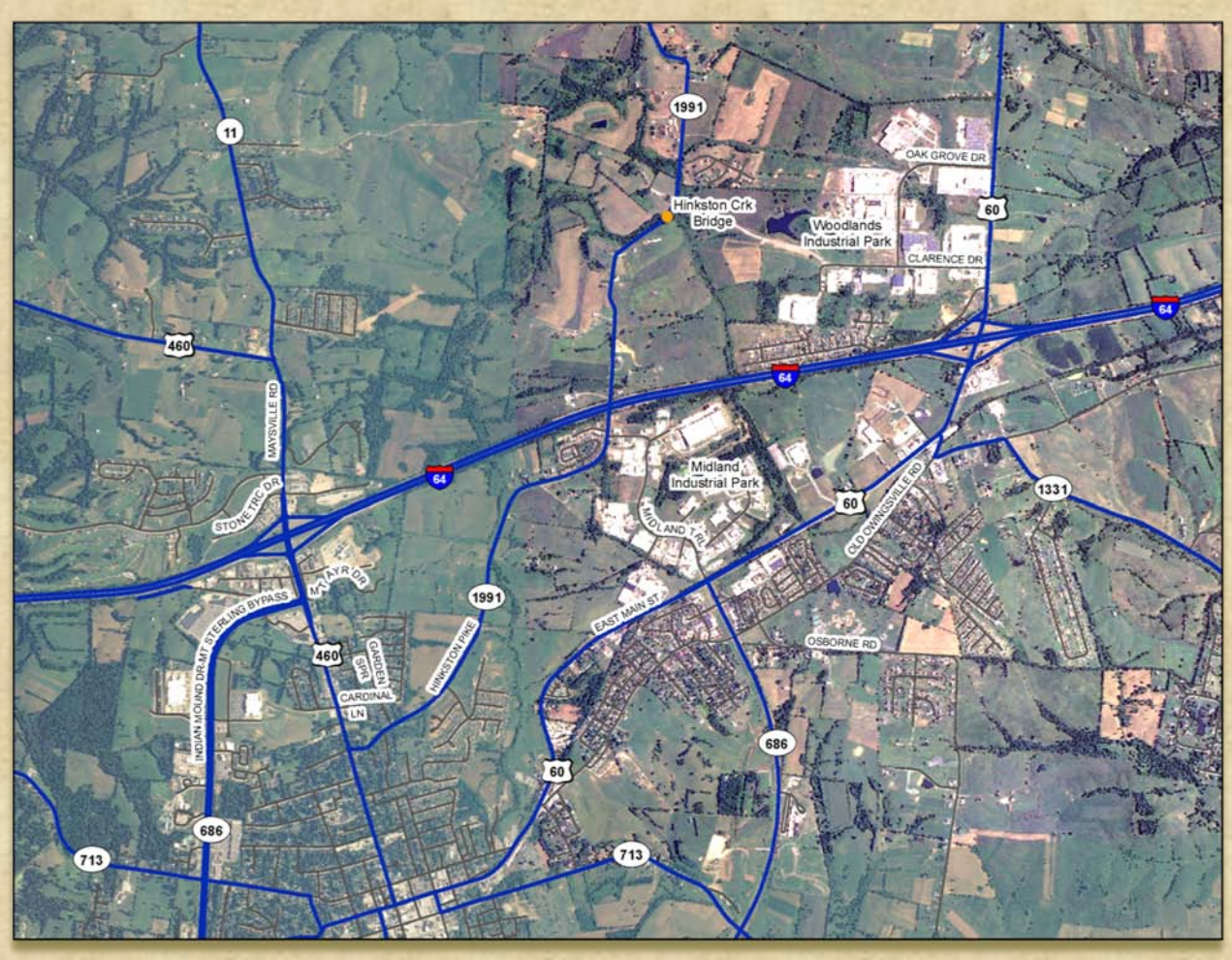
FINAL REPORT

MT. STERLING SUB-AREA PLANNING STUDY



PREPARED FOR:

KENTUCKY TRANSPORTATION CABINET

PREPARED BY:

QK4

Architecture Engineering Planning

Groundbreaking by Design.

January, 2012

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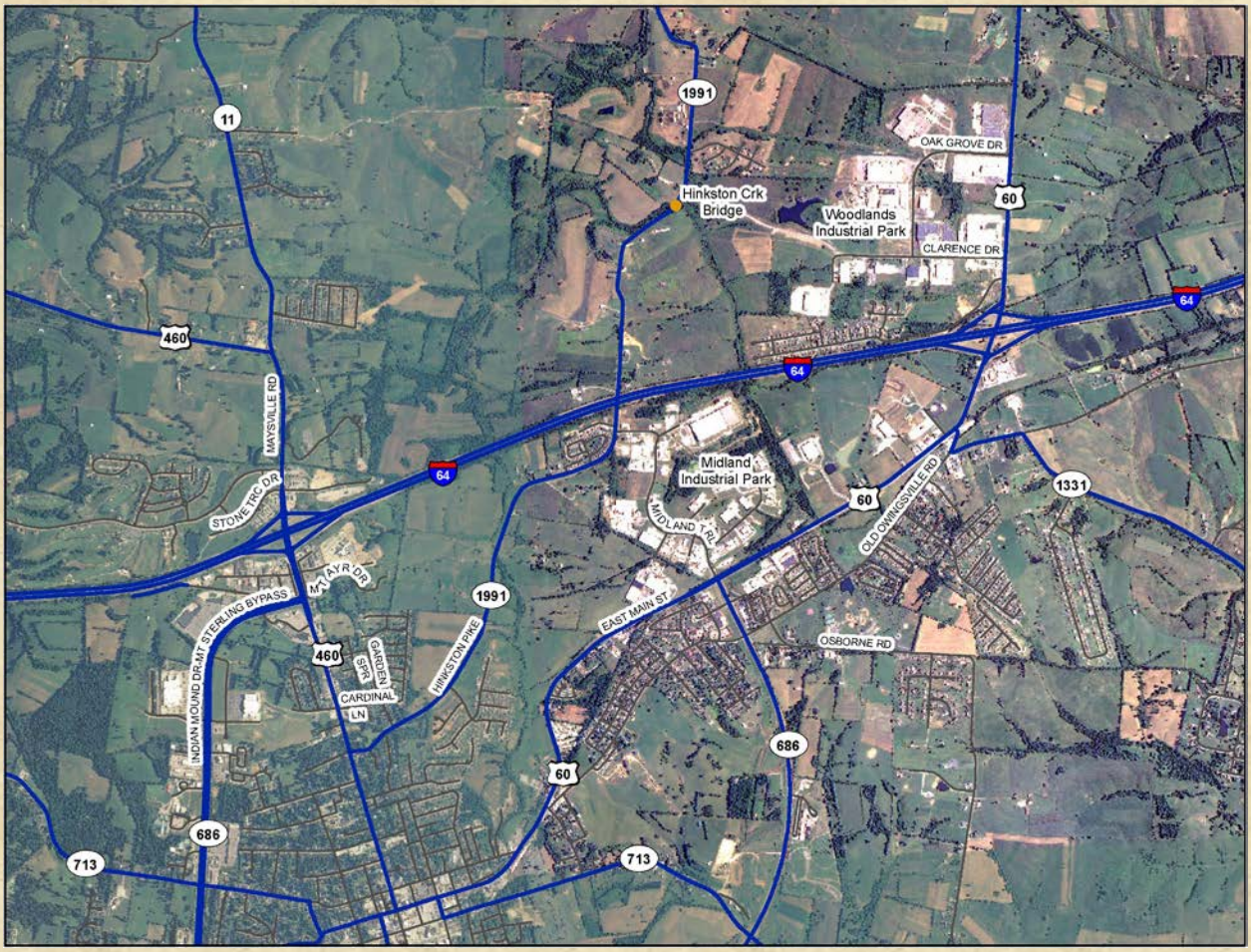

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January, 2012

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EXECUTIVE SUMMARY

Study Area

Mt. Sterling is the county seat of Montgomery County in the central Bluegrass Region of Kentucky. Over the past decade Mt. Sterling experienced a 17.3% increase in population and Montgomery County saw a similar (17.5%) increase. In comparison, Kentucky experienced an increase of 7.4%.

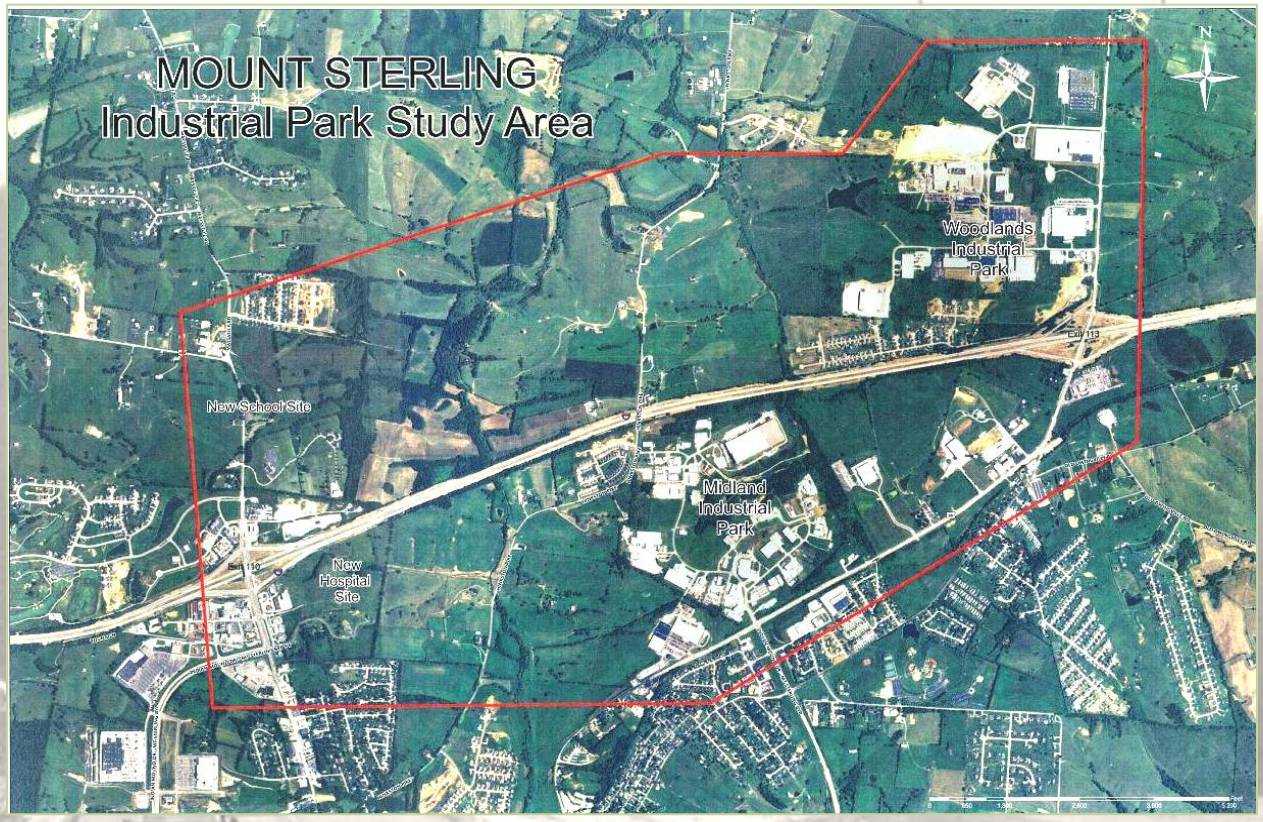


Figure ES-1: Project Study Area

Study Purpose and Issues

The Kentucky Transportation Cabinet (KYTC) initiated a study to identify needed improvements to the transportation system in and surrounding a portion of the Mt. Sterling area north and south of I-64 from the interchange with US 460/KY 11, Exit 110, eastward to the US 60 interchange, Exit 113 as shown in Figure ES-1.

The purpose of the transportation improvements identified in the Mt Sterling study area is to improve access in case of emergencies such as spills, explosions, or fires for the Woodlands Industrial Park, and to improve safety and reduce congestion on the transportation network. Currently all access into the park is from US 60. The need for safety and congestion improvements on various routes in the study area results from existing, and forecasted future, traffic volumes which produce deficient Levels-of-Service in the design year on several routes. A Crash Analysis has also identified several problem locations.

- As the study progressed, the following issues were considered as projects were developed:
- Improved or additional access to the Woodlands Industrial Park (WIP) in case of emergencies
- Potential expansion of employment in the Woodlands Industrial Park
- Relocation of St. Joseph's Hospital to a new facility near US 460 south of I-64 exit 110
- Construction of a new elementary school west of US 460 north of I-64 exit 110
- A desire within the community to add access to I-64 from Hinkston Pike
- A desire within the community to connect the east and west ends of the Mt. Sterling Bypass

Conditions Analysis

Currently, US 460/KY 11 in the vicinity of I-64 Exit 110 operates below LOS C, as does KY 686 at its western terminus with US 460/KY 11. All other major roadways within the study area operate at LOS C or greater.

Several roadway segments including US 60, I-64, KY 686, US 460 and KY 1991 (Hinkston Pike) in the study area showed Critical Crash Rate Factors (CCRF) greater than 1.0. Analyses showed a high percentage of nighttime crashes on US 60 just south of I-64 Exit 113. Streets and roads with relatively high traffic volumes—US 60, US 460, KY 686—typically have a low percentage of single-vehicle crashes. Conversely, a low volume road, such as KY 1991, has a higher percentage of such crashes. Adequacy ratings are a means of assessing a roadway's conditions based on three factors—safety, congestion, and pavement condition. The adequacy ratings for major area roadways indicate that 61% to 70% of Kentucky's similar roads are rated higher than US 460 in the study area. By comparison, the ratings for KY 686 indicate that only a fourth of the state's roads are rated higher than KY 686 at its junction with US 460. (See Section 2.4, Adequacy Rating, for further details.)

Project Development and Evaluation

Seventeen potential projects of varying size and type were looked at throughout the course of this study. These projects are shown in Figure ES-2.

The KYTC Project Team, using Stakeholders' input from two meetings, three project team meetings and presentation of data and analysis, narrowed the list of 17 projects to a list of six recommended short- and intermediate-term solutions estimated to cost a total of $7.78 million. The remaining projects were either referred to the Highway District 7 Office to be considered in the Planning Process through completion of a Project Identification Form or for operational improvements, considered to be outside the study purpose or area, or not critical to be included in an implementation plan. Recommended projects are shown in Table ES 1 and Figure ES-3.

Figure ES-2: All Projects Identified Throughout the Course of the Study

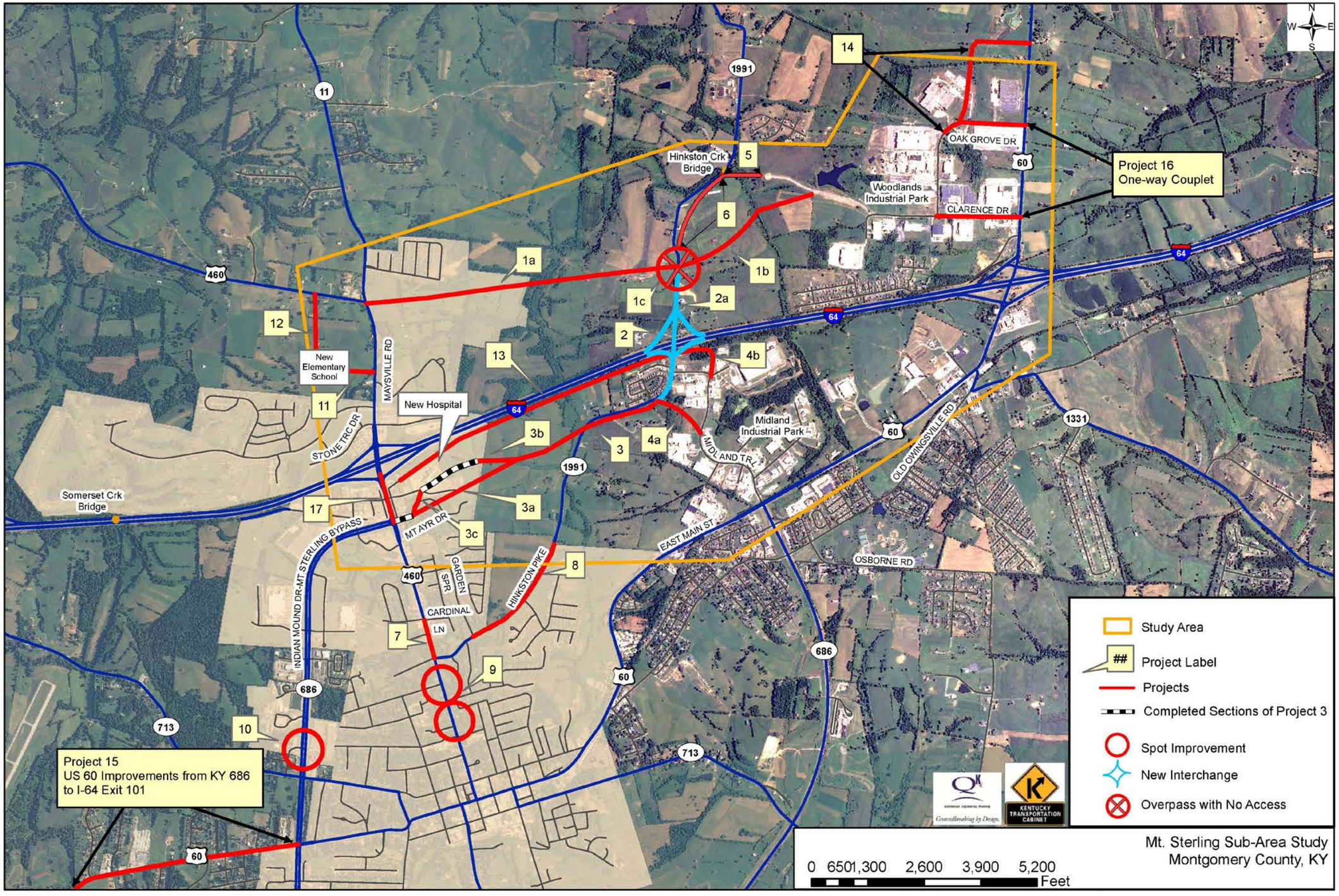
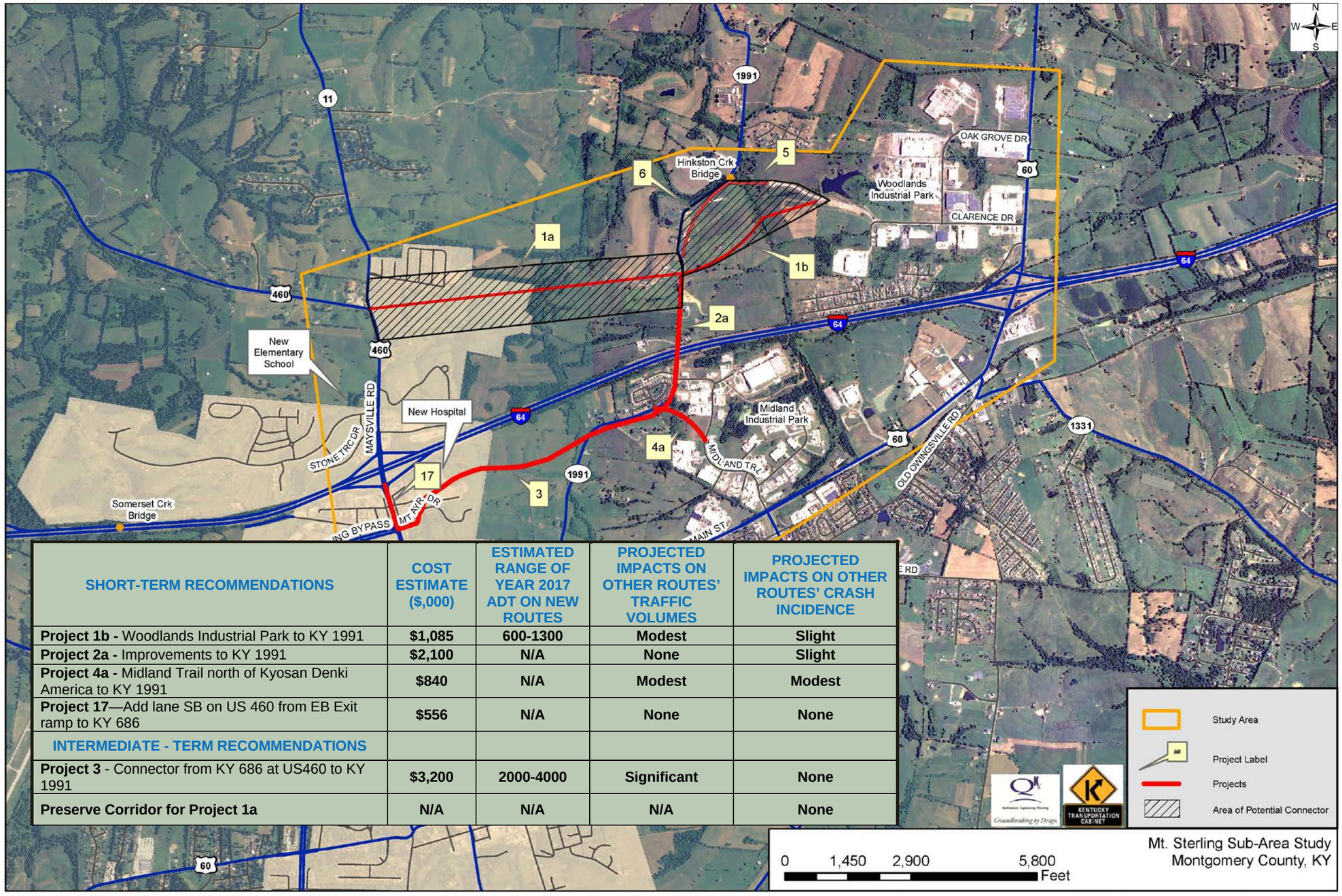


Figure ES-3: Recommended Projects



SHORT-TERM RECOMMENDATIONS	COST ESTIMATE ($,000)	ESTIMATED RANGE OF YEAR 2017 ADT ON NEW ROUTES	PROJECTED IMPACTS ON OTHER ROUTES' TRAFFIC VOLUMES	PROJECTED IMPACTS ON OTHER ROUTES' CRASH INCIDENCE
Project 1b - Woodlands Industrial Park to KY 1991	**$1,085**	**600-1300**	**Modest**	**Slight**
Project 2a - Improvements to KY 1991	**$2,100**	**N/A**	**None**	**Slight**
Project 4a - Midland Trail north of Kyosan Denki America to KY 1991	**$840**	**N/A**	**Modest**	**Modest**
Project 17—Add lane SB on US 460 from EB Exit ramp to KY 686	**$556**	**N/A**	**None**	**None**
INTERMEDIATE - TERM RECOMMENDATIONS				
Project 3 - Connector from KY 686 at US460 to KY 1991	**$3,200**	**2000-4000**	**Significant**	**None**
Preserve Corridor for Project 1a	**N/A**	**N/A**	**N/A**	**None**

1.0 INTRODUCTION

1.1 STUDY AREA

Mt. Sterling is the county seat of Montgomery County in the central Bluegrass Region of Kentucky (see Figure 1). Montgomery County is a regional hub for economic development where at least 22 counties commute to work. The Year 2010 U.S. Census identified Montgomery County in the top 10 growth areas of Kentucky. Mt. Sterling had a recorded 2010 population of 6,895 residents. According to same census, over the past decade Mt. Sterling experienced a 17.3% increase in population and Montgomery County, population 26,499, saw a similar (17.5%) increase. In comparison, Kentucky experienced an increase of 7.4%.

Identifying itself as the *Gateway between the Bluegrass and the Mountains,*[1] Mt. Sterling is a rural community located along I-64 just 29 miles east of the state's second largest urban area—Lexington-Fayette County. Mt. Sterling provides immediate access to the major east-west I-64 and close proximity to the north-south I-75 in Lexington. Mt. Sterling has 35 industries that employ more than 5,000 people. The focus of local development efforts is on manufacturing, and companies that are among the major employers are the internationally known Nestle Prepared Foods Company, which employees 1,200 and ships to 48 states from its facility in Mt. Sterling; Cooper Standard Automotive, which recently completed a $4 million expansion, adding 120 jobs to its Mt. Sterling facility; and Cleveland, Ohio-based Olympic Steel, which currently employs 20 people at its warehouse and shipping facility and has plans to invest a total of $11.2 million. In the project area, there are two industrial parks—Midland Trail Industrial Park on Midland Trail between Owingsville Road (US 60 east) and KY 1991, and Woodlands Industrial Park on US 60 north of the I-64 interchange at Exit 113.

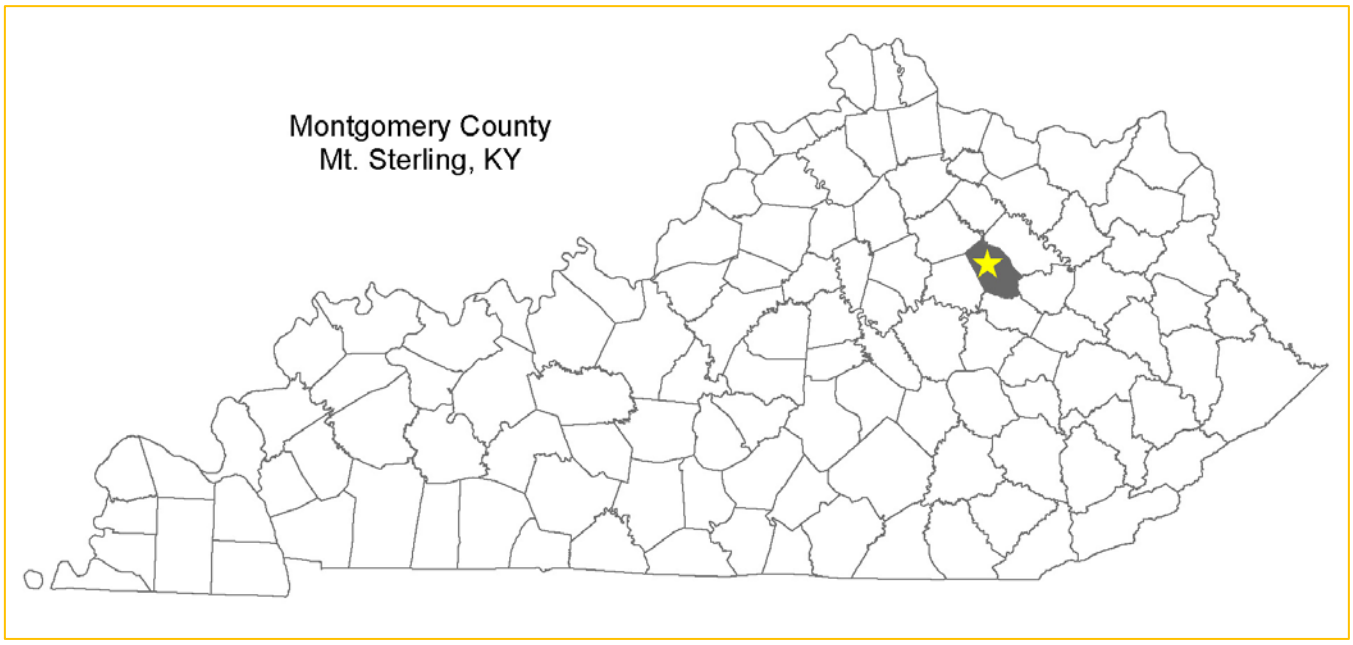


Figure 1 – Study Location

Existing health, education, and cultural facilities located in Mt. Sterling include St. Joseph–Mount Sterling hospital, which recently relocated to a new 40-bed facility that provides 300 jobs and serves Montgomery, Bath, Menifee and Powell counties; the Clay Community Center, which is home to an extended campus for Morehead State University; a new elementary school; and the Gateway Regional Arts Center,

[1] Source: http://mtsterlingtourism.com/

which is housed in a building listed on the National Register of Historic Places and includes a performance hall, an art gallery, and related facilities.

1.2 STUDY PROCESS

This study process included the following tasks:

- Conduct project site visits
- Review and evaluate highway inventory and crash data. Consult with the KYTC Project Team, local officials, and stakeholders to obtain their input
- Identify existing and projected future congested roadway segments
- Identify roadway spots where there is a statistically significant history of crashes
- Identify possible solutions and estimate project costs
- Present study information and obtain input at meetings with the KYTC Project Team, local officials, and stakeholders
- Develop recommendations and prioritize projects, with input from the local officials and stakeholders

1.3 STUDY PURPOSE AND ISSUES

The Kentucky Transportation Cabinet (KYTC) initiated a study to identify needed improvements to the transportation system in and surrounding a portion of the Mt. Sterling area north and south of I-64 from the interchange with US 460/KY 11, Exit 110, eastward to the US 60 interchange, Exit 113 as shown in Figure 2.

Figure 2 - Study Area Outlined by KYTC

This study is the result of discussions that began several years ago regarding a possible extension of Clarence Drive westward to KY 1991 (Hinkston Pike) to provide additional access to the Woodlands Industrial Park (WIP) in case of emergencies. Clarence Drive has since been extended westward but not as far as Hinkston Pike. Improvements to Hinkston Pike south of Midland Trail were included in the KYTC 2010 Highway Plan, but have not been implemented pending the results of this study.

The purpose of the transportation improvements identified in the Mt Sterling study area (detailed in Figure 3) is to improve safety by improving emergency access for the Woodlands Industrial Park, and reduce congestion and improve safety on the transportation network. The need for these improvements results from existing, and forecasted future, traffic volumes, which produce a deficient Level-of-Service in the design year on US 60 between I-64 and Clarence Drive. A Crash Analysis has also identified a total of 19 0.1-mile spots that have a Critical Crash Rate Factor > 0.9.

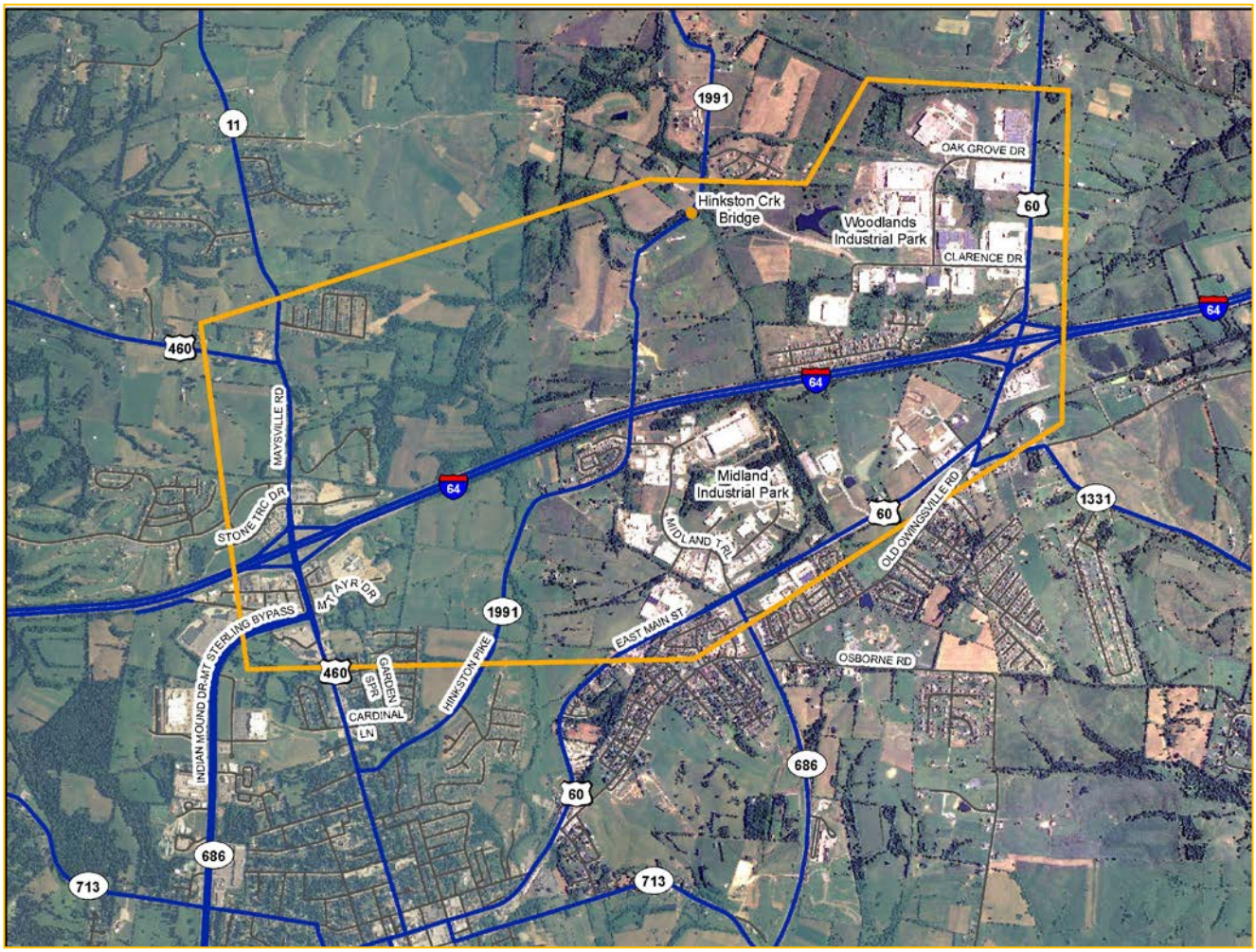


Figure 3: Study Area Details

As the study progressed, the following issues were considered as projects were developed:

- Improved or additional access to the WIP in case of emergencies
- Potential expansion of employment in the WIP
- Relocation of St. Joseph's Hospital to a new facility near US 460 south of I-64 Exit 110
- Construction of a new elementary school west of US 460 north of I-64 Exit 110
- A desire within the community to add access to I-64 from Hinkston Pike
- A desire within the community to connect the east and west ends of the Mt. Sterling Bypass

2.0 EXISTING AND FUTURE NO-BUILD CONDITIONS

2.1 HIGHWAY AND TRAFFIC CHARACTERISTICS

Data on the existing conditions of the major routes in the study area, were taken from the Division of Planning's Highway Information System (HIS) database and other noted sources, and is summarized in Table 1. The highlighted numbers in Table 1 indicate substandard conditions.

2.2 CURRENT YEAR LEVEL OF SERVICE AND DELAY

Level of service (LOS) is a qualitative measure of expected traffic conflicts, delay, driver discomfort, and congestion. Levels of service are described according to a letter rating system (similar to school grades) ranging from LOS A (free flow, minimal or no delays—best conditions) to LOS F (stop and go conditions, very long delays—worst conditions). For intersections the 2010 Highway Capacity Manual defines levels of service based on the average delay due to the signal or stop control. LOS C is often considered the threshold for desirable traffic conditions in cities such as Mt. Sterling. Current average daily traffic (ADT) volumes and levels of service on the major project area roads are shown on Exhibit 1 in Appendix A. Currently, US 460/KY 11 near I-64 Exit 110 operates below LOS C, as does KY 686 at its western terminus with US 460/KY 11. All other major roadways within the study area operate at LOS C or better.

2.3 CURRENT CRASH DATA

Abbreviated crash records from the Kentucky State Police website were reviewed to see if the crash patterns for the problem spots and segments in the study area deviated from the common metrics of crashes on similar roadway types. Table 1 summarizes this overview while Table 2 depicts some crash characteristics for those roadway segments exhibiting a Critical Crash Rate Factor (CCRF) equal to or greater than 1. The "Critical Crash Rate" is the maximum crash rate expected to occur on a roadway section, given the statewide average crash rate for that functional road class, the ADT volume, and the roadway section length. The ratio of the actual crash rate to the critical crash rate produces a Critical Crash Rate Factor (CCRF). If the roadway section's actual crash rate exceeds the critical rate (i.e., the CCRF is greater than 1.0), then that roadway section has more crashes than is statistically probable to be occurring randomly. Crashes spots and type are depicted in Figure 4.

There appears to be a high percentage of nighttime crashes on US 60 just south of I-64 Exit 113. Streets and roads with relatively high traffic volumes—US 60, US 460, KY 686—typically have a low percentage of single-vehicle crashes. Conversely, a low volume road, such as KY 1991, more often has a higher percentage of such crashes.

Table 1: Summary of Current Roadway Characteristics

Route	Beginning MP	Description	Ending MP	Description	Year 2011 LOS[1]	2011 ADT[2]	Crash Rate Factor (CRF)[3]	Composite Adequacy Rating Percentile[4]
US 60	7.185	KY 686	8.251	KY 1331	C	9,200	0.199	94
	8.251	KY 1331	8.647	I-64 Overpass	C	14,100	**2.059**	62
	8.647	I-64 Overpass	9.600		C	12,600	0.675	98
	9.600		10.036	Quisenberry Rd	A	3,100	0.522	68
US 460	7.316	KY 11	7.848	Stone Trace Dr / Interstate Dr	A	10,000	0.402	**39**
	7.848	Stone Trace Dr / Interstate Dr	8.281	KY 686/Mt Ayr Dr	**D**	18,500	**1.340**	**31**
	8.281	KY 686/Mt Ayr Dr	8.909	KY 1991	**D**	15,500	**1.190**	**30**
KY 1991	0.000	US 460	0.203	Garden Springs Dr	A	1,800	0.218	This information not available in HIS for KY 1991
	0.203	Garden Springs Dr	1.768	Midland Trail	A	1,700	**1.204**	
	1.768	Midland Trail	2.734	Hinkston Creek Bridge (B00032)	A	800	0.666	
KY 686	0.000	US 460	1.364	KY 713	**D**	17,500	**1.134**	74
	6.081	Old US 60	6.333	US 60	C	7,000	0.651	94
I-64	108.445	Somerset Creek Bridge – B00026	109.621	US 460 Underpass	A	23,600	**1.000**	100
	109.621	US 460 Underpass	112.498	US 60 Underpass	A	24,000	0.716	100
	112.498	US 60 Underpass	115.184	Saltwell Creek Culvert – B00028	A	21,400	0.353	100

[1] *2010 Highway Capacity Manual (see Section 2.2 for details),*
[2] *KYTC Traffic Counts System and 2011 Turning Movement Counts*
[3] *Kentucky Transportation Center Buildup Program and Kentucky State Police Crash Data (see Section 2.3 for details), and*
[4] *KYTC Highway Information System database. (The Composite Adequacy Rating Percentile is a method developed by FHWA and refined by KYTC to assess a roadway's condition. See Section 2.4, Adequacy Rating for details.)*

Table 2: Crash Analysis of Problem Spots and Segments

Route	Beginning MP	Ending MP	Number of Crashes	Critical Crash Rate Factor (CCRF)	% Crashes Occurring in Dry Weather	% Single Vehicle Crashes	% Night-time Crashes
US 60	KY 1331 (MP 8.251)	I-64 Overpass (MP 8.647)	41	2.059	68.1%	7.7%	54.9%
US 460	Stone Trace Drive (MP 7.848)	KY 686 (MP 8.281)	65	1.340	74.8%	3.7%	24.0%
US 460	KY 686 (MP 8.281)	KY 1991 (MP 8.909)	41	1.190	76.5%	3.9%	15.7%
KY 686	US 460 (MP 0.000)	KY 713 (MP 1.364)	145	1.134	75.7%	2.8%	17.2%
KY 1991	Garden Springs Drive (MP 0.203)	Midland Trail (MP 1.768)	11	1.204	67.4%	76.1%	34.8%
I-64	Somerset Creek Bridge (MP 108.445)	Saltwell Creek Culvert (MP 109.621)	24	1.000	50.0%	74.2%	37.9%

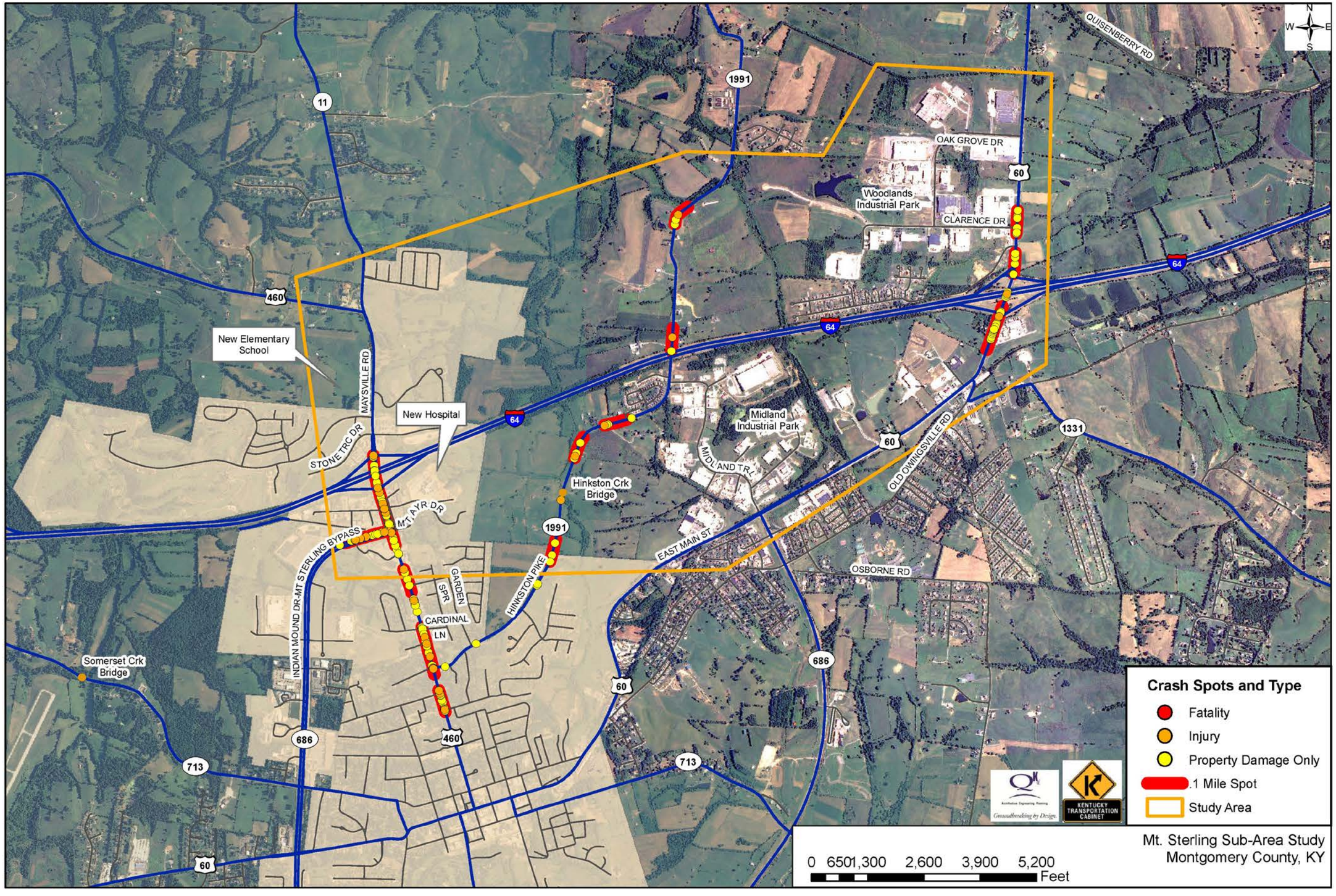


Figure 4: Crash Spots and Type

2.4 ADEQUACY RATING

The Composite Adequacy Rating Percentile is a method originally developed by FHWA and subsequently refined by KYTC to assess a roadway's condition. The ratings are calculated by individual functional class and based upon three roadway components—safety, congestion, and pavement condition—with each component comprised of several measures. The rating scores 100 as a perfect, or near perfect, highway. The Adequacy Percentile ranks a particular roadway section compared to other Kentucky roads in the same functional class into a percentile. For example, a road section with a composite adequacy percentile of 75.0 means that 25% of similar roads are rated better.

As indicated in Table 1, the Adequacy Ratings for the major roads indicate that 61% to 70% of Kentucky's roads are rated higher than sections of US 460 in the project corridor. By comparison, the ratings for KY 686 indicate that only 26% of the state's roads are rated higher from US 460 to KY 713, and only 6% of the state's roads are rated higher than the section from Old US 60E to US 60E. Adequacy ratings are not calculated by KYTC for roadways, such as KY 1991, that are functionally classified as Minor Collectors or Local Streets.

2.5 FUTURE YEAR LEVELS OF SERVICE

Projected future year roadway traffic volumes, levels of service, and other base data are shown in Exhibit 1 in Appendix A, and summarized in Table 1, for the current street and highway system ("no build"). The growth rates used to project future year traffic were determined after a review of the linear growth rate from historical count data maintained by KYTC; functional class average growth rate from the average traffic growth rates by functional class **Traffic Forecasting Report**[2] dated January 2008; examination of the population growth in Mt Sterling Montgomery County, and Kentucky; updated traffic counts performed by KYTC District 7 personnel; zoning and land use maps; recent and anticipated future expansions such as the hospital, school, and the Woodlands Industrial Park; and a review of the **St. Joseph Hospital Traffic Impact Study Mt Sterling, Kentucky**; and the **Montgomery County Schools Master Plan**. A growth rate of 2% was used for all routes in the western part of the study area. In the northeast portion of the study area around Woodlands Industrial Park, US 60E, KY 686 at US 60, and I-64 at US 60, a growth rate of 3% was used to project traffic to Year 2035. Congestion levels are projected to increase on US 60 north of I-64, on US 460 south of I-64, and on KY 686 at both its junctions with US 60 and US 460.

In the absence of a traffic model for Mount Sterling, engineering judgment was used to assign traffic ranges to new routes. Turning movements were performed at 11 intersections to understand the traffic patterns. Then, based on travel times and distances, traffic was estimated for new routes based on a range of percentage diversion.

Future Roadway Characteristics and other pertinent information regarding roadway characteristics are illustrated in Table 3 and Figure 5 of this study. Background information is located in Appendixes A and B.

[2] KTC-07-06/PL14-07-01F-Kentucky Transportation Center

Table 3: Projected Future Roadway Characteristic

Route	Beginning (MP)	Description	Ending MP	Description	Projected Year 2035 LOS	Projected 2035 ADT
US 60	7.185	KY 686	8.647	I-64	F	18,400
	8.647	I-64	8.951	Clarence Dr	F	22,000
	8.951	Clarence Dr	9.353	Oak Grove	A	22,000
US 460	7.316	KY 11	7.848	Stone Trace / Interstate Dr	B	16,100
	7.848	Stone Trace Dr / Interstate Dr	8.005	I-64 Overpass	D	18,500
	8.005	I-64 Overpass	8.281	KY 686/Mt Ayr Dr	F	34,400
KY 1991	0.000	US 460	1.768	Midland Trail	A	3,500
	1.768	Midland Trail	2.734	Hinkston Creek Bridge (B00032)	A	1,700
KY 686	0.000	US 460	1.364	KY 713	F	28,100
	6.081	Old US 60	6.333	US 60	F	14,200
I-64	108.445	Somerset Creek Bridge – B00026	109.621	US 460 Underpass	B	43,400
	109.621	US 460 Underpass	112.498	US 60 Underpass	B	44,100
	112.498	US 60 Underpass	115.184	Saltwell Creek Culvert – B00028	B	39,300

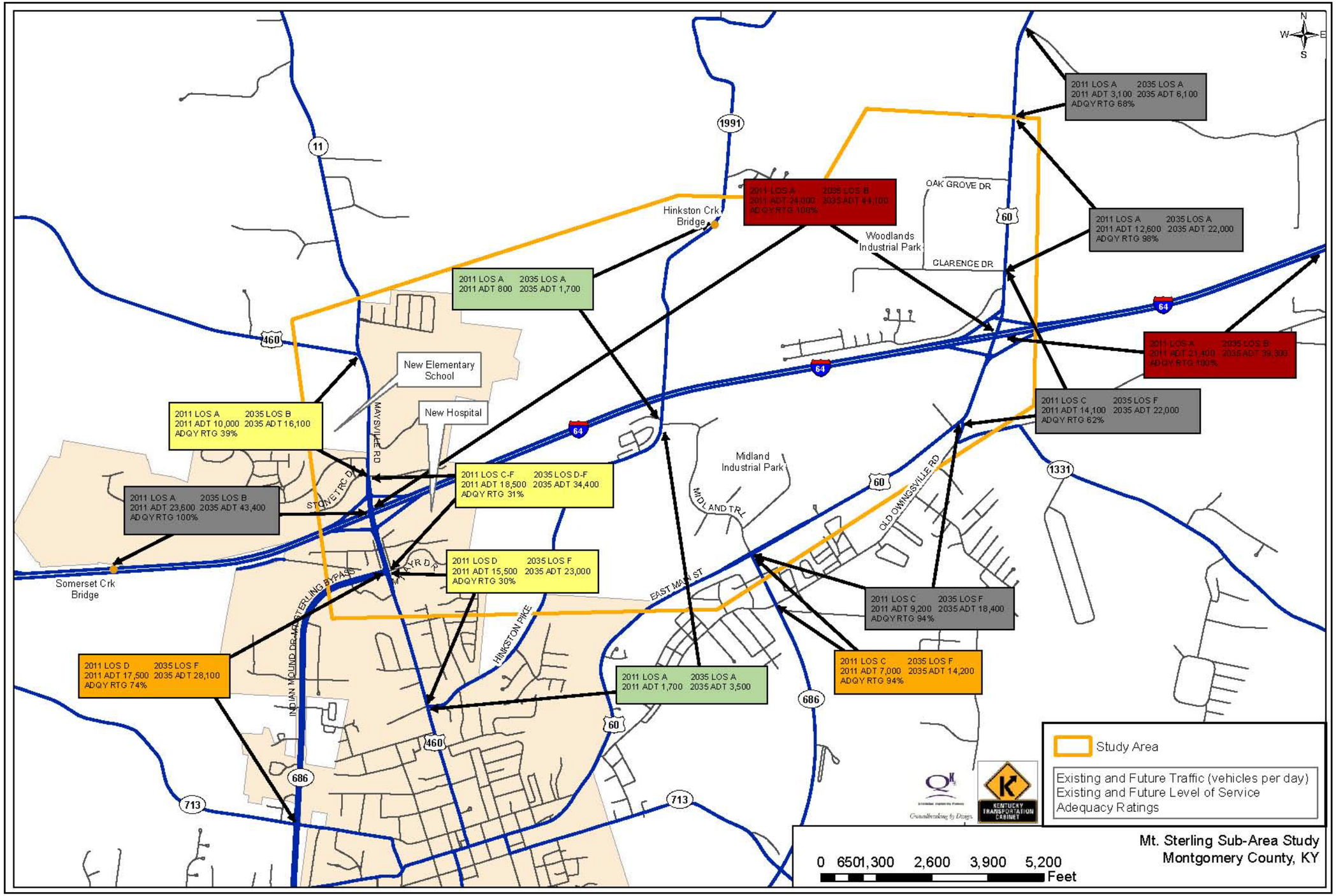


Figure 5: Existing and Future Roadway Characteristics

3.0 HUMAN ENVIRONMENTAL OVERVIEW

An environmental overview was conducted as a part of this overview. Figures 6, 7, and 8 summarize the overview. A summary of the known hazardous materials sites, including underground storage tanks, is provided as Appendix C (on a CD due to its volume). A letter report detailing known cultural historic and archaeological resources is included in Appendix D.

3.1 UST/HAZMAT

A search of 41 databases showed known or potential hazardous materials sites. Seventeen underground storage tanks were identified in or around the study area.

3.2 ARCHAEOLOGICAL AND HISTORIC SITES

An archaeological resource records search was conducted for this project in early 2011. The research included a review of the existing databases of the Office of State Archaeology. The research revealed that 51 archaeological sites have previously been identified within the study area: 39 of these sites are considered not eligible for listing in the National Register of Historic Places (NRHP); 11 have been insufficiently investigated for a determination of eligibility; and one site, on the southwest fringe of the study area, is listed in the NRHP and represents a pre-historic earth mound. In addition, 24 archaeological sites are located within a 1.24-mile buffer around the study area: 12 of those sites are considered not eligible for listing in the NRHP, while 12 others have been insufficiently investigated for a determination of eligibility.

A separate cultural historical resource overview was also conducted for the project study area in early 2011. This research included a review of the existing databases at the Kentucky Heritage Council. The overview identified one architectural resource that is currently listed in the NRHP although it has been demolished. This resource was located in the far southeast fringe of the study area. A second cultural resource in the study area was determined not eligible for listing in the NRHP, while a third site has been insufficiently investigated to make an eligibility determination. That third site is located within the Midlands Industrial Park. In addition, the Kentucky Heritage Council (KHC) has identified 10 buildings as “Historic Coded Properties,” meaning that, while they have not been formally surveyed, they have the potential to be historically significant.

3.3 AIR QUALITY AND NOISE IMPACTS

Sites within the study area where potential air quality concerns manifest themselves include all signalized intersections. Locations sensitive to transportation-related noise concerns include residential areas and the new school being constructed on the west side of US 460/KY 11 and north of I-64. As individual projects advance, noise analyses will be necessary.

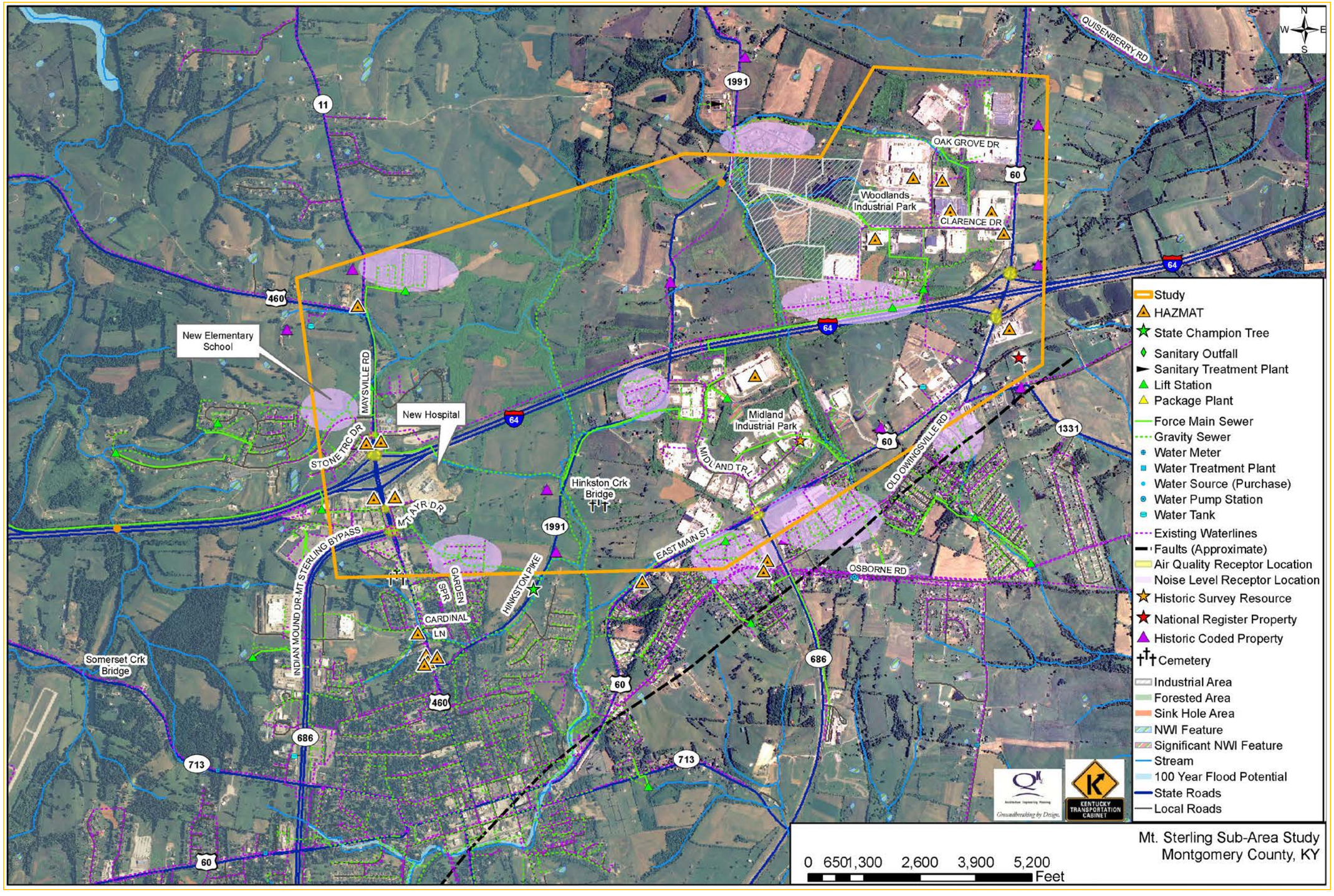


Figure 6: Environmental Footprint

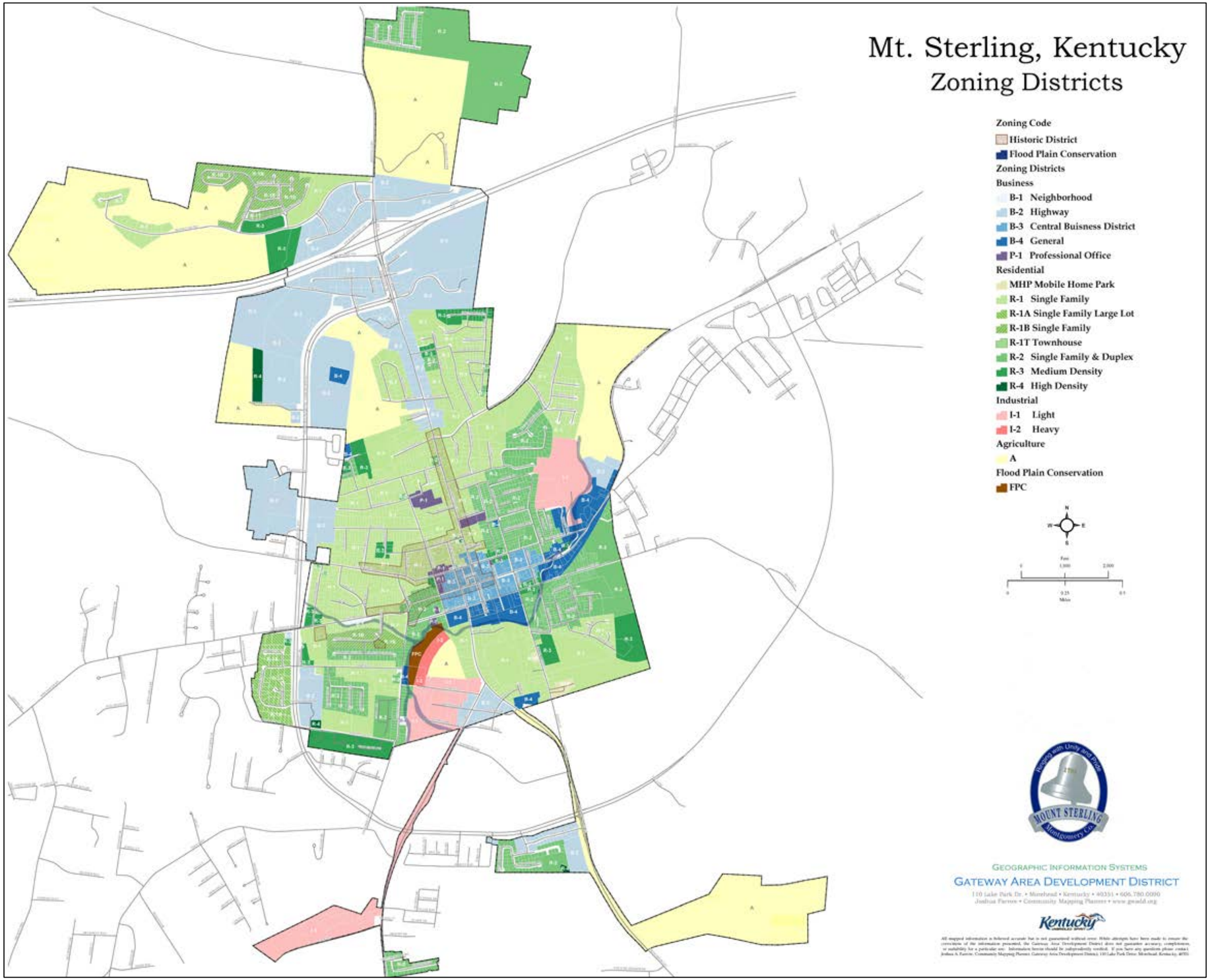


Figure 7: Mt. Sterling Land Use Map

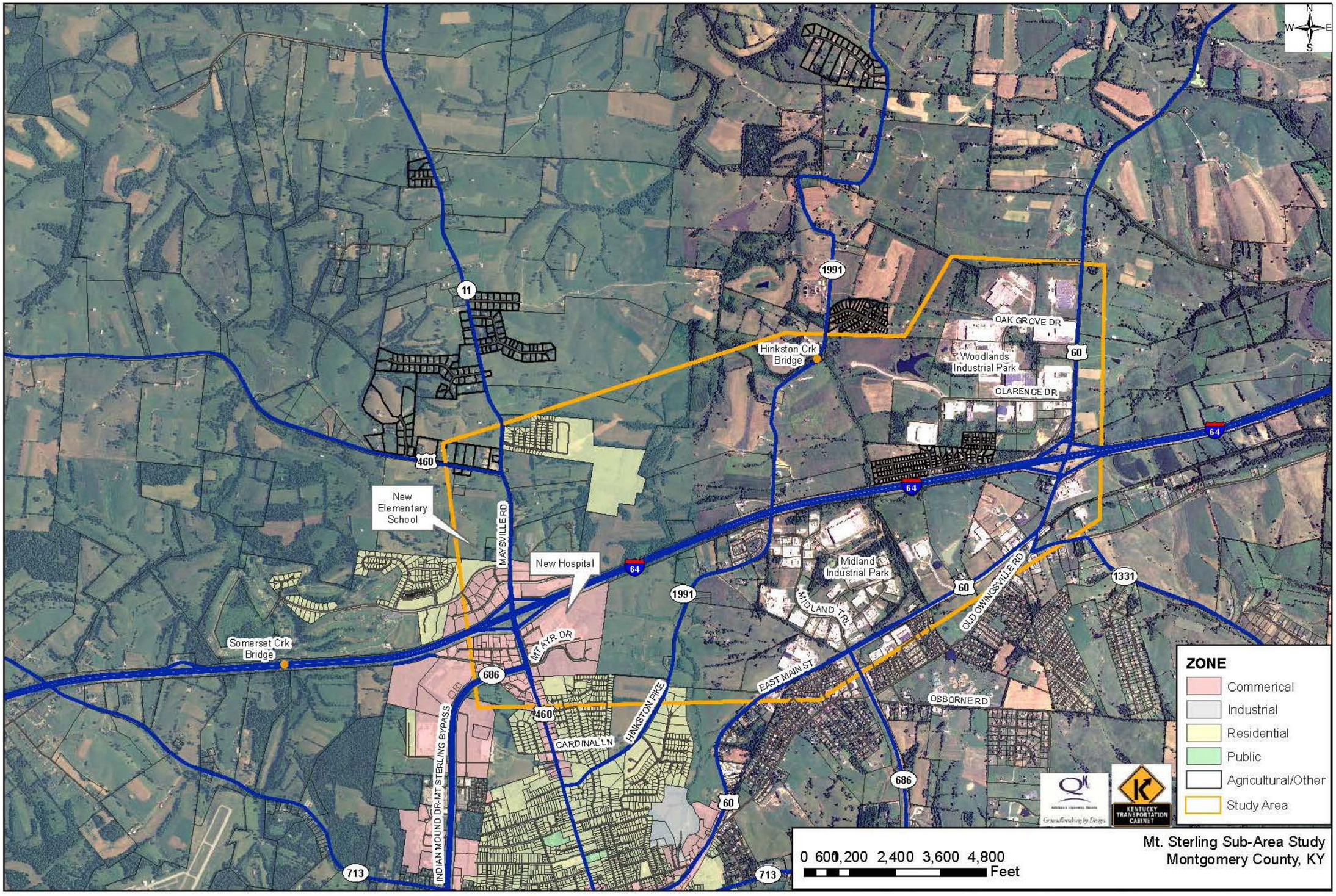


Figure 8: Residential Plats

3.4 LAND USE AND ZONING

The predominant land use within the study area is a mix of industrial and commercial development along major roadways, and a few residential clusters and institutional uses—namely the relocated St. Joseph Hospital and new elementary school northwest of I-64 Exit 110. North of the study area, land uses are primarily open agricultural. The Gateway Area Development District mapped zoning districts within the city limits of Mt. Sterling (Figure 7). The portion of Montgomery County outside the city of Mt. Sterling is not fully zoned, though some information on residential parcels is available (Figure 8).

3.5 ENVIRONMENTAL JUSTICE

Although not part of the scope of work, a preliminary review of the latest available U.S. Census data for the study area did not reveal environmental justice issues, in part because the study area is mostly industrial and commercial land use with few residential clusters. The US Census 2010 data was used for all categories but race and disability. Detailed Race data was not available for Year 2010 at the time of this study therefore Year 2000 data was used. As a result of this preliminary review, KYTC determined that the Gateway Area Development District would not perform a complete Environmental Justice report as a part of this study.

However, because the initial tool used did not map race with specific boundaries, further investigation of race and disability, revealed that the minority population in the study area is elevated as shown in Appendix E. Therefore, when or if projects progress from this study, a more in-depth comparison of the minority and disability impacts compared to the non-minority and non-disability impacts will be necessary.

4.0 NATURAL ENVIRONMENT

Herein is presented a brief summary of natural environmental issues within the study area. A complete Biological Overview Report is included in Appendix F.

4.1 AQUATIC ECOLOGY

Jurisdictional waters, as defined by the U.S. Army Corps of Engineers (USACE), are located within the study area. This includes an estimated 2.2-mile portion of Hinkston Creek, a perennial stream that flows south within the study area. In addition, there are multiple unnamed tributaries to Hinkston Creek that are potentially jurisdictional and could be impacted by roadway improvements. The headwaters of Salt Well Branch slightly encroach upon the study area to the east of US 60 with an estimated length of approximately 300 linear feet.

There are 23 potential palustrine wetlands present within the study area. No jurisdictional determinations were conducted during field surveys.

There are no outstanding waterways, wild rivers, or known exceptional waters within the study area. Mt. Sterling's wastewater treatment plant is located upstream of the study area. No aquatic macro invertebrate, fish, or water quality sampling was completed for this biological overview.

Coordination with USACE and the Kentucky Division of Water (KDOW) would be conducted during subsequent project development phases should proposed roadway improvements be undertaken that could impact jurisdictional waters and/or wetlands and require permits as a result.

4.2 TERRESTRIAL ECOLOGY, THREATENED AND ENDANGERED SPECIES

Terrestrial faunal species for which potential suitable habitat exists within the project study area are those readily adapted to habitat alteration and human disturbances. General terrestrial habitat types present within the study area include relatively small forest blocks, open areas (pasture/grasslands/agricultural), forest/field edge, and riparian zones. The largest section of relatively continuous forest exists in the northwestern section of the project along Hinkston Creek and to the west along unnamed tributaries to Hinkston Creek, although open areas such as grasslands and pasture make up the majority of the study area. Only small, scattered agricultural plots were observed during field verification. Riparian areas contribute some habitat but are minimal within the project study area and mainly located along Hinkston Creek and its tributaries.

The Kentucky Department of Fish and Wildlife Resources (KDFWR) Species Information System listed 10 mammal, 54 avian species, and 21 amphibian and reptile species that may possibly inhabit the study area. An ecological assessment of the terrestrial habitats would be necessary to accurately identify all taxonomic groups of terrestrial fauna present. No field surveys were conducted for terrestrial species within the project area.

The U.S. Fish and Wildlife Service (USFWS) identified one federally endangered mammal species, the Indiana bat (*Myotis sodalis*), and one federally endangered herbaceous plant species, running buffalo clover (*Trifolium stoloniferum*), as having a known occurrence in Montgomery County. The KDFWR Information System also indicated that the majority of the study area falls within the known summer habitat for the Indiana bat.

The Kentucky State Nature Preserves Commission (KSNPC) listed two occurrences of one mussel species, snuffbox (*Epioblasma triquerta*), recorded within the 5-mile buffer region of the study area for aquatic and federally listed species. Four additional species were noted from the 10-mile buffer for birds and mammals, including the sharp-shinned hawk (*Accipiter striatus*), Henslow's sparrow (*Ammodramus henslowii*), lark sparrow (*Chondestes grammacus*), and Indiana bat.

4.3 KARST AREAS

Mapping of karst features using the Kentucky Geological Survey's Geospatial Data Library revealed eight sinkholes but no known caves within the study area. Mapped features were located and field verified when possible; however, not all portions of the study area were readily accessible and more karst features may exist.

4.4 SPECIAL DESIGNATION LANDS

No state nature preserves, state parks, national parks, or wildlife management areas are present within the study area. Coordination with the Kentucky Division of Forestry revealed that there is one champion tree within the study area. A state champion hackberry (*Celtis occidentalis*) is located to the east of KY 1991 near Milepoint (MP) 0.6.

5.0 AGENCY AND STAKEHOLDER INVOLVEMENT

5.1 EARLY STAKEHOLDER INPUT

Following the first Project Team Meeting to discuss existing conditions, the Project Team sought input from stakeholders. The stakeholders included representatives from locally elected officials, the Mt. Sterling – Montgomery County Industrial Authority, Mount Sterling Police Department (MSPD), Mt. Sterling Water and Sewer, City of Mt. Sterling Planning and Zoning and Gateway Area Development District. The minutes of that meeting are located in Appendix G.

The members of the group raised the following concerns or issues:

- Would there be any benefit to another access to I-64 for Mt. Sterling?
- Concern has previously been expressed about a Hinkston Pike (KY 1991) to Clarence Drive connection because Hinkston Pike cannot handle the additional truck traffic. A route that would parallel I-64 and possibly bridge over Hinkston Pike and terminate near the new elementary school on Maysville Road is an alternate possibility.
- Some group members fear that any project that is south of I-64 Exit 110 will bring with it more congestion.
- Nestle had an explosion and the employees did not have an Interstate exit to use.
- Improvements will still likely have to be made to Hinkston Pike.
- The biggest part of Mt. Sterling's production workforce commutes from the South and East (Powell Bath, Menifee Counties). Management lives in Lexington and Winchester.
- Midland Trail Industrial Park has a very sharp curve that needs to be fixed. Trucks run off that curve daily.
- On US 460 South where a left turn lane was added, there is a big "hump", which results in a blind hill.

5.2 PROJECT DEVELOPMENT

Given the existing congestion and crash histories as well as the projected future levels of congestion, and input from the initial Stakeholders' Meeting, initial project concepts illustrated in Figure 9 and presented below, were developed to address these traffic and safety issues. Further, the desire for redundancy of transportation access to WIP in case of an emergency due to HazMat incidents that might result in closure of the main entrance, the relocated St. Joseph Hospital, and the new elementary school northwest of I-64 Exit 110 helped frame some of these concepts. Finally, potential future expansion of employment within WIP and development of satellite service functions near the hospital, either of which would generate additional traffic, also influenced the scope of these concepts.

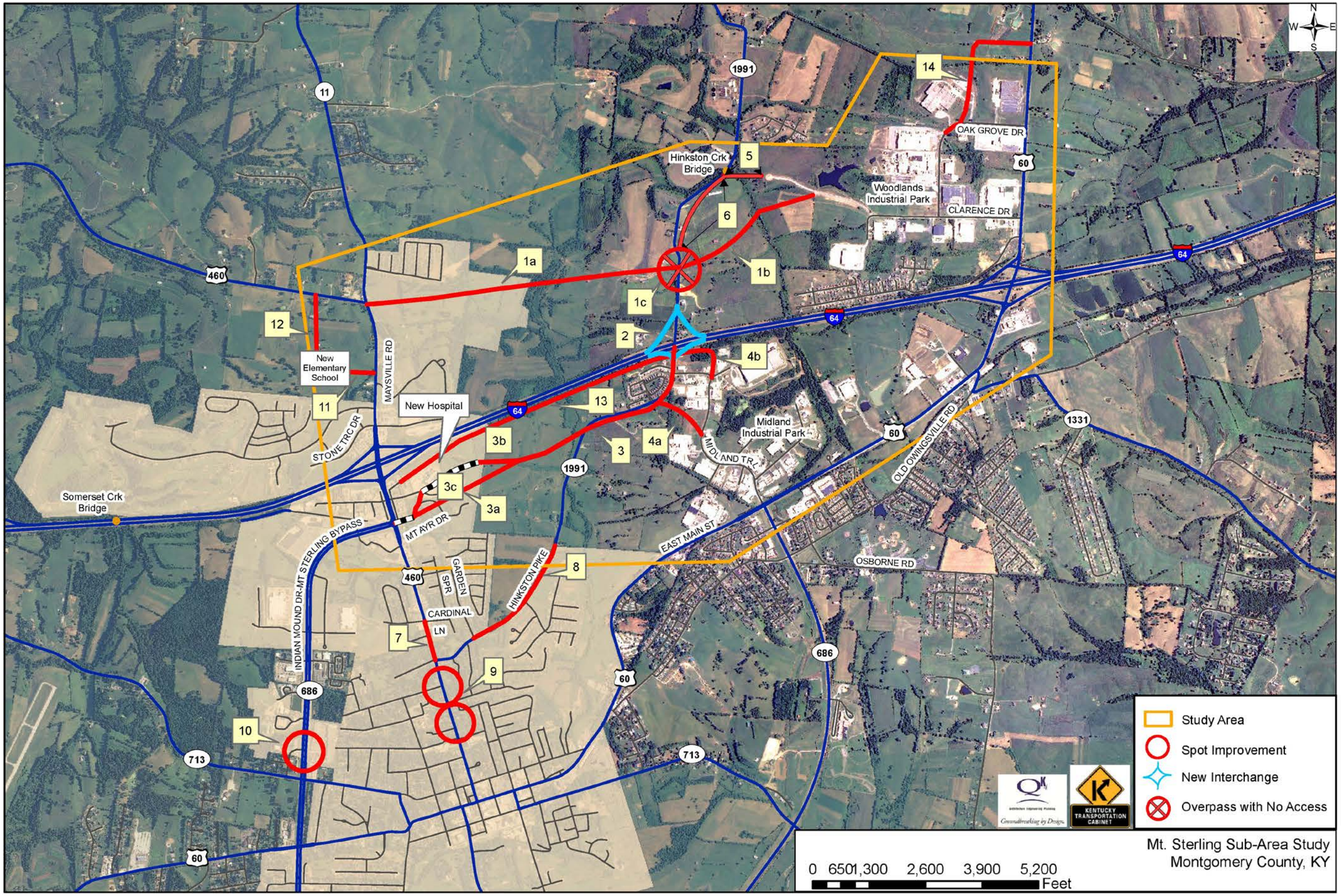
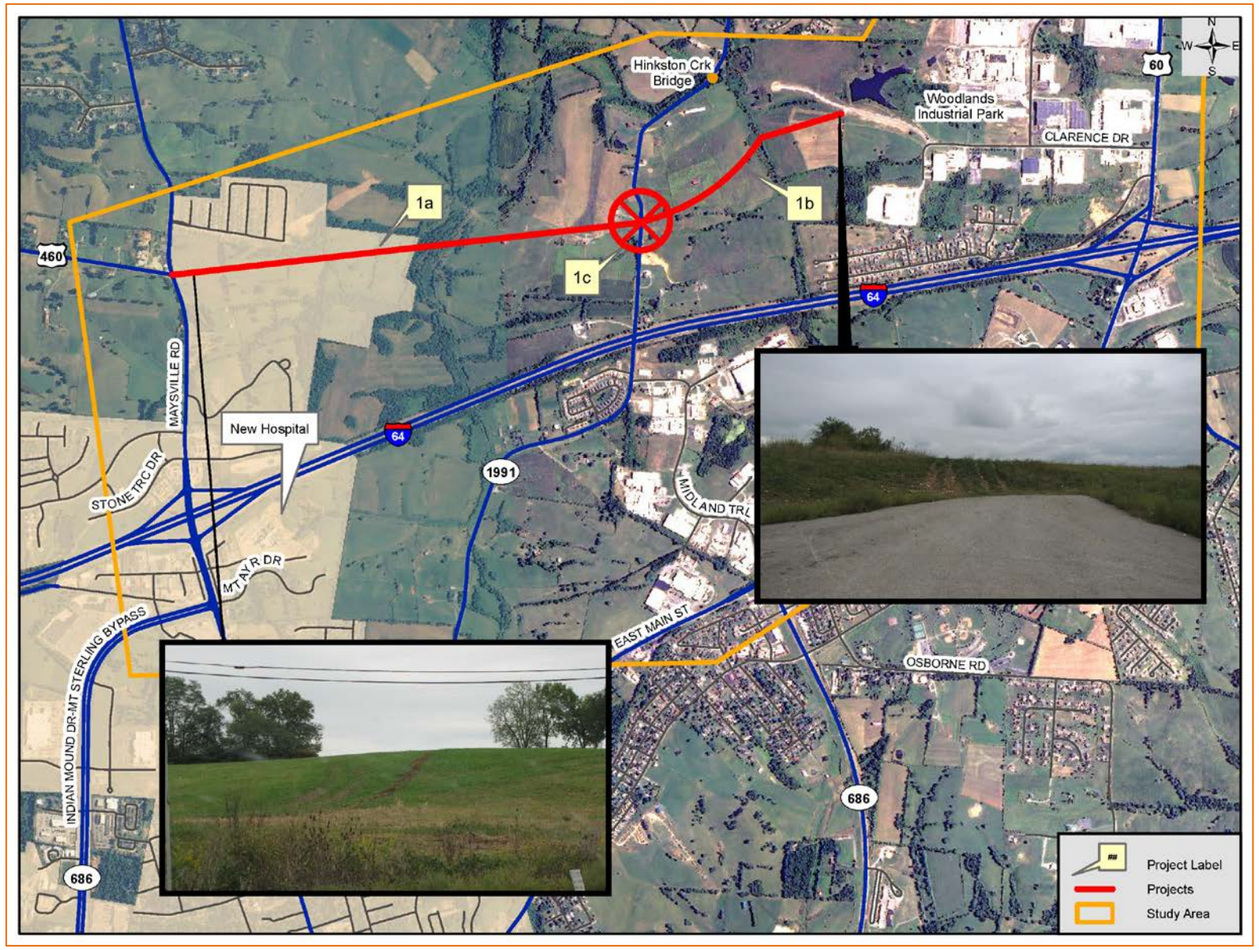


Figure 9: Original 14 Projects Identified

WOODLANDS INDUSTRIAL PARK CONNECTOR TO KY 1991 AND/OR US 460 - PROJECT 1 (1a, 1b, 1c)



Proposed Project: Project 1 is a 2.2-mile-long connector from US 460/KY 11 to Woodlands Industrial Park north of, and parallel to, I-64. It would serve between 1,300 and 3,900 vehicles per day in the year 2017, and would provide some degree of transportation redundancy to WIP depending upon the specific configuration of the alternative implemented. **Project 1a,** constructing only the portion of this project between US 460/KY 11 to KY 1991, would serve little current transportation purpose and would likely be used by fewer than 1,000 vehicles daily. **Project 1b,** constructing only the portion between WIP and KY 1991, would initially serve between 600 and 1,300 vehicles per day and would increase the traffic volumes on KY 1991 by this same volume, principally to the south of the new route. **Project 1c** constructing the complete link between US 460/KY 11 and WIP, but without providing access to KY 1991, would reduce likely traffic volumes on this project by as much as one-third.

Project Team Comments: The Project Team questioned the efficacy of Project 1c. Concerns had previously been expressed that a "back entrance" to WIP (Project 1b) might increase truck traffic on KY 1991. Currently this section of KY 1991 barely allows to trucks to pass at the same time due to the substandard geometrics. Inclusion of Project 2a might mitigate this concern, at least as far south on KY 1991 as Midland Trail.

Stakeholder Input: Endorsed by a representative of the Montgomery County School System. Project 1a would provide an Alternative route to US 460 for the school system.

Recommendations: Project 1b is recommended for short-term improvements. However, since it is early in the project development stages, a project corridor encompassing both Projects 1b and 5 has been drawn to illustrate a connection could be made anywhere between Project 1b and Project 5. For ease of discussion, this is referred to as Project 1b.

Purpose: An additional access to the Woodlands Industrial Park (WIP) has been envisioned as a workplace safety benefit to provide for redundant egress in times of emergencies such as hazardous spills. In addition, congestion entering and exiting WIP during peak hours at present results in unacceptable levels of service on US 60 which are projected to degrade further in future years. Traffic is concentrated on a few existing routes, which leaves drivers with virtually no alternatives during these peak hours or when safety conditions warrant more options.

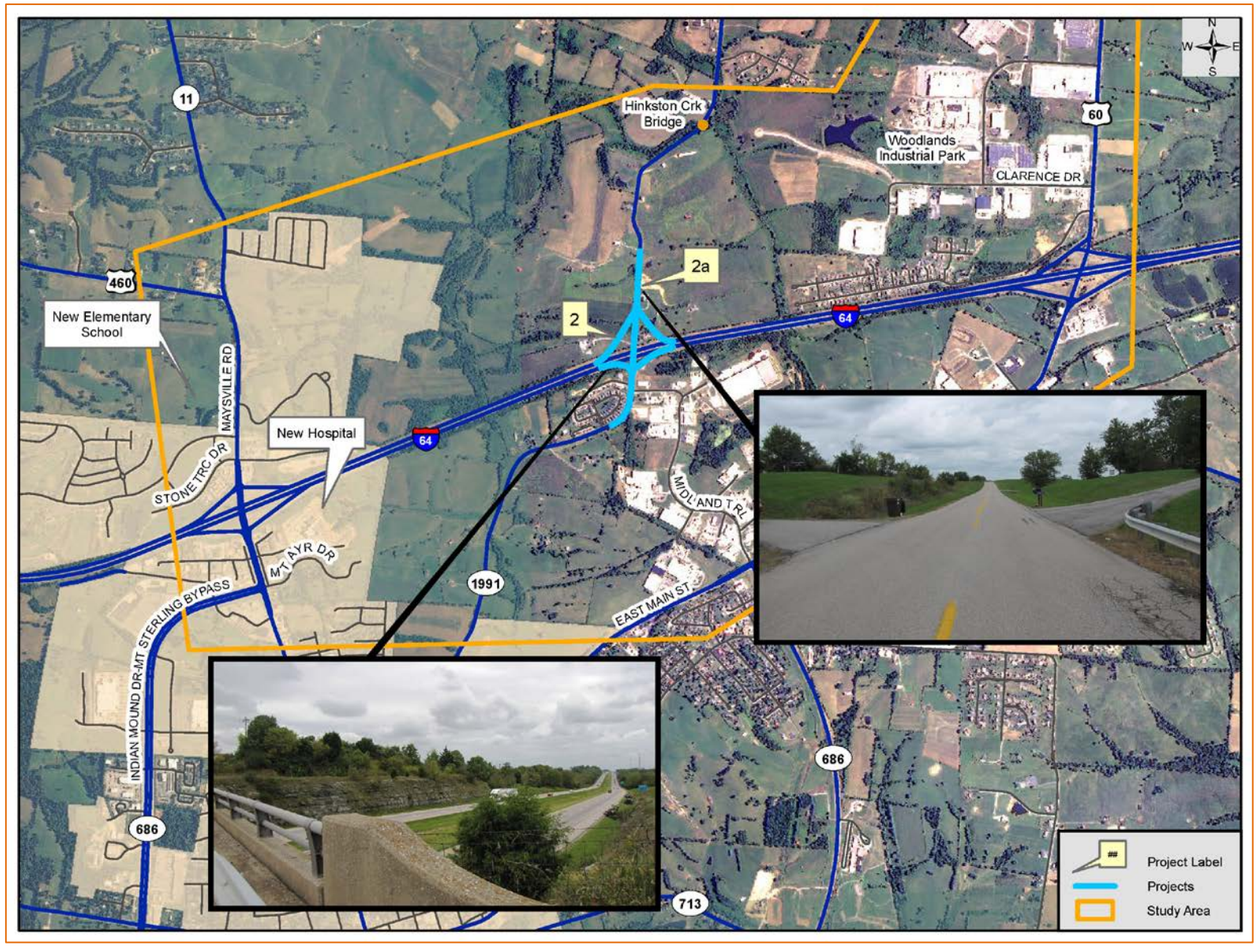
2017 Traffic Vehicles Per Day	
Project 1a	600-800
Project 1b	600-1300
Project 1c	1300-2600

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 1a 8500 feet	Project 1b 3200 feet	Project 1a + 1b 11700 feet	Incremental Additional 1c 100 feet
Design	$515	$67	$582	$38
Right-of-Way	$1,576	$291	$1,867	$209
Utilities	$100	$50	$150	$50
Construction	$5,148	$675	$5,823	$382
Total	$7,339	$1,083	$8,422	$679

NEW I-64 INTERCHANGE AT, AND IMPROVEMENTS TO, KY 1991 (HINKSTON PIKE) - PROJECT 2 (2, 2a)



Proposed Project: This project is an I-64 interchange at KY 1991. It is estimated that 1,600 vehicles daily, 56% to/from the west, would exit at this location in the year 2017, without other improvements. This project would provide transportation redundancy within the study area. An Interchange Justification Study (IJS) would be required before this project could be approved. KYTC would have to demonstrate to FHWA that constructing the new interchange would not negatively affect the operation of I-64. One of the likely conditions for such federal approval would also be improvements to KY 1991 between Midland Trail and Twin Oaks Boulevard. This would necessitate 1.2 miles of improvements to KY 1991. Projected usage of this interchange increases significantly if Project 1b is also constructed. If both the interchange and a new connection between WIP and KY 1991 are constructed, usage of the interchange may well increase to 4,000 vehicles daily, 65% to/from the east, while usage of the connector might increase to as much as 3,800 vehicles daily.

Project Team Comments: Concern was expressed that the weaving analysis that would be performed as part of a future FHWA Interchange Justification Study (IJS) might show the need for a collector-distributor roadway network between a new interchange and the existing interchange at Exit 113. Such a facility could add significantly to the cost of this project.

Stakeholder Input: Strong support for this project.

Recommendations: Project 2a, in the form of minor improvements to Hinkston Pike to accommodate Project 1b or 5, was recommended for short -term project implementation. Project 2 was not.

Purpose: Additional access to I-64 at KY 1991 has previously been envisioned locally, in part because of the additional direct access to both industrial parks such an interchange would provide. Congestion at present is tolerable at Exit 113 for most movements, but is forecasted to degrade in the future, in large part due to expected expansion of employment in WIP. Congestion at Exit 110 is already at undesirable levels, and is also forecast to degrade in the future since US 460 south, and in the vicinity of, Exit 110 has become the commercial center for the community.

2017 Traffic Vehicles Per Day	
Project 2	1400-1800*
Project 2a	3500-4200

*3000-4000 with Clarence Drive Extended

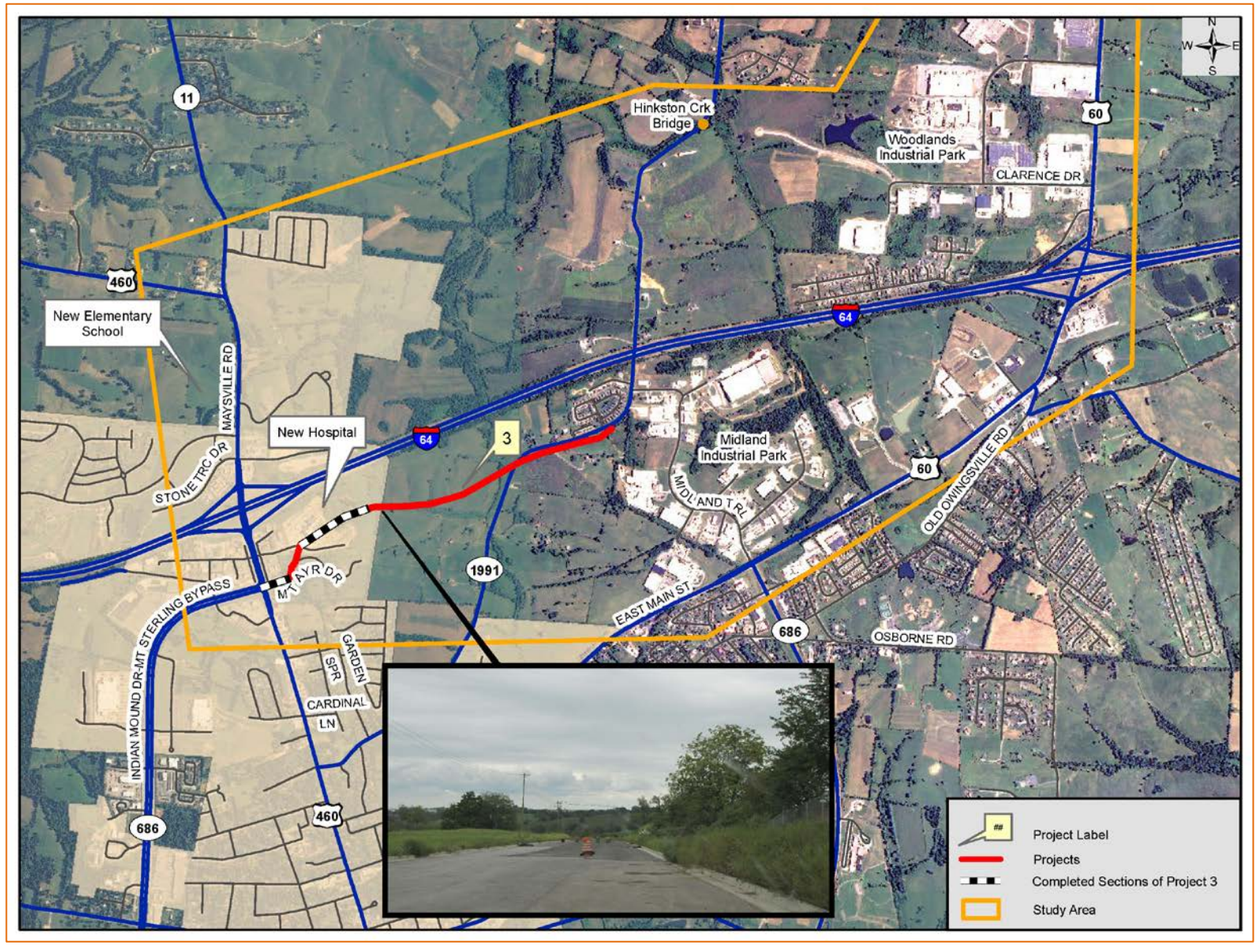
Notes

Planning Level Cost Estimates (Thousands)

Length	Project 2 3775 feet	Project 2a 1000 feet	Project 2 + 2a 4775 feet
Design	$1,255	$ 107	$ 1,362
Right-of-Way	$ 563	$ 832	$ 1,379
Utilities	$ 300	$ 100	$ 400
Construction	$12,551	$ 1,068	$13,619
Total	$ 14,669	$2,107	$16,776

No costs for collector/distributor routes are included.

EXTEND KY 686 EAST TO KY 1991- PROJECT 3



Purpose: An extension of KY 686 to KY 1991, and ultimately its eastern terminus at US 60, has previously been envisioned locally to "complete the bypass" from its current three-quarter circle configuration. Further, a direct connection to the new hospital, and to the ancillary medical service functions expected to develop in that vicinity, would reduce travel time to the hospital from points east. While a convenience for non- emergency transportation, this issue could be more significant for medical emergency travel.

Traffic which would likely use this facility currently either: (a) uses US 60 east and US 460 north, traveling through the downtown area, (b) uses KY 1991 and Midland Trail, and/or (c) even I-64 between exits 110 and 113.

	2017 Traffic Vehicles Per Day
Project 3	2000-4000

Proposed Project: Project 3 would extend KY 686 (Bypass) eastward from its current terminus at US 460 to KY 1991, a distance of between 1.3 and 1.45 miles. This link would likely reduce traffic volumes on KY 1991 south of the link's intersection with KY 1991 by 15% to 50%. This project would provide some degree of transportation redundancy to the Midlands Industrial Park (MIP). While Project 3 and Project 1a would likely be mutually exclusive, at least in the near-term, Project 3 would provide a measure of transportation redundancy to WIP if Project 1b were also constructed. If both Projects 1b and 3 were constructed, it is estimated that between 3,500 and 5,000 vehicles would use this link while a 40% to 60% reduction in traffic could be expected on KY 1991. Significant residential and/or commercial impacts would likely be associated with Project 3. This project would provide enhanced access to the new hospital from the east and to the Midlands Industrial Park to the west. Combined with other improvements, it could also enhance access to WIP to the west.

Project Team Comments: Originally there was Project 3a, 3b and 3c, the Project Team agreed that Projects 3a and 3b would not be presented to the Project Stakeholders for the following reasons: Project 3a bisected a family cluster, and Project 3b would not provide connection to US 460 at a suitable location. Conversely, Project 3c presented both the major advantages of Projects 3a and 3b while overcoming their respective disadvantages. The Project Team directed that Project 3c, only, be presented to the Project Stakeholders as a single Project 3.

Stakeholder Input: No concerns other than the hospital representative feared that this project would attract additional traffic to the vicinity of the hospital. He requested that consideration be given to making this project one-way.

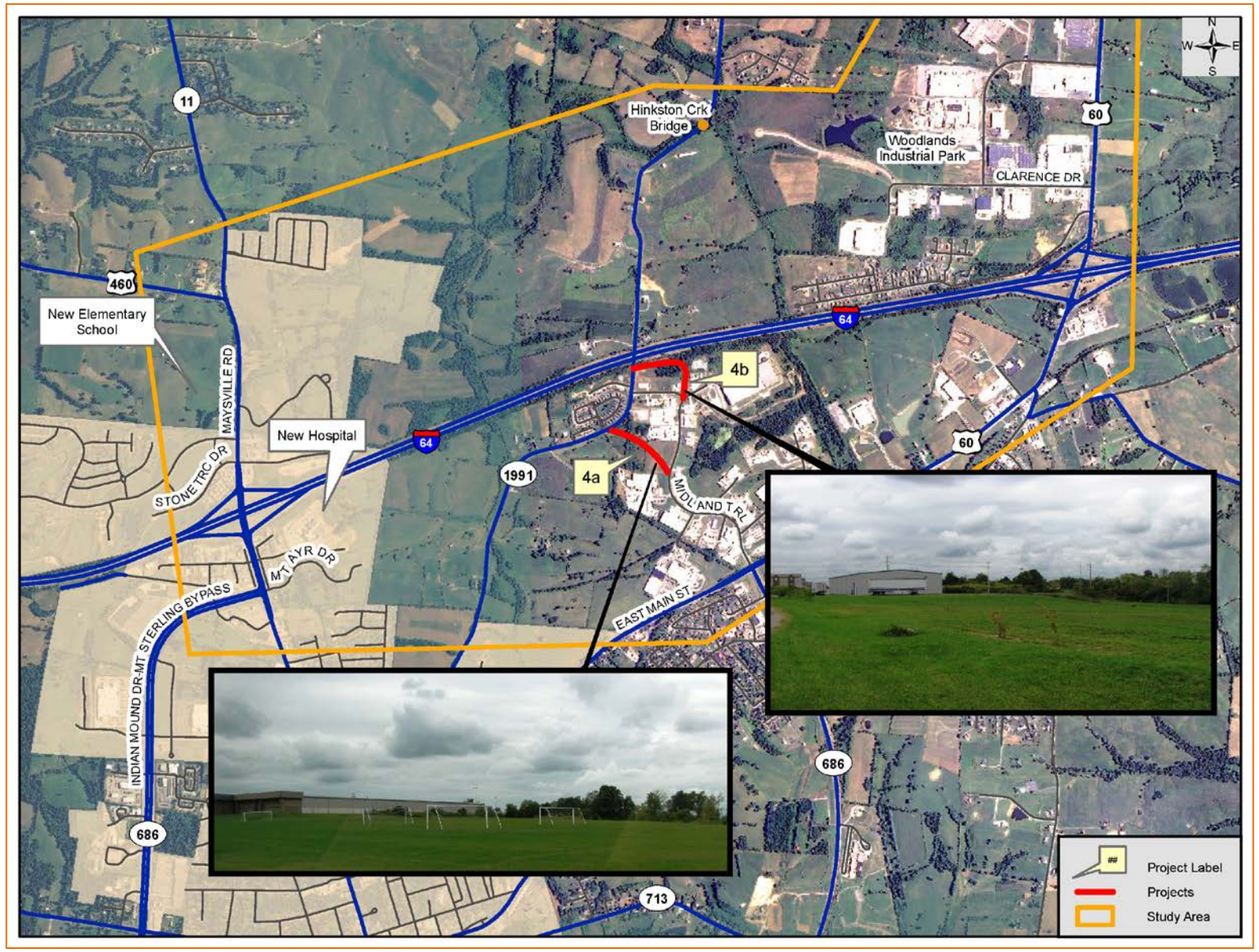
Recommendations: Project 3 was recommended for intermediate-term implementation.

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 3c 7200 feet
Design	$149
Right-of-Way	$654
Utilities	$750
Construction	$1,488
Total	$3,041

IMPROVE WEST END OF MIDLAND TRAIL- PROJECT 4 (4a, 4b)



Proposed Project: Project 4 is 1/3 mile long and would replace the northern/westernmost portion of Midland Trail to avoid (Project 4a) or improve (Project 4b) the curve at the Midland Trail/Flint Drive intersection. **Project 4a** would provide this connection just north of the Kyosan Denki America facility near Midland Trail MP 0.5, and would bypass the current Midland Trail /Flint Drive intersection. **Project 4b** would provide this connection north of the current route and south of I-64, and would include modification to the Midland Trail/Flint Drive intersection. Project 4b likely could not be constructed if Project 2 is implemented.

Project Team Comments: It was noted that either Project 4a or 4b could be the responsibility of the local industrial authority rather than KYTC.

Stakeholder Input: Project 4a was preferable to Project 4b

Recommendations: Project 4a was recommended for Short-term implementation.

Purpose: Midland Trail is the central traffic artery through the Midlands Industrial Park. Flint Drive is an intersecting street, at the end of which is located Lexington Metal Systems. Commercial vehicles, including tractor trailers, use these streets. The intersection of Midland Trail and Flint Drive is configured to ease access into Lexington Metal Systems at the end of Flint Drive. In so doing, through movement of tractor-trailer vehicles on Midland Trail at the Flint Drive intersection is constrained.

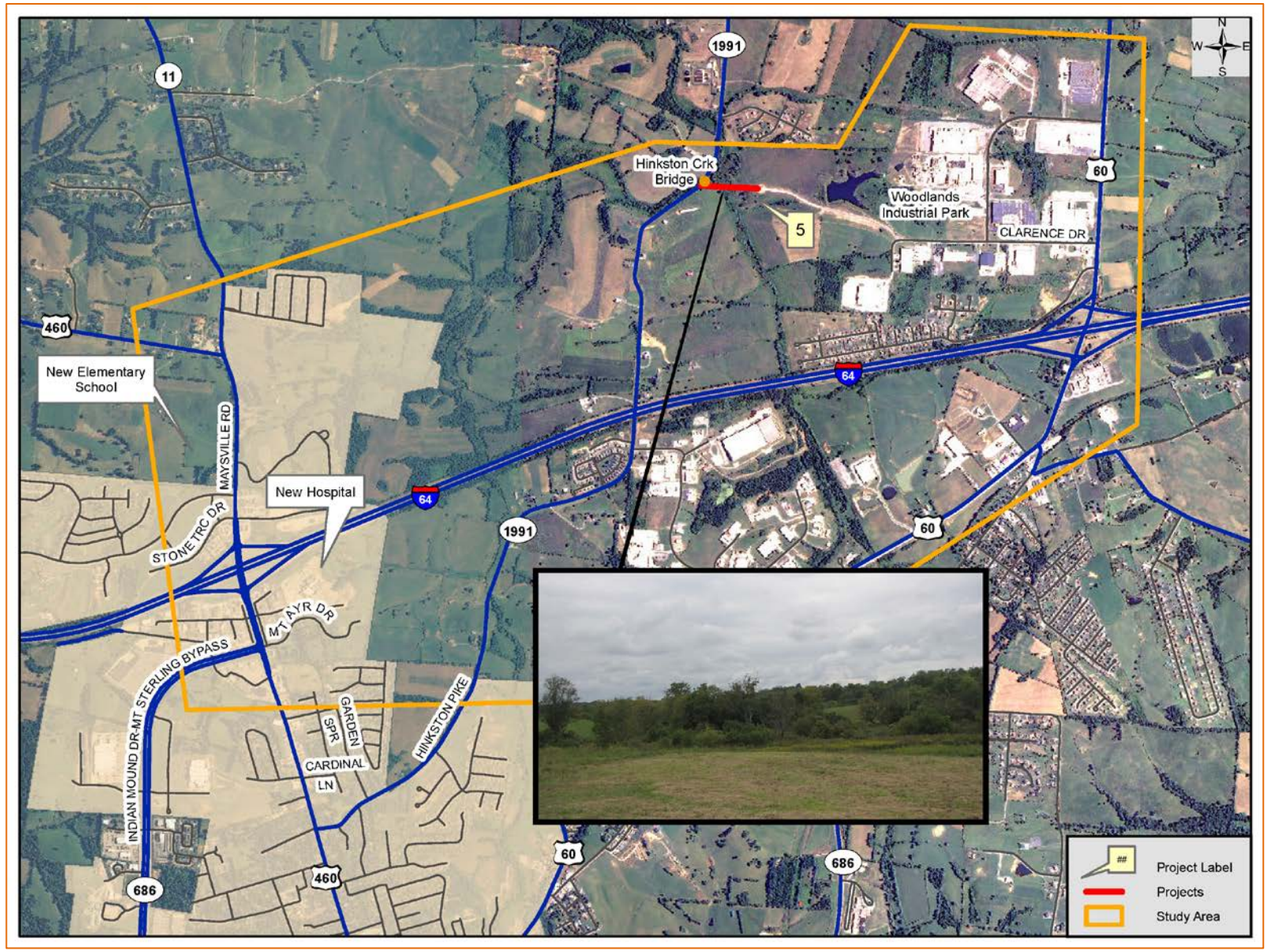
	2017 Traffic Vehicles Per Day
Project 4a and 4b	1000-2000

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 4a 1900 feet	Project 4b 1600 feet
Design	$38	$32
Right-of-Way	$370	$146
Utilities	$50	$100
Construction	$384	$320
Total	$842	$598

NEW CONNECTOR FROM KY 1991 TO WOODLANDS INDUSTRIAL PARK- PROJECT 5



Purpose: Additional access to the Woodlands Industrial Park has been envisioned both as a workplace safety benefit, i.e. redundant egress in times of emergencies, and as a congestion and highway safety benefit, reducing traffic volumes on existing roadway segments. Congestion entering and exiting WIP during peak hours at present results in unacceptable levels of service which are projected to degrade further in future years. Traffic is concentrated on a few existing routes, which leaves drivers with virtually no alternatives during these peak hours or when safety conditions warrant more options.

	2017 Traffic Vehicles Per Day
Project 5	600-1300

Proposed Project: This project would connect KY 1991 with WIP. **It** is similar to, and mutually exclusive with, Project 1b in that it would provide a connector road from Woodlands Industrial Park to KY 1991, though its location would be just south of Twin Oaks Boulevard. As with Project 1b, Project 5 would initially serve between 600 and 1,300 vehicles per day and would increase the traffic volumes on KY 1991 by this same volume, principally to the south of the new route. This project would provide transportation redundancy to Woodlands Industrial Park.

Project Team Comments: The Project Team decided that needed improvements to KY 1991 south of Project 5 to Midland Trail (Project 2b) would likely be minor unless Project 2 was also constructed.

Stakeholder Input: This project was preferable to Project 1b because they felt that it aligned with the Woodlands Industrial Park future expansion plats.

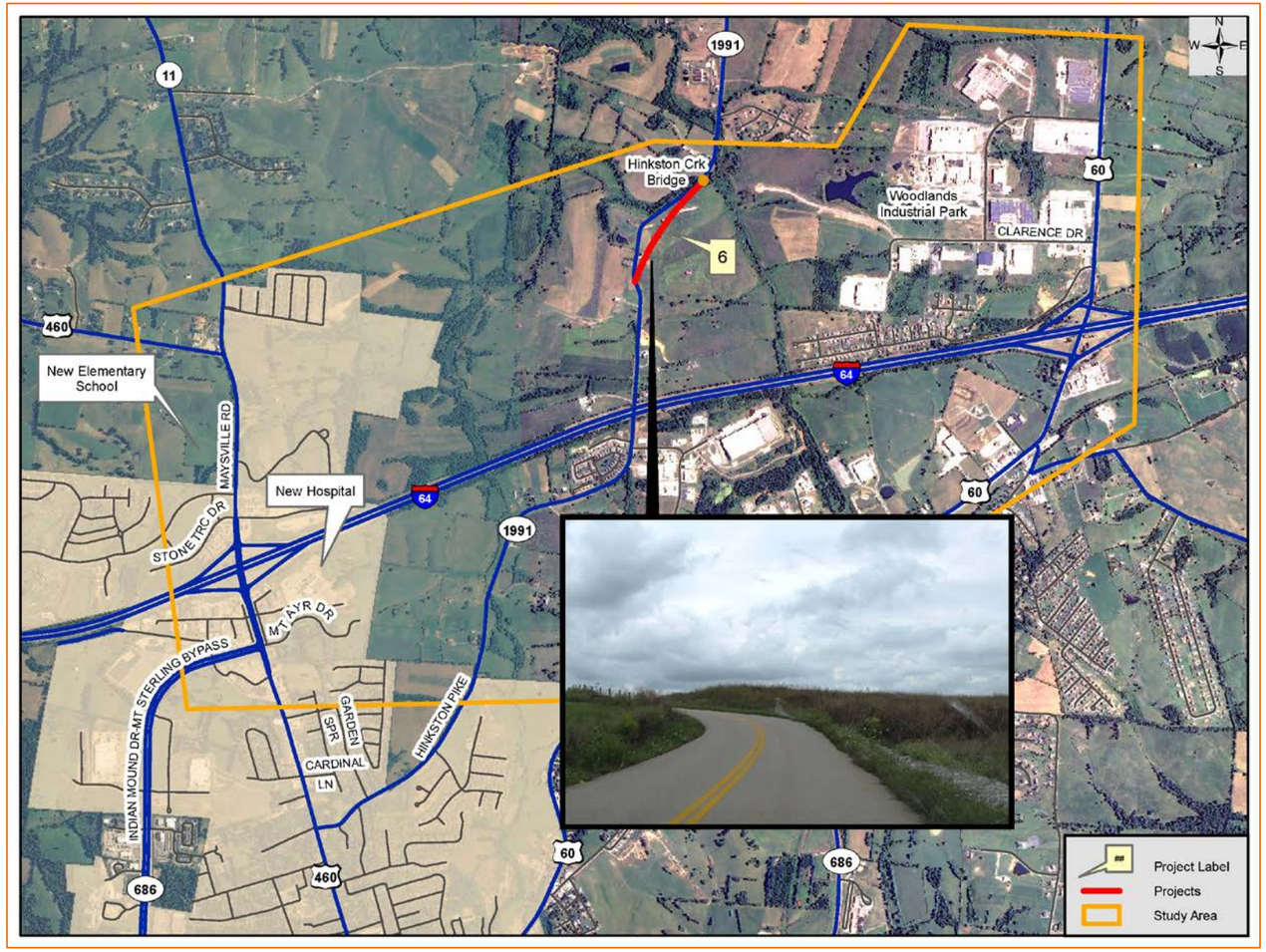
Recommendations: Project 5 was not specifically recommended for inclusion in either the short-term or intermediate term recommendations, but see recommendations for Project 1b.

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 5 3700 feet
Design	$78
Right-of-Way	$339
Utilities	$50
Construction	$782
Total	$1,249

HORIZONTAL ALIGNMENT IMPROVEMENTS TO KY 1991- PROJECT 6



Proposed Project: Project 6 would improve the horizontal alignment of KY 1991 between MP 2.2 and MP 2.8. Based on research conducted at the University of Kentucky (UK), this concept could reduce crashes and near-crashes by as much as 40%.

Project Team Comments: The Project Team decided that needed improvements to KY 1991 south of Project 5 to Midland Trail (Project 2b) would likely be minor unless Project 2 was also constructed.

Stakeholder Input: This project was favored in conjunction with Project 5.

Recommendations: This project was not specifically recommended for Short-term or Long-term implementation, but see comments for Project 1b.

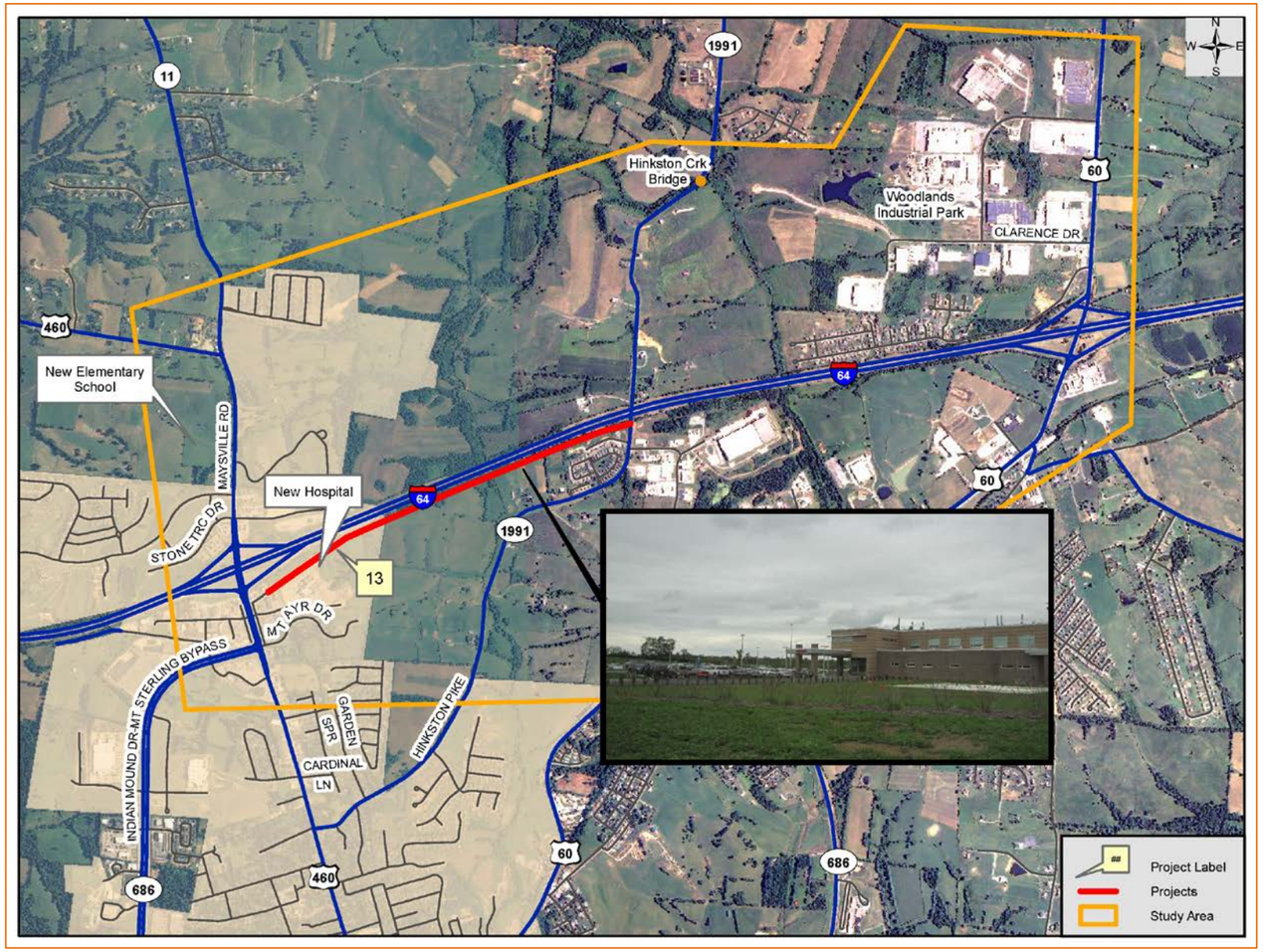
Purpose: This section of KY 1991 would likely experience an increase in traffic volumes of between 500 and 1000 vehicles daily if Alternate 5 were implemented. There are two horizontal curves in excess of 19 degrees in this roadway segment. Driving lane widths are nine feet, and shoulders are three feet wide. Though functionally classified as a local road, it is classified as a Rural Secondary route for maintenance purposes. Trucks are currently restricted to forty four thousand (44,000) pounds gross weight.

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 6 3170 feet
Design	$64
Right-of-Way	$520
Utilities	$25
Construction	$641
Total	$1,250

EXTEND RAGLAND AVENUE EAST TO KY 1991- PROJECT 13



Purpose: A direct connection to the new hospital, and to the ancillary medical service functions expected to develop in that vicinity, would reduce travel time to the hospital from points east. While a convenience for non-emergency transportation, this issue could be more significant for medical emergency travel. At present, there is not a route that makes this direct connection. Traffic travels 1.7 miles on KY 1991 and 0.9 miles on US 460 to make this trip.

2017 Traffic Vehicles Per Day	
Project 13	1500-3500

Proposed Project: A 1.35 mile connection from the new hospital to KY 1991 just south of, and paralleling I-64. At 30 mph, this connection would reduce travel time to the hospital from KY 1991 by about 2.5 minutes. Project 13 would provide transportation connectivity between the new hospital (and the satellite medical services functions likely to develop in that vicinity) and KY 1991 by extending Ragland Avenue eastward, parallel to and just south of I-64. Project 13's location is viewed as less desirable than Project 3 due to its greater distance from traffic generators other than the hospital and more rugged terrain. Because of Project 13's less desirable location than Project 3 as an eastward extension of KY 686, it could be expected to provide service to fewer vehicles daily than Project 3.

Project Team Comments: None

Stakeholder Input: This project was viewed less favorably than either Projects 1 or 3. Hospital officials were concerned about the conceptual location shown for Project 13 with respect to the hospital parking lot.

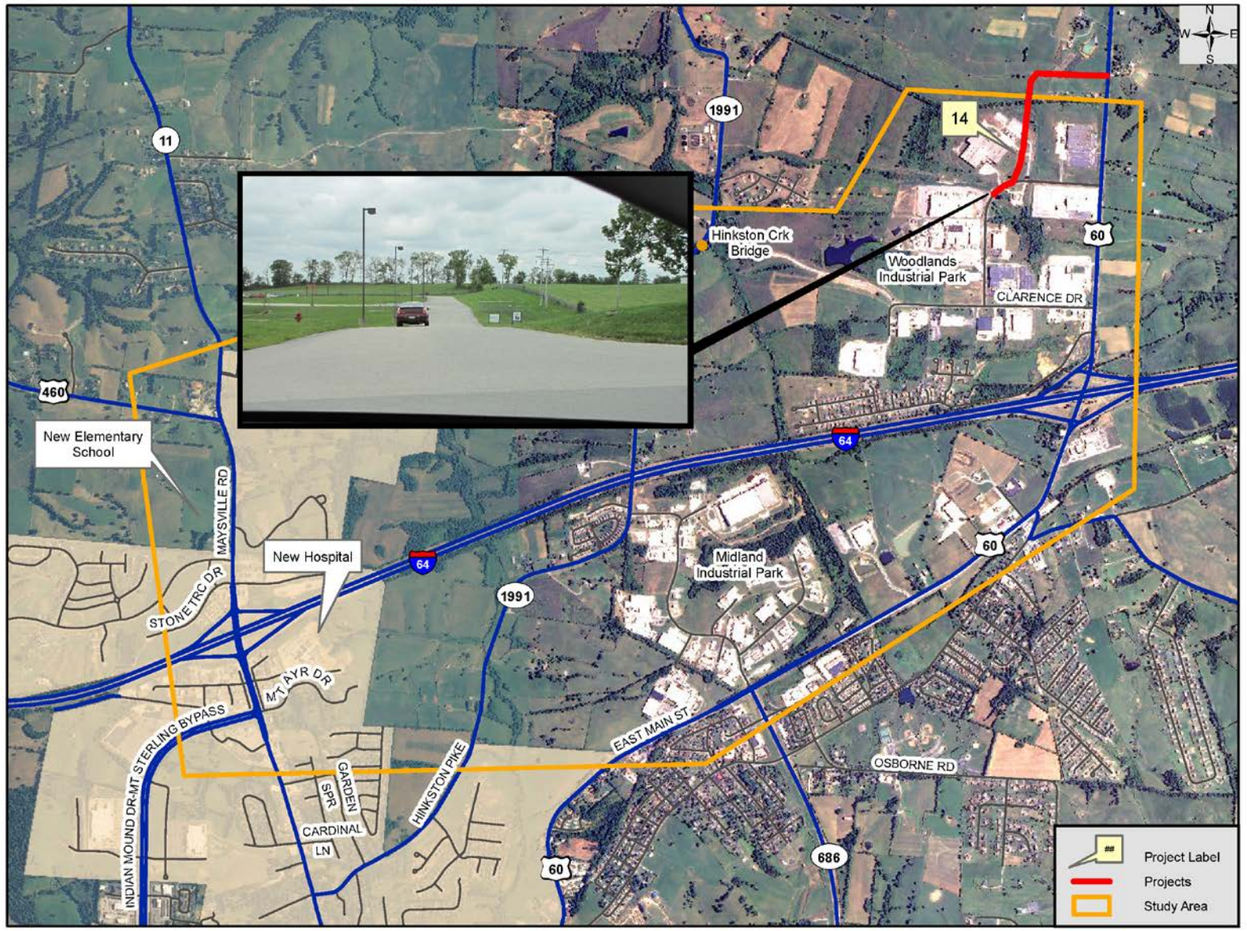
Recommendations: This project was not recommended for short-term or intermediate term improvements.

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 13 7130 feet
Design	$174
Right-of-Way	$654
Utilities	$200
Construction	$1,736
Total	$2,764

THIRD US 60 ACCESS ROAD TO WOODLANDS INDUSTRIAL PARK- PROJECT 14



Proposed Project: Project 14 would provide transportation redundancy for Woodlands Industrial Park through the construction of a third access point to US 60 north of the industry Cooper Standard. This concept would connect with the current Clarence Drive/Oak Grove street network within Woodlands Industrial Park and could possibly, in combination with Projects 1, 3, 5, and/or 13, provide connectivity to US 460/KY 11. While Project 14 could contribute to such connectivity, the principal transportation purpose of this project would be to distribute access from US 60 to the industrial park over three, rather than two, locations.

Project Team Comments: The KYTC Project Team discussed the possibility of combining a more northern location of Project 1a with Project 14 to form a north side outer connector. However, the Project Team ultimately decided this concept did not merit due principally to the low volume of estimated traffic that would use such a facility.

Stakeholder Input: As envisioned by Project Stakeholders, this concept would connect with the current Clarence Drive/Oak Grove street network within WIP and could possibly, in combination with Project 1, 3, 5, and/or 13, provide connectivity to US 460/KY 11.

Recommendations: This project was not recommended for inclusion in the short-term or intermediate-term improvements.

Purpose: Additional access to the Woodlands Industrial Park has been envisioned both as a workplace safety benefit, i.e. redundant egress in times of emergencies, and as a congestion and highway safety benefit, reducing traffic volumes on existing roadway segments. Access to the Woodlands Industrial Park is currently provided from US 60 at two locations: Clarence Drive (MP 8.951) and Oak Grove Drive (MP 9.353). The Clarence Drive intersection currently operates at level-of-service D during the p.m. peak period. All other peak hour levels-of-service at these locations are currently B.

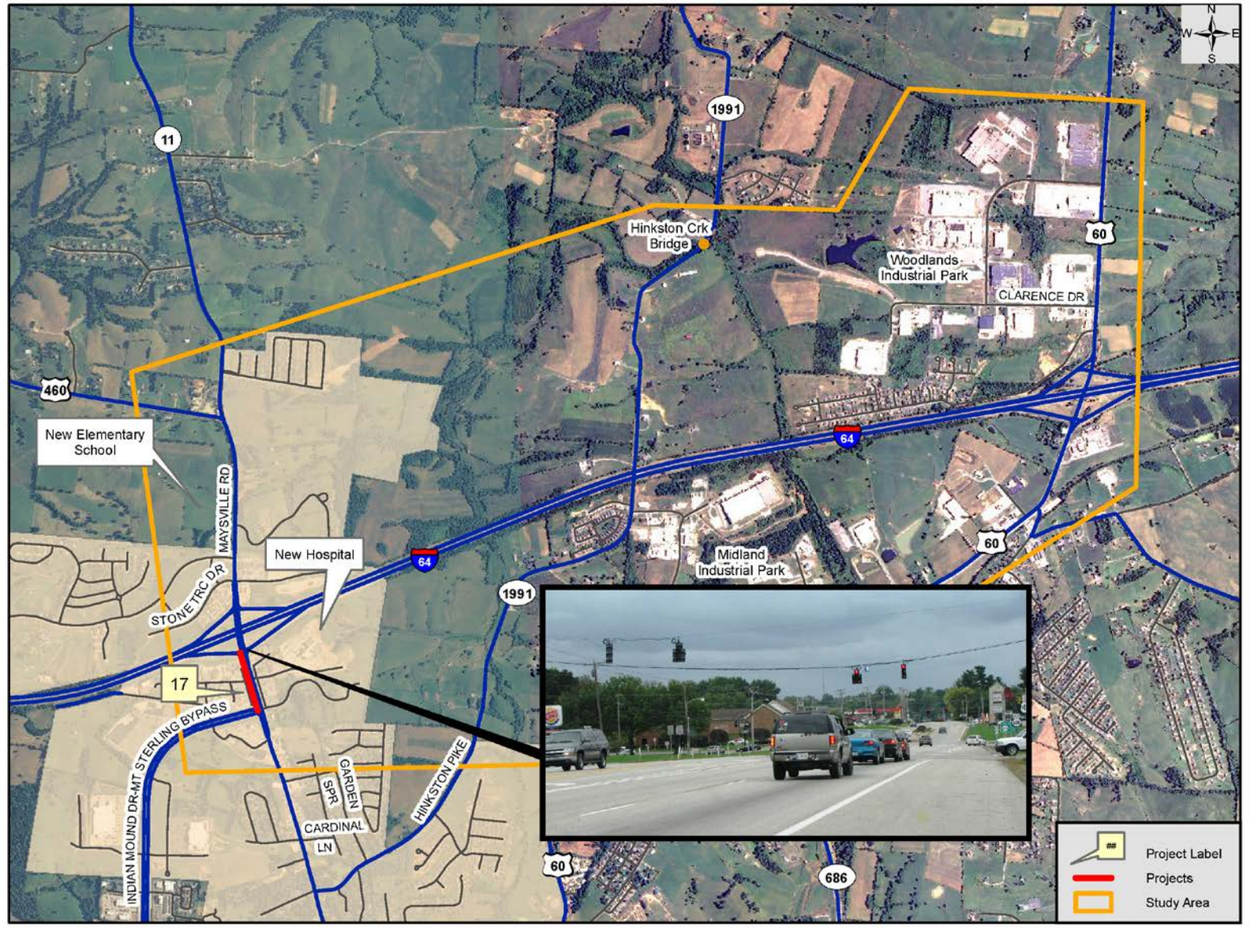
	2017 Traffic Vehicles Per Day
Project 14	1500-2200

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 14 3700 feet
Design	$81
Right-of-Way	$339
Utilities	$150
Construction	$812
Total	$1,382

ADDITIONAL SOUTHBOUND LANE ON US 460 FROM I-64 TO KY 686- PROJECT 17



Purpose: Congestion and safety issues have been identified on US460/KY 11 at I-64 Exit 110. Roadway geometrics provide a large-scale physical plant at this site, including mainline, ramps, and turning lanes. US 460/KY 11 features four through lanes with a dual left-turn northbound to I-64 westbound. Westbound entrance ramp is 2-lane at entry point; eastbound entrance ramp is 1-lane. Eastbound and westbound exit ramps are 3-lane at US 460/KY 11. Not all signals are currently interconnected.

Proposed Project: Both KYTC Project Team and Stakeholders recognized the low probability of major additional improvements to the existing conditions. The Project Team asked that signal timing on US 460/KY 11 be investigated for possible improvements. Signal timing analysis revealed that modest improvements to US 460 congestion levels could be achieved by adding an additional southbound lane between the I-64 eastbound exit ramp and KY 686 and that this action would provide the most significant level of relief, improving the current year level-of-service from D to C. The additional lane would allow the right-most I-64 eastbound exit turn-lane to provide continuous flow onto US 460/KY 11 as well as provide additional capacity on US 460/KY 11 from the ramp terminal to KY 686.

Project Team Comments: The Project Team endorsed this Project as an inexpensive way to provide congestion relief at Exit 110.

Stakeholder Input: This project was developed after both stakeholder meetings. However, stakeholders throughout this study were concerned with the congestion at Exit 110.

Recommendations: Project 17 was recommended for inclusion in the short-term recommendations.

Notes

Planning Level Cost Estimates (Thousands)

Length	Project 17 1100 feet
Design	$44
Right-of-Way	$25
Utilities	$50
Construction	$437
Total	$556

Three sources contributed to these project concepts:

- Ideas historically expressed within the community
- Project Team
- Stakeholders' comments

Fourteen projects and an evaluation matrix comparing projects using various metrics were presented at the second Project Team Meeting as shown in Figure 9 and Table 4. Following Project Team review and discussion, three projects were not advanced to the next Stakeholders' Meeting. Those projects were Projects 10, 11, and 12. Details of that decision are included in the discussion below.

At its second meeting, (minutes found in Appendix G) the Project Team:

Questioned the efficacy of Project 1c while acknowledging the potential for increased truck traffic on KY 1991. At present KY 1991 has substandard geometrics that barely allow two trucks to pass.

Showed concern that a future weaving analysis for Project 2 may show the need for a collector/distributor roadway network between the new interchange and the existing interchange at Exit 113, and potentially increase the length of the existing bridge which would increase the cost. However, the Project Team did not remove this project from those to be discussed with the Project Stakeholders.

Projects 3a, 3b, and 3c would be presented as one project represented by 3c. Project 3a split a family cluster of homes that is unfavorable given there were other options. Project 3b created a less than desirable dogleg intersection. Therefore, Project 3c became Project 3.

- Agreed that Project 10 was both outside the project study area and beyond the scope of the current study. Project 10 would have modified the midblock entrance to the Kroger shopping complex on the east side of KY 686 to a "right-in/right-out only" access point. A Project Stakeholder identified the problem with violations of the "No Left Turn" sign for exiting traffic at this location. Full directional, signalized access to the Kroger shopping complex would still be provided both north of this location, opposite Mapleton Elementary School, and south of this location at KY 713.

Stated that Project 11 is incorporated into the construction plans of the scheduled US 460 improvement project (KYTC Highway Plan Item Number 7-317.00). This project would have provided for improved east-side access for the new elementary school to US 460/KY 11 in lieu of the current, interim access point opposite Rolling Hills Drive. This project's purpose is already being addressed with an improved access point as shown in the school site development plan analyzed in the November 2010 Traffic Engineering Study for the new school (Appendix H).

Decided that Project 12 has been considered by the Montgomery County School Board as a possible future addition, but is not currently scheduled. This project would have provided transportation redundancy for the new elementary school with a north-side access point to US 460.

Table 4: Alternatives Comparison Matrix for Original 14 Projects

PROJECT NUMBER		DESCRIPTION	COST ESTIMATE ($,000)	IMPACTS TO		MUTUAL EXCLUSIVITY	ESTIMATED 2017 ADT RANGE	TRAFFIC IMPACTS ON OTHER ROUTES	CRASH IMPACTS	PROVIDES TRANSPORTATION REDUNDANCY?
				NATURAL ENVIRONMENT	HUMAN ENVIRONMENT					
1	1	Connector Road from US 460/KY 11 to Woodlands Industrial Park	$9,185							
	1a	Connector Road from US 460/KY 11 to KY 1991	$7,400	Crosses stream; potential wetlands issues	Some area zoned residential near US 460	PROJS 3,13	600-800	Slight[1]	Slight	No
	1b	Connector Road from KY 1991 to Woodlands Industrial Park—Southern Option	$1,085	Crosses stream tributary; potential wetlands issues		PROJ 5	600-1300	Modest[2]	Slight	Yes
	1c	Overpass of I-64, with no access to, KY 1991	$700	Potential wetlands issues	Potential residential impacts	PROJS 3, 5, 6, 13	1300-2600	Modest	Slight	Yes
2	2	New I 64 Interchange at KY 1991	$14,669	Potential wetlands issues	Potential residential impacts	PROJS 4b, 13	1600 EXITS DAILY	Significant[3]	Significant	Yes
	2a	Improvements to KY 1991 associated with construction of a new interchange	$2,100	Potential archaeological sites	Potential residential and drainage impacts		3500-4200	Modest	Slight	Yes
3	3	Connector Road from KY 686 @ US 460 to KY 1991								
	3a	Connector Road directly from KY 686 to KY 1991	$3,600	Crosses stream tributary; potential archaeological site	Significant residential impacts	PROJS 1a, 3b, 3c, 13	2000-4000	Significant	None	Yes
	3b	Connector Road from Falcon Drive to KY 1991	$3,000	Crosses stream tributary		PROJFS 1a, 3a, 3c, 13		Significant	None	Yes
	3c	Blended Connector Road from KY 686 via Falcon Drive to KY 1991	$3,200	Crosses stream tributary	Potential commercial impacts if implementation is delayed	PROJS 1a, 3a, 3b, 13		Significant	None	Yes
4	4	Connector Road from Midland Trail to KY 1991								
	4a	Connector Road from Midland Trail—north of Kyosan Denki America—to KY 1991	$840		"Total take" of soccer fields	PROJ 4b	1000-2000	Modest	Modest	Yes
	4b	Connector Road from Midland Trail—between current Midland Trail and I 64—to KY 1991	$600			PROJS 4a, 13		Modest	Modest	Yes
5		Connector Road from Woodlands Industrial Park to KY 1991 just south of Twin Oaks Boulevard, and improvements to 2400' of KY 1991	$1,250	Crosses stream and tributaries, perhaps more than once; potential archaeological site	Constrained on north side by Twin Oaks residential area; other potential residential impacts	PROJ 1b	600-1300	Significant	Slight	Yes
6		Straighten curve on KY 1991 @ approximately MP 2.2-2.8	$1,250		Potential residential and drainage impacts	----	N/A	None	Significant	No
7		Sidewalks, left-turn bays, and pedestrian lighting on US 460 between Cardinal Lane and KY 1991	$1,500		Potential UST impacts; culvert; utility poles; potential historic home; retaining wall	----	N/A	None	Significant	No
8		KY 1991 between Garden Springs Drive and City Limits @ approximately MP 0.2-0.8: raise above floodplain	$1,750	Whatever issues are present were addressed during the redesign of this roadway.		----	N/A	None	Modest	No
9	9	Flatten grade on US 460	$1,500			----				No
	9a	US 460 south of Hinkston Pike: Flatten vertical crest to improve sight distance	$750			----	N/A	None	Modest	No
	9b	US 460 south of Winn Street: Flatten vertical crest to improve sight distance	$750			----	N/A	None	Modest	No
10		Right in/right out entrance to Kroger on KY 686	$215			----	N/A	None	Slight	No
11		East-side access to new school from US 460/KY 11	$1,400			----		None	None	No
12		North-side access to new school from US 460 west of its intersection with KY 11	$3,500			----		Slight	None	Yes
13		Extend Ragland Avenue from new hospital to KY 1991, parallel to and just south of I 64	$2,765			PROJS 1a, 2, 3	1500-3500	Slight	None	Yes
14		3rd entrance to US 60 from Woodlands Industrial Park connecting to internal street network in park.	$1,385	Potential stream and wetlands issues	Potential impact to Walters Lane residential area	----	1500-2200	Modest	None	Yes

(1) Slight depicts a very small impact (2) More than a slight impact but less than significant (3) Consequential impacts

Requested that signal timings on US 460 between KY 686 and Interstate Drive be reviewed to see if improvements could be recommended.

The Project Evaluation Matrix was modified to reflect the Project Team Meeting and that matrix and reduced number of alternatives was taken to the next Project Stakeholders' Meeting. A second Stakeholders' Meeting in which stakeholders' preferences and priorities among project concepts were sought, resulted in the suggestion of two additional projects (Projects 15 and 16). Project 15 consists of improvements to US 60 West, from KY 686 to I-64 Exit 101, as a way of reducing travel demand on US 460 in the vicinity of I-64 Exit 110. Project 16 suggested by the stakeholders was a possible one-way couplet in Woodlands Industrial Park where Oak Grove would be one-way in one direction while Clarence Drive would be one-way in the opposite direction between Oak Grove Drive and US 60.

At the second Stakeholders' Meeting, the stakeholders expressed their priorities as a combination of Projects 1a, 2, 2a, 3, 4a, 5 and 6. Taken together, this combination is estimated to cost $25.84 million. Improvements to US 60 West from KY 686 to I-64 Exit 101 (added at the meeting) were estimated to cost almost as much ($30.7 million) as the other Stakeholder priorities combined.

A third Project Team Meeting was held November 22, 2011. The Project Team decided Projects 7 and 9 are really out of the study area. Since these projects are high crash locations, and are supported by the Project Stakeholders, the Highway District 7 Office staff will examine these projects through possibly the Planning Process for a Project Identification Form (PIF) or the Highway Safety Improvement Program (HSIP). The remaining projects were considered candidates for either a short- or intermediate-term improvement program for the Mt. Sterling Sub Area. For purposes of this study, it is assumed any new roadways would not be opened to traffic before 2017. Also included in the following description of remaining projects, is more detailed stakeholder comments on what they considered priority where appropriate. These comments were gained at a second meeting for which minutes can be found in Appendix G.

5.3 PROJECT TEAM RECOMMENDATIONS

After review of current and projected future conditions, discussions with the Project Team and Project Stakeholders, and with a goal of maximizing transportation benefits commensurate with a modest level of expenditures, the following recommendations, as summarized in Table 5 and shown in Figure 10, are made:

5.3.1 IMMEDIATE/SHORT-TERM IMPROVEMENTS

Redundant Access to Woodlands Industrial Park

While improvements to the transportation system to reduce crashes and congestion are worthy goals in and of themselves, the value of a transportation network to provide a safe and, if necessary, redundant means for evacuation from a site during emergencies is one that cannot be easily quantified. Given the modest cost of providing such redundant access to WIP (project concepts considered range from $1.1 million to $2.5 million), it is recommended that one of these options be implemented.

Access to KY 1991, rather than additional access to US 60, represents both a better technical solution to this issue and better alignment with the preferences expressed by Project Stakeholders. Project Stakeholders seem to have preferred Project 5 over Project 1b because of a stated belief that Project 5 better aligns with future development within the WIP. However, Project 1b does this as well as Project 5 and has fewer stream crossings.

Further, inclusion of Project 6, while desirable, might be a less pressing need if Project 1b were implemented instead of Project 5. Therefore, Project 1b is recommended for immediate or short-term implementation. However, since this project would be in the early development stages, it was suggested that a project corridor encompassing both projects 1b and 5 be drawn to illustrate that a connection could be made anywhere between Project 1b and Project 5. For ease of discussion, this is referred to as Project 1b.

Enhance System Connections from the South and East to Woodlands Industrial Park

If either Project 1b or 5 is implemented, then many WIP-based users of this new connection will have a travel desire to access KY 686 at US 60 East for travel to the south and east. This enhances the value of an improved connection from KY 1991 to Midland Trail, especially as a cost-effective option to Project 2. Project 4a is preferable from a transportation systems perspective to 4b, and Project Stakeholders also preferred Project 4a. It is recommended that Project 4a be implemented if the previous recommendation (Projects 1b or 5/6) is accepted.

SHORT-TERM RECOMMENDATIONS	COST ESTIMATE ($,000)	ESTIMATED RANGE OF YEAR 2017 ADT ON NEW ROUTES	PROJECTED IMPACTS ON OTHER ROUTES' TRAFFIC VOLUMES	PROJECTED IMPACTS ON OTHER ROUTES' CRASH INCIDENCE
Project 1b - Woodlands Industrial Park to KY 1991	$1,085	600-1300	Modest	Slight
Project 2a - Improvements to KY 1991	$2,100	N/A	None	Slight
Project 4a - Midland Trail north of Kyosan Denki America to KY 1991	$840	N/A	Modest	Modest
Project 17—Add lane SB on US 460 from EB exit ramp to KY 686	$556	N/A	None	None
INTERMEDIATE - TERM RECOMMENDATIONS				
Project 3 - Connector from KY 686 at US460 to KY 1991	$3,200	2000-4000	Significant	None
Preserve Corridor for Project 1a	N/A	N/A	N/A	None

Table 5: Recommended Projects

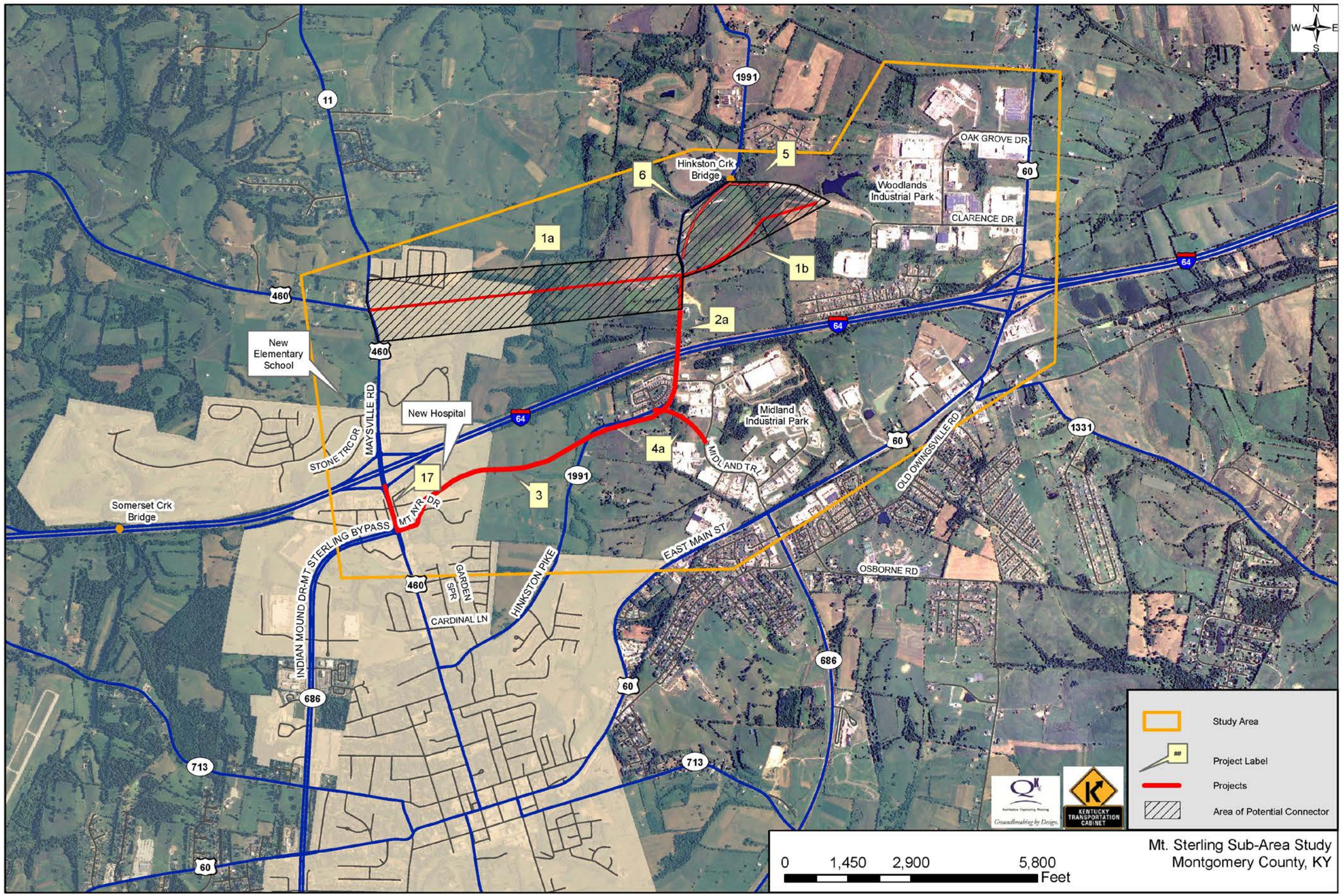


Figure 10: Recommended Projects

Additional Improvements to KY 1991

Improvements to KY 1991 south of Midland Trail (between MP 1.2 to MP 1.8) are currently scheduled for implementation through KYTC Highway Plan Item Numbers 7-240 and 7-8501. The stretch of KY 1991 between the currently scheduled improvements ending around MP 1.8 and the likely intersection with Project 1b, or the southern terminus of Project 6, (MP 2.2) could be improved with practical solutions or spot improvements. The KY 1991 structure over I-64 (Bridge Number 087B00030N) is adequately wide for two travel lanes (albeit without shoulders), is neither structurally deficient nor functionally obsolete, and has a sufficiency rating of 73.3. Improvements could be made to the existing roadway bed by widening the current 10-foot-wide driving lanes and narrowing the current 6-foot-wide earthen shoulders. The horizontal alignment between MP 1.8 and MP 2.2 is adequate. Final design of improvements to this 0.4-mile-long roadway segment should include these or other cost reduction techniques.

One Additional South-Bound Lane on US 460/KY 11 between I-64 Exit 110 Eastbound Exit Ramp and KY 686

A review of signal timing options requested by KYTC indicated this low-cost improvement would provide a modest reduction in congestion at this location. By creating a continuous right-turn lane for eastbound traffic exiting I-64, the possibility of backups onto mainline I-64 is reduced. This improvement could be implemented in the short term with minor repaving and striping of the existing shoulder. A more thorough improvement could be implemented for $556,000.

5.3.2 INTERMEDIATE-TERM IMPROVEMENTS

Extension of KY 686 from US 460 to KY 1991

Implementation of Project 3 would initially attract between 2,000 and 4,000 vehicles daily, and this volume could be expected to increase somewhat if the Immediate/Short-Term Improvements discussed above were constructed. Implementation of both Projects 3 and 4a would, in effect, “complete the circle” of KY 686. Local government should initiate reservation of a transportation corridor to enable ultimate development of Project 3. If constructed, KYTC may consider rerouting KY 1991 to this new facility, with the current KY 1991 south of its intersection with Project 3 reverting to a local street.

Development Corridor Reservation for Project 1

As development occurs in the area north of I-64, east of US 460/KY 11, and west of KY 1991, it would be prudent for a transportation corridor to be reserved in the approximate area of Project 1a. If Project 3 is implemented, then much of the near-term transportation service that Project 1a would provide would be satisfied by Project 3. Reserving the Project 1a corridor for future transportation needs should be pursued by local government officials.