000 feet between full access intersections. The Rural Section has an average of 600 feet between full access intersections, with the closest intersections only 32 feet apart. In both cases, the current spacing is far less than the 2,400 feet recommended by KYTC for a major arterial.<sup>1</sup> Proactively managing access points, especially on arterials meant for higher mobility, promotes safe and efficient travel through the transportation network.

### Local Official / Stakeholder Outreach

Over the course of the study, the project team met twice with local officials and stakeholders to provide information and to solicit input on transportation concerns in the study area and the proposed improvement concepts. Overall, feedback from the local officials and stakeholders indicated that safety is more of a concern than congestion. Intersection improvements were the highest priority in the Danville Section, consolidating median openings were the highest priority in the Rural Section, and reducing speeding was the highest priority in the Stanford Section.

### Improvement Concepts

Improvement concepts were developed to improve safety and congestion by reconfiguring intersections along the study corridor. Improvement concepts include the addition of positive offset left turn lanes at intersections, eliminating left-turns from side streets at unsignalized intersections, extending merge lanes at US 127 and US 27, and extending frontage roads to provide secondary access to adjoining properties. This will reduce the number of potential conflict points, a proven countermeasure to reduce crash frequency. More importantly, these concepts have been proven to significantly reduce serious opposing left-turn and angle crashes, especially from the side streets. Recently constructed Restricted Crossing U-Turn (RCUT) intersections across Kentucky have reduced severe crashes by 50 percent or more. These improvements also help traffic flow more freely and reduce congestion.

The following figures provides a summary of the improvement concepts within each Section:

- **Danville Section (Figure ES-2)**
- **Rural Section (Figure ES-3)**
- **Stanford Section (Figure ES-4)**

#### Top 5 Concerns Identified by Local Officials / Stakeholders

1. **Speeding**
2. **Vehicles Slowing to Turn**
3. **Difficulty Turning onto US 150**
4. **Safety**
5. **Too Many Driveways / Median Cuts**

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<sup>1</sup> <https://transportation.ky.gov/Congestion-Toolbox/Documents/Access%20Management%20Implementation%20Report%202008.pdf>



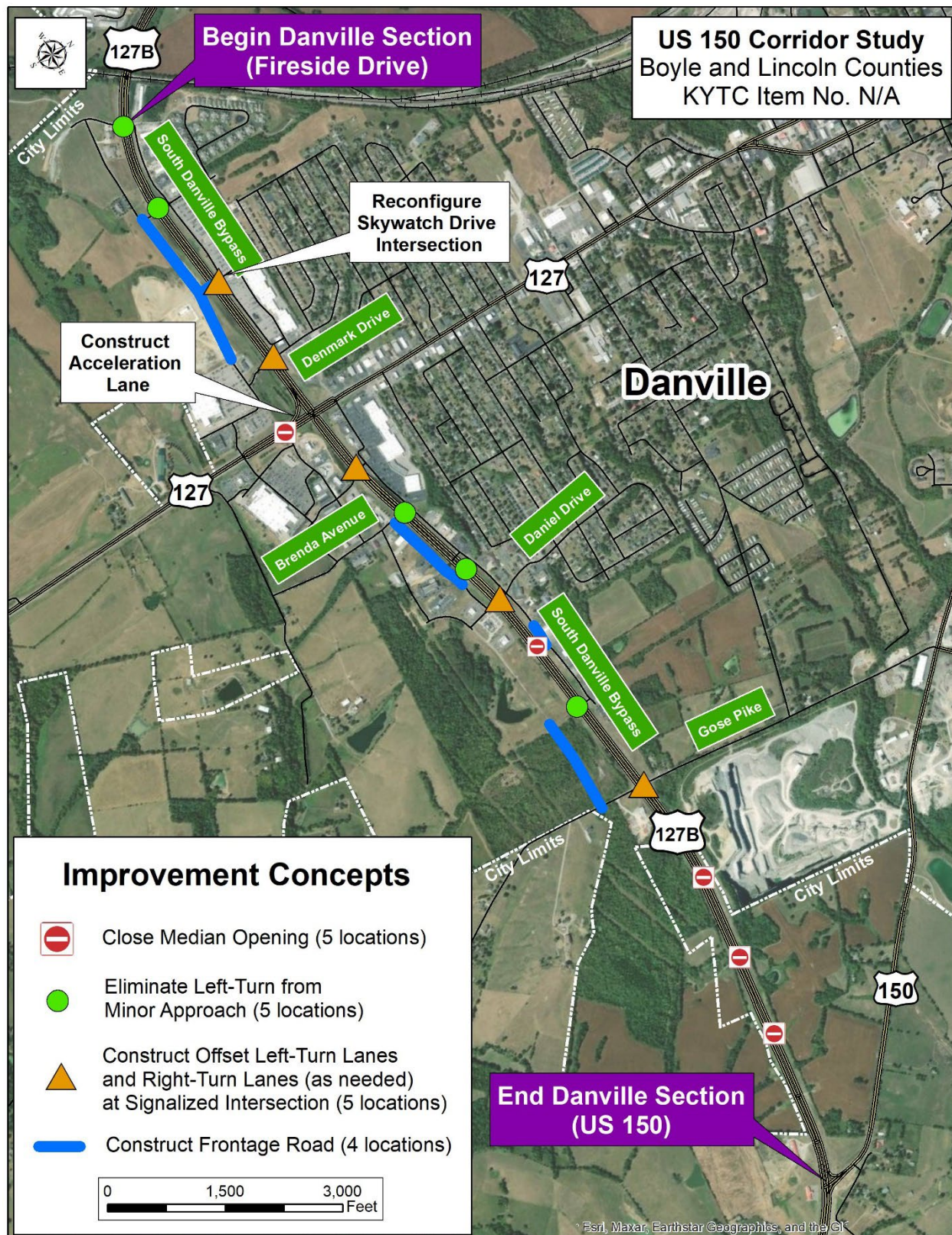


Figure ES-2: Improvement Concepts – Danville Section



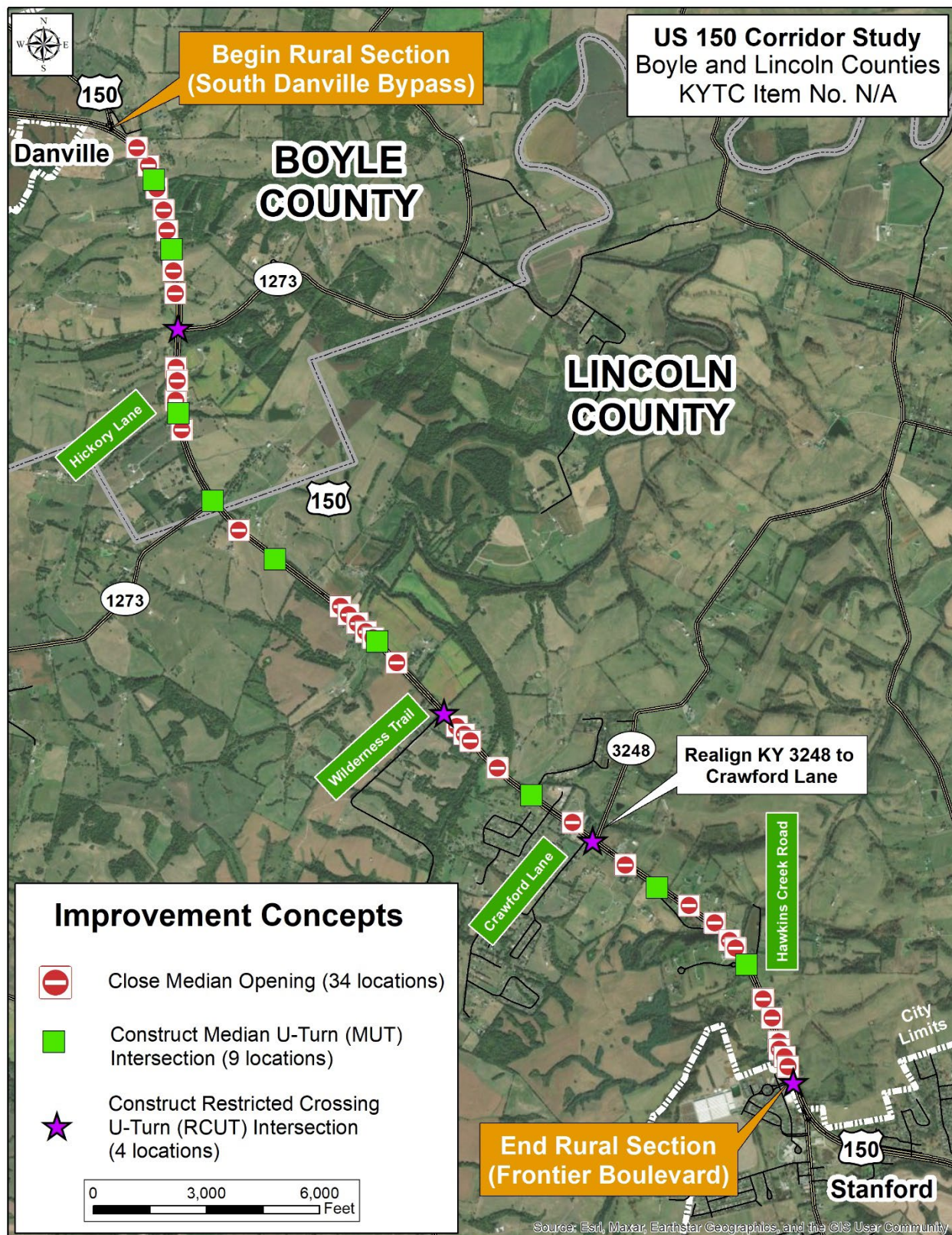


Figure ES-3: Improvement Concepts – Rural Section



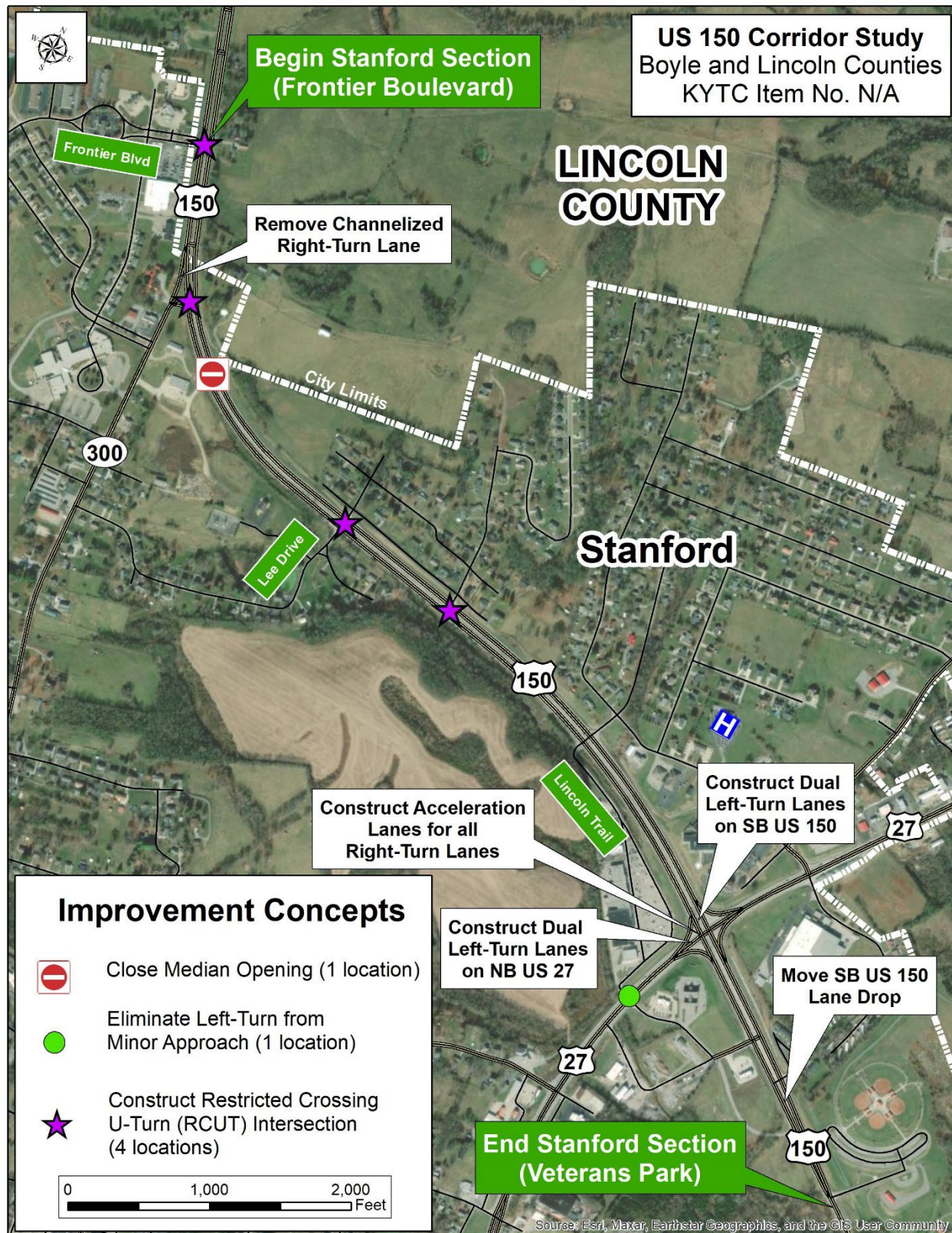


Figure ES-4: Improvement Concepts – Stanford Section

**Table ES-1** presents an evaluation matrix showing the total 2023 cost for the improvement concepts within each Section (design, right-of-way, utility, and construction), the return-on-investment (ROI), the priority rankings based on input from the Local Officials / Stakeholders, and whether or not the improvements address the project goals. The ROI compared the estimated costs to the expected safety benefits for the improvements. An ROI above one indicates the project is cost-effective.

**Table ES-1: Evaluation Matrix**

Project Goals	Danville Section	Rural Section		Stanford Section
		Boyle County	Lincoln County	
Project Length	3.3 miles	2.1 miles	4.1 miles	1.3 miles
Design Cost	\$1.9 million	\$500,000	\$600,000	\$900,000
Right-of-Way Cost	\$1.6 million	\$200,000	\$700,000	\$300,000
Utility Cost	\$600,000	\$100,000	\$1 million	\$300,000
Construction Cost	\$12.8 million	\$3.1 million	\$4.3 million	\$5.7 million
Total Cost Estimate (2023 Dollars)	\$16.9 million	\$10.5 million		\$7.2 million
Return-On-Investment (ROI)	1.7	1.4		3.5
Local Officials Priority Ranking	2	3		1
Improves Safety	✓	✓		✓
Reduces Existing Congestion	✓	✓		✓
Accommodates Future Traffic	✓	✓		✓
Reduces Right-of-Way Impacts	✓	✓		✓
Reduces Utility Impacts	✓	✓		✓

## Next Steps

The recommended improvement concepts in all three Sections satisfy the project goals of improving safety, congestion, and mobility on US 150 and the South Danville Bypass and were deemed cost-effective based on results from the ROI analysis.

The next step following this study for any potential improvements would be Phase 1 Design (Preliminary Engineering and Environmental Analysis). Depending on funding availability, the improvement concepts within each Section could be implemented separately, over time.



## **Executive Summary**

### **US 150 Corridor Study**

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In the Rural and Stanford Sections, there are three design projects listed in the recently passed *2024-2026 Biennial Highway Plan*:

- KYTC Item No. 8-80300.00 has \$1.368 million in design funds listed in FY 2026 for improving safety and access control along US 150 from Danville to Stanford.
- KYTC Item No. 8-80001.00 has \$150,000 in design funds listed in FY 2024 for installing a turn lane on US 150 near Crawford Lane in Lincoln County.
- KYTC Item No. 8-80111.00 has \$100,000 in design funds listed in FY 2024 for installing a turn lane on US 150 at the Dollar General on Withers Court in Stanford.

The recommended improvements in the Rural and Stanford Sections address safety and congestion issues at all three project locations listed above. As such, it is recommended they be combined into one design project and completed as KYTC Item No. 8-80300.00 to provide consistency throughout the corridor.

In the Danville Section, the City of Danville is currently pursuing a Safe Streets and Roads for All (SS4A) Federal grant to help implement the improvement concepts identified as part of this study. If successful, they would work with KYTC during design.

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## 1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated the *US 150 Corridor Study* in Boyle and Lincoln Counties to improve safety, congestion, and mobility on the South Danville Bypass and US 150 from Fireside Drive in Danville to US 27 in Stanford. Boyle County is located in the southern portion of KYTC District 7 and Lincoln County is in the northern portion of KYTC District 8, as shown in **Figure 1**.

This study is funded with Federal Statewide Planning and Research (SPR) Chapter 7 funds.

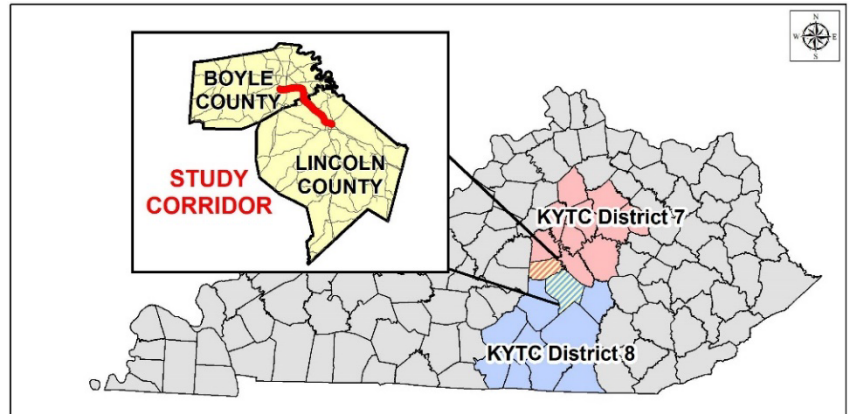


Figure 1: KYTC Districts 7 and 8

### 1.1 STUDY AREA

US 150 is a major east-west principal arterial through central Kentucky, and a regionally important route. Within the Bluegrass Region, US 150 connects communities between the Bluegrass Parkway in Nelson County and I-75 in Rockcastle County. Because of this connectivity, US 150 serves dual roles: it provides access to local businesses, homes, and serves regional through traffic. The US 150 study corridor, shown in **Figure 2**, includes US 150 and the South Danville Bypass from Fireside Drive in Danville to US 27 in Stanford. The study corridor was divided into three sections based on the distinct land use and roadway characteristics:

- Through the **Danville Section**, shown in purple, the South Danville Bypass serves commercial shopping centers with trip attractors such as Kroger, Starbucks, Lowe's, and Walmart. This section of the study corridor is in Boyle County (KYTC District 7) and is considered urban, with a higher percentage of local trips.
- The **Rural Section**, shown in orange, stretches between Boyle County and Lincoln County (KYTC District 8) and transitions from the South Danville Bypass to US 150. This section is considered rural and serves mostly residential and farm areas between Danville and Stanford.
- The **Stanford Section**, shown in green, transitions back to an urban corridor as US 150 approaches the more densely populated areas near Stanford. Local traffic increases on this section as US 150 serves residential and commercial areas, along with Stanford Elementary School.

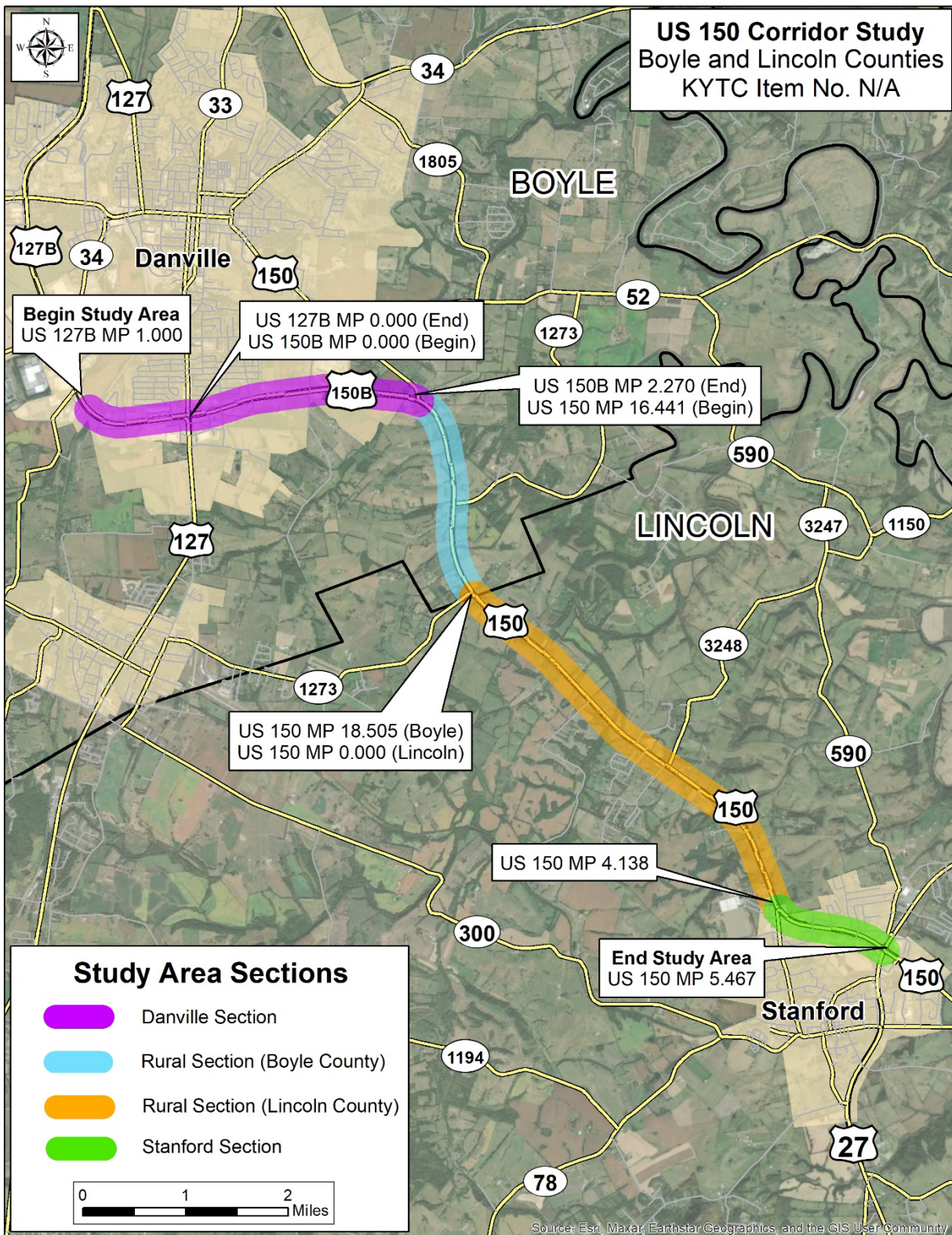


Figure 2: Study Area Sections



## 1.2 PLANNED AND COMMITTED PROJECTS

There are three US 150 projects listed in the recently passed *2024-2026 Biennial Highway Plan*:

- KYTC Item No. 8-80300.00 includes safety and access control along US 150 from Danville to Stanford (D = \$1,368,000).
- KYTC Item No. 8-80001.00 includes installing a turn lane on US 150 near Hubble Road and Crawford Lane (D = \$100,000; U = \$50,000; C = \$350,000).
- KYTC Item No. 8-80111.00 includes installing a turn lane on US 150 at Dollar General (D = \$150,000; R = \$360,000; U = \$300,000; C = \$1,200,000).

There is one Highway Safety Improvement Program (HSIP) project in the vicinity:

- KYTC Item No. 7-0965.00 includes constructing a median U-turn (MUT) intersection at South Danville Bypass and US 150. This project was constructed in late 2023, as shown in **Figure 3**. While Restricted Crossing U-Turn (RCUT) intersections allows left turns from the mainline, MUTs do not.



Figure 3: Median U-Turn (MUT) intersection at South Danville Bypass and US 150

## 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 KYTC's Highway Information System (HIS) database, KYTC's Traffic Count Reporting System, aerial photography, and field inspection.

### 2.1 FUNCTIONAL CLASSIFICATION

Functional classification is the process of grouping streets and highways according to the character of travel service they provide. The functional classification of the study corridor and adjacent routes are shown in **Figure 4**. US 150 and the South Danville Bypass are classified as principal arterials through the study area.

US 27 and US 127 are the only other identified principal arterials, just outside the boundary of the study corridor. The remaining state-maintained roads that intersect US 150 in the study area are classified as collectors.

### 2.2 ROADWAY GEOMETRY

The South Danville Bypass and US 150 are four-lane divided highways with 12-foot lanes, as shown in **Figure 5**.

Shoulder widths vary on the study corridor from 10-foot paved shoulders in the Danville and Stanford Sections to eight-foot combination shoulders in the Rural Section, as shown in **Figure 6**. Additionally, US 150 and the South Danville Bypass have a depressed, non-traversable 30 to 36-foot median separating the directions of travel for the entire study corridor.



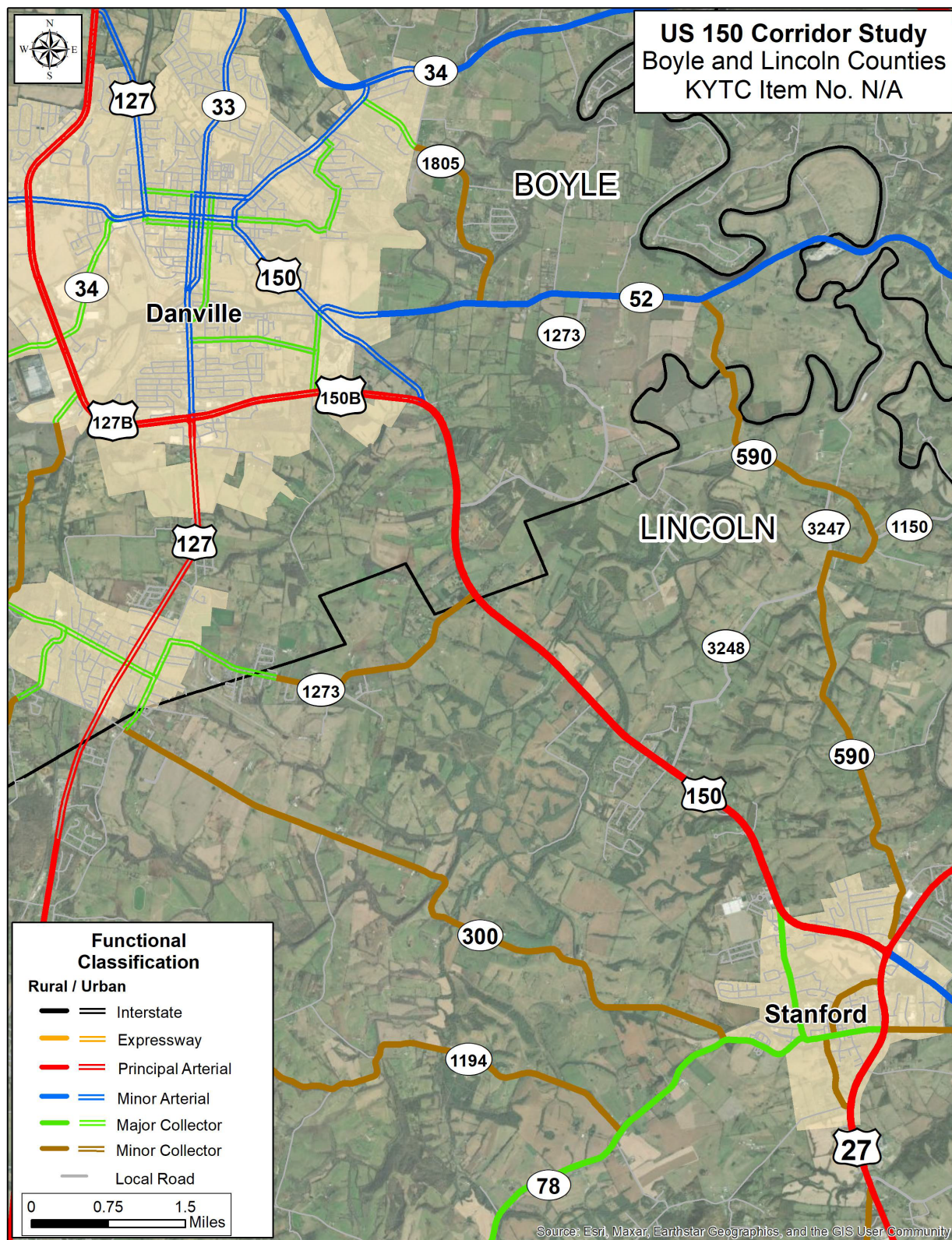


Figure 4: Functional Classification



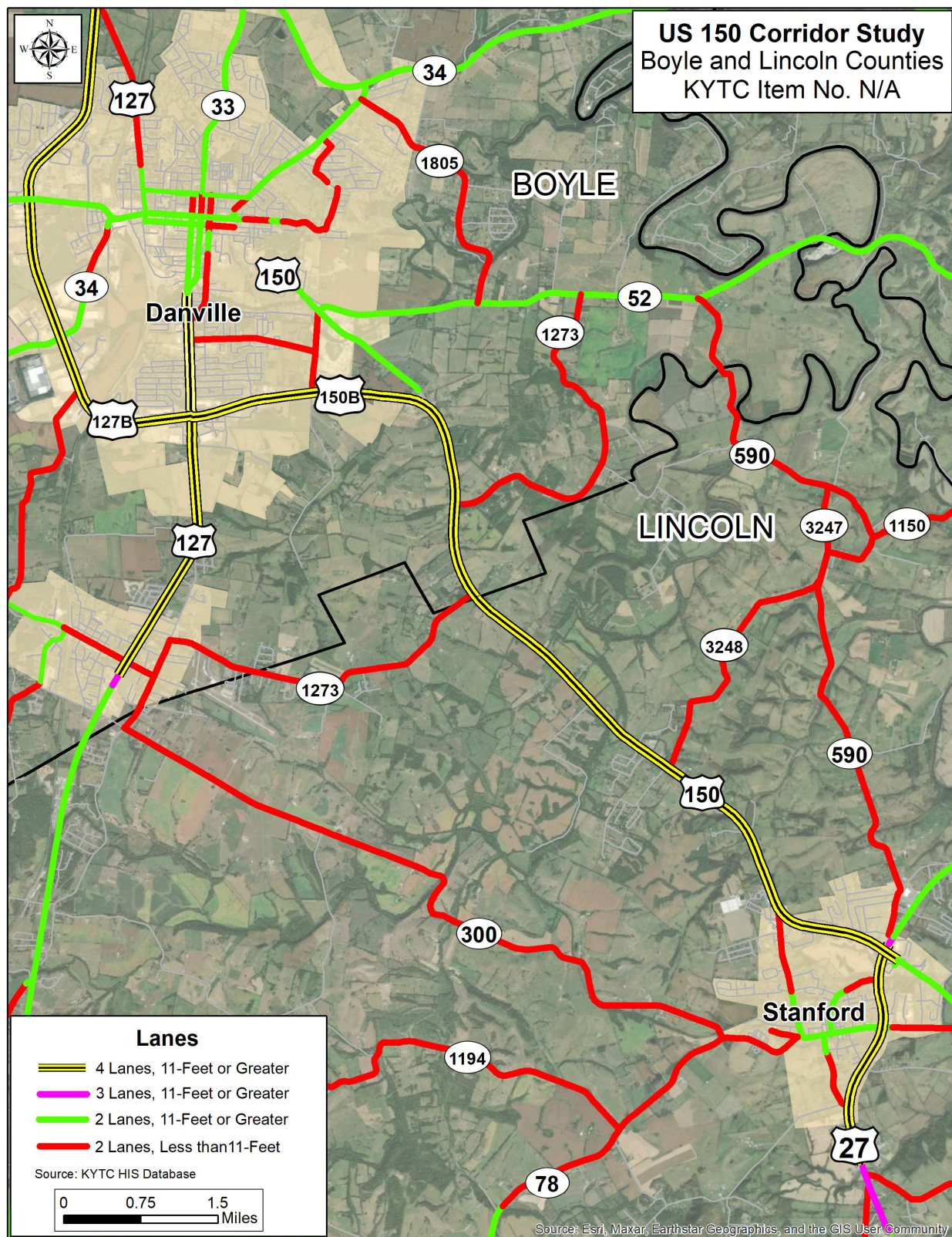


Figure 5: Lane Widths



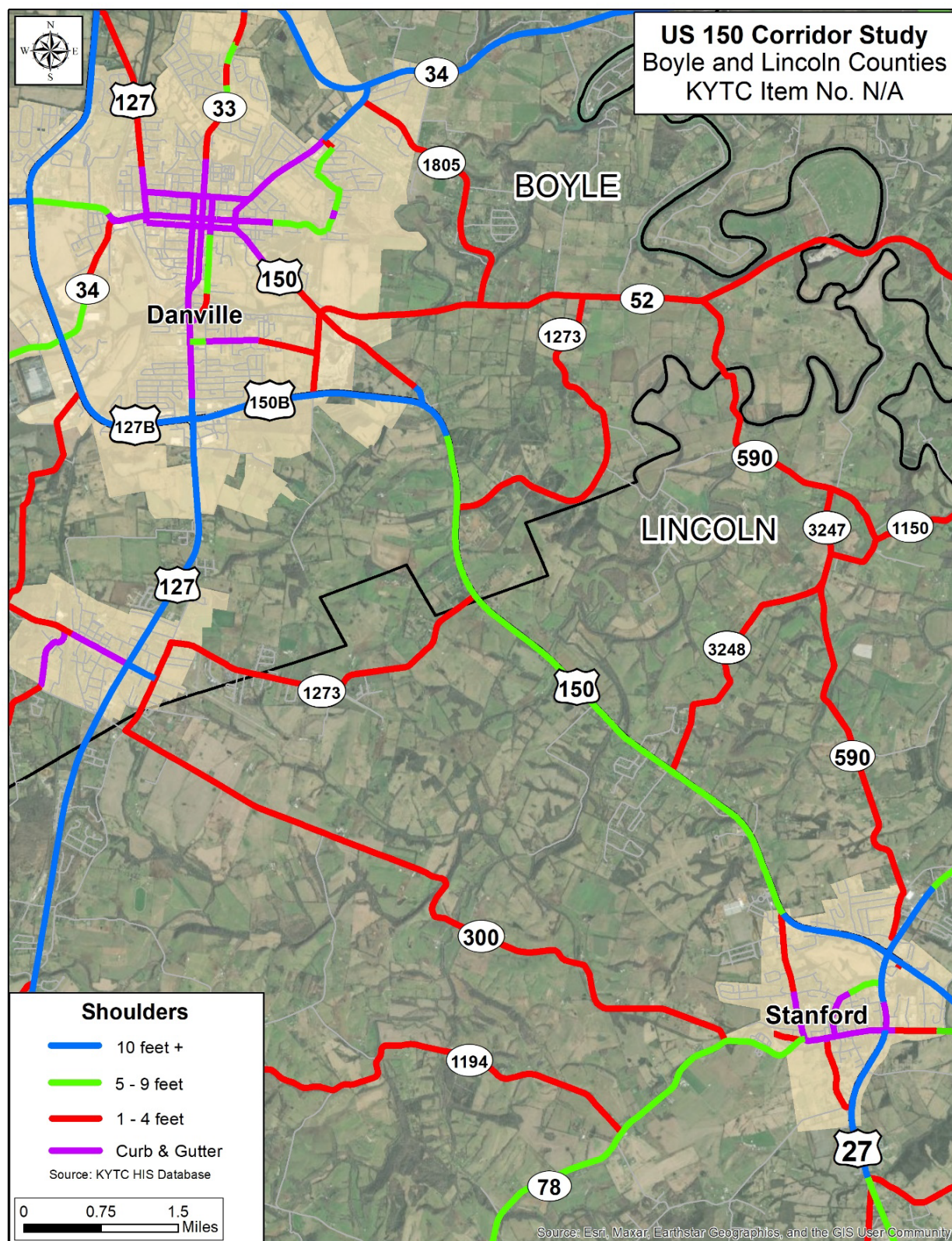


Figure 6: Shoulder Widths

## **2.2.1 Intersection Spacing**

There are currently 72 full access intersections on the study corridor, 53 of which are for private driveways and 19 of which are for public streets. Full access intersections allow all turning movements to take place from both the mainline highway and the adjacent connection. Access management guidance from KYTC recommends a minimum of 2,400 feet between full access intersections on principal arterials and 1,200 feet between openings with partial access control<sup>1</sup>. The Danville and Stanford Sections were found to have an average spacing of 1,000 feet between full access intersections. The Rural Section has an average of 600 feet between median openings, shown in



**Figure 7: US 150 Median Openings (Rural Section)**

**Figure 7**, with the closest median openings 32 feet apart. In both cases, the current spacing is far less than the 2,400 feet recommended along a major arterial.

Of the 53 private entrances, five (nine percent) have left-turn lanes while 16 of the 19 (84 percent) public entrances have left-turn lanes. An analysis was performed using origin-destination data from Streetlight to determine the number of daily lefts turns at the median openings in the Rural Section between the South Danville Bypass intersection and Stanford. Of the 54 median openings in the Rural Section, only three had more than five left turns per day, including KY 1273, Grist Mill Road, and KY 3248, all of which have existing left-turn lanes.

## **2.3 SPEED LIMIT**

Posted speed limits along the study corridor and adjacent roads are shown in **Figure 8**. The study corridor maintains a 55 mile per hour (mph) speed limit except for the portion of the South Danville Bypass between Skywatcher Drive and Southtown Connector Drive, where the speed limit is reduced to 45 mph through the commercial section.

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<sup>1</sup> <https://transportation.ky.gov/Congestion-Toolbox/Documents/Access%20Management%20Implementation%20Report%202008.pdf>



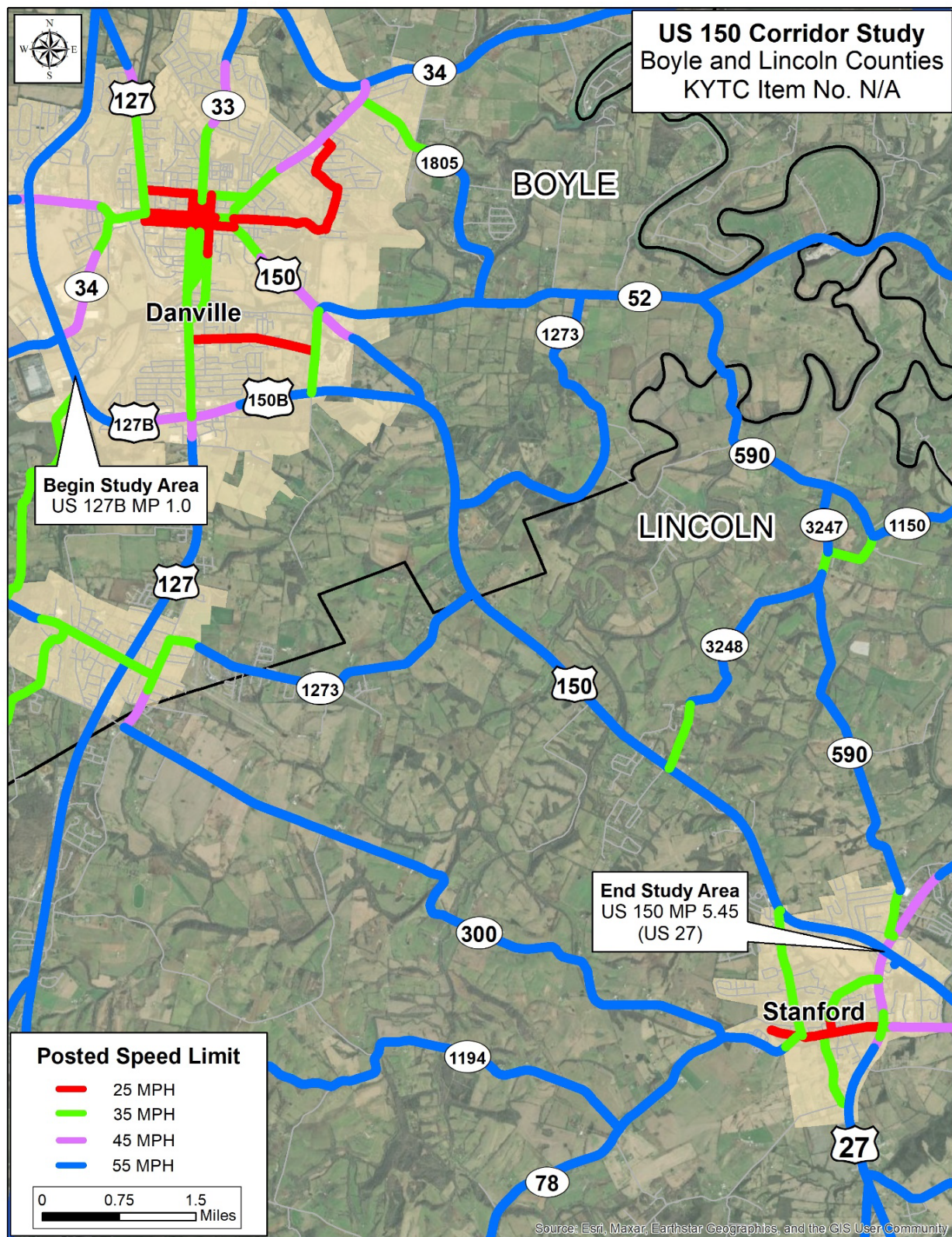


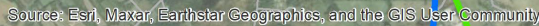
Figure 8: Speed Limits

## 2.4 EXISTING TRAFFIC ANALYSIS

Existing traffic volumes were analyzed for the study corridor. The most current annual average daily traffic (AADT) volumes from KYTC's traffic count stations are shown on **Figure 9**. Daily traffic is heaviest on the South Danville Bypass west of US 127, at 23,100 vehicles per day (VPD). East of US 127, daily traffic drops to 13,600 VPD on the South Danville Bypass. US 150 carries up to 12,700 VPD in the Rural Section and 13,500 VPD in the Stanford Section. Based on a Highway Capacity Software (HCS) analysis, the four through lanes (two lanes in each direction) on US 150 and the South Danville Bypass currently operate under capacity.

Existing peak hour turning movement counts were collected in September 2022 at the 24 busiest intersections along the study corridor. These counts were used to analyze existing peak hour traffic using HCS. Level of service (LOS), a qualitative measure describing operational conditions, was used to evaluate the adequacy of the existing roadway. In rural areas, LOS C or better is desirable and in urban areas, LOS D or better is desirable. Results from the AM and PM peak hour traffic analysis demonstrate that all study area intersections operate at acceptable levels during the peak hours. **Figure 10** presents the existing PM peak hour LOS at the study area intersections where turning movement counts were collected. The US 27 and US 127 intersections are located in urban areas and operate at an acceptable LOS D, while all other intersections operate at LOS C or better.







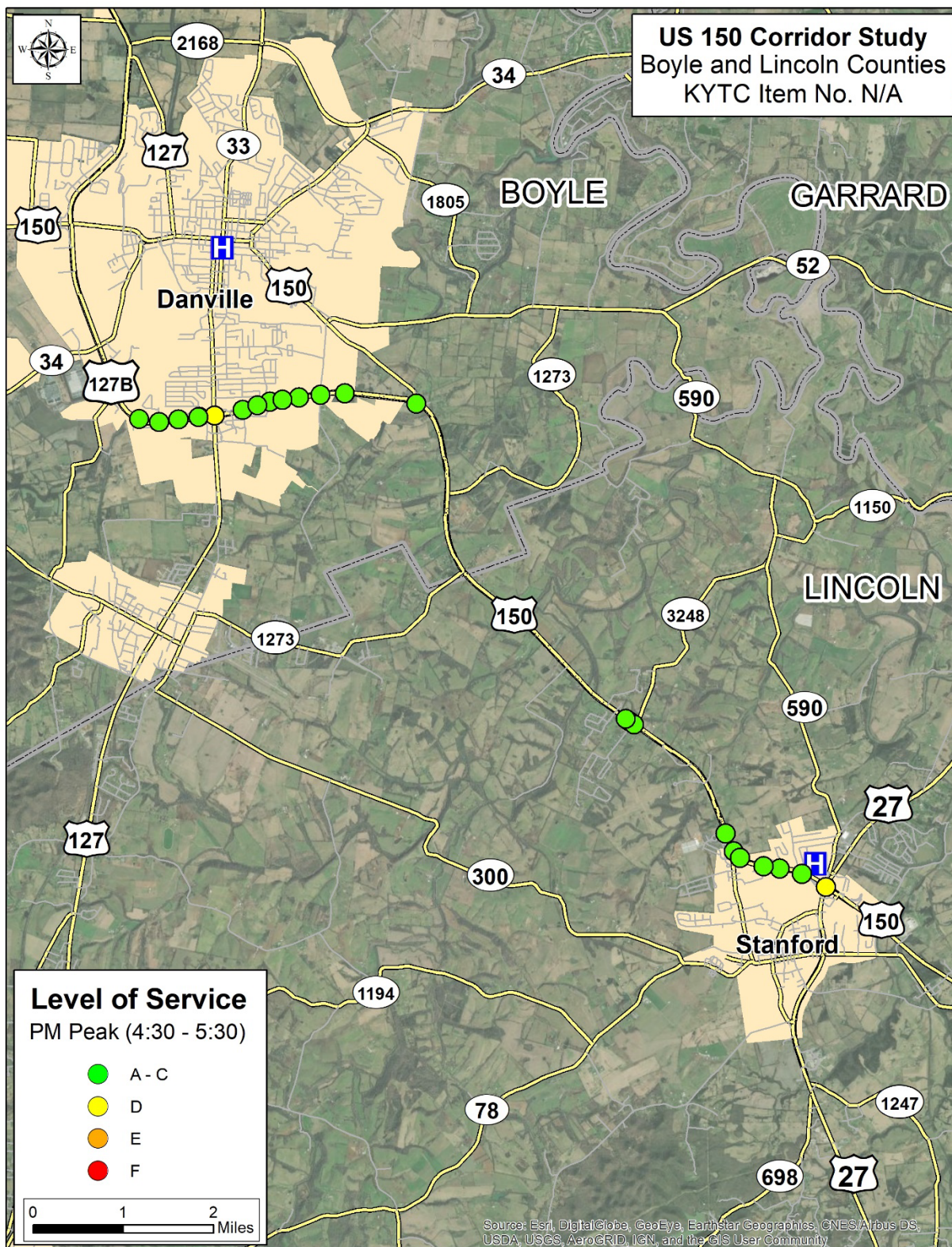


Figure 10: Existing PM Peak Hour Intersection Level of Service (LOS)



## 2.5 CRASH HISTORY

Crash data were collected along existing roadways within the study area for a five-year period between 2017 and 2021. Over the course of five years, there were 501 collisions on US 150 and the South Danville Bypass. The crash records are included in **Appendix A**.

Of the 501 crashes, five resulted in a fatality (one percent), 128 resulted in an injury (26 percent), and 368 resulted in property damage only (73 percent), as shown in **Table 1** and **Figure 11**. Many of these crashes can be attributed to the abundance of driveways, intersections, and median openings. Of the 501 reported crashes on the study corridor, 306 (61 percent) were at an intersection, four of which resulted in a fatality (1 percent) and 94 resulted in one or more injuries (31 percent). The fatal collisions included three intersection collisions in the Danville Section, two of which occurred at Daniel Drive, and one intersection collision in the Stanford Section at KY 300.

The most common crash types, as shown in **Figure 12**, were rear end and angle crashes (35 percent each), most of which occurred in the more congested urban portions of US 150 and the South Danville Bypass near Danville and Stanford. Single vehicle collisions (nine percent) were more common in the Rural Section.

The Kentucky Transportation Center's (KTC's) Crash Data Analysis Tool (CDAT) was used to perform an Excess Expected Crashes (EEC) analysis. EEC is a measure of the 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 should be expected. Results from this analysis showed several segments with a positive EEC, the highest of which included the section west of US 127 in Danville and the rural section in Lincoln County, as shown in **Figure 13**. 13 intersections showed positive EECs.

**Table 1: Crash History (2017 - 2021)**

Crash Type	Fatal	Injury	PDO	Total
All Crashes	5	128	368	501
Intersection Crashes	4	94	208	306
Non-Intersection Crashes	1	34	160	195

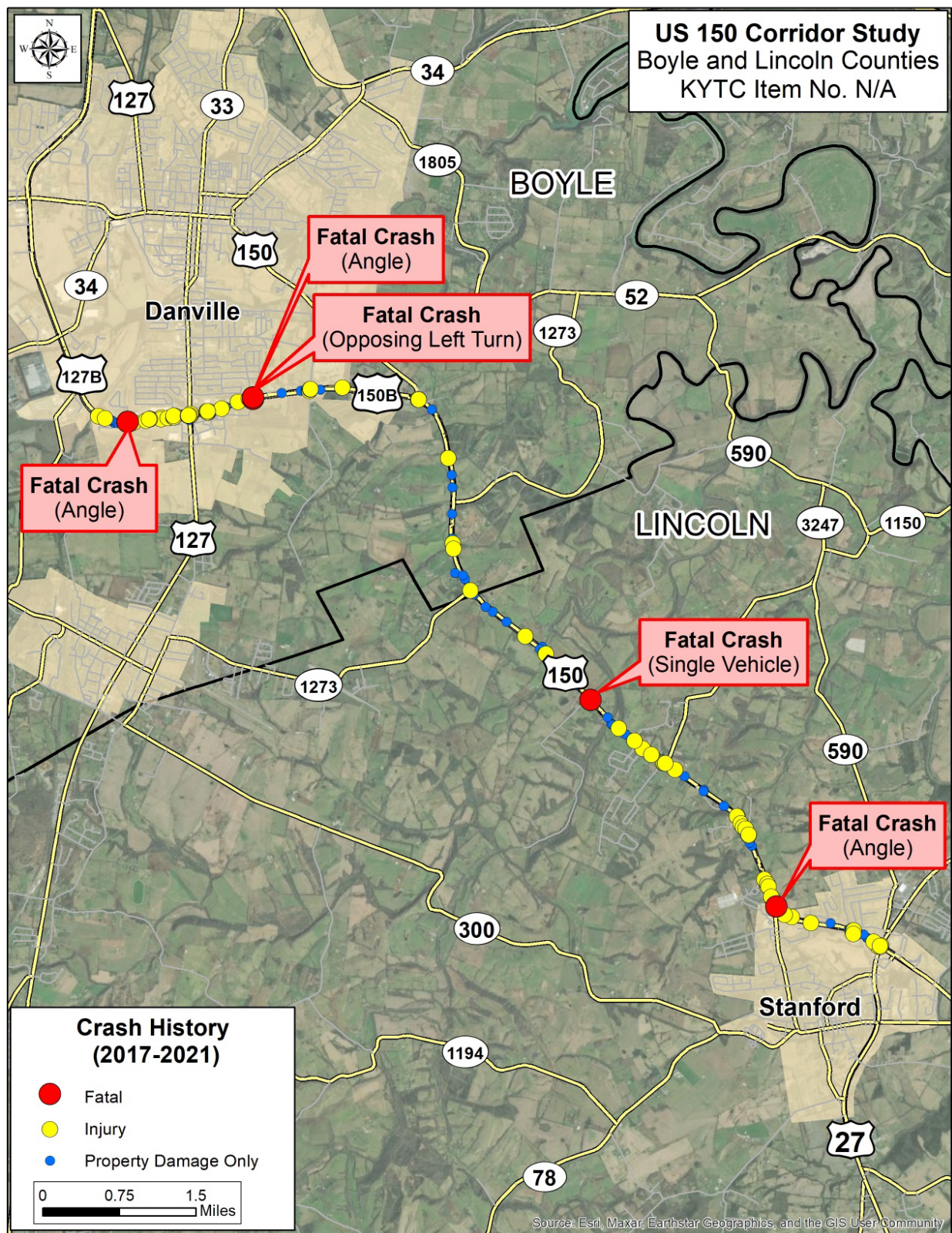


Figure 11: Crash Severity (2017 - 2021)



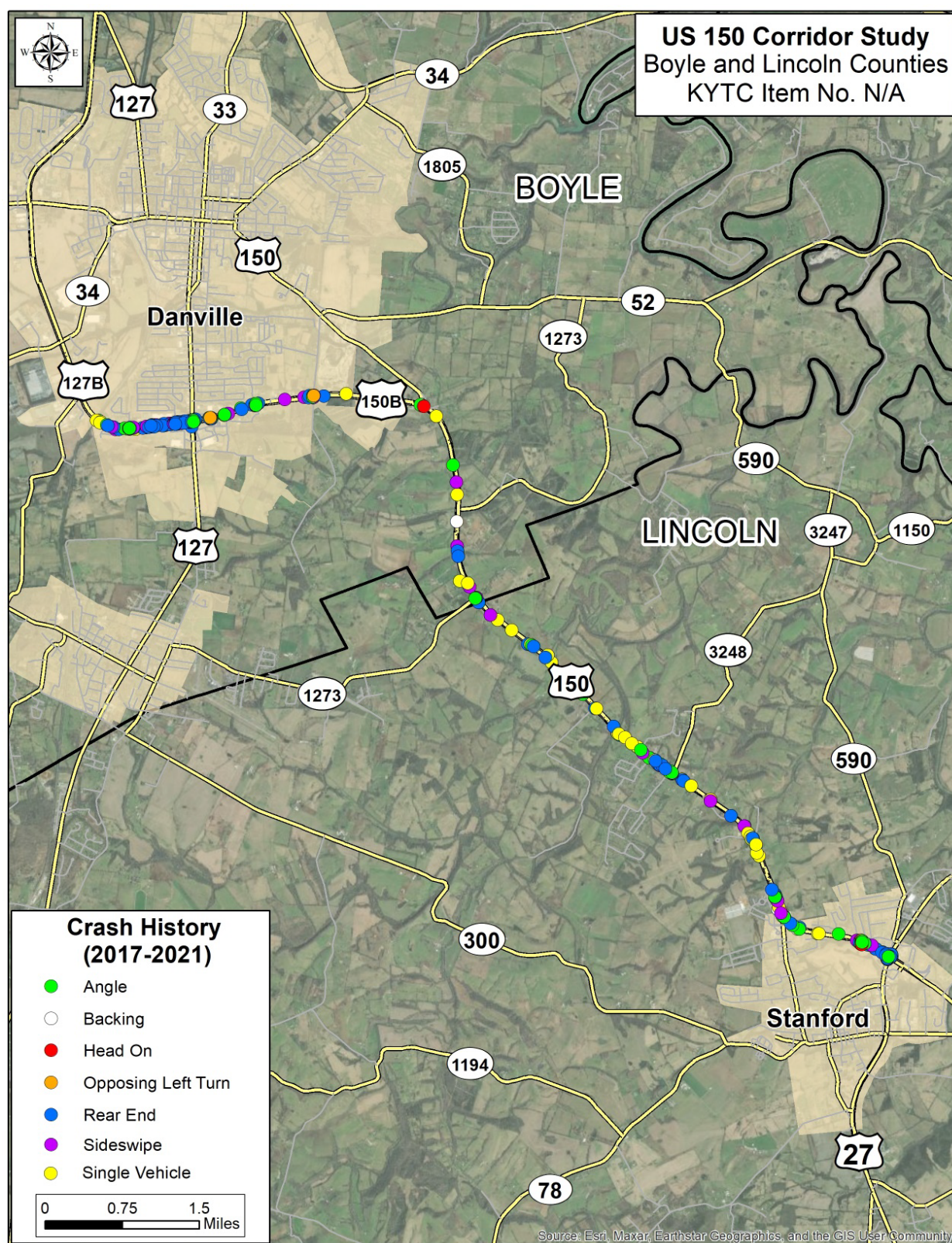


Figure 12: Crash Type (2017 - 2021)



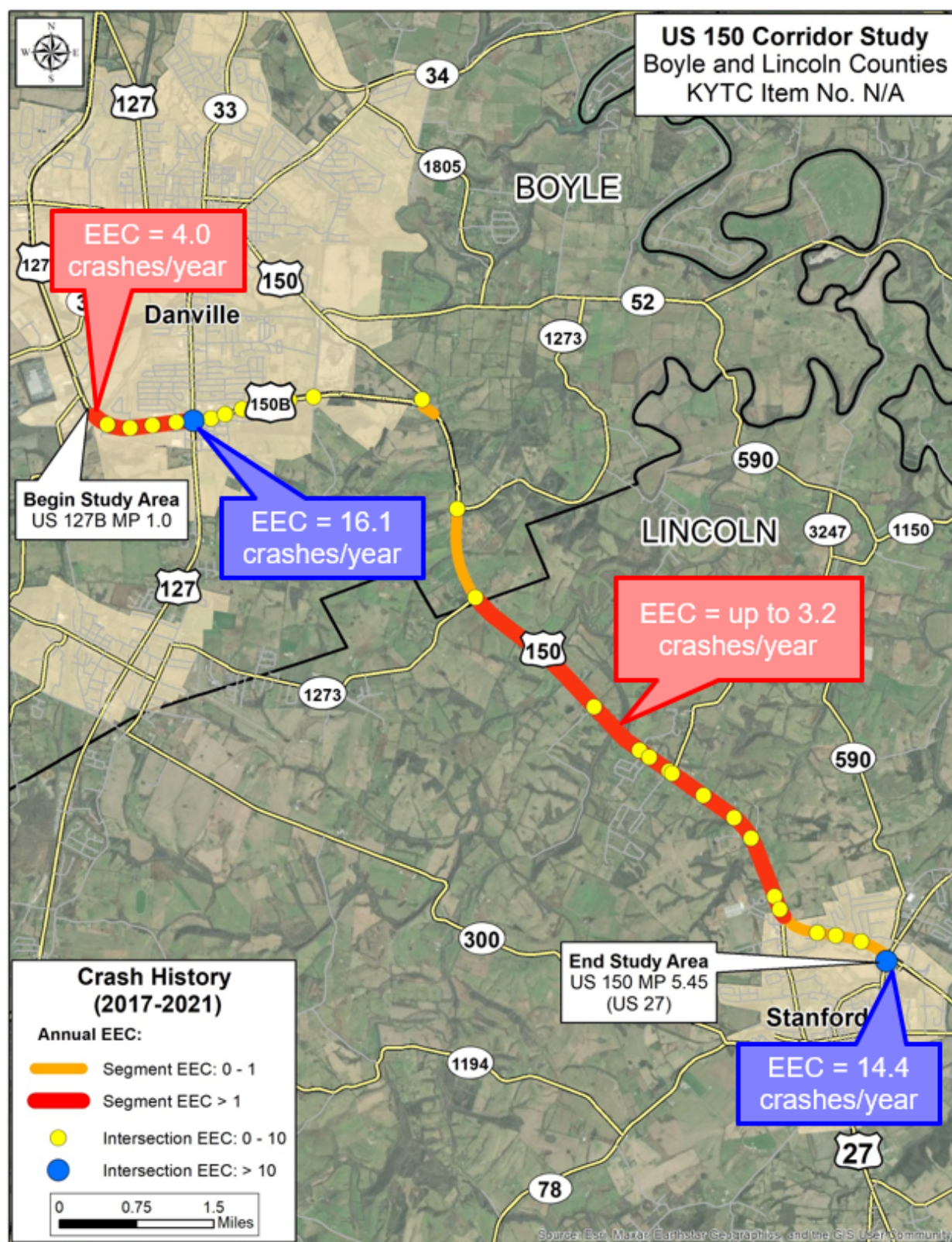


Figure 13: Excess Expected Crashes (EEC)



## 3.0 ENVIRONMENTAL OVERVIEW

An Environmental Overview was completed to identify known natural and human features which occur within the study area. These features should be considered during the development and advancement of improvement concepts along with avoidance or minimization of impacts to the environment. The complete document is included in **Appendix B**.

### 3.1 NATURAL ENVIRONMENT

There are five National Wetland Inventory (NWI) features mapped within the study area. All five are classified as Fresh Water Emergent (PEM) wetlands totaling 5.29 acres. A review of available data revealed 138 state water wells are found within the study area, 130 are listed as monitoring wells and eight are domestic use wells. The study area falls within the Dix River watershed. An overview of the water resources in the study area is shown in **Figure 14**.

Most of the study area is underlain by bedrock and has a low likelihood of karst features and there are no reports of sinkholes or caves within the study area.

According to U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) there are sixteen federally listed endangered species, two federally listed threatened species and one federally listed candidate. All have the potential to occur within the study area.

Approximately 65 percent of the study area is classified as "Prime Farmland" or "Farmlands of Statewide Importance."

### 3.2 HUMAN ENVIRONMENT

An overview of the human environment in and around the study area is shown in **Figure 15** and **Figure 16**.

Based on the review of National Register of Historic Places (NRHP), there are no historic districts in the study area but there are five registered historic places located within the study corridor. The historic places include the McFerran House, Waveland, Gentry House, Spring Hill (Thomas Lillard House), and Withers Horace House.

Community resources and sensitive noise receptors in the study area include several residential neighborhoods and houses, at least four houses of worship, one elementary school (Stanford Elementary School), four childcare centers, and 8 public services. There is one cemetery along the study corridor but there may be additional private, or family cemeteries present on the study corridor that have not been previously mapped or located.





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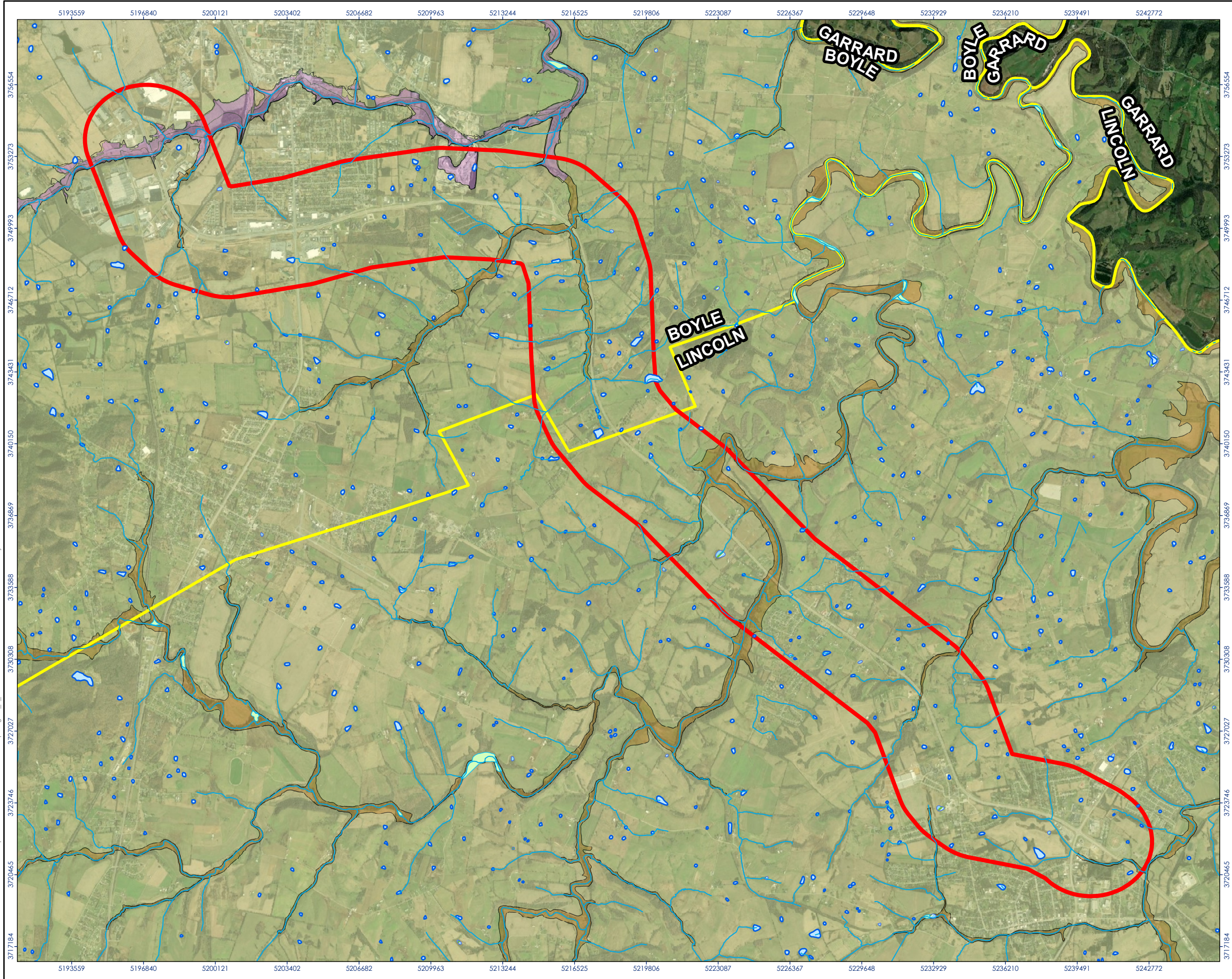


Figure No. **14**

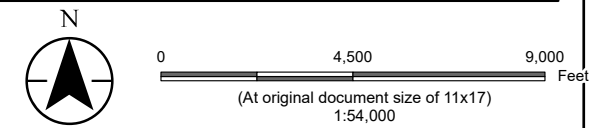
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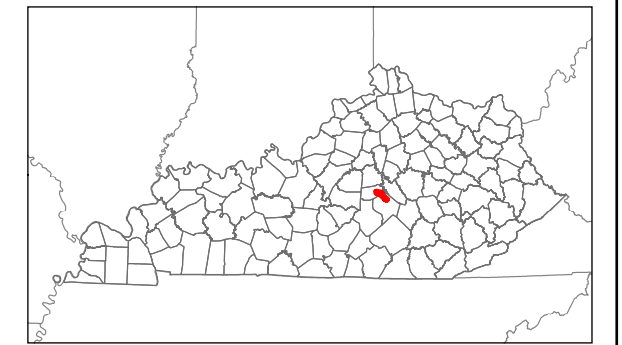
Client/Project Site Overview REVA  
Client: KYTC  
Project: US 150 Study  
Report: Environmental Overview

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Project Location Prepared by CK on 2022-10-28  
T11N, R12E, S05 TR by SPK on 2022-10-29  
T. of Dane, Dane Co., WI IR Review by LC on 2022-10-30



- Legend**
- Influence Area
  - NHD Flowlines
  - National Wetland Index**
  - Wetland Type**
  - Freshwater Emergent Wetland
  - Freshwater Forested/Shrub Wetland
  - Freshwater Pond
  - 100-Year Floodplain**
  - Flood Hazard Zone**
  - A
  - AE
  - X



**Notes**

1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet.  
2. Data Sources: KYTC, USGS National Boundaries Dataset, FEMA NFHL, USFWS NHD  
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





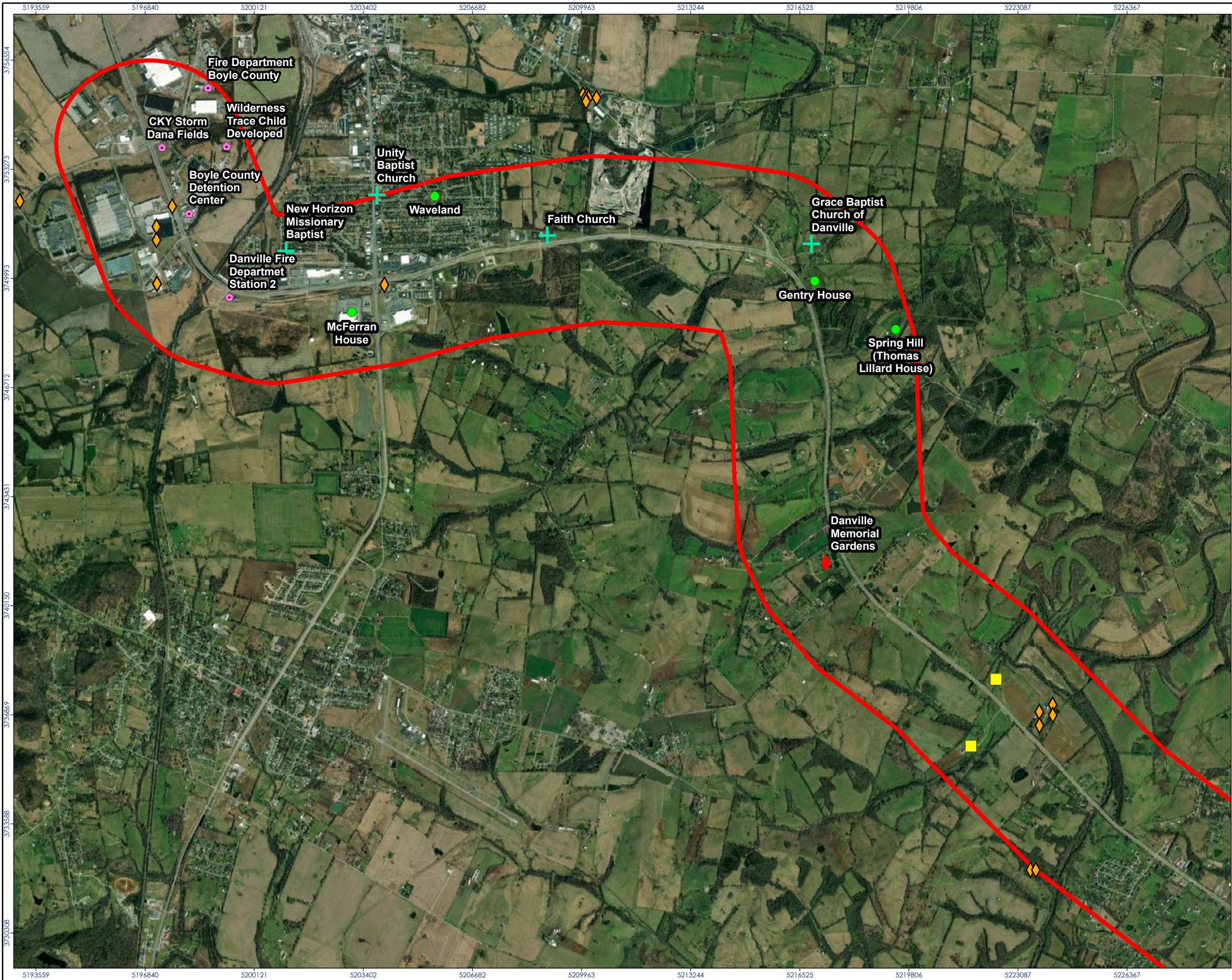


Figure No. 15

Title Human Enviroment

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Client/Project Site Overview REVA

Client: KYTC

Project: US 150 Study

Report: Environmental Overview

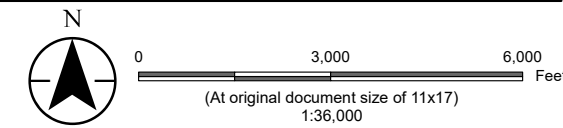
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Project Location T. of Dane, Dane Co., WI

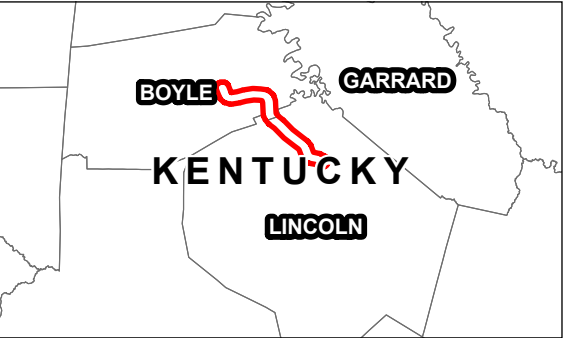
Prepared by CK on 2022-10-28

TR by SPK on 2022-10-29

IR Review by LC on 2022-10-30



- Legend
- Influence Area
  - Cemeteries
  - Churches
  - NRHP Buildings
  - Oil & Gas Wells
  - Water Wells
  - Other



Notes

1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: KYTC, PADUS, Google Earth, NRHP EDR
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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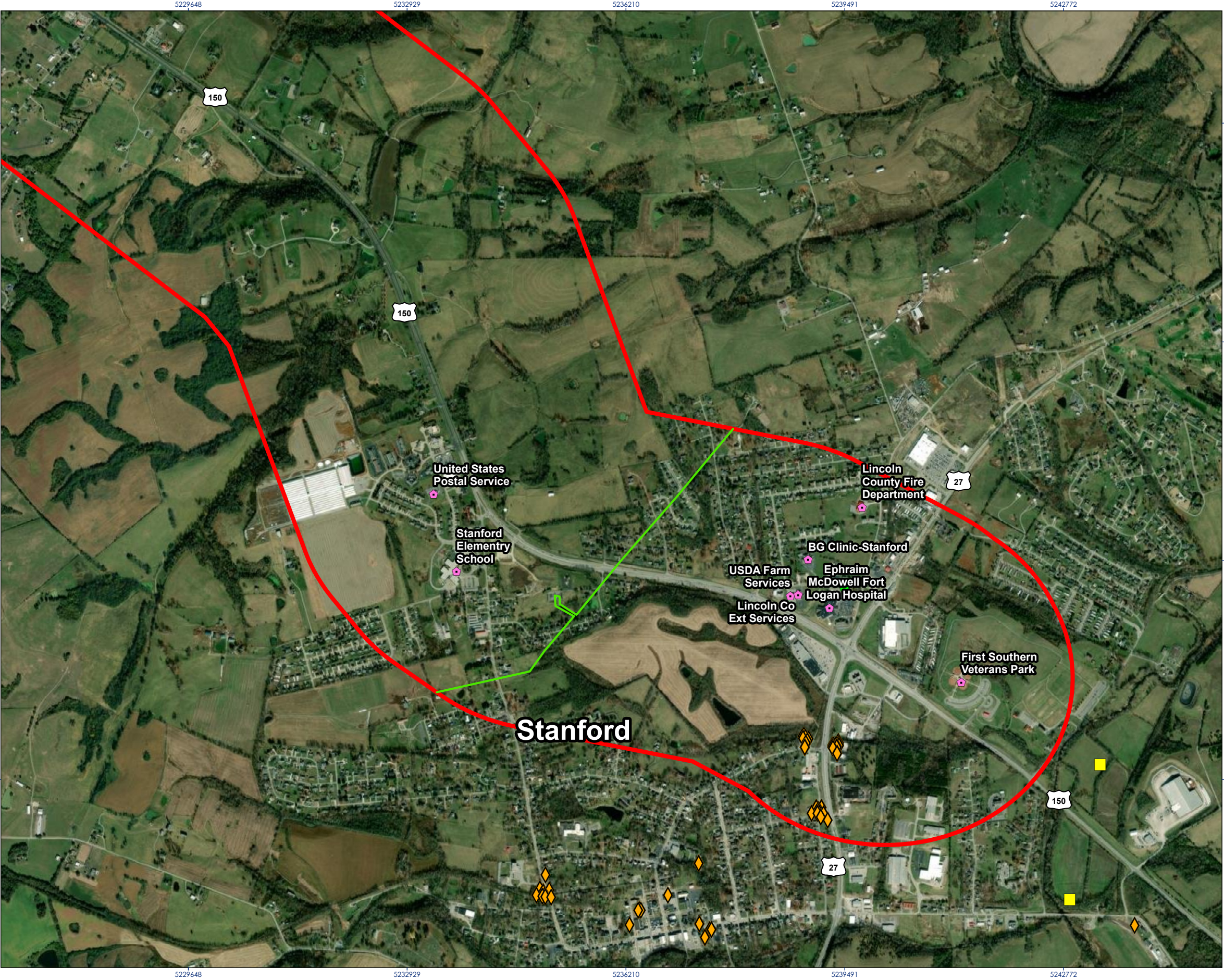


Figure No.  
**16**

Title  
**Human Enviroment**

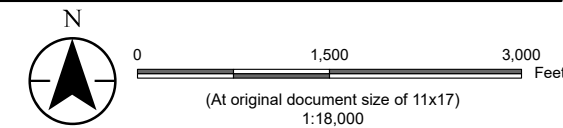
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Client/Project  
Client: KYTC  
Project: US 150 Study  
Report: Environmental Overview

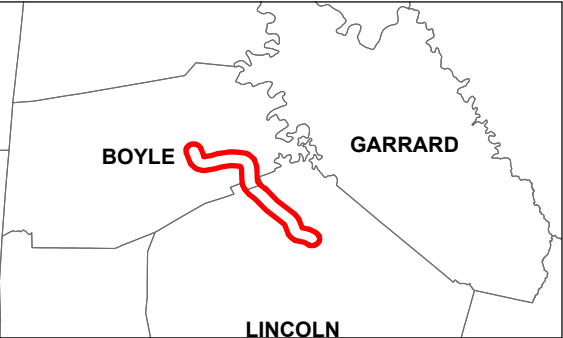
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Project Location  
US HWY 150  
Lincoln and Boyle Counties, Kentucky

Prepared by CK on 2022-10-28  
TR by SPK on 2022-10-29  
IR Review by LC on 2022-10-30



- Legend**
- Influence Area
  - NRHP Buildings
  - Oil & Gas Wells
  - ◆ Water Wells
  - ◆ Other
  - Electric Transmission Lines



**Notes**

1. Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
2. Data Sources: KYTC, PADUS, Google Earth, NRHP EDR, NPMS, HIFLD
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





### 3.3 SOCIOECONOMIC STUDY

The Bluegrass Area Development District conducted a Socioeconomic Study for the study area. A complete copy of the report is found in **Appendix C**. The information in this report outlines 2017-2021 American Community Survey (ACS) statistics in and near the study area using tables, charts, and maps. The data presented in this document is intended to highlight areas that may require additional analysis should a project in the study area be advanced to future phases.

This information is intended to aid in making informed and prudent transportation decisions, especially regarding the requirements of *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (signed February 11, 1994). Statistics are provided for minority, elderly, poverty status, limited English proficiency (LEP), and disabled populations for the nation, state, and county in **Table 2**.

**Table 2: Socioeconomic Summary**

Category	United States	Kentucky	Boyle	Lincoln	Study Area
Percent of Minority Population	39.91%	15.97%	14.69%	6.53%	13.65%
Percent Below the Poverty Line	12.80%	17.42%	15.41%	18.01%	17.77%
Percent of Adults over 65	16.00%	17.06%	18.68%	18.81%	21.67%
Percent of Adults with a Disability	12.70%	21.97%	21.06%	20.03%	21.36%
Percent with Limited English Proficiency	21.70%	2.18%	1.91%	2.23%	1.46%

The study area contains higher percentages than Boyle County in percent below the poverty line, adults over 65, disabled adults, and those with limited English proficiency. In addition, the study area contains higher percentages of minority population, adults over 65, adults with a disability, and limited English proficiency than Lincoln County.

During future phases of project development, a more detailed and robust analysis would be required for the National Environmental Policy Act (NEPA) documentation when assessing the potential for adverse and disproportionate impacts to those with disabilities, poverty status, and minority populations.



## 4.0 FUTURE CONDITIONS

To determine the need for and purpose of potential transportation improvement options, it is necessary to estimate future conditions. This chapter summarizes the anticipated future conditions within the study area. A full summary of the traffic forecasting process can be found in **Appendix D**.

### 4.1 POPULATION TRENDS

Population data, including data from the 2020 Census, were obtained from the Kentucky State Data Center (KSDC) at the University of Louisville, Kentucky's official clearinghouse for Census data. Population projections for the state of Kentucky, Boyle County, Lincoln County, Danville, and Stanford are summarized in **Table 3**. Over the past 20 years, Boyle County has grown at a rate similar to the statewide average while Lincoln County has experienced slightly lower growth. The population growth is expected to continue in Boyle County to 2050, just under half a percent per year. Lincoln County, however, is expected to experience population decline over the next 30 years.

**Table 3: Population Estimates & Projections**

Area	Census Estimates			Annual Growth	2050 Projection	Annual Growth
	2000	2010	2020	2000 - 2020		2020 - 2050
<b>Kentucky</b>	4,041,769	4,339,367	4,505,836	0.54%	4,785,233	0.20%
Boyle County	27,697	28,432	30,614	0.50%	33,330	0.28%
Lincoln County	23,361	24,742	24,275	0.19%	21,436	-0.41%
Danville	15,477	16,218	17,234	0.54%	N/A	
Stanford	3,430	3,487	3,640	0.30%	N/A	

### 4.2 HISTORICAL TRAFFIC COUNTS

Historical average daily traffic volumes and annual growth rates, between 2011 and 2021, for US 150 and the South Danville Bypass are summarized in **Table 4**. Over the past 10 years, seven of the eight stations have shown growing traffic, ranging between 0.1 percent to over three percent per year. The red text represents traffic counts from 2020 which were not an accurate representation of recent traffic patterns due to COVID shutdowns in 2020 and was not used to calculate the compound annual growth rates.



Table 4: KYTC Historical Average Daily Traffic

Year	South Danville Bypass			US 150				
	Boyle County					Lincoln County		
	Sta. 011P66	Sta. 011B06	Sta. 011276	Sta. 011278	Sta. 011263	Sta. 069774	Sta. 069773	Sta. 069A21
2011		14,300		11,800		12,200	12,500	
2012	21,607		8,407		10,339			12,558
2013	21,506							
2014	21,920	13,724		11,998		12,491	12,839	
2015	22,725		9,878		11,726			14,425
2016	23,457							
2017	23,477	<b>13,567</b>		<b>12,588</b>		<b>12,253</b>	<b>13,160</b>	
2018	23,448		9,497		12,199			<b>13,515</b>
2019	23,787							
2020	20,986	13,501		11,695		12,003	12,682	
2021	23,062		<b>11,129</b>		<b>12,659</b>			
2022	<b>23,134</b>							
Historical Annual Growth Rate (%)	0.69%	-0.87%	3.17%	1.08%	2.27%	0.07%	0.86%	1.23%

### 4.3 KENTUCKY STATEWIDE TRAVEL DEMAND MODEL (KYSTM)

As an additional data source, study area growth rates from the Kentucky Statewide Travel Demand Model (KYSTMv19) were reviewed. Between 2019 and 2045, annual KYSTM growth rates on the South Danville Bypass (US 127B and US 150B) range from 0.9 to 1.1 percent per year while rates on US 150 range from 1.0 to 1.3 percent per year. Growth rates on adjacent roadways vary, but generally show slight positive growth.

### 4.4 2045 DAILY TRAFFIC FORECASTS

Based on the historical count data demonstrating moderate increases in traffic, stable study area population estimates and projections, compatible rates of growth from the KYSTM, and US 150 being a major east-west arterial through central Kentucky, an annual growth rate of one percent was selected to reflect steady growth through the year 2045. The growth rate was applied to the latest KYTC traffic counts to develop 2045 daily traffic forecasts, shown in **Figure 17**.

2045 daily traffic on the study corridor is expected to range from 14,100 VPD near the US 150 intersection to 29,300 VPD west of US 127 in Danville. The rural portion of US 150 is expected to carry just over 16,000 VPD in 2045 and the city of Stanford is expected to have 17,700 VPD.



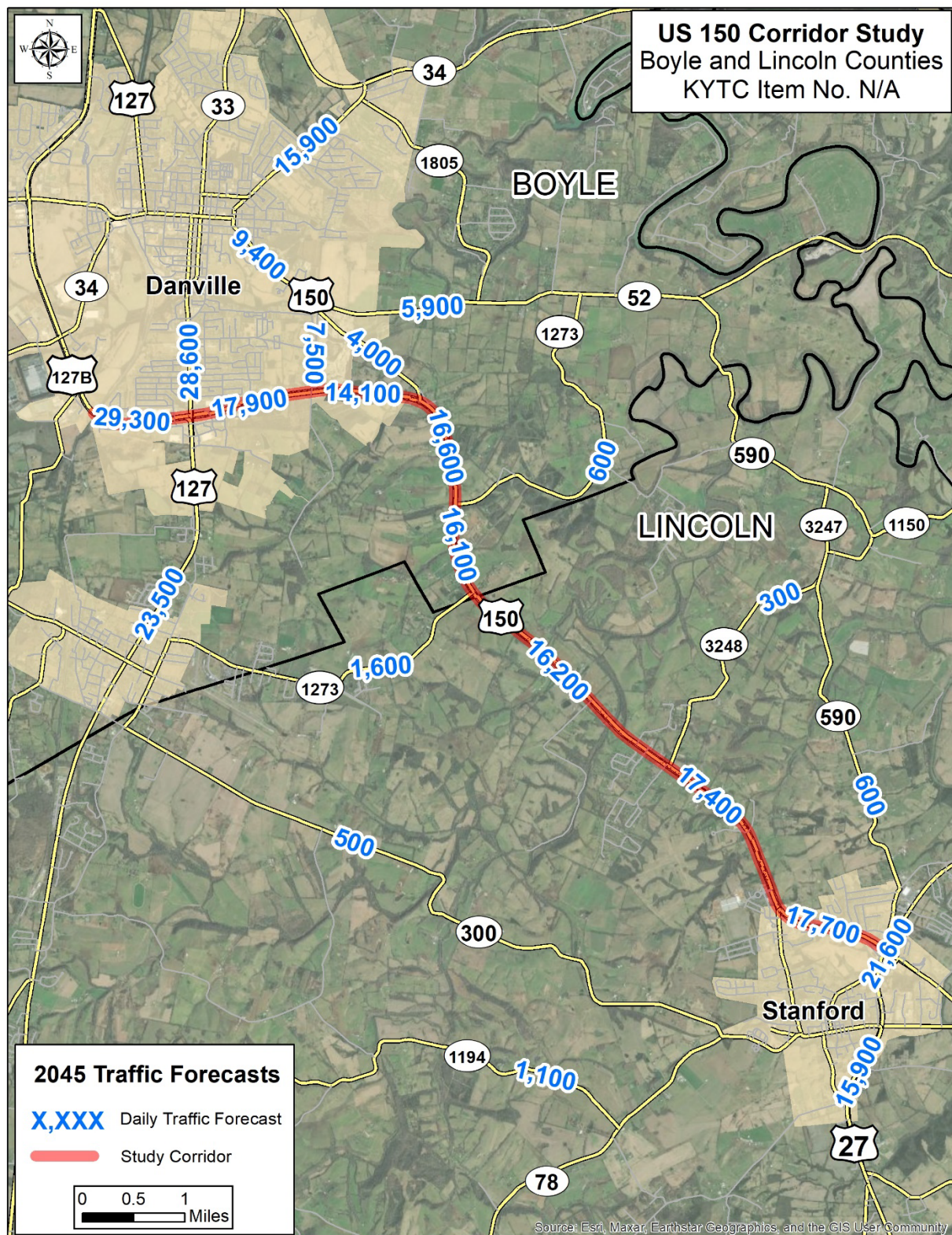


Figure 17: 2045 Daily Traffic Forecasts (Vehicles per Day)



## **4.5 2045 TRAFFIC ANALYSIS**

A 2045 HCS analysis was performed to determine the potential need for additional capacity on the study corridor. Results from the analysis show that the four through lanes (two lanes in each direction) on US 150 and the South Danville Bypass currently operate at acceptable levels, meaning additional through lanes are not warranted.

Peak hour turning movement forecasts were developed to analyze future traffic operations at the major intersections. Results from the analysis demonstrate that all study area intersections are expected to operate at acceptable levels during the peak hours. The US 127 and US 27 intersections are expected to operate at LOS D, while all other intersections are expected to operate at LOS C or better.

## **5.0 INITIAL PROJECT TEAM AND STAKEHOLDER COORDINATION**

Over the course of the study, the project team met with key Local Officials and Stakeholders to coordinate on study issues and goals. The project team included representatives from KYTC Central Office, KYTC Districts 7 and 8, the Bluegrass Area Development District (BGADD), and the consultant, Stantec. Detailed summaries of each meeting are presented in **Appendix E**.

### **5.1 PROJECT TEAM MEETING NO. 1**

The first Project Team Meeting for the subject project was held at the University of Kentucky (UK) Lincoln County Extension Office and virtually via Microsoft Teams the morning of February 7, 2023. The purpose of the meeting was to present the results from the existing conditions analysis and get feedback on transportation issues in the study area. Key discussion items included the following:

- Approximately 16 houses along the rural section of US 150 do not have full access intersections.
- The southbound approach at the Skywatch Drive signalized intersection currently has green extension set to the maximum of five seconds.
- School buses can legally make U-turns if the movement is signed.
- KYTC recently performed a speed study on the Stanford section of US 150. At that time, it was determined that travel speeds did not warrant a speed limit reduction. A speed limit reduction based on target speeds could be considered in Stanford.

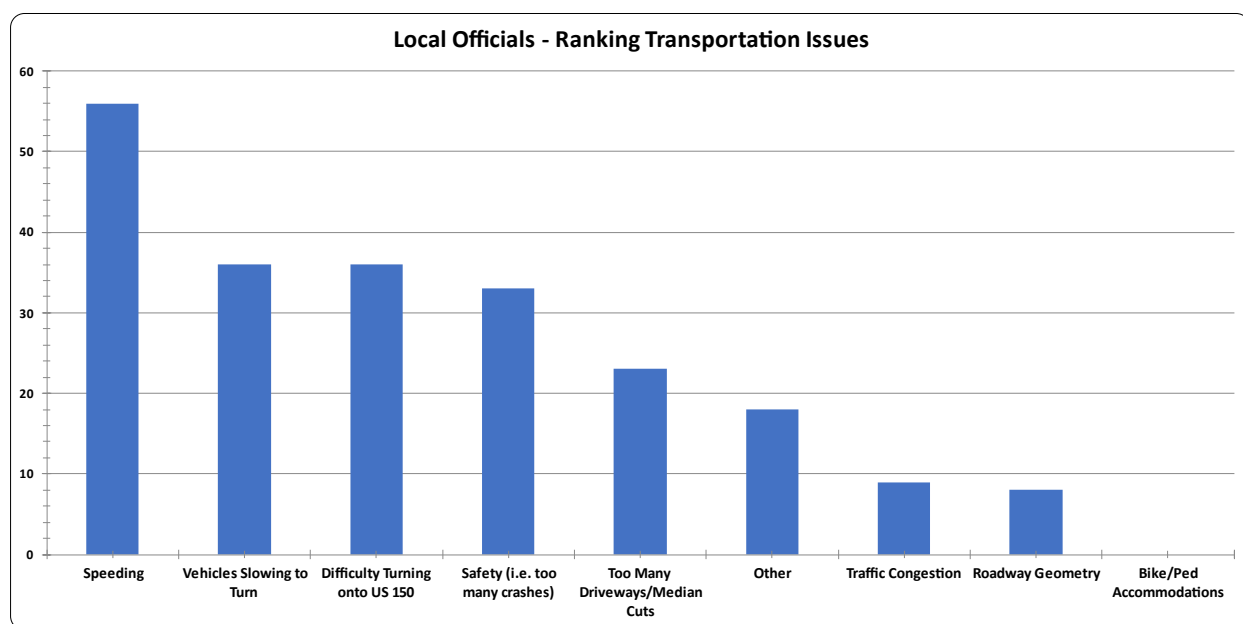
### **5.2 LOCAL OFFICIALS MEETING NO. 1**

The first Local Officials / Stakeholder Meeting for the subject project was held at the UK Lincoln County Extension Office in Stanford, Kentucky and virtually via Microsoft Teams the afternoon of February 7, 2023. The purpose of the meeting was to present the existing conditions and to solicit feedback from the local officials and stakeholders on transportation issues in the study area.



An online MetroQuest survey was developed to prioritize transportation issues, locate trouble spots related to safety and congestion, and identify improvement ideas. There were 10 participants who completed the survey and 15 who completed partial surveys. Of the 10 respondents, nine travel US 150 at least two to three times per week. Six of the respondents live in Lincoln County and four live in Boyle County.

Respondents were asked to rank their top five transportation concerns in the study area. A scoring system was used to rank the concerns with top priority given five points, second given four points, third given three points, fourth given two points, and fifth given one point. Of the concerns listed, speeding was ranked as the highest priority receiving 56 points, followed by vehicles slowing to turn, and difficulty turning onto US 150, as shown in **Figure 18**. Bicycle and pedestrian accommodations received zero points.



**Figure 18: Local Officials Survey No. 1 – Transportation Concerns**

Respondents were then asked to identify trouble spots in the study area. In Boyle County, there were 17 locations identified with safety concerns, one with congestion concerns, and two categorized as “other,” as shown in **Figure 19**. The South Danville Bypass intersections with Belinda Boulevard, Skywatcher Drive, Daniel Drive, and US 150 were all noted as needing intersection reconfiguration. As mentioned in Chapter 1, the South Danville Bypass intersection with US 150 was recently reconfigured as part of an HSIP project to improve safety. Other concerns included the need for additional turn lanes at Skywatch Drive, speeding, sight distance, and too many median openings near the Lincoln County/Boyle County line.

In Lincoln County, there were 14 locations identified with safety concerns, five with congestion concerns, and eight other concerns, as shown in **Figure 20**. The Danville Avenue (KY 300) intersection was the most identified location with concerns including the need for a traffic signal, intersection reconfiguration, poor sight distance, difficulty turning onto US 150, and the need for turn lanes. Several responses also indicated the need for reduced speed on US 150 between





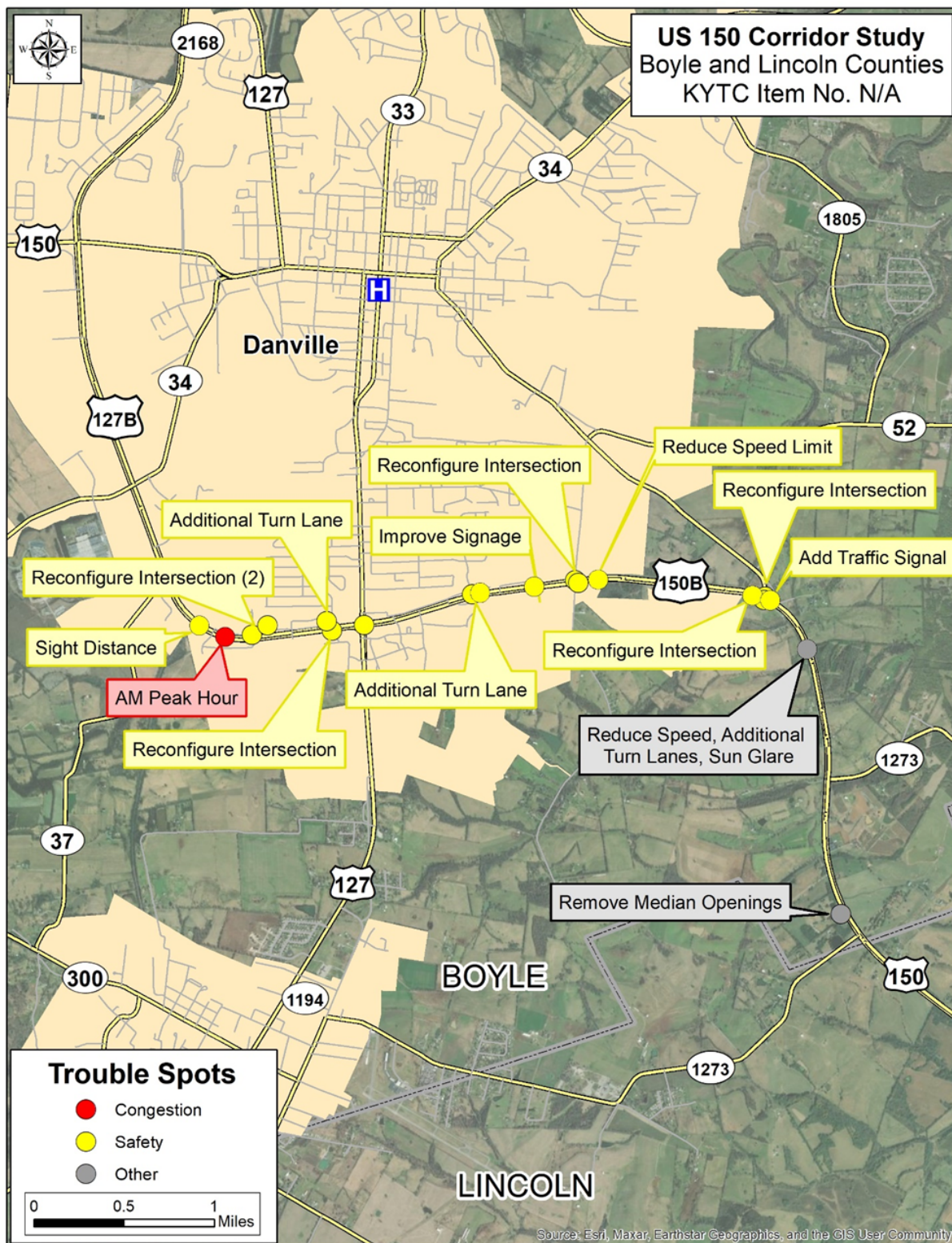


Figure 19: Local Officials Survey No. 1 – Boyle County Trouble Spots



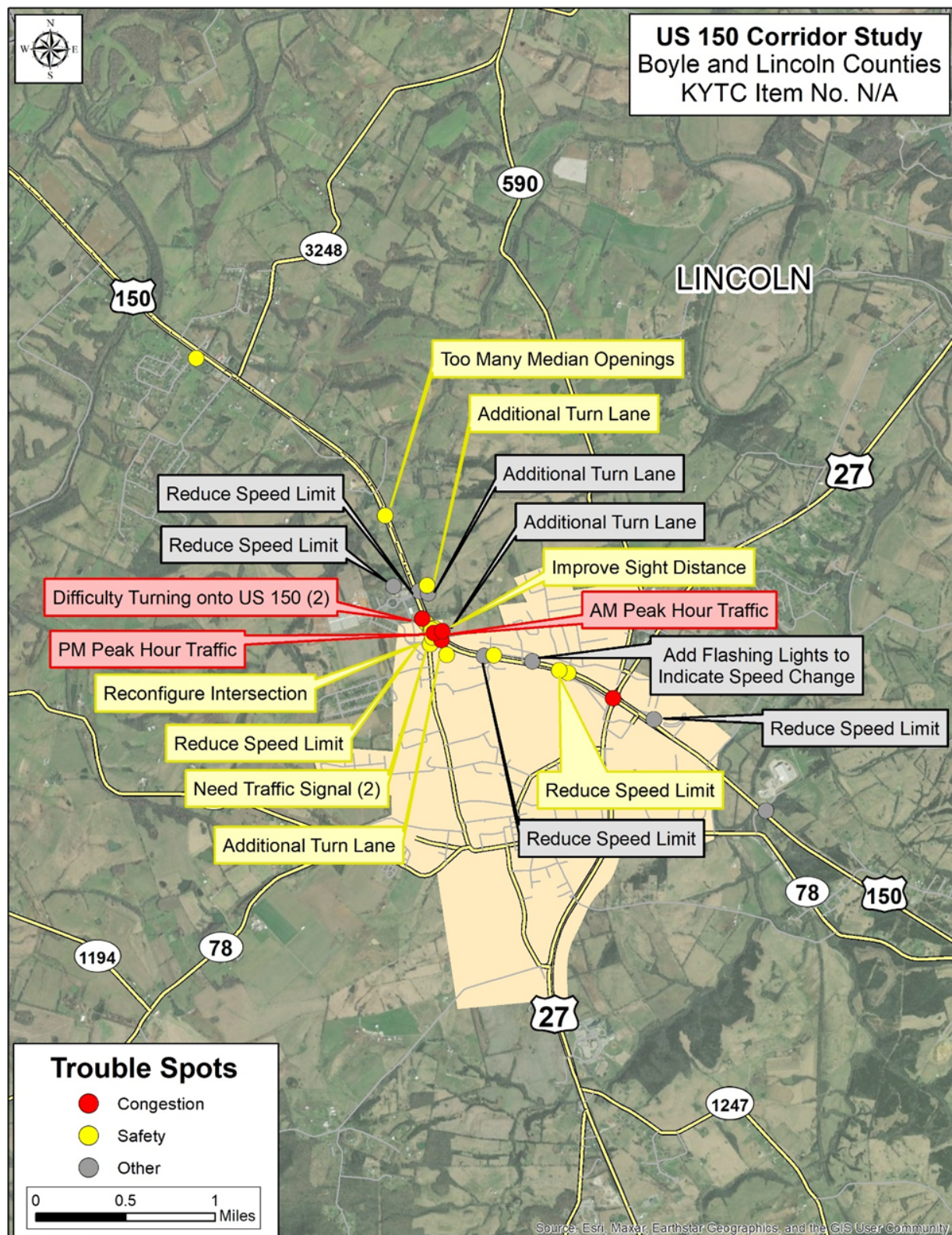


Figure 20: Local Officials Survey No. 1 – Lincoln County Trouble Spots



Danville Avenue and US 27. The next question asked participants for improvement ideas in the study area. In Boyle County, there were suggestions to add turn lanes, improve signal timing, construct a roundabout, install a traffic signal, and restrict turning, as shown in **Figure 21**. In Lincoln County, the most common improvement ideas were reducing the speed limit and adding a turn lane, as shown in **Figure 22**.

Overall, results from the survey indicated that safety is more of a concern to the local officials than congestion. Speeding is the biggest concern, especially in Stanford. Most of the identified concerns and improvement ideas were in the urban areas near Danville and Stanford. Reducing the number of median openings was the only suggestion along the rural portion of the study area. Bicycle and pedestrian accommodations were not priorities for the ten participants in the survey.



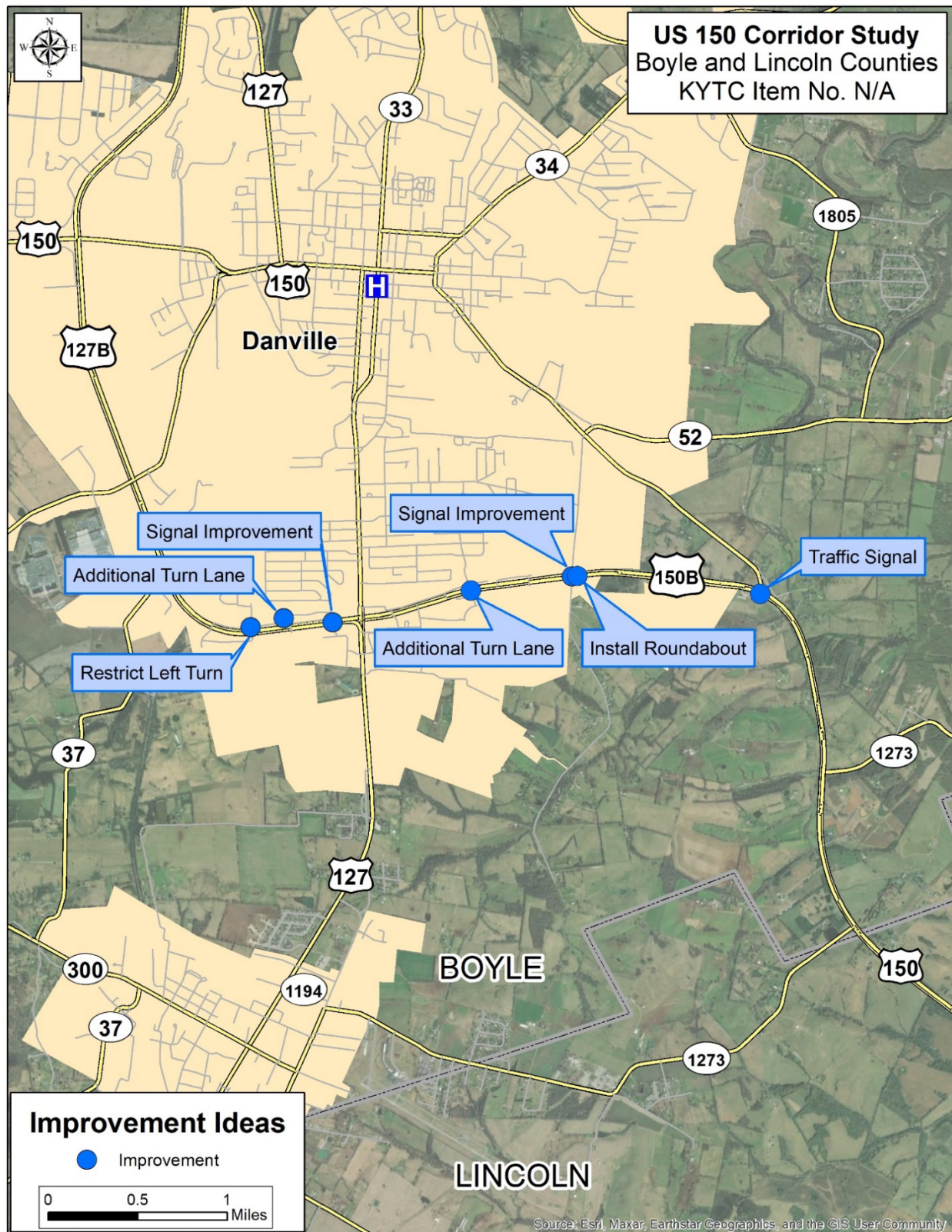


Figure 21: Local Officials Survey No. 1 – Boyle County Improvement Ideas



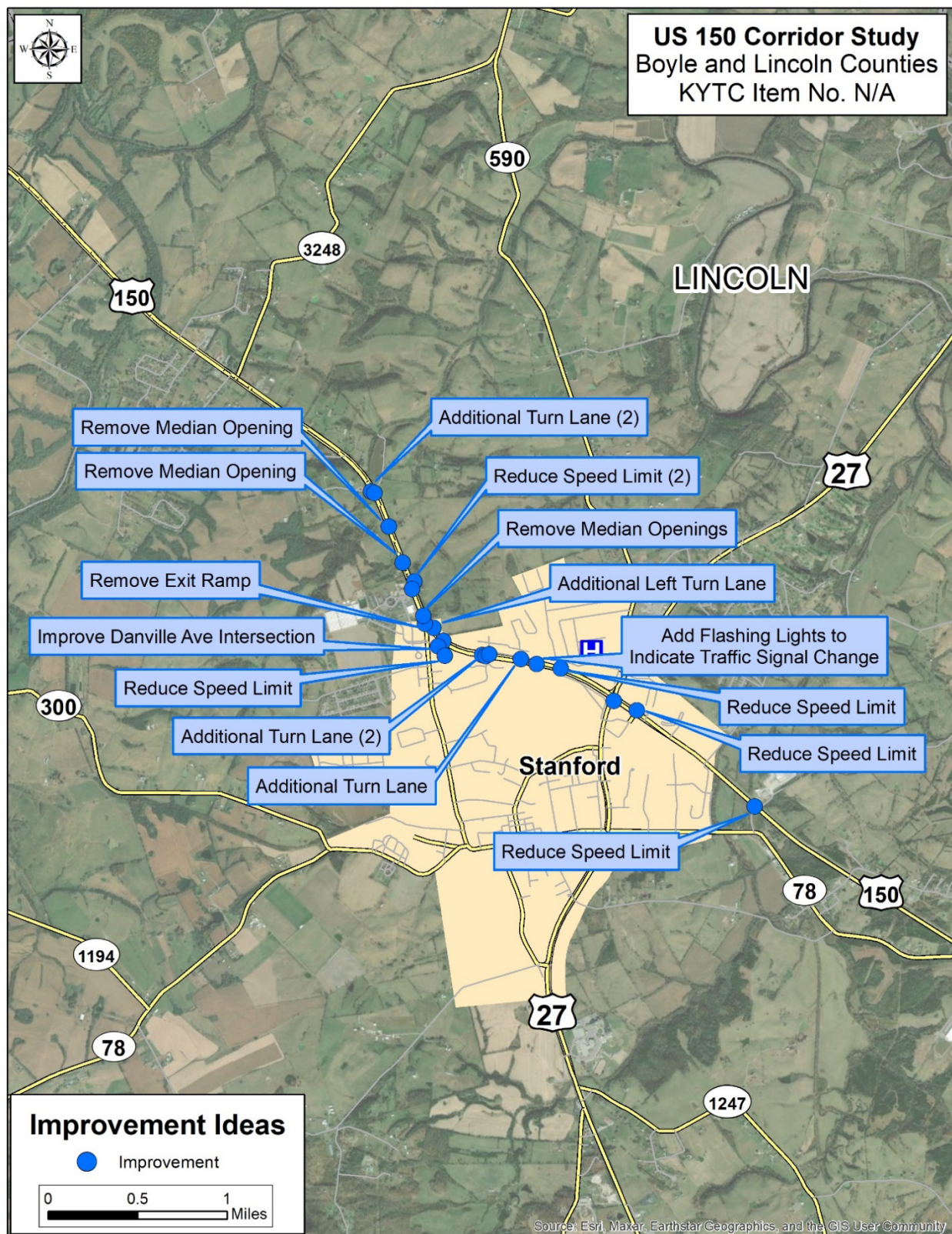


Figure 22: Local Officials Survey No. 1 – Lincoln County Improvement Ideas

## 6.0 SUMMARY OF STUDY AREA NEEDS

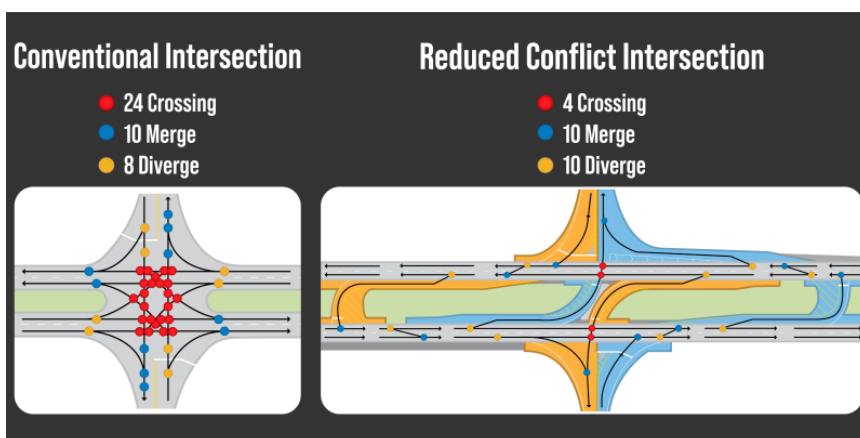
Based on the existing and future conditions analyses and feedback from Local Officials and Stakeholders, the following study area needs were identified to help inform the development of improvement concepts.

US 150 is a major east-west arterial through Kentucky, and a regionally important route. Within the Bluegrass Region, US 150 connects communities between the Bluegrass Parkway in Nelson County and I-75 in Rockcastle County. Because of this connectivity, US 150 serves dual roles: it provides access to local businesses / homes and serves as an artery for regional through traffic.

Current daily traffic volumes range from nearly 13,000 vehicles per day in the Rural Section to just over 23,000 vehicles per day on the South Danville Bypass near the west end of the Danville Section. The entire study area has four travel lanes (two lanes in each direction) and a depressed median, which can adequately accommodate existing and future traffic volumes. However, some of the intersecting side streets (such as Skywatch Drive, US 27, KY 300, US 127) are experiencing delays due to peak hour congestion.

Crash data were collected for the five-year period from 2017 through 2021. A total of 501 crashes were reported over the 11-mile section during this time. Many of these crashes can be attributed to the abundance of driveways, intersections, and median openings. Of the 501 reported crashes on the study corridor, 306 (61 percent) were at an intersection, four of which resulted in a fatality (1 percent) and 94 resulted in one or more injuries (31 percent). Based on a comprehensive safety analysis, US 150 and the South Danville Bypass have a Level of Service of Safety (LOSS) of 3, which indicates a moderate to high potential for crash reduction.

There are currently 72 full access intersections along the study corridor, many of which serve private driveways. Each intersection creates potential conflict points (i.e., location where vehicle paths cross) between through traffic and turning traffic, as shown in the conceptual schematic to the right. The Danville and Stanford Sections were found to have an average spacing of 1,000 feet between full access intersections. The Rural Section has an average of 600 feet between full access intersections. In both cases, the current spacing is far less than the 2,400 feet recommended for a major arterial. Proactively managing access points, especially on arterials such as US 150 which are meant for higher mobility, promotes safe and efficient travel through the transportation network.



*The red dots on this diagram represent the potential for the most severe types of crashes (angle and left-turn collisions), the blue and yellow dots are typically less severe. Reduced conflict intersections improve safety because they have significantly fewer potential crash or conflict points than conventional intersections.*



## 7.0 INITIAL IMPROVEMENT CONCEPT DEVELOPMENT

Improvement concepts were developed based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance. The concepts discussed in the sections below were developed to address the issues summarized in Chapter 6.0.

### 7.1 DANVILLE SECTION

The Danville portion of the study corridor includes the South Danville Bypass between Fireside Drive and US 150. The following preliminary concepts were developed to address the issues unique to this Section:

**South Danville Bypass at Skywatch Drive:** Over the five-year period between 2017 and 2021, there were 22 crashes at this intersection, four of which resulted in an injury. The most common crash types were angle collisions (11 crashes) and rear ends collisions (10 crashes).

One concept to improve safety is to reconfigure the intersection and improve the flow of traffic by forcing northbound traffic to turn left or right rather than being able to continue straight, as shown in **Figure 23**. Vehicles traveling southbound on Skywatch Drive will be restricted from turning left and must yield to the eastbound approach before entering the intersection. Additionally, westbound Skywatch Drive will be restricted to right-in / right-out. Signage should be placed for driver clarity. As this is a city street, the City of Danville would be responsible for implementing the improvements on Skywatch Drive.



Figure 23: South Danville Bypass at Skywatch Drive

**South Danville Bypass at Signalized Intersections (except for US 127):** Over the five-year period between 2017 and 2021, there were 163 crashes at the South Danville intersections with Skywatch Drive, Denmark Drive, Brent Avenue, Daniel Drive, and Gose Pike. Two of these crashes resulted in fatalities, one fatal collision was an angle collision while the other was an opposing left turn. 41 of the remaining collisions resulted in an injury, while 120 crashes were property damage only. The most common crash types were angle collisions (82 crashes), rear ends collisions (52 crashes) and opposing left turn collisions (17 crashes).

A concept to improve safety is to construct positive offset left-turn lanes to improve driver sightlines at the intersection, as shown in **Figure 24**. Positive offset left-turn lanes are proposed at the South Danville intersections with Skywatch Drive, Denmark Drive, Brent Avenue, Daniel Drive, and Gose Pike. This improvement would provide an estimated 38 percent crash reduction of angle and left turn collisions.



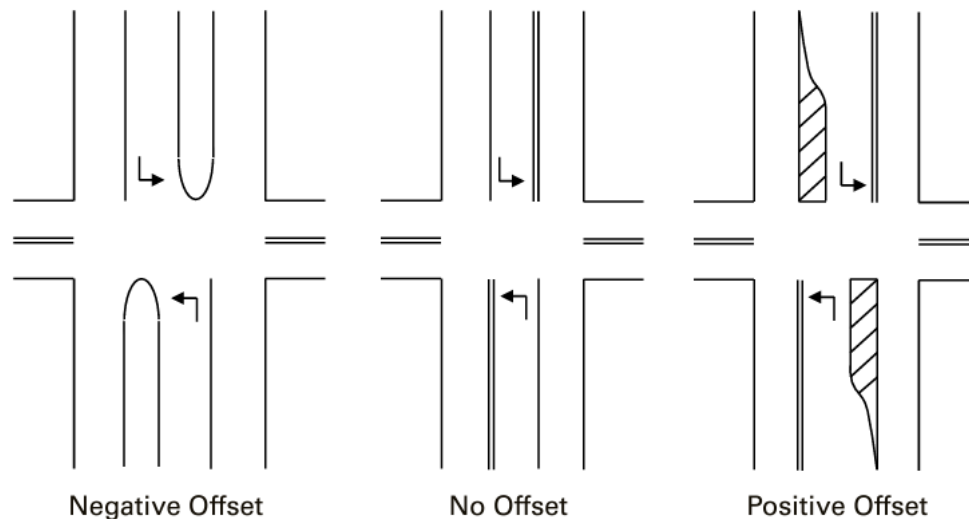


Figure 24: Conceptual Schematic of Left-Turn Offset Types <sup>2</sup>

**South Danville Bypass at Unsignalized Intersections:** A concept to improve safety at the South Danville Bypass intersections with Fireside Drive, Belinda Boulevard, Brenda Drive, Southtown Connector Drive, Windjammer Circle, and Shannon Way is to convert the full access intersections to limited access connections allowing only right-in/right-out and left-in movements. An example is shown in **Figure 25**. This improvement would provide an estimated crash reduction of 46 percent.



Figure 25: South Danville Bypass at Brenda Ave. and Southtown Connector Dr.

<sup>2</sup> Safety Evaluation of Offset Improvements for Left-Turn Lanes, FHWA-HRT-09-035

**Frontage Roads:** An option to improve traffic flow and provide safer access to adjacent businesses is to construct frontage roads parallel to the South Danville Bypass. Most of the frontage road network exists today and filling in the missing gaps will improve safety by allowing left-turn movements onto the South Danville Bypass to occur at the signalized intersections. The frontage roads are shown as guidance for future developments and would need to be constructed with private funds.

**South Danville Bypass at US 127:** An option to improve safety at this congested intersection, which operates at LOS D during the existing PM peak, is to construct an acceleration lane for the eastbound right-turn onto US 127. This improvement provides an estimated crash reduction of 19 percent. Another option to improve safety is to construct a median barrier on the northbound US 127 approach to restrict left-turns onto Jane Trail.

## **7.2 RURAL SECTION**

Between the South Danville Bypass intersection in Boyle County and the Frontier Boulevard intersection in Lincoln County, US 150 is a rural corridor serving mostly farmland and residential areas with full access median openings every 600 feet, on average.

While the overall percentage of injury collisions on US 150 and the South Danville Bypass over the past five years is 26 percent, the percentage of injury collisions in the Rural Section is 35 percent. This is in part due to drivers on the stop-controlled side streets attempting to turn left onto US 150 must cross two directions of travel.

An effective solution to reduce the number of injury collisions, especially angle collisions from vehicles turning left, is to convert the stop-controlled intersections to Median U-Turn (MUT), as shown in **Figure 26**, or Restricted Crossing U-Turn (RCUT) intersections, shown in **Figure 27**, by forcing all traffic on the minor approaches to turn right at the main intersection. Drivers wanting to turn left can then make a U-turn downstream at a designated median opening. Left-in turn movements would be allowed at major intersections with higher turning traffic, as shown in the conceptual schematic below. This improvement provides an estimated crash reduction of 46 percent.



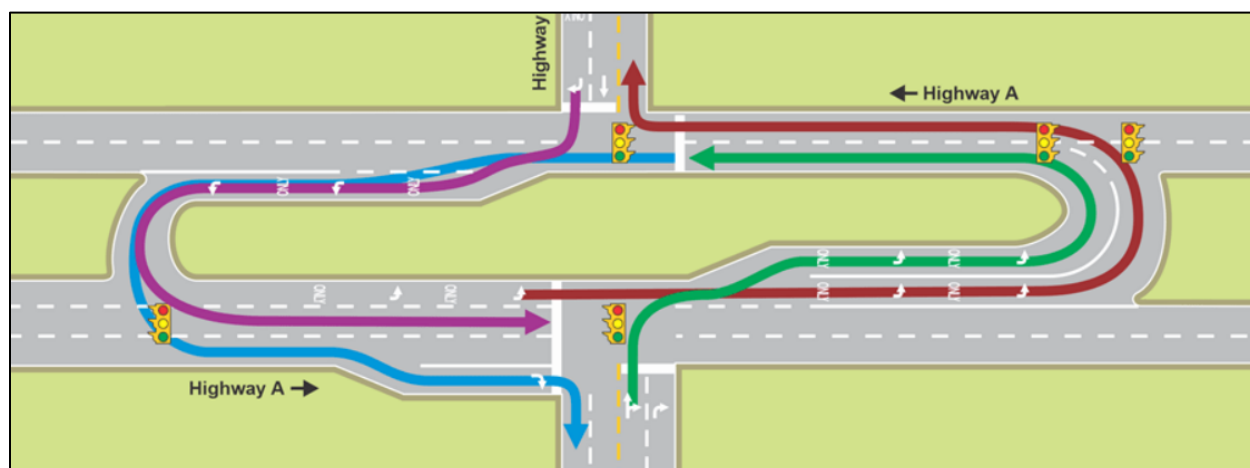


Figure 26: Median U-Turn (MUT) Crossing Intersection<sup>3</sup>

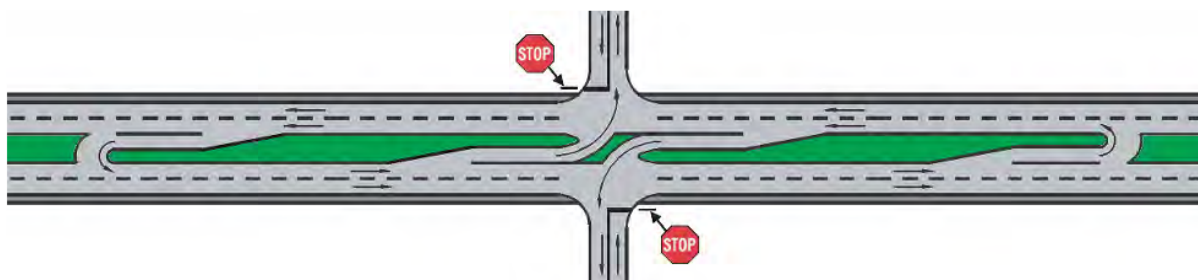


Figure 27: Restricted Crossing U-Turn (RCUT) Intersection Conceptual Schematic<sup>4</sup>

## 7.3 STANFORD SECTION

The Stanford Section, from Frontier Boulevard to east of the US 27 intersection, transitions to a more urban setting with commercial areas and increased congestion. Improvements to this section include:

**US 150 at Unsignalized Intersections:** An option to reduce the number of injury and fatal collisions, especially angle collisions from vehicles turning left onto US 150, is to force movements on the minor approaches at Frontier Boulevard, KY 300, Withers Court, Lee Drive, and Choctaw Drive to turn right at the main intersection. Drivers wanting to turn left can then make a U-turn downstream at a designated median opening. Left-in turn movements would be allowed from US 150. This improvement would provide an estimated crash reduction of 38 percent crash reduction of angle and left turn collisions.

<sup>3</sup> <https://www.michigan.gov/mdot/travel/safety/road-users/michigan-lefts>

<sup>4</sup> NCHRP Report 650: Median Intersection Design for Rural High-Speed Divided Highways

**US 150 at US 27:** Over the five-year period between 2017 and 2021, there were 21 crashes on the eastbound channelized right-turn from US 150 to US 27. There is no receiving lane on US 27, so vehicles must yield to oncoming traffic, which causes rear end collisions. Constructing an acceleration lane for this right-turn movement would improve safety by reducing the number of rear end collisions.

**US 150 East of US 27:** East of the US 27 intersection, US 150 transitions from four-lane typical section (two-lanes in each direction) to a two-lane typical section (one-lane in each direction), with the eastbound lane drop occurring near Vincent Drive.

An option to improve safety is to move the transition from four lanes to two lanes on US 150 east past the entrance to First Southern Veterans Park. This would push the transition away from the existing business entrances.

Additionally, the northbound US 27 approach currently has one dedicated left-turn lane. It was noted by the local officials that this approach will likely need a second left-turn lane in the future. The 2022 turning movement count revealed 270 left-turning vehicles during the PM peak hour, with 340 left-turning vehicles expected during the PM peak by 2045.

## **8.0 SECOND PROJECT TEAM AND STAKEHOLDER MEETINGS**

Following the development of the initial improvement concepts, the project team met for a 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 E**.

### **8.1 PROJECT TEAM MEETING NO. 2**

The second Project Team Meeting was held at the KYTC District 8 office in Somerset, Kentucky on May 17, 2023. The purpose of the meeting was to get feedback from the Project Team on initial improvement concepts. Key discussion items included the following:

- U-turns for the MUT and RCUT median reconfigurations were initially spaced approximately 2,400 feet apart. The Project Team will also consider 1,200-foot spacing.
- The median opening in front of Lincoln Motors was updated to allow left turns into the business.
- A Green-T intersection will be analyzed at the US 150 intersection with KY 300.

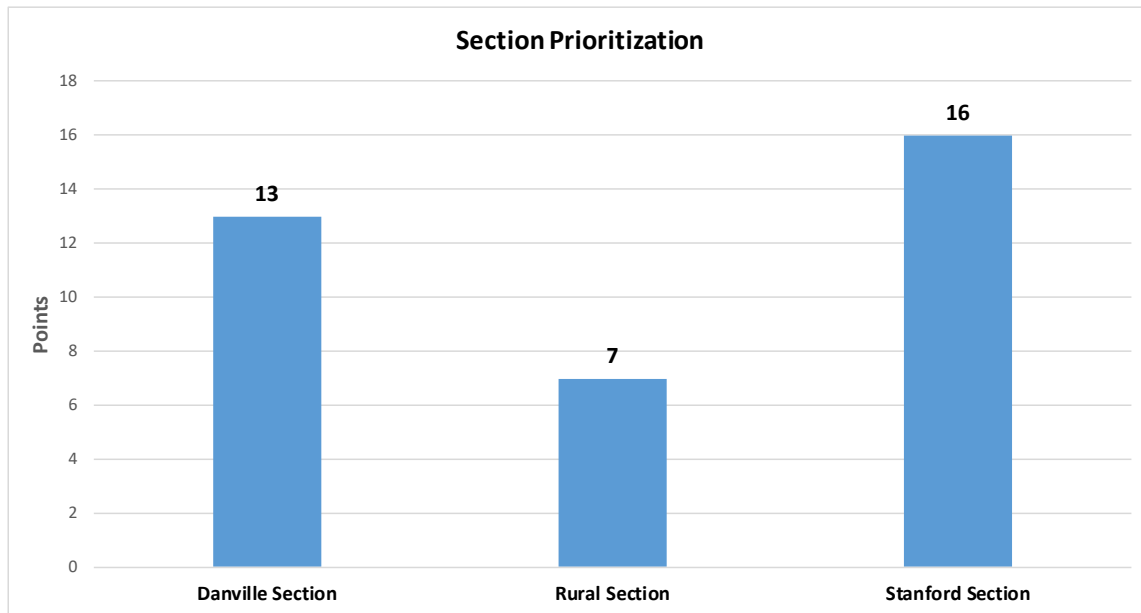
### **8.2 LOCAL OFFICIALS / STAKEHOLDER MEETING NO. 2**

Following the development of the initial improvement concepts, the project team met with the local officials and stakeholders for a second time at the UK Lincoln County Extension Office in Stanford, Kentucky on August 30, 2023. The purpose of the meeting was to provide updates on the study and to solicit feedback from the local officials and stakeholders on initial improvement concepts.





Attendees were asked to fill out a survey to provide input on the initial improvement concepts. Nine Local Officials / Stakeholders filled out the survey, seven of which live or work in the study area. Seven of the respondents indicated they drive through the study area daily and the remaining two drive through it monthly. Respondents were then asked to prioritize the improvements by section, with a ranking of one being the top priority and receiving three points, two being the second priority and receiving two points, and three being the third priority and receiving one point. The Stanford Section scored highest with 16 points while the Danville Section scored 13 points, as shown in **Figure 28**.



**Figure 28: Local Official / Stakeholder Survey No. 2 – Section Prioritization**

The following suggestions were made on by the local officials:

- Remove some of the intersections in-and-out of the shopping center by Starbucks (Skywatch Drive).
- Three people recommend a right turn lane on the South Danville Bypass at Cattleman's Roadhouse (Commerce Street).
- Add a right-turn lane on the South Danville Bypass at Daniel Drive.
- Make sure school buses can maneuver the U-turns.
- Reduce the speed limit on US 150 coming into Stanford, especially if U-turns are required.
- Two people recommended extending the Danville Avenue U-turn storage on US 150 to accommodate more school busses.
- Three people recommended extending the four-lane typical section on US 150 to Cordier Road to accommodate future development.

## 9.0 FINAL COORDINATION

Following the second Local Officials / Stakeholder Meeting, the project team met for a third time. During the meeting, revised improvement concepts based on feedback from the Local Officials and the Project Team were presented. Summaries for all meetings are found in **Appendix E**.

### 9.1 PROJECT TEAM MEETING NO. 3

A meeting was held at the KYTC District 8 Office and virtually via Microsoft Teams on October 16, 2023. The purpose of the meeting was to prioritize the revised improvement concepts. Key discussion items included the following:

- Adding back plates to the traffic signal heads as they are rebuilt will provide better visibility at night.
- Installing a right-turn lane at Denmark Drive would require the signal to be rebuilt.
- Add a raised Pexco median on US 127 in front of Jane Trail.

### 9.2 REVISED IMPROVEMENT CONCEPTS

Improvement concepts were revised based on results from the traffic and safety analyses and feedback from the stakeholders and the project team. Detailed layouts showing the revised improvement concepts are included in **Appendix F**.

#### 9.2.1 Danville Section

The Danville Section includes the South Danville Bypass between Fireside Drive and US 150. This portion of the study corridor, located in Boyle County, serves commercial shopping centers, and is considered urban, with a higher percentage of local trips. Revised improvements are summarized in the following sections and shown in **Figure 29**:





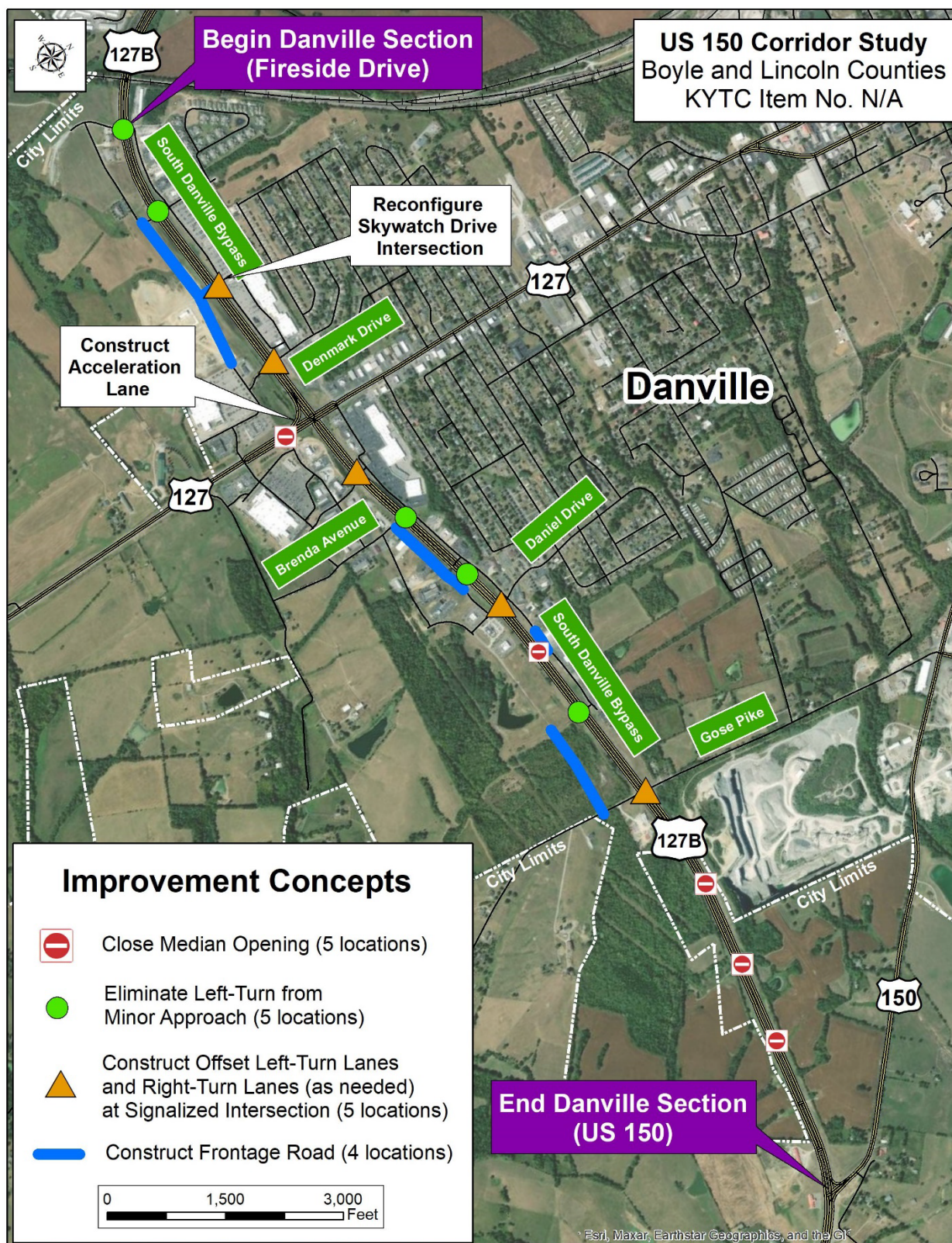


Figure 29: Revised Improvement Concepts – Danville Section



### 9.2.1.1 South Danville Bypass between Fireside Drive and US 127

#### South Danville Bypass at Fireside Drive

- Convert the Fireside Drive intersection to a Restricted Crossing U-Turn (RCUT) with westbound left-turns from South Danville Bypass allowed in, as shown in **Figure 30**.



Figure 30: South Danville Bypass at Fireside Drive

#### South Danville Bypass at Belinda Boulevard / Smoky Way

- Convert the Belinda Boulevard / Smoky Way intersection to an RCUT with left turns from the South Danville Bypass allowed in, as shown in **Figure 31**.
- Extend Smoky Way to May Boulevard, including a frontage road connection to Skywatch Drive. The frontage roads are shown as guidance for future developments and would need to be constructed with private funds.



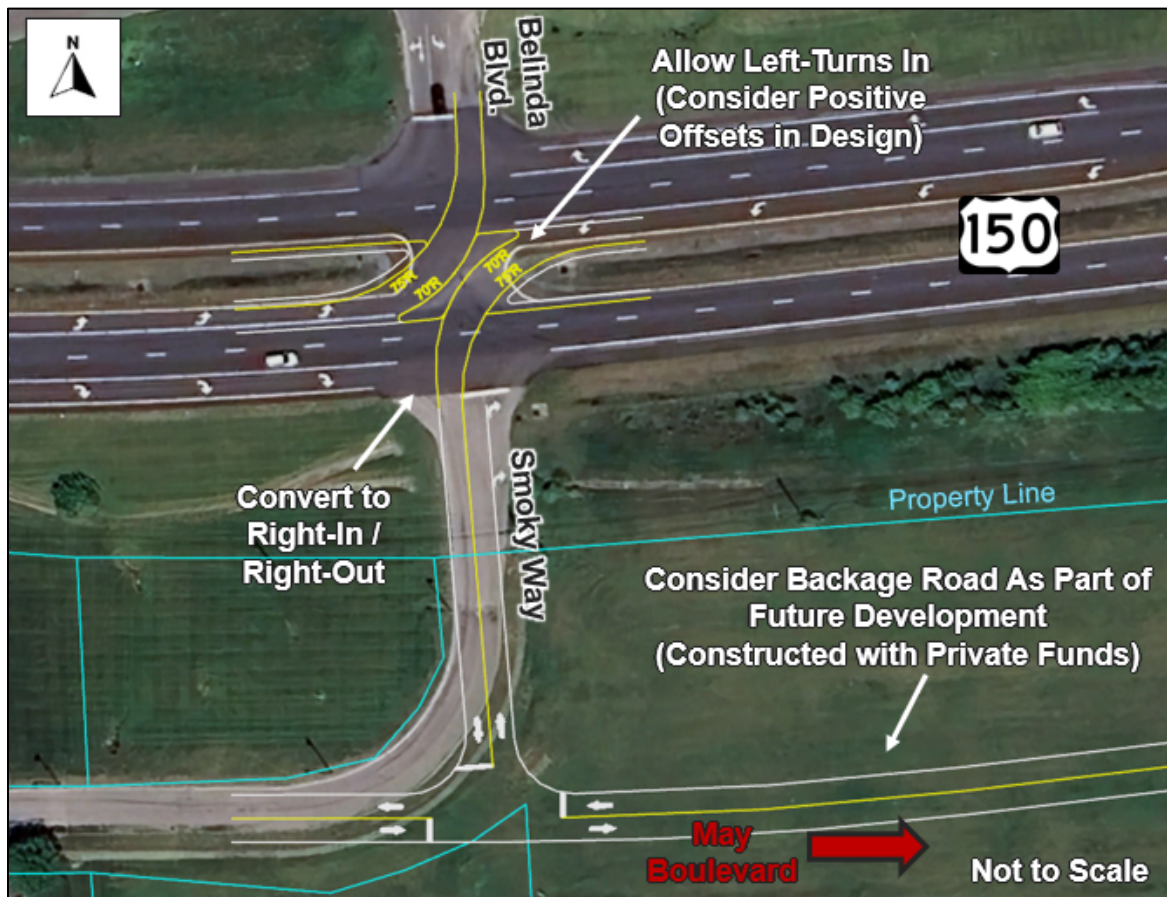


Figure 31: South Danville Bypass at Belinda Boulevard / Smoky Way

#### South Danville Bypass at Skywatch Drive

- Construct positive offset left-turn lanes on the South Danville Bypass, as shown in Figure 23.
- Construct wide pavement “bump outs” to allow trucks and buses to make U-turns.
- Reconfigure the intersection to force northbound traffic entering Skywatch Drive north of the intersection to left or right rather than continuing straight. Vehicles traveling southbound on Skywatch Drive will be restricted from turning left and must yield to the eastbound approach before entering the intersection. Additionally, westbound Skywatch Drive will be restricted to right-in / right-out. Because this is a city street, the City of Danville would be responsible for implementing the improvements on Skywatch Drive.

#### South Danville Bypass at Denmark Drive

- Construct positive offset left-turn lanes on the South Danville Bypass, as shown in Figure 32.
- Construct a westbound right-turn lane on the South Danville Bypass.

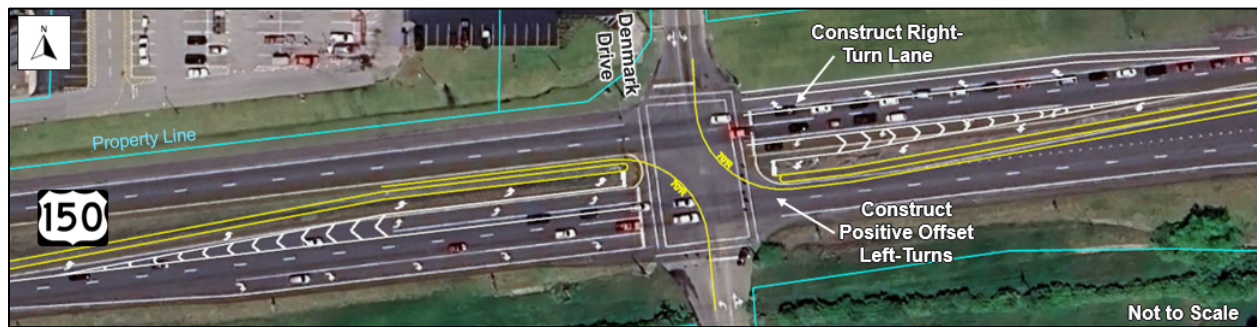


Figure 32: South Danville Bypass at Denmark Drive

### South Danville Bypass at US 127

- Construct an acceleration lane for the channelized eastbound right-turn lane, as shown in **Figure 33**.
- Construct a median barrier on the northbound US 127 approach to restrict left-turns into Jane Trail.

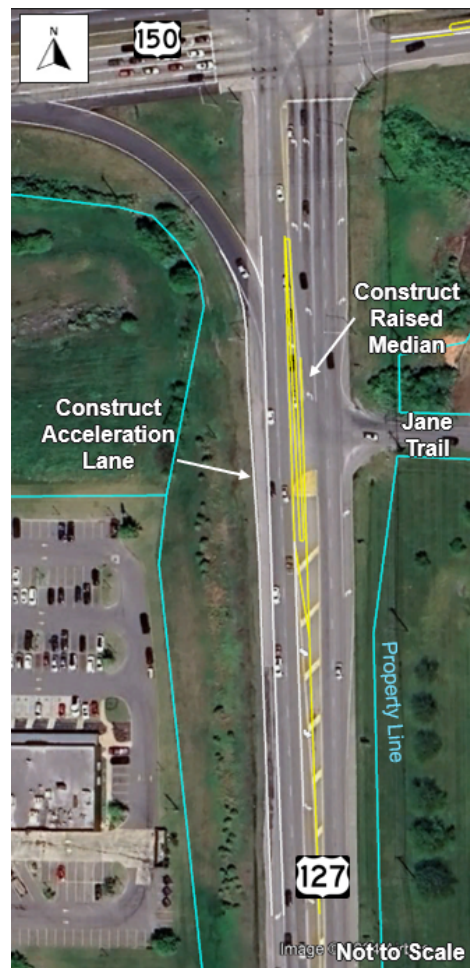


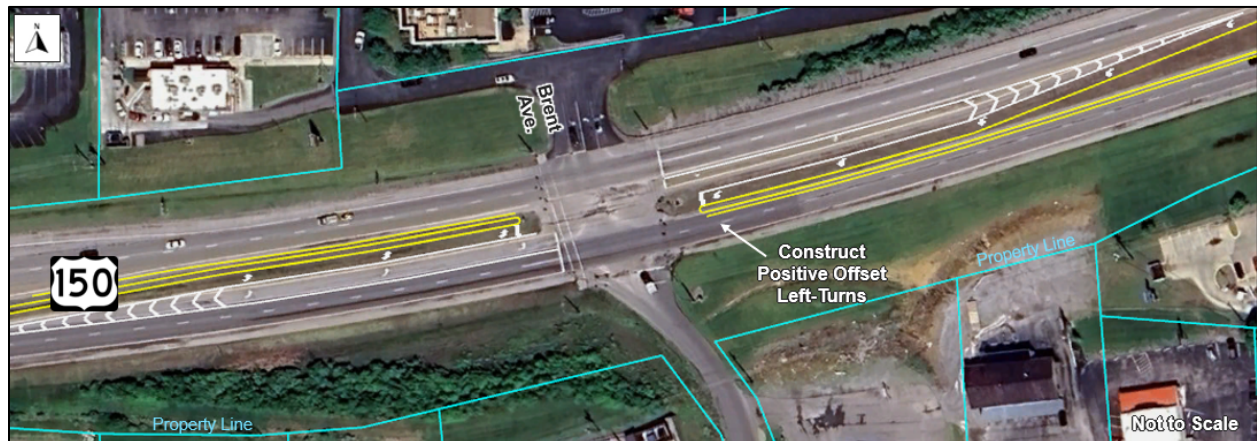
Figure 33: South Danville Bypass at US 127



### 9.2.1.2 South Danville Bypass between US 127 and Gose Pike

#### South Danville Bypass at Brent Avenue

- Construct positive offset left-turn lanes on the South Danville Bypass, as shown in **Figure 34**.



**Figure 34: South Danville Bypass at Brent Avenue**

#### South Danville Bypass at Brenda Avenue

- Convert the Brenda Avenue intersection to an RCUT with westbound left turns from South Danville Bypass allowed in, as shown in **Figure 35**.
- Consider a frontage road to connect to Montgomery Way, including an intersection with Southtown Connector Drive. The frontage roads are shown as guidance for future developments and would need to be constructed with private funds. Hightower Road and Shannon Way are backage roads that serve the existing businesses, which may negate the need for the frontage road connection at this location.



Figure 35: South Danville Bypass at Brenda Avenue & Southtown Connector Drive

#### South Danville Bypass at Southtown Connector Drive

- Convert the Southtown Connector Drive intersection to an RCUT with left turns allowed from the South Danville Bypass.

#### South Danville Bypass at Daniel Drive / Commerce Street

- Construct positive offset left-turn lanes on the South Danville Bypass, shown in **Figure 36**.
- Construct eastbound and westbound right-turn lanes on US 150.
- Restripe the northbound Commerce Street approach to a left-turn lane and combined through / right-turn lane.
- Construct “bump outs” for U-turns.

#### South Danville Bypass at Windjammer Circle

- The frontage road connecting Southtown Drive to Windjammer Circle was recently constructed with private funds as part of a new development.
- Close the median opening.



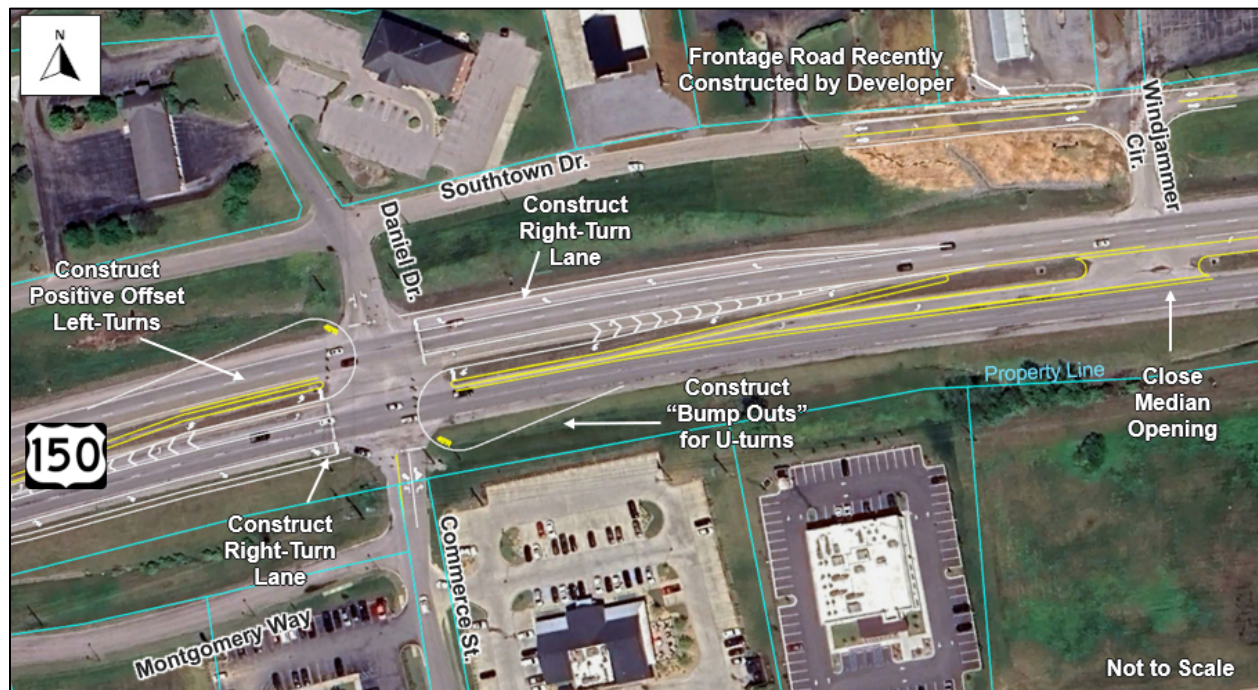


Figure 36: South Danville Bypass at Daniel Drive & Windjammer Circle

#### South Danville Bypass at Shannon Way

- Convert the Shannon Way intersection to an RCUT with left turns from the South Danville Bypass allowed in, as shown in **Figure 37**.
- Construct a backage road connecting Shannon Way to Gose Pike. The backage roads are shown as guidance for future developments and would need to be constructed with private funds.
- **South Danville Bypass at Gose Pike**
  - Construct positive offset left-turn lanes on the South Danville Bypass.
  - Construct eastbound and westbound right-turn lanes.
  - Construct "bump outs" for U-turns.

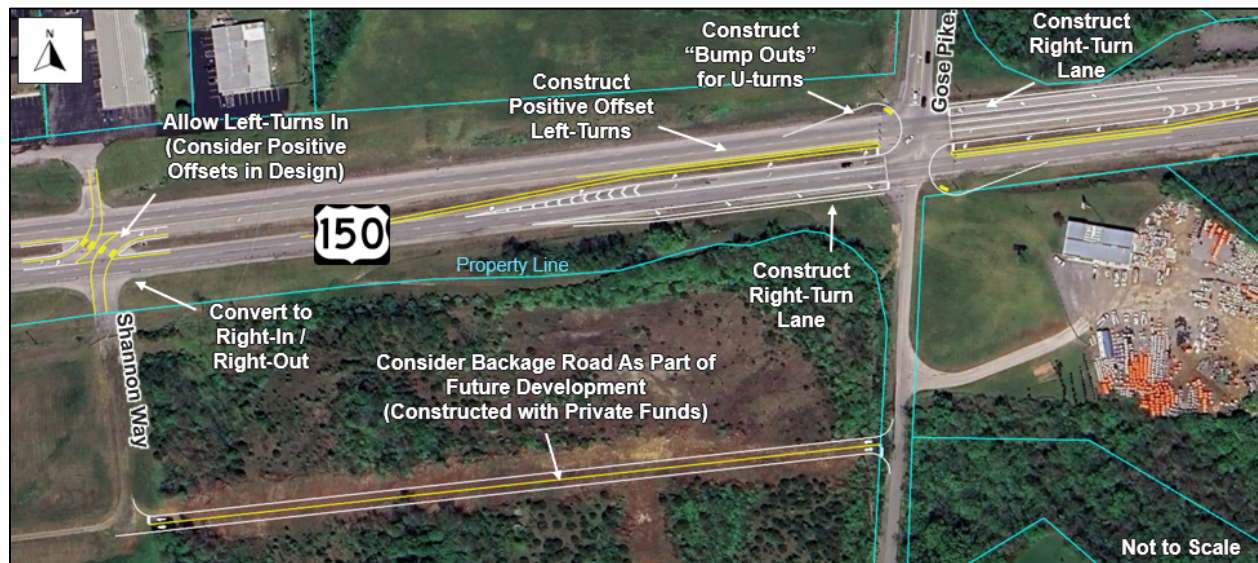


Figure 37: South Danville Bypass at Shannon Way & Gose Pike

### 9.2.1.3 South Danville Bypass between Gose Pike and US 150

- Consolidate median openings, as shown in **Figure 38**.

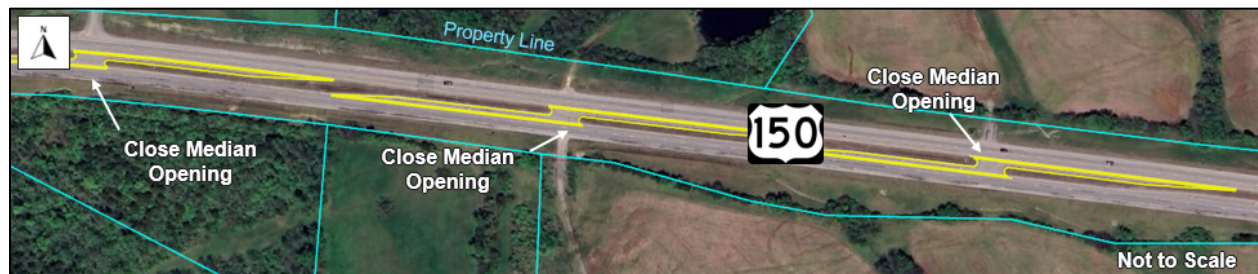


Figure 38: South Danville Bypass between Gose Pike and US 150

## 9.2.2 Rural Section

The Rural Section includes US 150 between the US 150B intersection in Boyle County and the Frontier Boulevard intersection in Lincoln County. This portion is a rural corridor serving mostly farmland and residential areas with median openings every 600 feet. Revised are shown in **Figure 39** improvements include:

- Convert intersections to MUTs or RCUTs. Intersecting roadways with higher traffic volumes and locations where school busses turn would allow left turns in from US 150.
- Consolidate median openings and construct U-turn openings with left-turn lanes and wider pavement for trucks and buses with approximately 1,200' spacing, as shown in **Figure 40**.



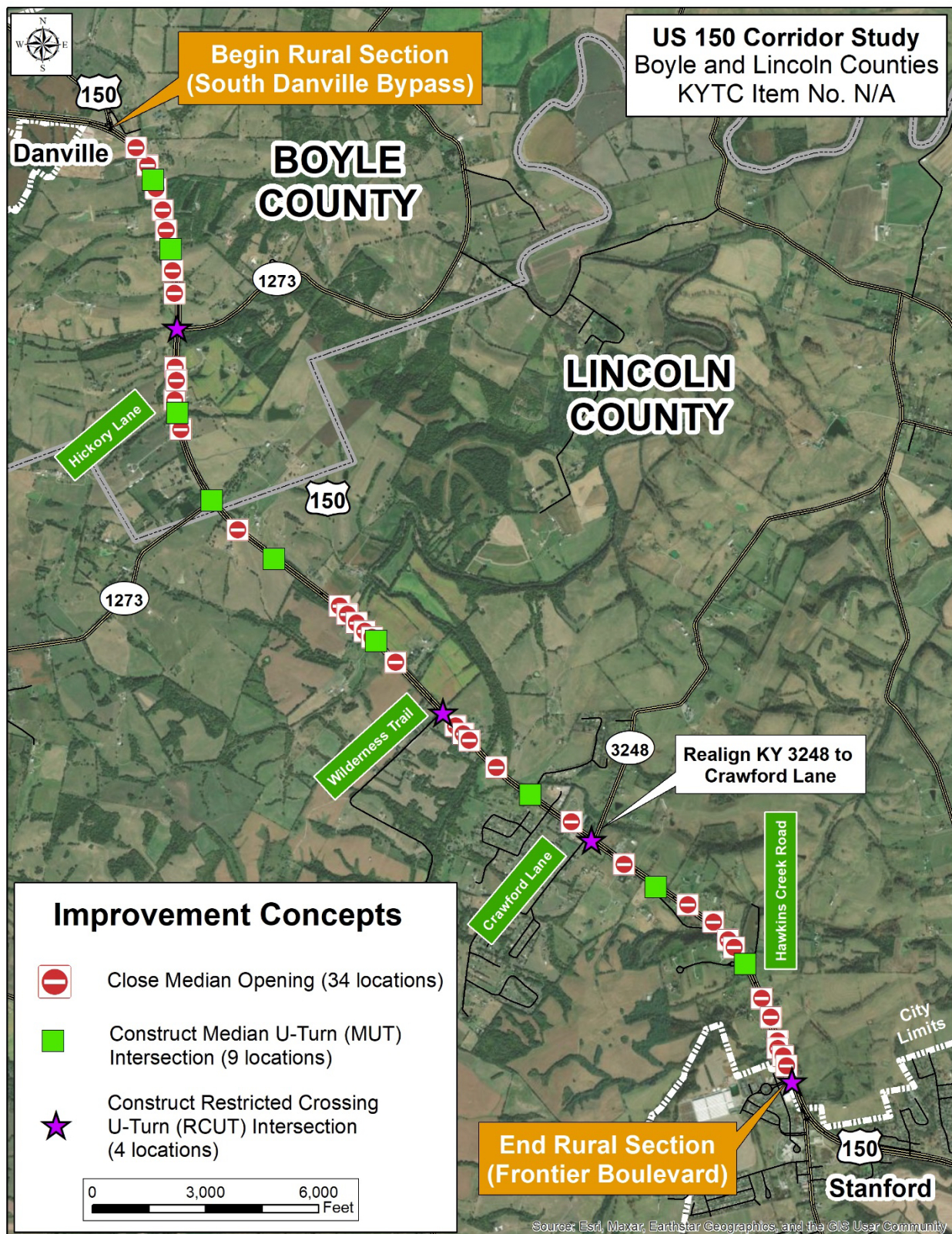


Figure 39: Revised Improvement Concepts - Rural Section





Figure 40: Example Median Opening Relocation (Rural Section)

### 9.2.3 Stanford Section

The Stanford Section includes US 150 in Lincoln County from Frontier Boulevard to east of the US 27 intersection. This section of the study corridor transitions to a more urban setting with commercial areas and increased congestion. Revised improvements are summarized in the following sections and shown in **Figure 44**.

#### US 150 at Frontier Boulevard

- Convert to an RCUT with left turns from westbound US 150 allowed in, as shown in **Figure 42**.



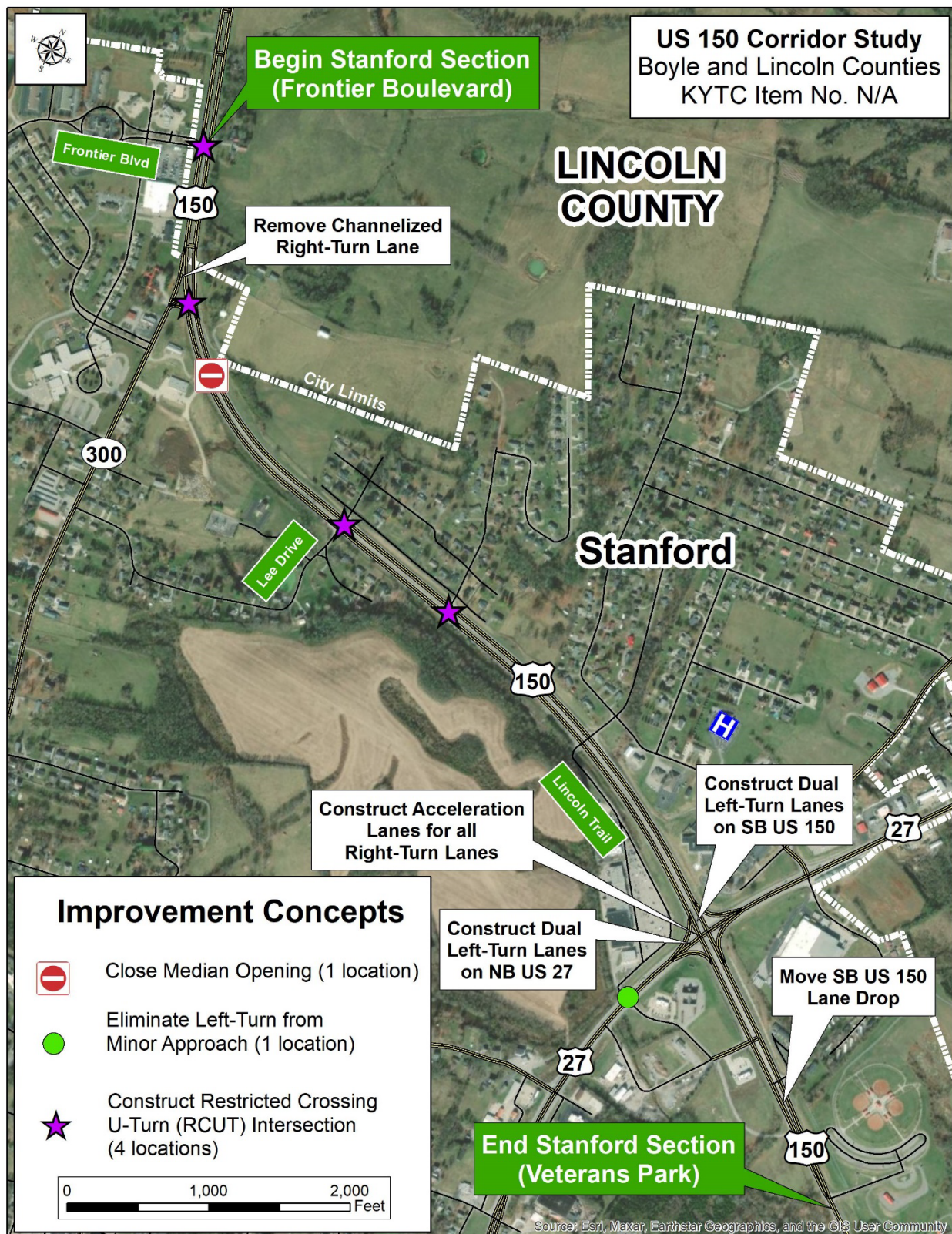


Figure 41: Revised Improvement Concepts - Stanford Section



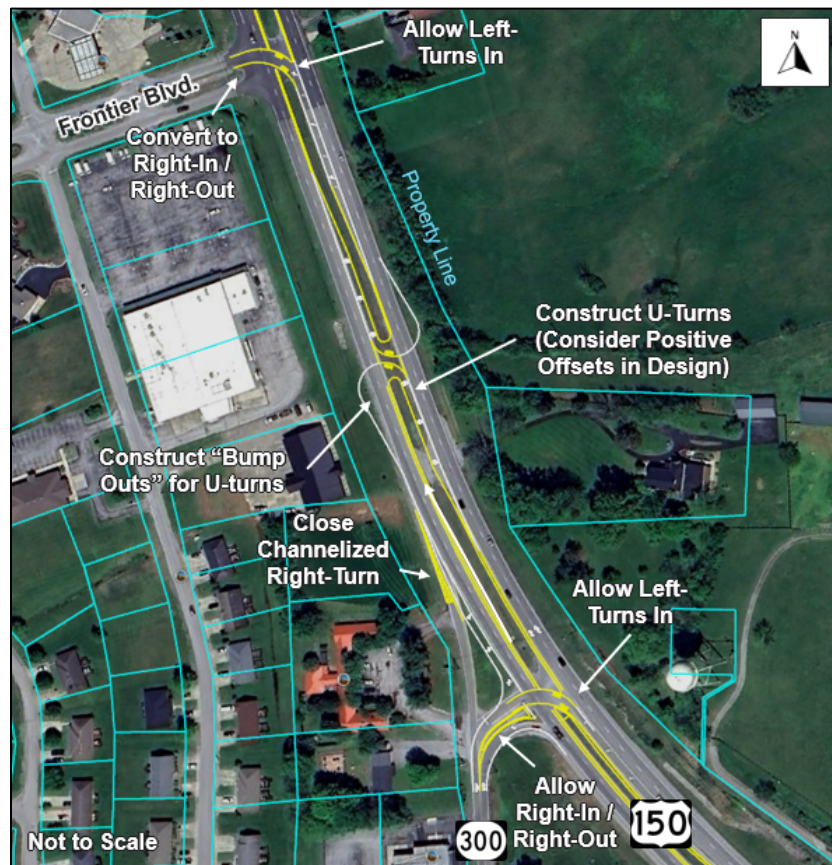


Figure 42: US 150 at Frontier Boulevard & KY 300

#### US 150 at KY 300

- Convert to an RCUT.
- Remove the eastbound US 150 channelized right-turn lane.
- Construct median opening on US 150 between Frontier Boulevard and KY 300 and between KY 300 and Indian Trail with positive offset left-turn lanes and "bump outs" for U-turns.

#### US 150 at Indian Trail & Choctaw Drive

- Convert to right-in / right-out with left-turns from US 150 allowed in, as shown in **Figure 43**.
- Construct "bump outs" for U-turns.
- Convert the entrance to Dollar General to right-in/right-out.

#### US 150 at US 27

- Construct acceleration lanes for the channelized right turns, as shown in **Figure 44**.
- Construct northbound dual left-turn lanes on US 27.
- Extend the second US 150 eastbound through lane east of Oakview Road.
- Convert the US 27 intersection with Vincent Road to an RCUT with left turns from US 27 allowed in.





Figure 43: US 150 at Indian Trail and Choctaw Drive

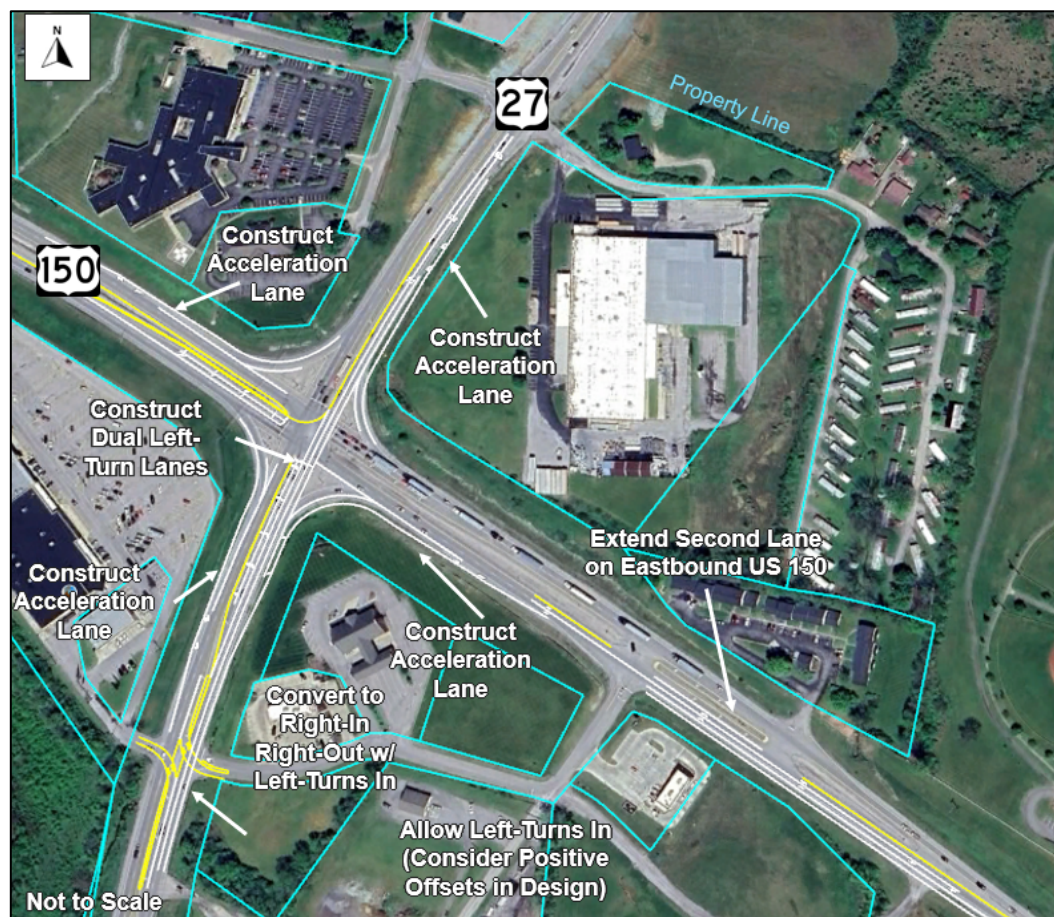


Figure 44: US 150 at US 27

## 10.0 CONCLUSIONS

The objective of the *US 150 Corridor Study* was to improve safety, congestion, and mobility on the South Danville Bypass and US 150 from Fireside Drive in Danville to US 27 in Stanford. Improvement concepts were developed based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance.

### 10.1 COST ESTIMATES

**Table 5** presents the cost estimates for the improvement concepts within each Section.

**Table 5: Cost Estimates (2023 Dollars)**

Section	County	Description	Design	Right-of-Way	Utility	Construction	Total
Danville	Boyle	South Danville Bypass from Fireside Drive to US 150 (3.3 miles)	\$1.9 million	\$1.6 million	\$0.6 million	\$12.8 million	\$16.9 million
Rural	Boyle	US 150 from South Danville Bypass to the Boyle County Line (2.1 miles)	\$0.5 million	\$0.2 million	\$0.1 million	\$3.1 million	\$3.9 million
	Lincoln	US 150 from the Lincoln County Line to Frontier Boulevard (4.1 miles)	\$0.6 million	\$0.7 million	\$1.0 million	\$4.3 million	\$6.6 million
	Total	US 150 from the South Danville Bypass to Frontier Boulevard (6.2 miles)	\$1.1 million	\$0.9 million	\$1.1 million	\$7.4 million	\$10.5 million
Stanford	Lincoln	US 150 from Frontier Boulevard to US 27 (1.3 miles)	\$0.9 million	\$0.3 million	\$0.3 million	\$5.7 million	\$7.2 million



## 10.2 EVALUATION MATRIX

**Table 6** presents an evaluation matrix showing the total 2023 cost estimate for the improvement concepts within each Section, the return-on-investment (ROI), the priority rankings based on input from the Local Officials / Stakeholders, and whether or not the improvements address the project goals. The ROI compared the estimated costs to the expected safety (i.e., crash reduction) benefits for the improvements. An ROI above one indicates the project is cost-effective. **Appendix G** presents a summary of the safety benefit calculations.

**Table 6: Evaluation Matrix**

Project Goals	Danville Section	Rural Section		Stanford Section
		Boyle County	Lincoln County	
Project Length	3.3 miles	2.1 miles	4.1 miles	1.3 miles
Design Cost	\$1.9 million	\$500,000	\$600,000	\$900,000
Right-of-Way Cost	\$1.6 million	\$200,000	\$700,000	\$300,000
Utility Cost	\$600,000	\$100,000	\$1 million	\$300,000
Construction Cost	\$12.8 million	\$3.1 million	\$4.3 million	\$5.7 million
Total Cost Estimate (2023 Dollars)	\$16.9 million	\$10.5 million		\$7.2 million
Return-On-Investment (ROI)	1.7	1.4		3.5
Local Officials Priority Ranking	2	3		1
Improves Safety	✓	✓		✓
Reduces Existing Congestion	✓	✓		✓
Accommodates Future Traffic	✓	✓		✓
Reduces Right-of-Way Impacts	✓	✓		✓
Reduces Utility Impacts	✓	✓		✓

## 10.3 NEXT STEPS

The recommended improvement concepts in all three Sections satisfy the project goals of improving safety, congestion, and mobility on US 150 and the South Danville Bypass and were deemed cost-effective based on results from the ROI analysis.

The next step following this study for any potential improvements would be Phase 1 Design (Preliminary Engineering and Environmental Analysis). Further funding will be necessary to



advance an improvement to the design phase. Depending on funding availability, the improvement concepts within each Section could be implemented separately, over time.

In the Rural and Stanford Sections, there are three design projects listed in the recently passed *2024-2026 Biennial Highway Plan*:

- KYTC Item No. 8-80300.00 has \$1.368 million in design funds listed in FY 2026 for improving safety and access control along US 150 from Danville to Stanford.
- KYTC Item No. 8-80001.00 has \$150,000 in design funds listed in FY 2024 for installing a turn lane on US 150 near Crawford Lane in Lincoln County,
- KYTC Item No. 8-80111.00 has \$100,000 in design funds listed in FY 2024 for installing a turn lane on US 150 at the Dollar General on Withers Court in Stanford, and

The recommended improvements in the Rural and Stanford Sections address safety and congestion issues at all three project locations listed above. As such, it is recommended they be combined into one design project and completed as KYTC Item No. 8-80300.00 to provide consistency throughout the corridor. A low-cost, short-term concept in the Stanford Section that could be reevaluated by KYTC is a reduced speed limit on US 150 in Stanford. Reducing the speed limit from 55-mph to 45 -mph was recommended by several Local Officials and Stakeholders.

In the Danville Section, the City of Danville is currently pursuing a Safe Streets and Roads for All (SS4A) Federal grant to help implement the improvement concepts identified as part of this study. If successful, they would work with KYTC during design.

## **11.0 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)) or the KYTC District 8 Project Manager, Jeff Dick, at (606) 677-4017 (email at [JeffD.Dick@ky.gov](mailto:JeffD.Dick@ky.gov))

