Hopkinsville Small Urban Area Study
Christian County

Kentucky Transportation Cabinet

Final Report
August 2013

Stantec Inc.

One Team. Infinite Solutions.

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EXECUTIVE SUMMARY

This project is a Small Urban Area (SUA) study for the City of Hopkinsville, Kentucky in Christian County. The purpose is to identify and examine transportation issues related to safety and congestion in the city and its surrounding area. The study focused on both short-term improvements, projects that can be quickly and effectively implemented at both an individual intersection level and at an area-wide level, and long-term improvements requiring more significant resources to implement. The study also addressed long-term concerns by examining the future transportation needs and determining options for future improvement projects.

The basic work items accomplished under this SUA study include the following:

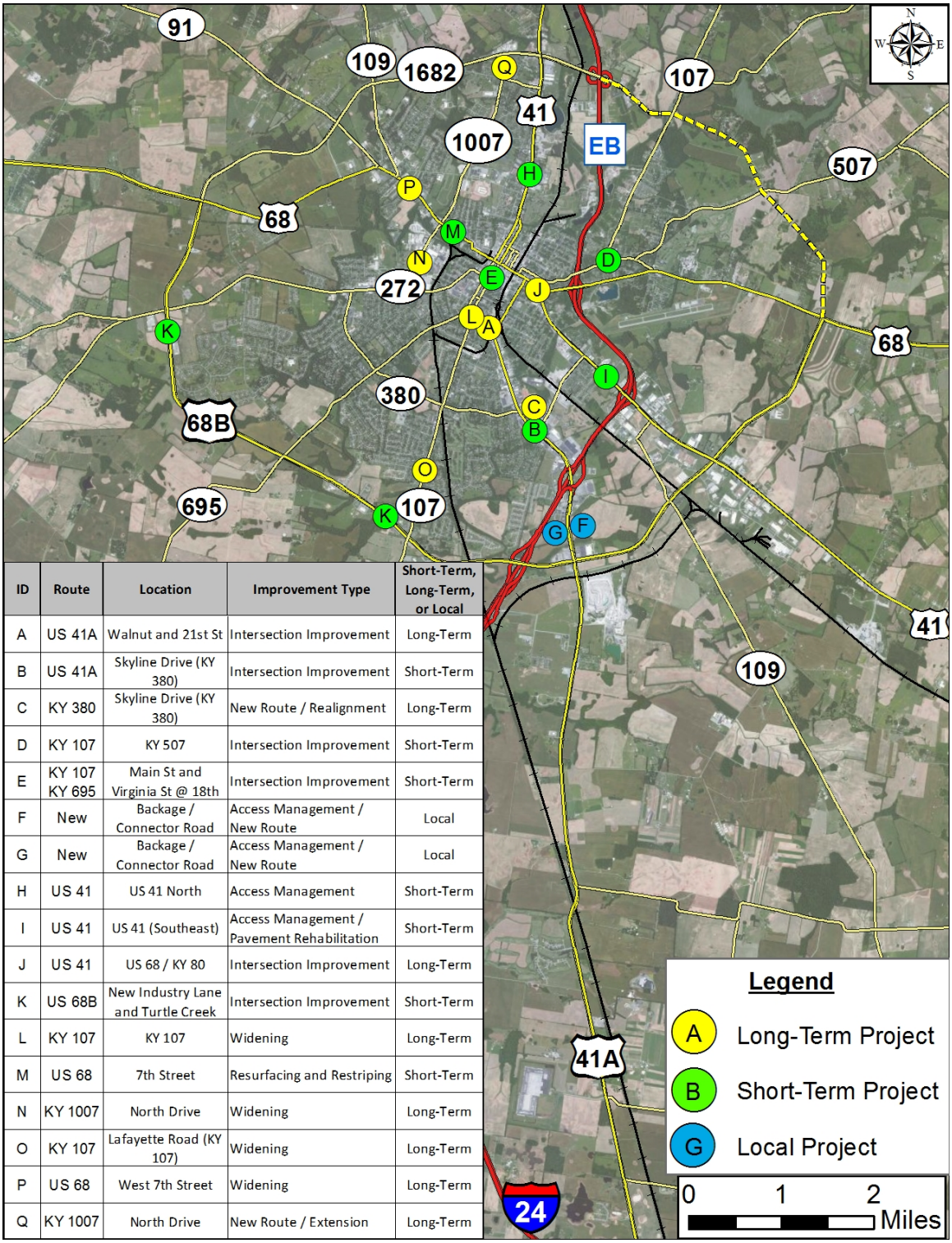
- Review of previous planning documents and committed transportation projects
- Data collection and analysis of existing transportation system
- Travel demand model development update and recalibration (parallel effort)
- Analysis of anticipated future conditions
- Development of recommended projects and strategies
- Coordination with KYTC, City of Hopkinsville, PADD, and Christian County staff
- Disseminated information, gathered input, and identified project needs and goals during the public involvement process
- Study documentation

The Project Team, consisting of the Kentucky Transportation Cabinet (KYTC), the Pennyrile Area Development District (PADD), and the consultant, Stantec, developed a set of conceptual improvement projects to address concerns raised by the local officials, and nearly all the concepts were based on existing safety or congestion concerns. Over the course of the study, the Project Team worked to determine which projects would be most effective and carried those forward for further evaluation and eventual recommendation at the end of the study. The KYTC, as well as the PADD, also contributed to the project by respectively providing the Geotechnical Overview and the Environmental Justice analysis.

The study resulted in a list of recommendations which the KYTC, City of Hopkinsville, Christian County and/or private developers can take for further project development and implementation. The improvement concepts are categorized as follows:

- **Short-term:** The short-term concepts are typically lower-cost projects that can be implemented in the near term. These types of improvements should require little or no right-of-way to construct and in some cases may be implemented by the KYTC Division of Maintenance.
- **Long-term:** The long-term concepts are higher cost projects that will require more significant resources to implement. These types of improvements will require additional right-of-way to construct and will likely need to be funded through the KYTC Six Year Plan (SYP) process.
- **Local projects:** The local projects are not located on the state-maintained system and would likely need to be funded by the City of Hopkinsville or Christian County. A private developer may also take on this responsibility.

The recommended projects are shown on **Figure ES-1**.



ID	Route	Location	Improvement Type	Short-Term, Long-Term, or Local
A	US 41A	Walnut and 21st St	Intersection Improvement	Long-Term
B	US 41A	Skyline Drive (KY 380)	Intersection Improvement	Short-Term
C	KY 380	Skyline Drive (KY 380)	New Route / Realignment	Long-Term
D	KY 107	KY 507	Intersection Improvement	Short-Term
E	KY 107 KY 695	Main St and Virginia St @ 18th	Intersection Improvement	Short-Term
F	New	Backage / Connector Road	Access Management / New Route	Local
G	New	Backage / Connector Road	Access Management / New Route	Local
H	US 41	US 41 North	Access Management	Short-Term
I	US 41	US 41 (Southeast)	Access Management / Pavement Rehabilitation	Short-Term
J	US 41	US 68 / KY 80	Intersection Improvement	Long-Term
K	US 68B	New Industry Lane and Turtle Creek	Intersection Improvement	Short-Term
L	KY 107	KY 107	Widening	Long-Term
M	US 68	7th Street	Resurfacing and Restriping	Short-Term
N	KY 1007	North Drive	Widening	Long-Term
O	KY 107	Lafayette Road (KY 107)	Widening	Long-Term
P	US 68	West 7th Street	Widening	Long-Term
Q	KY 1007	North Drive	New Route / Extension	Long-Term

Figure ES-1: Hopkinsville Small Urban Area Study – Recommended Projects

Project prioritization was accomplished through a two-step process. At the second Advisory Committee meeting, attendees were asked to indicate their level of support for each conceptual improvement project by rating them from 0 to 10, where 0 indicates strong disapproval of the concept and 10 indicates strong support. Six comment sheets were submitted after the meeting. A similar evaluation process was then undertaken at the final Project Team meeting where representatives from the KYTC Division of Planning and District 2 were asked to evaluate the 17 improvement projects and provide an evaluation score for each. The scores from the Advisory Committee, Division of Planning, and District 2 were averaged to arrive at a composite average evaluation score for each project. That score was then used to assign a high, medium, or low priority to each project. The resulting prioritization and average evaluation scores are summarized below. Long-term recommended projects are shown in **Table ES-1**, Short-term projects in **Table ES-2**, and Local projects in **Table ES-3**.

Table ES-1: Recommended Long-Term Projects

ID	Route	Location	Description	Approximate Construction cost	Average Evaluation Score	Prioritization
J	US 41	US 68 / KY 80	Reconstruct intersection	$2,000,000	8.5	High
L	KY 107	KY 107	Add lane on KY 107 between 20th and 21st Streets	$500,000	7.8	High
O	KY 107	Lafayette Road (KY 107)	Widen KY 107 from US 68B to Gateway Lane	$2,500,000	8.4	High
P	US 68	West 7th Street	Widen US 68 from KY 1007 to KY 91	$2,000,000	8.1	High
A	US 41A	Walnut and 21st St	Improve the intersection to remove the multi-legged approaches	$1,000,000	7.1	Medium
N	KY 1007	North Drive	Widen North Drive from Canton St. to US 68 (7th Street)	$2,700,000	7.0	Medium
C	KY 380	Skyline Drive (KY 380)	Realign Skyline Drive east of US 41A to meet with Country Club Way at US 41A	$3,250,000	4.5	Low
Q	KY 1007	North Drive	Extend KY 1007 from Sanderson Dr. to the Hopkinsville Bypass (US 68B)	$750,000	4.8	Low

Table ES-2: Recommended Short-Term Projects

ID	Route	Location	Description	Approximate Construction cost	Average Evaluation Score	Prioritization
B	US 41A	Skyline Drive (KY 380)	Add additional left turn lane on southbond US 41 A to Skyline Drive (No Skyline Drive realignment)	$175,000	8.3	High
E	KY 107 KY 695	Main Street and Virginia Street @ 18th Street	Improve end of one-way intersections on Main and Virginia Streets at 18th Street	$100,000	8.3	High
K	US 68B	New Industry Lane and Turtle Creek Drive	Add left turn lanes to each direction of US 68B at New Industry Lane and on eastbound US 68B at Turtle Creek Drive	$500,000	8.6	High
D	KY 107	KY 507	Realign intersection to remove skewed approach and make KY 107 the through route	$250,000	6.4	Medium
M	US 68	7th Street	Resurface and stripe 7th street to three lanes between 9th and North Ave	$150,000	7.2	Medium
H	US 41	US 41 North	Conduct Access Management Study for US 41 north of downtown Hopkinsville; consider removing median and improving US 41 north	$100,000 (study only)	5.3	Low
I	US 41	US 41 (Southeast)	Perform pavement rehabilitation project; remove mountable median and add bike lanes to US 41	$4,000,000	4.8	Low

Table ES-3: Recommended Local Projects

ID	Route	Location	Description	Approximate Construction cost	Average Evaluation Score	Prioritization
F	New	Backage / Connector Road	Construct new road from US 68 Bypass along the east side of US 41A as backage road to Walmart	$3,100,000	7.9	Local
G	New	Backage / Connector Road	Construct new road from US 68 Bypass along the west side of US 41A as backage road as alternative access	$2,200,000	7.3	Local

1.0 INTRODUCTION

In 2012, the Kentucky Transportation Cabinet (KYTC) initiated a Small Urban Area (SUA) study for the City of Hopkinsville, Kentucky in Christian County. The purpose of the study was to identify and examine transportation issues related to safety and congestion in the city and surrounding area. The study's focus and primary goal was to recommend short-term improvements which the KYTC, City of Hopkinsville, Christian County and/or private developers can quickly and effectively implement at both an individual intersection level and at an area-wide level. The study also sought to address long-term concerns by examining the future transportation needs and determining options for future improvement projects.

The Division of Planning conducts SUA transportation studies in Kentucky for areas with populations of 5,000 to 50,000. A SUA study provides a thorough examination of an area's transportation network, including an analysis of existing and future traffic conditions, with the goal of identifying needs and potential solutions to provide a more efficient transportation network. Completed studies generally include a Travel Demand Model and recommended operational improvements that address any deficiencies that are identified by the forecasted Level of Service (LOS).

The Project Development Team (PDT), consisting of KYTC, the Pennyrile Area Development District (PADD), and the consultant, Stantec, determined which projects are the most effective and those were brought forward for further evaluation and eventual recommendation at the end of the study. Conceptual descriptions of the improvements and cost estimates were developed.

1.1 Study Area

The study area includes the Hopkinsville incorporated limits and surrounding area as shown in **Figure 1**. This area is located in south-central Christian County, approximately 70 miles northwest of Nashville, TN. The city of Oak Grove and the Fort Campbell Military Reservation, both located south of Hopkinsville, are not included in the study area.

The study area extends just beyond US 68B and KY 1682 (Hopkinsville Bypass) to the west and north, Pembroke to the east, and just south of the US 41A interchange with I-24 to the south. With an area of over 724 square miles, Christian County is the second largest county in Kentucky. According to the U.S. Census Bureau, Christian County's population was 73,955 at the 2010 Census, ranking it as Kentucky's 11th most populous county. Hopkinsville is Kentucky's sixth largest city with an estimated population of 31,577 at the 2010 Census. The SUA study area comprises approximately 156 square miles of Christian County.

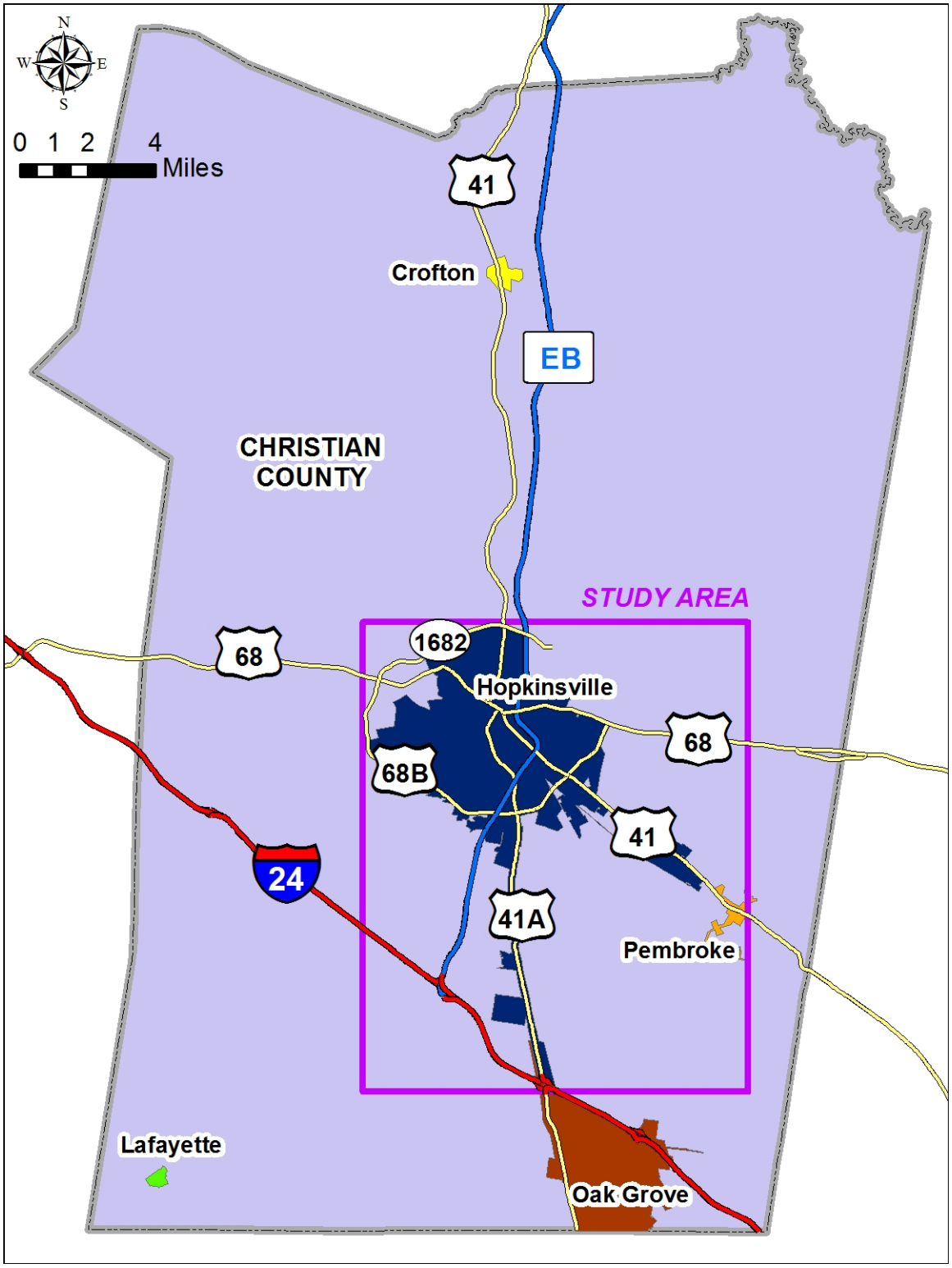


Figure 1: Hopkinsville Small Urban Area Study – Study Area

1.2 Study Scope

The Hopkinsville SUA study has been prepared under the direction of the KYTC District 2 and the KYTC Division of Planning. The study examines existing transportation conditions in terms of both safety and operational characteristics. Following the analysis of these characteristics, the study recommends a list of transportation projects to address existing and long-range transportation needs for this portion of Christian County. The basic work items accomplished under this transportation study include the following:

- Review of previous planning documents and committed transportation projects
- Data collection and analysis of existing transportation system
- Travel demand model development update and recalibration (parallel effort)
- Analysis of anticipated future conditions
- Development of recommended projects and strategies
- Coordination with KYTC, City of Hopkinsville, PADD, and Christian County staff
- Disseminated information, gathered input, and identified project needs and goals during the public involvement process
- Study documentation

2.0 EXISTING CONDITIONS

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

2.1 Roadway Systems

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

- Provide a framework for highways serving mobility and connecting regions and cities within a state.
- Provide a basis for assigning jurisdictional responsibility according to the roadway's importance.
- Provide a basis for development of minimum design standards according to function.
- Provide a basis for evaluating present and future needs.
- Provide a basis for allocation of limited financial resources.

Figure 2 shows the functional classification of roadways within the study area. In the southern portion of the study area, I-24 provides regional east-west connectivity to major destinations within Kentucky and Tennessee, such as Paducah and Nashville, and extending to other surrounding states. Two interchanges exist along I-24 within the study area, at the Edward T. Breathitt Parkway (KY 9004, exit 81A) and US 41A (exit 86). Other interchanges are provided just beyond the limits of the study area at KY 117 (exit 73) and KY 115 (exit 89).

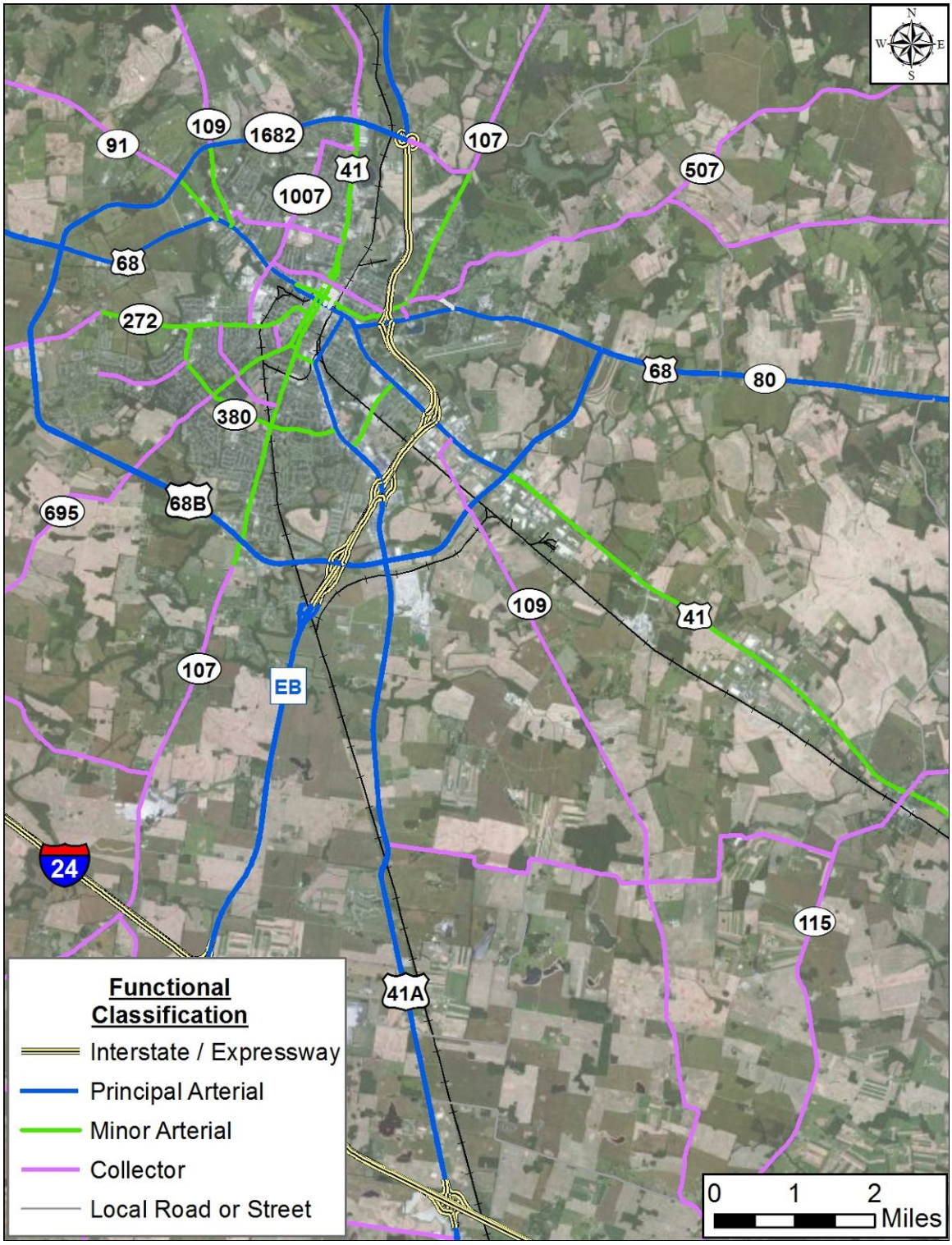


Figure 2: Functional Classification of Study Area Roadways

Other regionally important roadways, which are functionally classified as Principal Arterials, include the following:

- Edward T. Breathitt Parkway (KY 9004, formerly known as the Pennyrile Parkway)
- US 41 (Pembroke Road / Madisonville Road)
- US 41A (Fort Campbell Boulevard)
- US 68 (Jefferson Davis Highway)
- US 68B / KY 1682 (Eagle Way, referred to locally as the Hopkinsville Bypass)

The National Highway System (NHS) consists of roadways important to the nation's economy, defense, and mobility. This designation includes the following subsystems of roadways:[1].

- Interstate: The complete Interstate System of highways is listed on the NHS.
- Other Principal Arterials: These are highways in rural and urban areas which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- Strategic Highway Network (STRAHNET): This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.
- Major Strategic Highway Network Connectors: These are highways which provide access between major military installations and highways which are part of the Strategic Highway Network.
- Intermodal Connectors: These highways provide access between major intermodal facilities and the other four subsystems making up the National Highway System.

Figure 3 depicts the study area roadways listed on the NHS. I-24, the Breathitt Parkway, US 41A, US 68, US 68B, and US 41 (from the Breathitt Parkway to US 68) are NHS routes. US 41A provides access to the Fort Campbell military reservation.

In compliance with the Surface Transportation Assistance Act of 1982 (STAA), Kentucky has established a network of highways on which commercial vehicles with increased dimensions may operate. These “STAA” vehicles include semi-trailers with 53-foot long trailers and single-unit trucks with a total length of 45 feet. These designated truck routes are shown on **Figure 4**. I-24, the Breathitt Parkway, KY 1682, and portions of US 68 (east of the Breathitt Parkway and west of US 68B) are federal designated truck routes. US 68B is a state designated truck route.

[1] Source: http://www.fhwa.dot.gov/planning/national_highway_system/

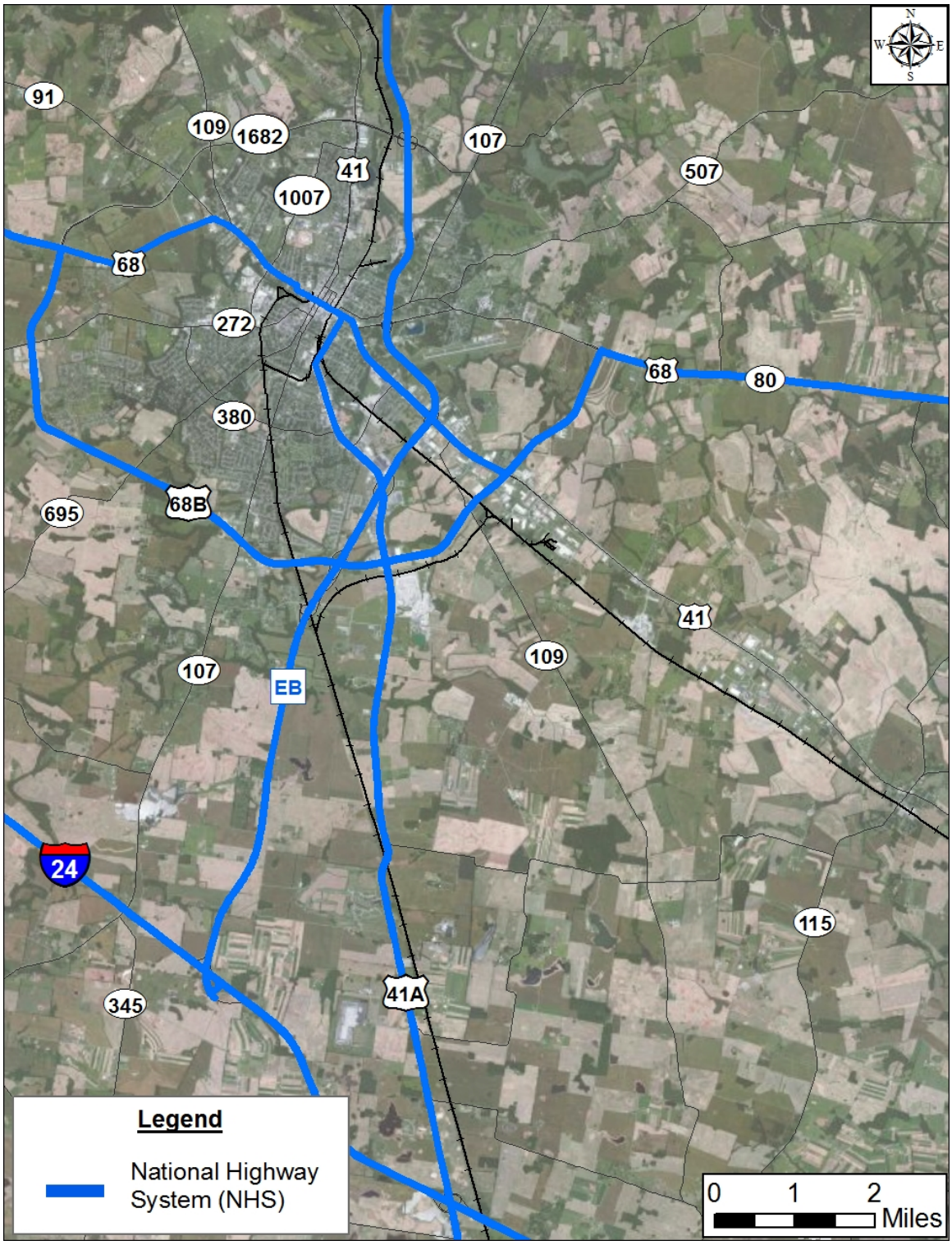


Figure 3: National Highway System (NHS) Routes

Figure 4: Designated Truck Routes

2.2 Roadway Geometric Characteristics

The current number of lanes and estimated lane widths along study area roadways are shown on **Figure 5**. Current KYTC design guidelines suggest a minimum of 11-foot wide lanes on arterials and collector roadways. With two exceptions, all study area arterials have 11-foot or wider lanes. The exceptions are KY 109 between US 68 and KY 1682 with nine-foot lanes, and US 41 in the southeastern portion of the study area approaching Pembroke with 10-foot lanes. Several collector roadways (portions of KY 107, KY 109, KY 507 and others) have lane widths less than 11 feet. All state-maintained, multi-lane facilities have lane widths of at least 11 feet.

Estimated shoulder widths are shown on **Figure 6**. Most arterial routes have shoulders at least eight feet wide, the recommended minimum for such roadways. Some of the more rural routes have shoulders between one and four feet in width. Many of the downtown streets have curb and gutter and, therefore, are shown as having no shoulder.

2.3 Existing Traffic Volumes

Average daily traffic (ADT) volumes are shown on **Figure 7**. ADT volumes on state-maintained routes in the study area range from 350 vehicles per day (VPD) on KY 508 to 34,400 VPD on I-24. US 41A is the heaviest traveled non interstate roadway in the study area with portions having ADTs 15,750 to 29,150 VPD. The Breathitt Parkway and portions of US 41 and US 68B have ADTs over 10,000 VPD.

Level of service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience[2]. There are six levels of service, having letter grades A through F. Level-of-service (LOS) A is associated with free-flow conditions, high freedom to maneuver, and little or no delay. Conditions at or near capacity typically are associated with LOS E. At LOS F, traffic conditions are oversaturated and beyond capacity, with low travel speeds, little or no freedom to maneuver, and high delays.

Levels of service for different facility types are based on service measures deemed most appropriate for describing operations. For interstates, freeways and multilane highways, LOS is based on density (expressed in passenger car equivalents per mile). For arterial streets, LOS determinations are based on the percent of free-flow speed. This measure includes delay at signalized intersections. For two-lane highways, levels of service are determined based on two parameters – average travel speed and percent time following in a platoon.

At the facility level, LOS can be computed using methods that involve detailed data and operational parameter input. At an area-wide level such as the study area for the Hopkinsville SUA, the same methods can be applied, using default values and simplifying assumptions, to produce “planning” LOS estimates. This approach is particularly useful when data are limited or when projected future year scenarios are being compared with the current state. Included in the simplifying assumptions is the use of readily available average daily traffic counts or projections.

[2] *Highway Capacity Manual*, Transportation Research Board, National Research Council, Washington, D.C., 2010.

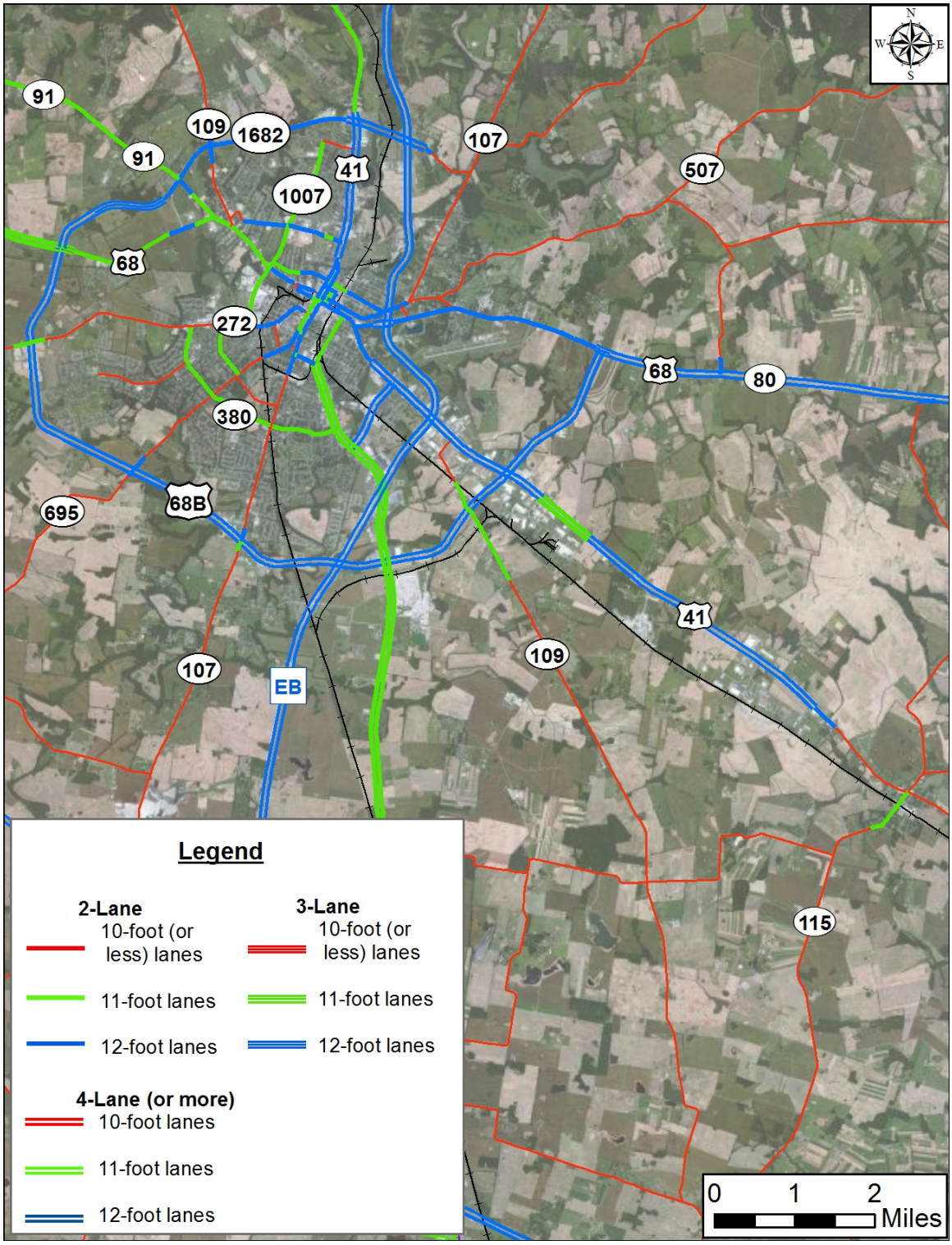


Figure 5: Number of Lanes and Lane Widths

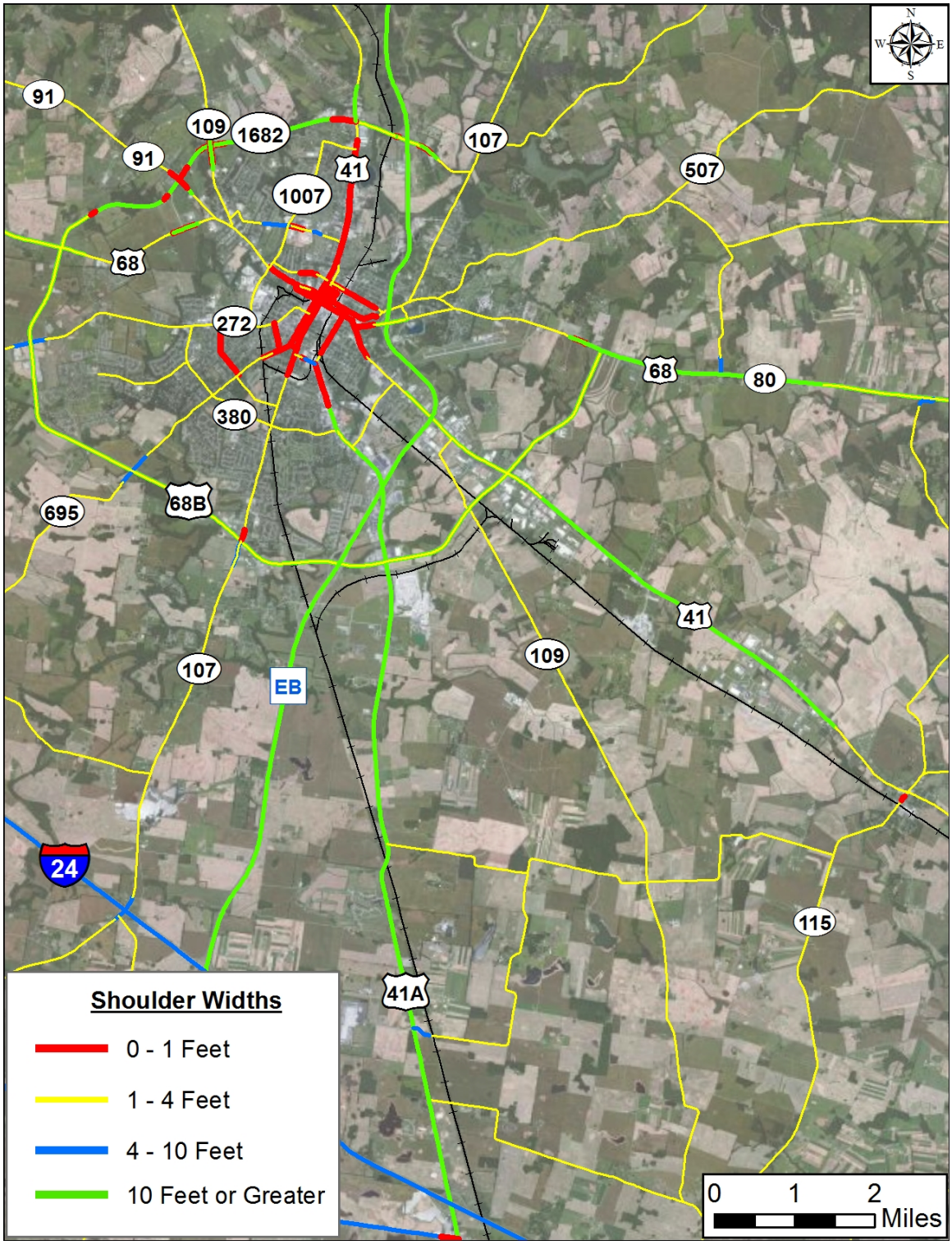


Figure 6: Shoulder Widths

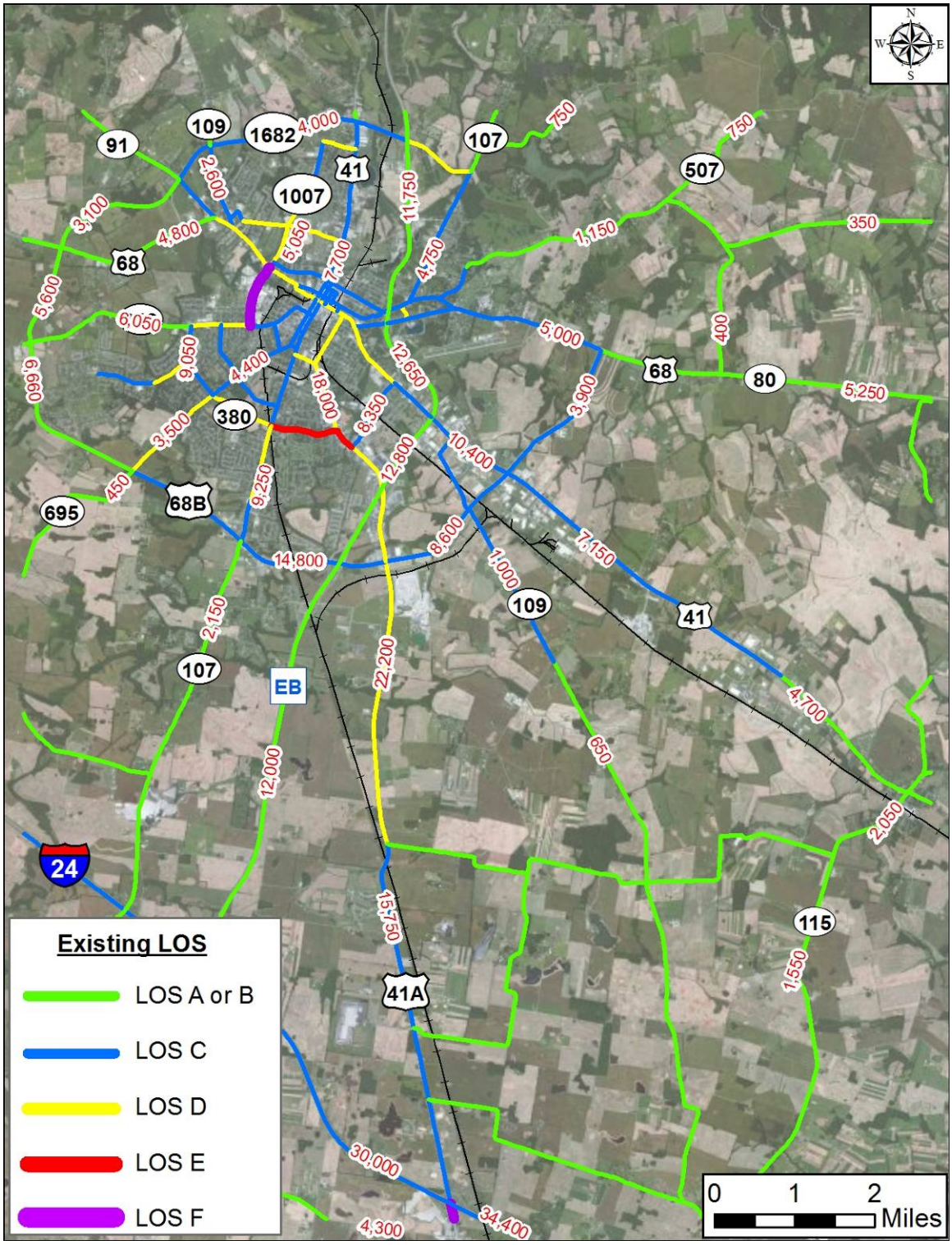


Figure 7: Current Average Daily Traffic (ADT) Volumes and Levels of Service (LOS)

Based on this planning-level analysis, three roadway segments appear to operate at LOS E or LOS F today. These are KY 1007 (North Drive) between KY 272 and US 68, KY 380 between KY 107 and US 41A, and US 41A between the two KY 380 intersections.

2.4 Crash History

Crash data were collected along existing roadways within the study area for a three-year period between 2009 and 2011. A total of 4,286 crashes were reported within the study area. This accounts for about 66 percent of the 6,508 crashes reported in Christian County over the same period.

Critical Rate Factors (CRFs) were determined as part of this analysis. The CRF value is calculated by dividing the actual crash rate along a particular roadway segment by the critical rate, which is the accident rate for which it can be said that crashes are probably not occurring randomly based on roadway characteristics and traffic. A CRF greater than 1.0 suggests that conditions may exist that contribute to non-random occurrences.

Segment locations with CRF values greater than 1.0, shown on **Figure 8**, are listed below.

- US 41: between US 68 and KY 107, CRF = 2.4
- US 41A: between US 68 and E 19th Street, CRF = 2.0
- US 68: between Breathitt Parkway and US 41, CRF = 2.1
- US 68: between US 68B and KY 91, CRF = 1.3
- US 68: between KY 109 and KY 107, CRF = 1.8
- KY 107: between US 68B and E 21st Street, CRF = 1.2
- KY 107: between US 41 and KY 507, CRF = 2.1
- KY 109: between US 68 and KY 1682, CRF = 1.1
- KY 109: between US 68B and US 41, CRF = 1.1
- KY 115: between KY 1027 and US 41 in Pembroke, CRF = 1.1
- KY 272: between KY 1007 and KY 107, CRF = 1.0
- KY 380 (Country Club Lane): between KY 107 and US 41A, CRF = 1.1
- KY 380 (Skyline Drive): between US 41A and US 41, CRF =1.4
- KY 507: between KY 107 and Woodbine Street, CRF = 1.3
- KY 695: between US 68B and KY 380, CRF =1.7
- KY 1682: east of Breathitt Parkway, CRF = 1.4

Additionally, roadway spots (a roadway length of less than 0.3 miles) with high crash rates were also identified. These locations, shown on **Figure 9**, are summarized in **Table 1**.

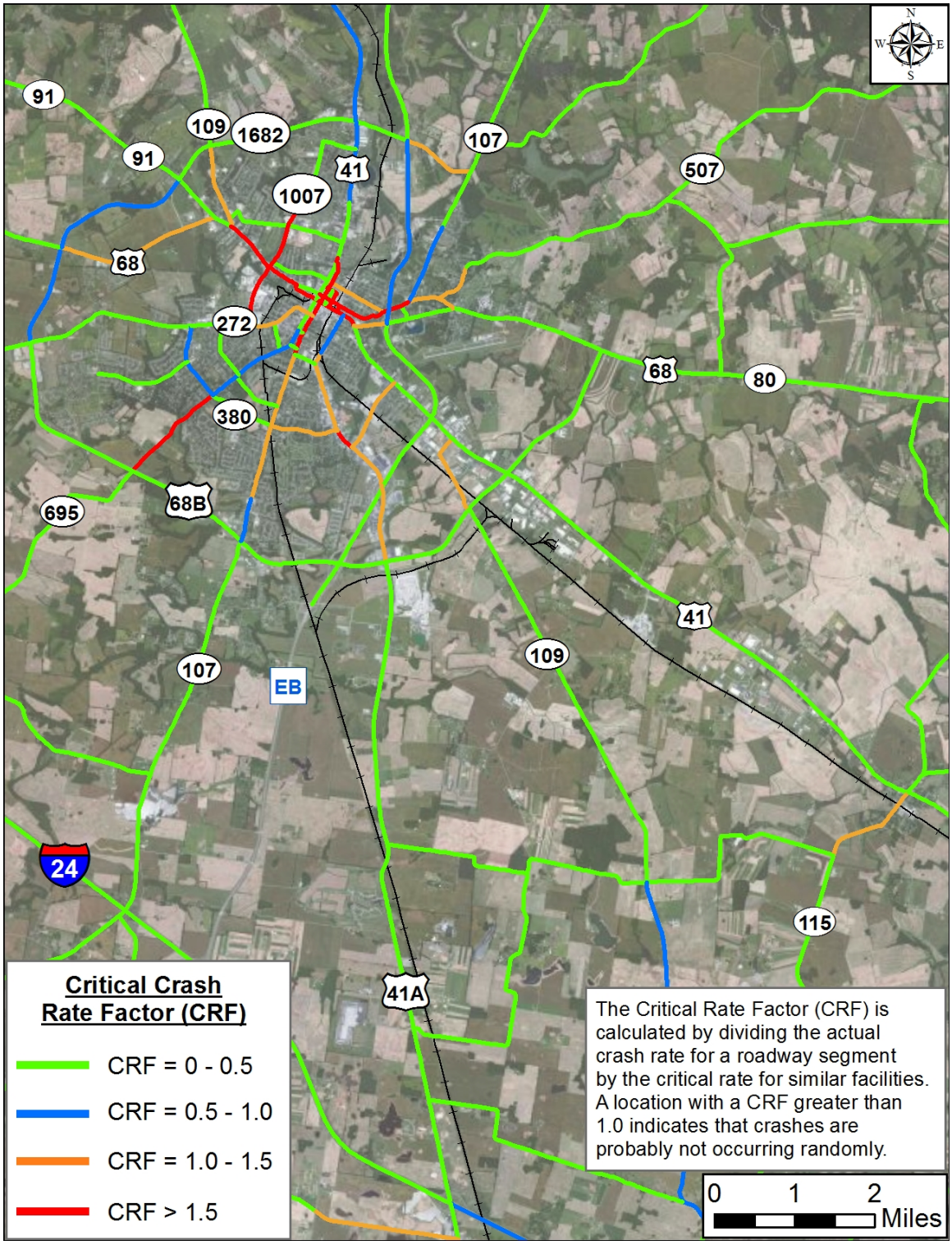


Figure 8: Crash History (2009-2011) and Critical Crash Rate Factors (CRF)

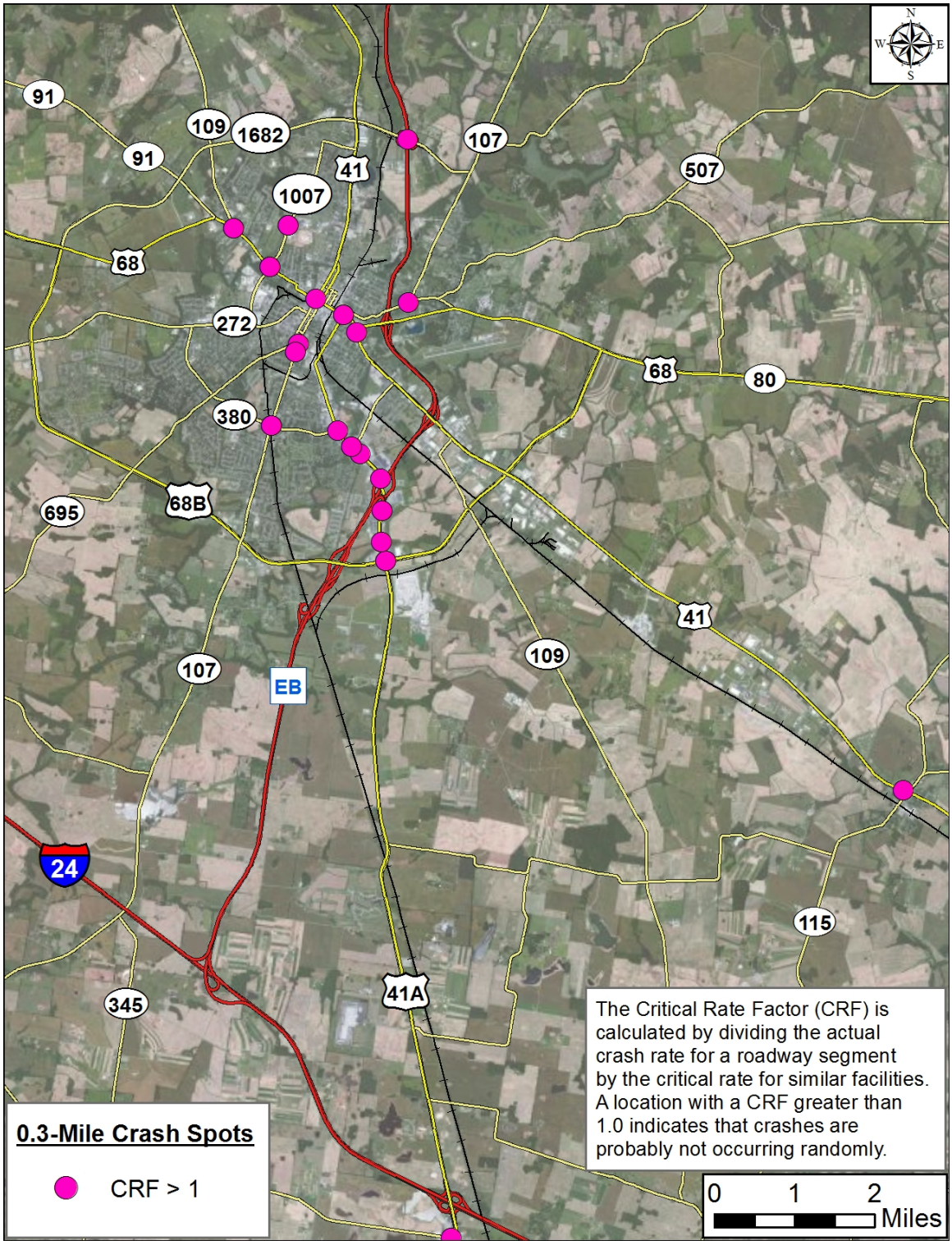


Figure 9: 0.3-Mile Spots with Critical Crash Rate Factors Greater than 1.0

Table 1: Summary of 0.3 Mile Crash Spots with CRF Greater than 1.0

Route	Milepost	Location Description	Crashes	Average ADT	CRF
EB 9004	11.70	KY 1682 interchange	11	11,100	1.17
KY 1007	0.78	US 68 (7th Street)	48	8,800	2.79
KY 1007	1.35	Glass Avenue	18	5,100	1.59
KY 107	17.17	KY 380 (Country Club Lane)	34	7,600	2.20
KY 107	18.15	E. 21st Street	29	7,500	1.94
KY 107	18.25	Near 19th Street	64	8,200	2.65
KY 107	19.84	KY 507	14	4,100	1.43
US 41	2.79	KY 115 in Pembroke	6	2,750	1.01
US 41	11.81	US 68	22	11,800	1.02
US 41	12.11	US 41A	45	11,700	2.11
US 41A	12.56	US 68B	62	30,000	1.20
US 41A	12.68	North of US 68B	63	30,200	1.21
US 41A	13.19	Clinic Drive	119	30,500	2.27
US 41A	14.00	Near the Mall	90	24,750	2.04
US 41A	14.15	KY 380 (Skyline Drive)	69	22,800	1.67
US 41A	14.41	KY 380 (Country Club Lane)	82	16,700	1.71
US 68	9.47	KY 109 (Dawson Springs Road)	26	10,900	1.32
US 68	10.14	KY 1007 (North Drive)	90	12,200	4.09
US 68	10.87	KY 107 / US 41	38	10,250	1.96

2.5 Adequacy Ratings

To provide an objective approach to evaluating the general condition of roadways across the state, the KYTC assigns adequacy ratings to state-maintained roadway segments. The composite adequacy rating takes into account the roadway condition as well as the safety and service provided. Adequacy ratings range from 0 to 100, and a “perfect” roadway would be scored 100. To help compare estimated roadway conditions across the state, a percentile is used for adequacy rating composite scores in each of the rated highway functional classifications. The percentile compares the condition of a roadway or roadway segment to other roadway sections of the same functional classification elsewhere in Kentucky.

Figure 10 shows the adequacy ratings for roadways within the study area.

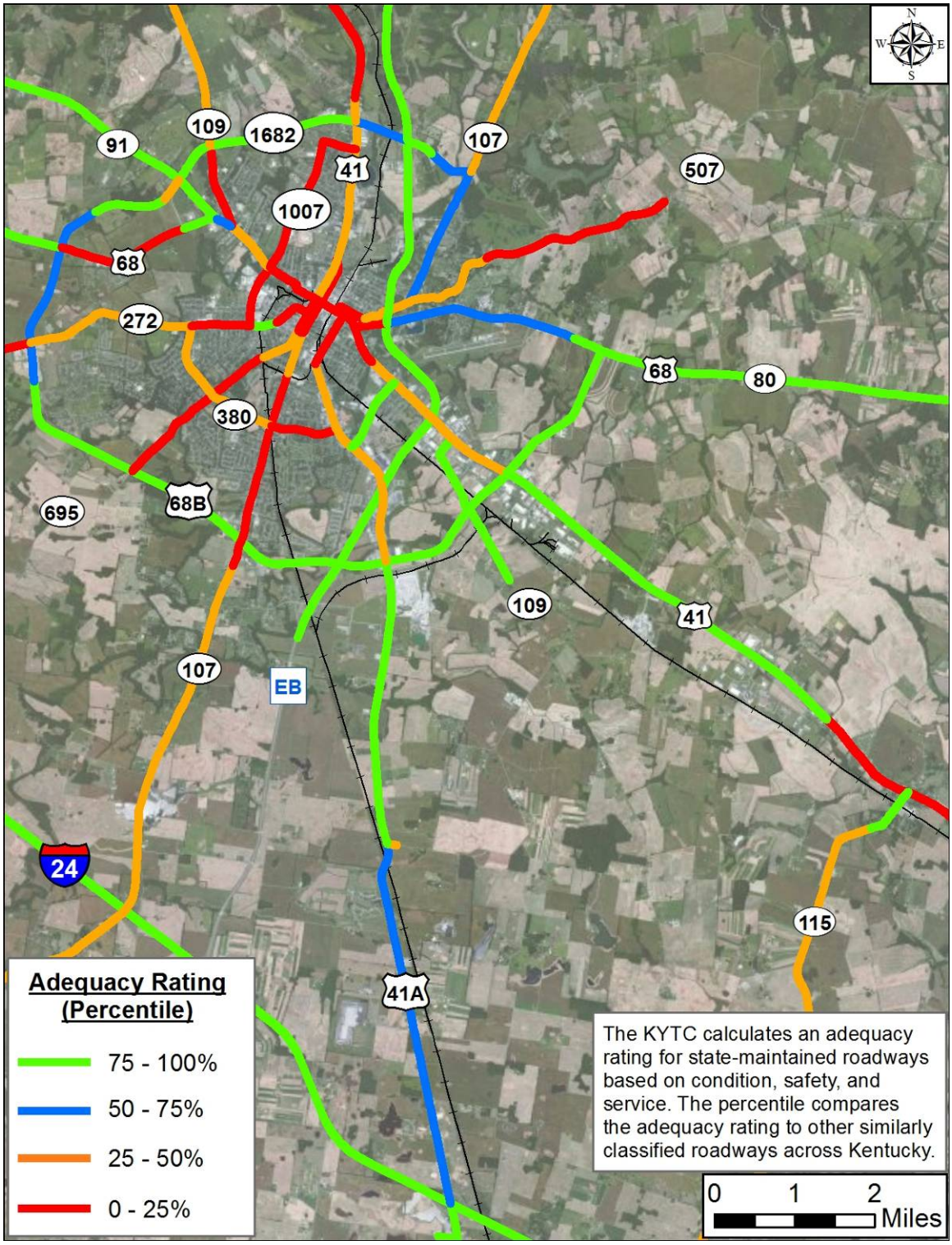


Figure 10: Composite Adequacy Ratings

3.0 ENVIRONMENTAL OVERVIEW

An Environmental Overview has been prepared for the Hopkinsville SUA Study and submitted under separate cover; a copy is found in **Appendix A**. It was performed to identify environmental resources and potential issues of concern, and establishes an environmental footprint for consideration in the development of future transportation projects and avoidance and minimization of impacts. The study area assessed for the report includes the city limits of the City of Hopkinsville, extending southeastward to include the City of Pembroke and southward to the I-24 and US 41A interchange. A summary of results follows, however the Environmental Overview report should be referenced for complete and final consideration.

3.1 Social and Economic Resources

Numerous cemeteries are noted in the area. Some cemeteries showing only on USGS topographic maps may be historical or small, unnamed church or family burial plots. A minimum of twenty-five churches are mapped in the study area although numerous other smaller churches and worship centers are suspected to be present. Six fire departments, one emergency center, three hospitals, and five law enforcement agencies locations are present in the study area. Twenty-five schools of various levels of education are listed. Hopkinsville Industrial Park on US 41 southeast of downtown Hopkinsville and Southpark on US 41A are the two industrial parks in the area. Three golf courses are mentioned in the area. No federally owned land or operated facilities are mapped in the study area.

3.2 Air Quality

Due to the non-specific nature of the report and large study area, the environmental study looked at a general, county wide issue for air quality. Review of available USEPA Green Book data (USEPA, 2012b) indicated Christian County and the surrounding counties are not listed for any criteria pollutants. The Kentucky Transportation Cabinet (KYTC), Division of Planning's Air Quality Modal Program does list Christian County as an Air Quality Maintenance Area for 8-Hour Ozone as of July 2012 (KYTC, 2012a).

3.3 Noise

Due to the non-specific nature of the report and large study area, the environmental study looked at a general, county wide issue for noise. Noise-sensitive receptors as identified per KYTC's Noise Analysis and Abatement Policy (KYTC, 2011) are present throughout the study area, including specified activity categories (land uses) of:

- Category B Residential areas, exterior.
- Category C & D Active sport areas, cemeteries, hospitals, parks, picnic areas, places of worship, playgrounds, Section 4(f) sites, schools, exterior and interior.
- Category E Hotels, motels, offices, restaurants/bars, etc., exterior.

More specific traffic noise impact analyses may need to be conducted based on the recommended projects related to this SUA study.

3.4 Aquatic and Terrestrial Ecology

Three hundred twenty-three (323) streams and 1,290 NWI-mapped wetlands are mapped within the study area. Of particular concern are the West Fork Red River (a KDOW designated Special Use Water), the North Fork Little River (a KDOW 305(b) and 303(d) listed stream), and the South Fork Little River (a KDOW 303(d) listed stream). 100-year FEMA floodplains are mapped along the major rivers and tributaries in the area. FEMA regulated floodways are present in the North Fork Little River and South Fork Little River with in the City of Hopkinsville. Three public water supply wells are present in the study area which is mostly covered by one of two Source Water Assessment and Protection (SWAP) areas. Ninety-nine (99) other wells are registered for domestic or agricultural uses.

One federal endangered species, the gray bat, has been reported to occur within the study area boundary, and three additional federal-listed species are known to occur within five miles of the study area. A portion of the study area is within USFWS known Indiana bat habitat area. Projects which occur within this area will require project-specific evaluation by the Service to assess appropriate minimization and mitigation measures for project related habitat impacts. Specific habitat surveys may be required for subsequent projects which impact potential habitat for the Gray bat, Indiana bat or the copperbelly water snake. Coordination with the USFWS Kentucky Field Office will help determine the need and implementation of such surveys.

3.5 Cultural Historic and Archaeological Resources Evaluation

Twenty-seven (27) National Register of Historic Places registered historic properties and five NRHP historic districts are present in the study area. Two hundred five (205) previously recorded archaeological sites are identified within the study area, two of which are listed on the NRHP and one considered eligible for inclusion on the National Register. Approximately 30% of the study area has been previously surveyed for archaeological resources, indicating additional archaeological resources are potentially present throughout the study area.

3.6 UST/Hazmat Considerations

Two CERCLIS (USEPA Superfund) sites, one RCRA COR ACT (USEPA Corrective Action) site, two RCRA TSD (USEPA Treatment, Storage, and Disposal) sites, three solid waste landfills, and 33 LUST sites are present within the study area. Project specific Phase I surveys will need to be performed to assess businesses and other areas for potential hazardous materials and location of UST and AST at such places as gas stations.

3.7 Geotechnical Considerations

The KYTC Division of Structural Engineering, Geotechnical Branch provided a Geotechnical Overview for the study area, a copy of which is found in **Appendix B**. The review noted the study area is well known for its rolling terrain, red clay soils (residual material remaining after the soluble elements of the bedrock have dissolved), and the Karst behavior of the underlying bedrock. Available mapping indicates notable faults north of the study area as well as numerous karst features such as sinkholes, caves, and solution features in the bedrock.

Foundations for bridges in the study area are generally rock bearing (end bearing piles, drilled shafts, or spread foundations). Smaller structures such as retaining walls and box culverts are commonly founded on soil. Native soils in the area are generally suitable for embankment construction, accommodating embankments to a height of 60 feet with 2:1 sideslopes if the foundation is suitable and proper compaction methods are used. However, soil cuts in the native soils have been historically problematic and cuts over approximately 10 feet often require geotechnical analyses to design proper sideslopes. In no case should soil cuts be steeper than 2:1. California Bearing Ratio (CBR) values used in pavement design are generally low for subgrades in the area. Chemical modification of subgrade or the use of rock roadbed is common in the area.

3.8 Environmental Justice

Issues pertaining to minority, elderly, disability and low income (persons living in poverty) populations in the project study area were evaluated and documented in an August 2012 report entitled *Hopkinsville Small Urban Study within Christian County, Kentucky - Environmental Justice Review*. A copy of the report is found in **Appendix C**. The report concluded that Environmental Justice (EJ) populations above the state and county averages occur in several Census Block Groups in the study area. Recommendations resulting from this SUA study effort should not disproportionately impact the residences of these Census Block Groups.

4.0 FUTURE CONDITIONS

To determine the need for and purpose of potential transportation improvement projects, it is necessary to estimate future conditions within the study area. This chapter summarizes the anticipated future conditions within the study area portion of Christian County.

4.1 Committed Projects

A number of transportation improvements are currently underway or are programmed for implementation in Christian County within the coming years. These projects, summarized in **Figure 11**, are listed in the 2012 KYTC Highway Plan.

4.2 Christian County Travel Demand Model Update

The previous version of the Christian County Travel Demand Model (the model) was developed by Alliance Transportation Group and RPM Transportation Consultants for the Clarksville Urban Area Metropolitan Planning Organization (CUAMPO). The model was developed with the TransCAD software package, version 4.8 and was completed in September 2010. While the model used socioeconomic and highway network data provided and/or approved by KYTC, CUAMPO maintained primary oversight over model development, resulting in a model structure distinct from the standard format KYTC has been pursuing for its small urban area models. Further, the Traffic Analysis Zone (TAZ) structure in the model did not conform to KYTC's statewide model zone structure making comparisons between the two models' outputs difficult.

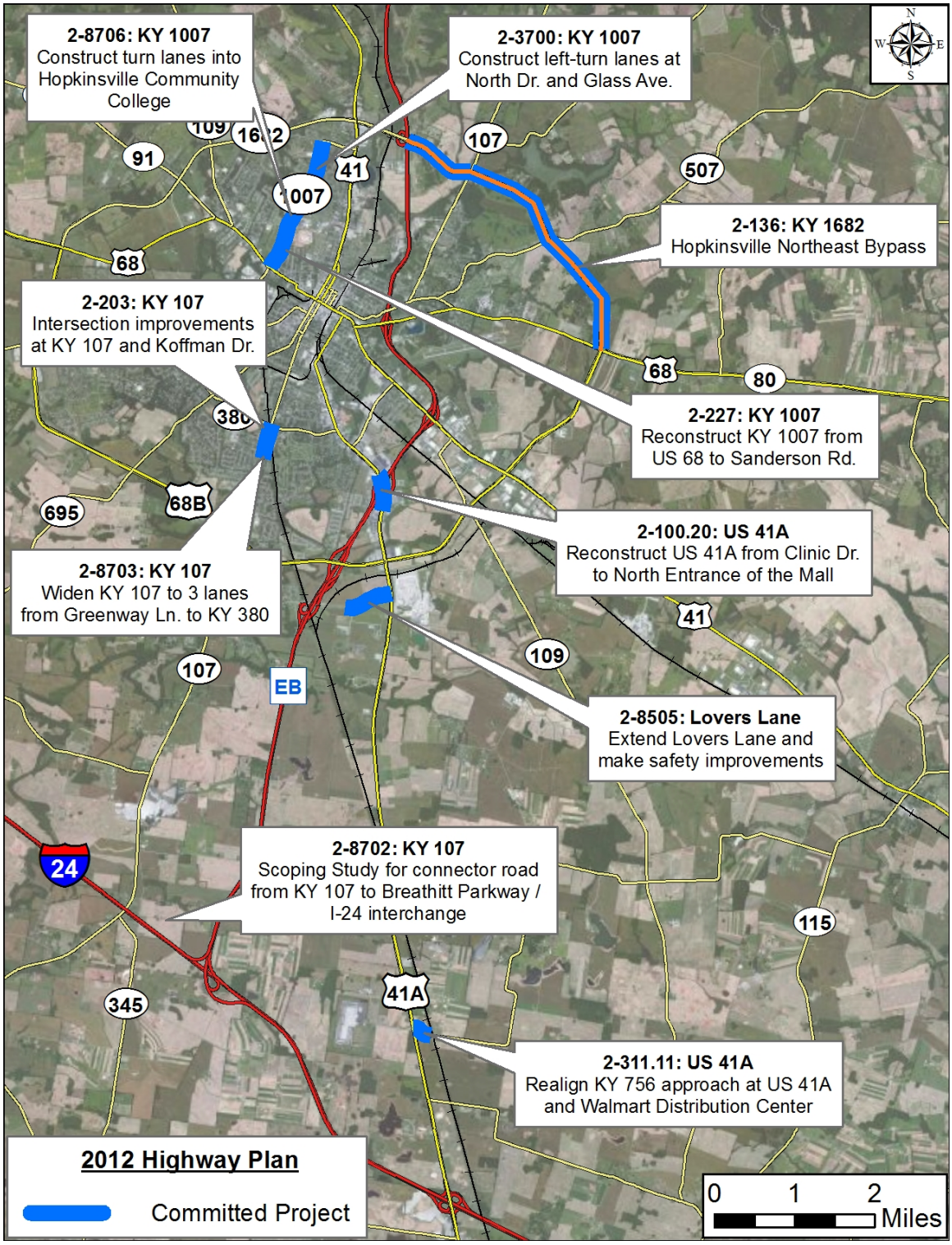


Figure 11: Committed Projects from the KYTC 2012 Highway Plan

Traffic Analysis Zone (TAZ) and Model Network Revisions

Given the availability of new 2010 Census data as well as the issues previously stated, KYTC contracted with Stantec to update the zonal structure and socioeconomic and network data in the model and convert the model structure to conform with KYTC's other recently developed small urban area models in the latest TransCAD version 6.0 environment. While the process of transitioning the model structure into KYTC's preferred format continues as of the completion of the Small Urban Area Study, the update of input files and recalibration of the model in its existing form was completed to provide 2040 forecasts for the study.

The first element of the model update was a revision of the geographic files that make up the spatial foundation of the model. Given that the previous model had been developed relatively recently, revisions to the 2010 base network were limited to incorporating the recently completed extension of the Breathitt Parkway from Lover's Lane to I-24.

The previous model organized Christian County into 187 internal TAZs, which produce and attract vehicular trips that are then assigned to the highway network. While these TAZs include Fort Campbell, the post was and continues to be treated as three external gateways into the county, similar to the 26 other major and minor highways where external traffic enters and exits the county network. Stantec redefined the boundaries of these TAZs so that they would conform to both the boundaries of KYTC's statewide model TAZ coverage as well as the 2010 Census tract boundaries. As a result, 64 new internal TAZs were created, bringing the total number of internal TAZs in Christian County to 251. **Figure 12** compares the new TAZ boundaries in blue, with the previous model boundaries in red.

Socioeconomic Data Updates

The previous model had based its 2008 base year population estimates on the 2000 Census and the Kentucky State Data Center's (KSDC) estimate for 2008. Local officials had expressed concern that the previous model had underrepresented the total population of Christian County. Therefore, household and population estimates were updated based on the newly available 2010 Census data. TAZ boundaries were redrawn, in part, to match census tract boundaries so that 2010 base year population could be verified at both the block and tract level. Given that households are reported at the tract level, household estimates for TAZs within census tracts were controlled to match tract totals.

Census tract boundaries also conform with the boundaries of Fort Campbell. While technically located within Christian County, following the precedent of the previous model, the current model functionally treats Fort Campbell as external to Christian County. This is, in part, due to the atypical household makeup and trip behavior found within military installations, as well as the defined and controlled access entry points. Further, the active area of Fort Campbell extends extensively across the border of Christian County and Kentucky into Tennessee, beyond the model area.

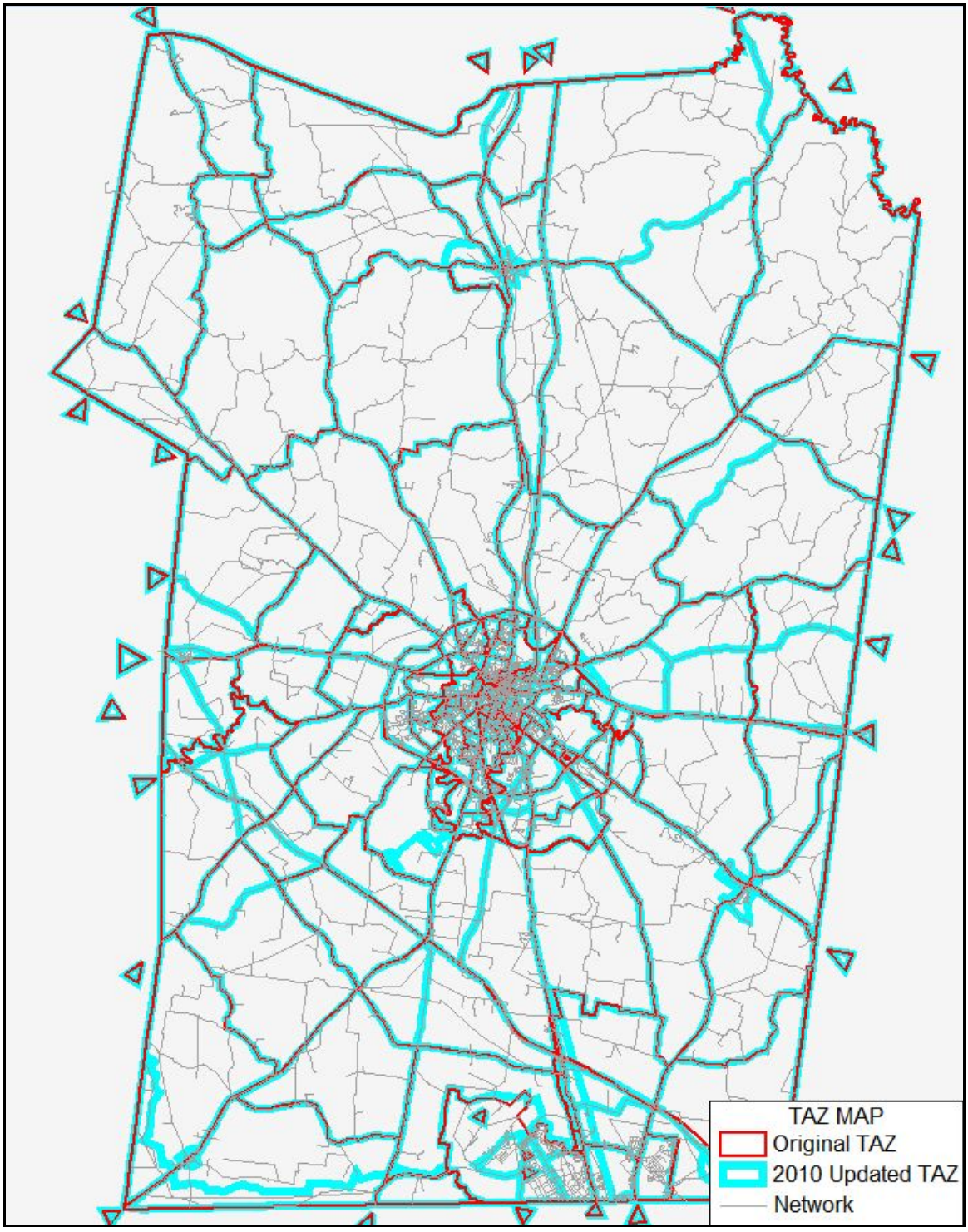


Figure 12: Model Traffic Analysis Zone (TAZ) Comparison

The KYTC provided current Bureau of Labor Statistics (BLS) employment data at the TAZ level. Employment is reported in three categories which determine trip rates: Retail, Service, and Other. The BLS employment source is more conservative than the privately collected Woods and Poole employment data used in the previous model in that it measures employment from payroll records collected from the employer. This results in lower aggregate total numbers, as the self-employed are typically omitted. However the BLS data are more accurate in terms of identifying the actual locations of places of employment. It is also important to note that employment-related trips are generated (or "produced") on the basis of total households in the study area and attracted to places of employment. Therefore, the proportional location of employment is much more important than total jobs.

Table 2 presents summary statistics of the 2010 socioeconomic data used in the model. The population for Fort Campbell is included in the Christian County total, but not included in the actual model calculations, as the entire post is treated as external to Christian County.

Table 2: 2010 Base Model Socioeconomic Data

Socioeconomic Input	Christian County	Hopkinsville[1]	Fort Campbell[2]
Population	73,900	33,200	13,700
Households	23,400	13,400	2,500
Retail Employment	2,900	2,100	n/a[3]
Service Employment	10,400	8,400	n/a[3]
Other Employment	11,000	9,900	n/a[3]
Total Employment	24,300	20,400	n/a[3]

[1] Hopkinsville's estimates are based on approximate city and TAZ boundaries.

[2] 4,000 of Ft. Campbell's Census population is classified in Group Quarters, i.e. barracks-style housing.

[3] On-post employment within Christian County is not available given Fort Campbell's location across the state border.

Future Year Forecasts

The travel demand model has been updated to provide a horizon forecast year to 2040. The basis of the forecast is the growth in countywide population forecast by the KSDC. The KSDC estimated an increase of 8,100 persons by 2040 to a total county population of 82,000. This additional population was distributed throughout the county based on the rates of population growth attributed to each TAZ in the previous model. Household and employment growth was tied to this population growth estimate so that employment growth would not disproportionately exceed population growth. However, an additional 1,500 jobs were assigned to the proposed I-24 megasite development located northeast of the I-24 interchange with US 41A. In all, 4,200 new jobs, for a total of 28,500 jobs, were included in the 2040 forecast. Based on discussions with

personnel at Fort Campbell and a general lack of new estimates regarding future plans there, the growth of traffic related to Fort Campbell was maintained from the previous model.

Kentucky's Six Year Plan (SYP) project list was the basis for programmed modifications to the base year network. Most of these projects involve minor spot improvements or repairs that would not substantially affect network connectivity or capacity and, therefore, could not be captured in a travel demand model. The changes incorporated in the future year network include the following:

1. The completion of the northeast Hopkinsville Bypass from the Breathitt Parkway interchange to the southeastern US 68B bypass terminus at US 68;
2. Additional lane capacity to reflect continuous two way center left turn lanes on KY 107 between KY 380 (Country Club Lane) and the Gateway Lane; and
3. Additional lane capacity to reflect continuous two way center left turn lane on KY 1007 (North Drive) between US 68 and Sanderson Drive.

The 2040 forecasts developed from the updated Christian County travel demand model are shown on **Figure 13**. Generally speaking, traffic volumes are not expected to increase significantly with limited exceptions. For example, the model output suggests strong growth in traffic along US 41A north of I-24. Much of this increase can be attributed to the proposed I-24 Megasite and the assumed 1,500 new jobs it will create by 2040.

Continuing Model Work

At the conclusion of the SUA study, Stantec continues to work on updating and revising the Christian County model structure to conform to KYTC's standard structure and interface. Most of this work will not substantially affect the forecasts presented here given that the updated input data will be the same. However, new speed and capacity calculations, as well as new methods for apportioning the distribution of external traffic may result in minor changes in base year calibrated and forecast assignments.

5.0 STAKEHOLDER INPUT

Comprehensive public involvement plays a critical role in the success of a SUA study. The purpose of the public outreach component of the Hopkinsville SUA Study was to bring different groups of people together to express their ideas, clarify areas of agreement and disagreement, and to develop shared resolutions. The KYTC seeks to build partnerships among stakeholders to better understand the relationships among problems and to bring more resources and expertise together to develop alternate solutions. The public involvement component of this study was used to:

- Inform and educate stakeholders on the study and its goals
- Gauge the interest in the desire for transportation improvement projects
- Identify the needs of the study area
- Identify the project issues and goals
- Identify and prioritize potential improvement projects

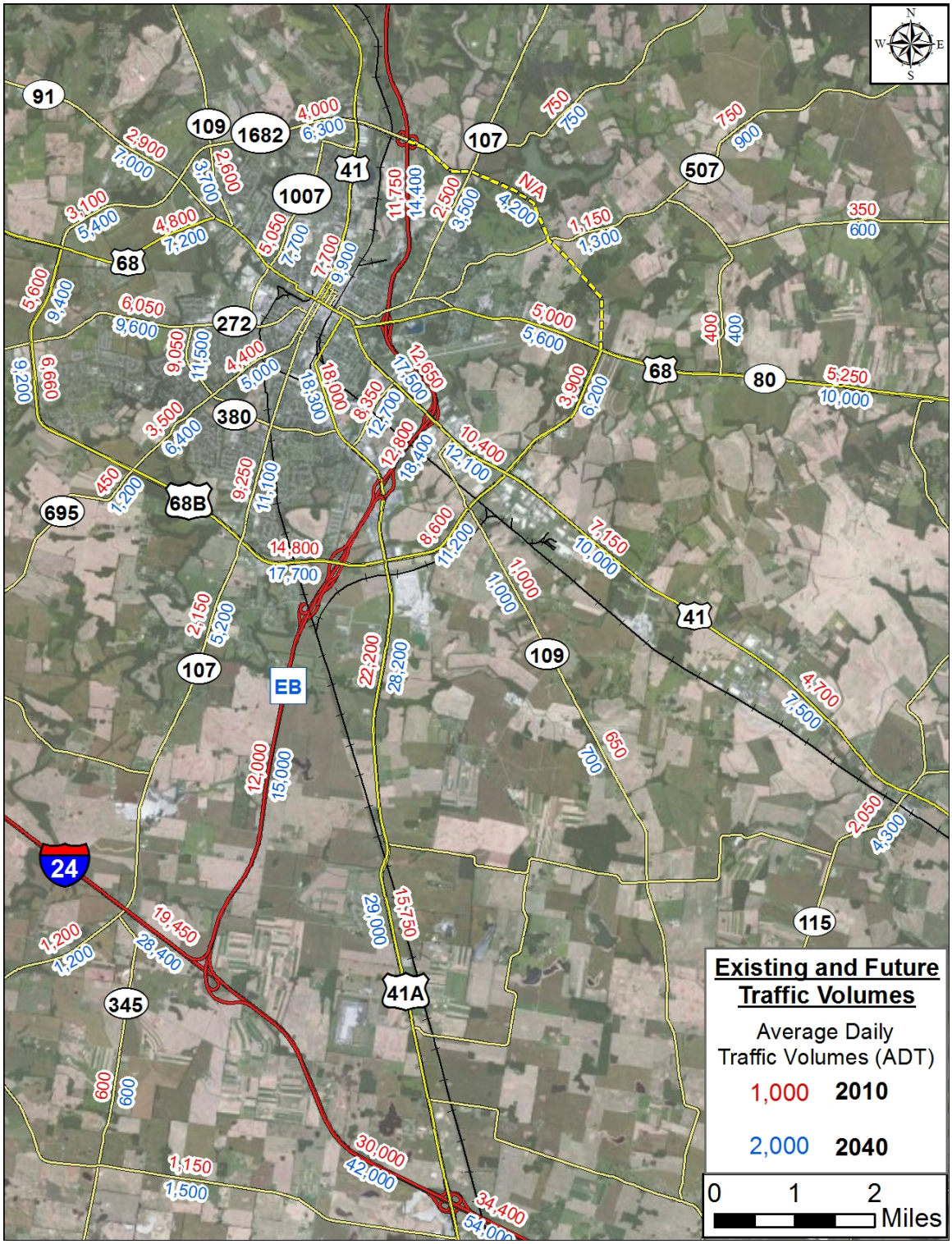


Figure 13: 2010 and Forecasted 2040 Average Daily Traffic Volumes

Public involvement during the study was guided by the Hopkinsville Advisory Committee, made up of local officials, emergency responders, and other stakeholders. Invitations to serve on the committee were sent to a diverse array of individuals. Meetings were held with the Advisory Committee at regular intervals over the course of the study and provided opportunities for the study team to provide information and listen to local concerns. Summaries for all project meetings are found in **Appendix D**.

A group exercise was undertaken at the first committee meeting to provide attendees an opportunity to work with each other to identify existing transportation issues and potential improvements. The committee was divided into small groups and provided maps depicting the study area and asked to identify key areas the study should focus on, referred to as "trouble spots". **Figure 14** presents the results from the identification of trouble spots. The following discusses some of the items which were brought up during the exercise.

- KY 1007 North Drive at US 68 (West 7th Street) Intersection – Due to congestion problems, a widening and extension of North Drive to US 68B should be considered.
- KY 107 Lafayette Road – This facility has high traffic volumes, narrow lanes, and no shoulders. Major congestion problems may be lessened by widening the road.
- US 41 Main Street at 9th Street - Intersection improvements are needed to relieve congestion.
- US 41A Fort Campbell Boulevard at Skyline Drive – This is a poor and confusing intersection for drivers.
- US 41A between US 68 Bypass and Breathitt Parkway - This area was identified as a high accident section of roadway.
- KY 380 Country Club Lane – Narrow road cannot support volume of traffic, especially during rush hour. A widening of the road should be considered.
- KY 695 Cox Mill Road – Curves in the road present sight distance issues for drivers and unsafe conditions.

The trouble spots identified by the Advisory Committee served as a starting point for the development of improvement concepts. A follow-up meeting was held with Advisory Committee members unable to attend the first meeting. Comments from the follow-up meeting confirmed the identified trouble spots.

At the second Advisory Committee meeting, 17 improvement concepts were presented and discussed, as shown on **Figure 15**. Many of the concepts were developed to address concerns raised by the Advisory Committee, and nearly all the concepts are based on existing safety or congestion concerns. Construction cost estimates were provided for each concept, and it was noted that several could have significant right-of-way and utility costs.

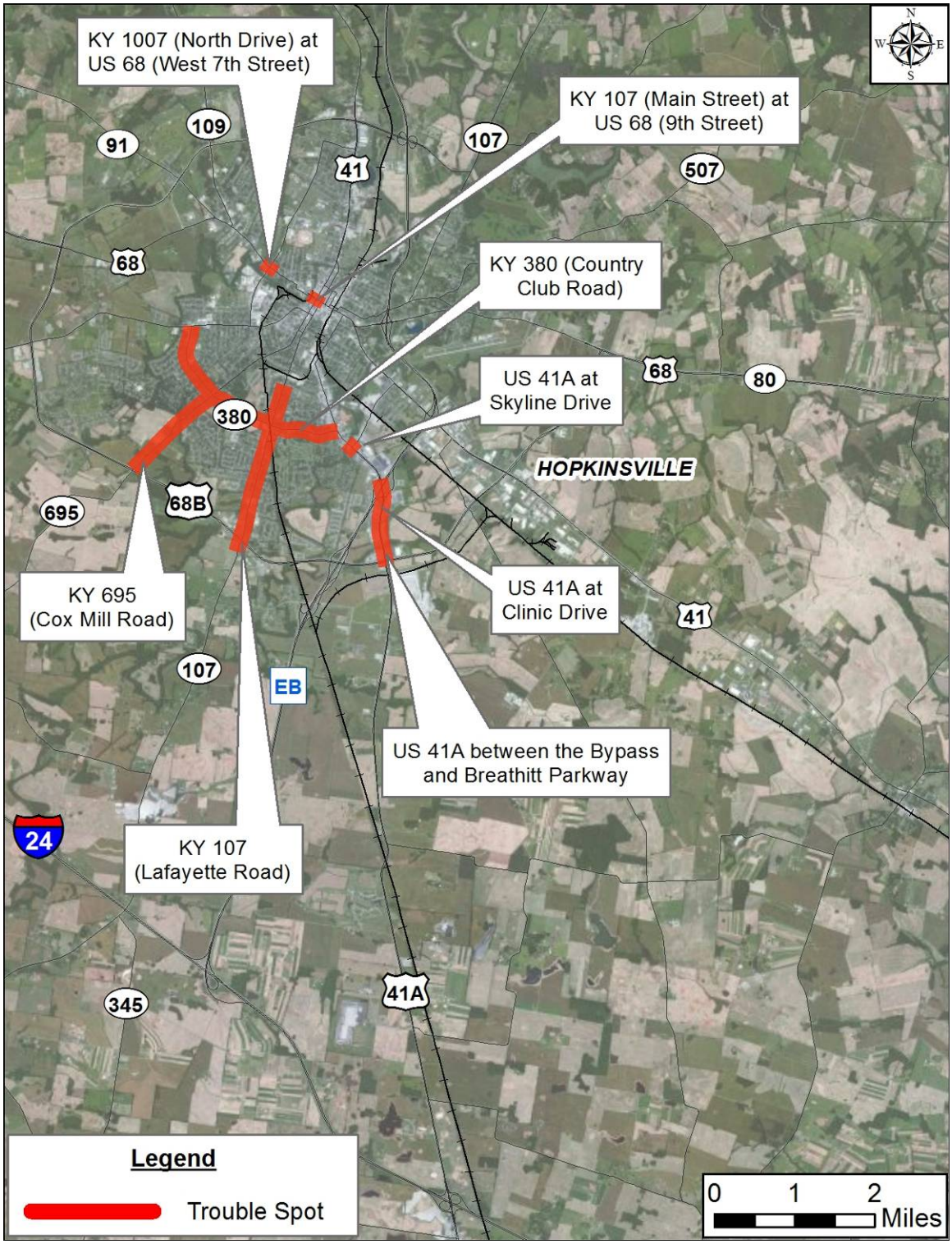
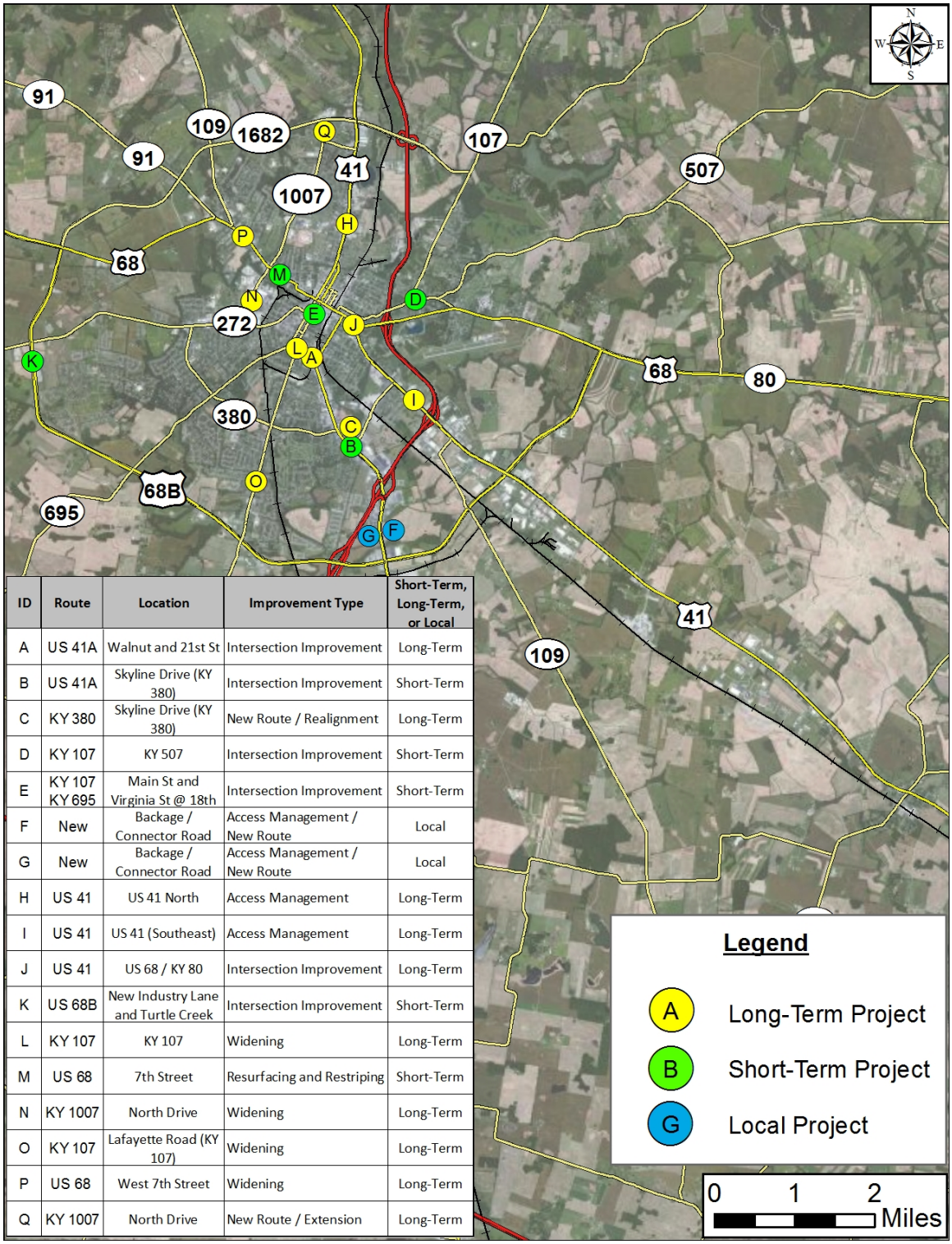


Figure 14: "Trouble Spots" Identified by the Hopkinsville SUA Advisory Committee



ID	Route	Location	Improvement Type	Short-Term, Long-Term, or Local
A	US 41A	Walnut and 21st St	Intersection Improvement	Long-Term
B	US 41A	Skyline Drive (KY 380)	Intersection Improvement	Short-Term
C	KY 380	Skyline Drive (KY 380)	New Route / Realignment	Long-Term
D	KY 107	KY 507	Intersection Improvement	Short-Term
E	KY 107 KY 695	Main St and Virginia St @ 18th	Intersection Improvement	Short-Term
F	New	Backage / Connector Road	Access Management / New Route	Local
G	New	Backage / Connector Road	Access Management / New Route	Local
H	US 41	US 41 North	Access Management	Long-Term
I	US 41	US 41 (Southeast)	Access Management	Long-Term
J	US 41	US 68 / KY 80	Intersection Improvement	Long-Term
K	US 68B	New Industry Lane and Turtle Creek	Intersection Improvement	Short-Term
L	KY 107	KY 107	Widening	Long-Term
M	US 68	7th Street	Resurfacing and Restriping	Short-Term
N	KY 1007	North Drive	Widening	Long-Term
O	KY 107	Lafayette Road (KY 107)	Widening	Long-Term
P	US 68	West 7th Street	Widening	Long-Term
Q	KY 1007	North Drive	New Route / Extension	Long-Term

Figure 15: Improvement Concepts Presented to the Hopkinsville SUA Advisory Committee

The improvement concepts were categorized as follows:

- **Short-term:** The short-term concepts are typically lower-cost projects that can be implemented in the near term. These types of improvements should require little or no right-of-way to construct and in some cases may be implemented by the KYTC Division of Maintenance.
- **Long-term:** The long-term concepts are higher cost projects that will require more significant resources to implement. These types of improvements will require additional right-of-way to construct and will likely need to be funded through the KYTC Six Year Plan (SYP) process.
- **Local projects:** The local projects are not located on the state-maintained system and would likely need to be funded by the City of Hopkinsville or Christian County.

5.1 Project Prioritization

Project prioritization was accomplished through a two-step process. At the final Advisory Committee meeting, attendees were asked to indicate their level of support for each conceptual improvement project by rating them from 0 to 10, where 0 indicates strong disapproval of the concept and 10 indicates strong support. The results are summarized in **Table 3**. The highest scored concept with an average score of 9.7 was the reconstruction of the US 41 intersection with US 68/KY 80 east of downtown Hopkinsville and west of the Breathitt Parkway. Two projects received an average score of nine. These included widening KY 107 (Lafayette Road) between US 68B and KY 380 (Country Club Lane) and providing an additional left turn lane on southbound US 41A at the KY 380 (Skyline Drive) intersection. The conceptual realignment of KY 380 (Skyline Drive) to connect to Country Club Lane, providing a continuous east-west alignment for KY 380, received the lowest average score of 3.3.

A similar evaluation process was undertaken at the final Project Team meeting. Representatives from the KYTC Division of Planning and District 2 were asked to evaluate the 17 improvement projects and provide an evaluation score for each. The scores from the Advisory Committee, Division of Planning, and District 2 were averaged to arrive at a composite average evaluation score that was then used to assign a high, medium, or low priority to each project. The average evaluation scores and recommended project priorities are also summarized in **Table 3**. High priority projects have average scores greater than 7.5 and low priority projects are less than 5.5.

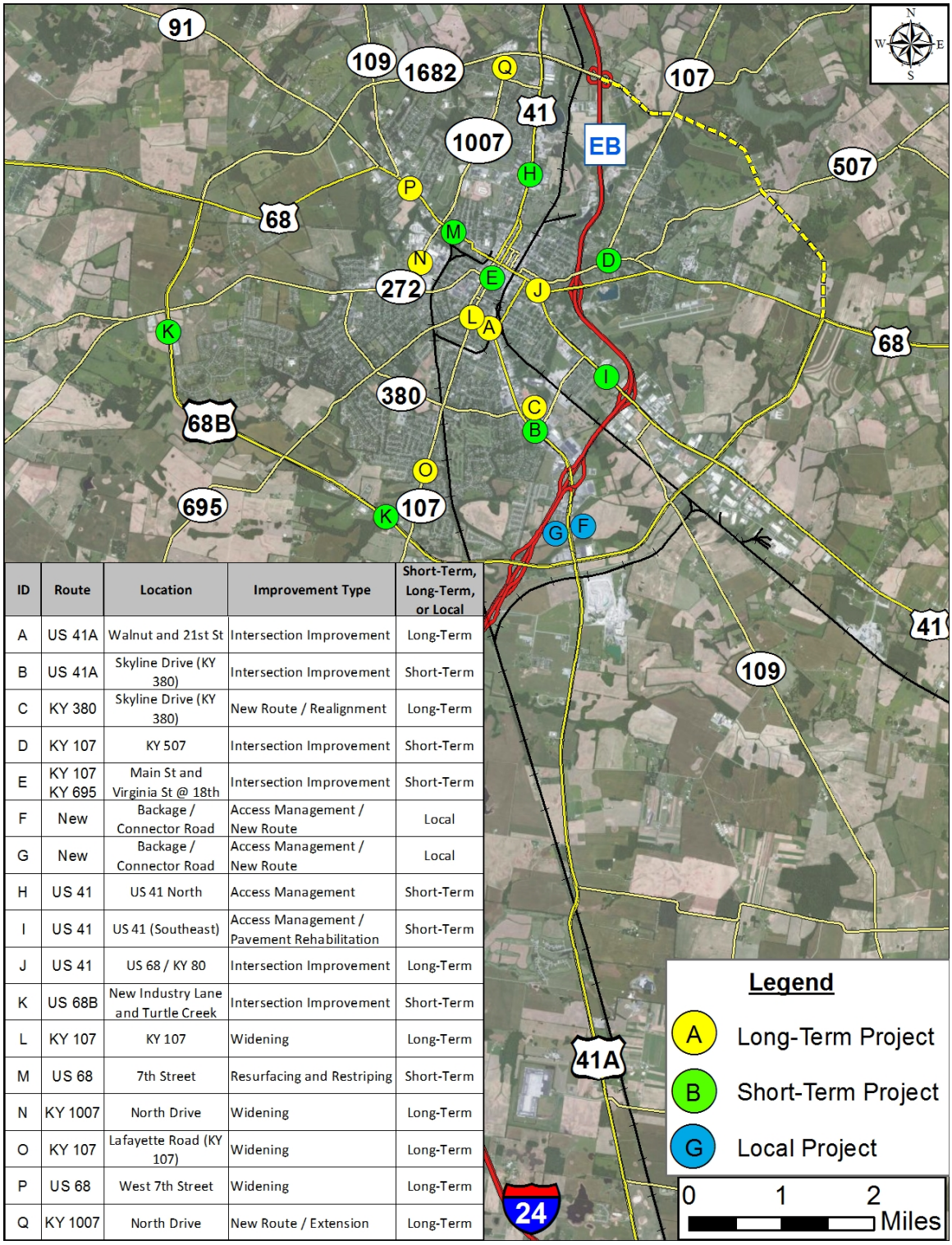
6.0 RECOMMENDED TRANSPORTATION IMPROVEMENTS

The Hopkinsville Small Urban Area Study resulted in a number of conceptual improvement alternatives recommended for future implementation. These improvement concepts focus on areas with existing safety concerns, excessive congestion, and other transportation deficiencies identified by the Project Team. The nature and likely causes of problems identified over the course of the study were examined through field reconnaissance, and improvement alternatives were developed to address the identified problems. The recommended projects are shown on **Figure 16**. The descriptions of each roadway facility with identified problems and an explanation of recommended improvements are shown on the following pages.

Table 3: Recommended Improvement Projects and Prioritization

ID	Route	Location	Short-Term, Long-Term, or Local	Advisory Committee Score	KYTC Central Office Planning Score	KYTC District 2 Score	Average	Prioritization
K	US 68B	New Industry Lane and Turtle Creek Drive	Short-Term	7.7	8	10	**8.6**	High
J	US 41	US 68 / KY 80	Long-Term	9.7	8.3	7.5	**8.5**	High
O	KY 107	Lafayette Road (KY 107)	Long-Term	9.3	7	9	**8.4**	High
B	US 41A	Skyline Drive (KY 380)	Short-Term	9	8	8	**8.3**	High
E	KY 107 KY 695	Main Street and Virginia Street @ 18th Street	Short-Term	8	8	9	**8.3**	High
P	US 68	West 7th Street	Long-Term	8.2	8	8	**8.1**	High
L	KY 107	KY 107	Long-Term	8	7.3	8	**7.8**	High
M	US 68	7th Street	Short-Term	6.5	8	7	**7.2**	Medium
A	US 41A	Walnut and 21st St	Long-Term	6.2	8	7	**7.1**	Medium
N	KY 1007	North Drive	Long-Term	6.3	8.7	6	**7.0**	Medium
D	KY 107	KY 507	Short-Term	6	7.3	6	**6.4**	Medium
H	US 41	US 41 North	Short-Term	4.7	6.3	5	**5.3**	Low
I	US 41	US 41 (Southeast)	Short-Term	4.8	4.7	5	**4.8**	Low
Q	KY 1007	North Drive	Long-Term	5	5.3	4	**4.8**	Low
C	KY 380	Skyline Drive (KY 380)	Long-Term	3.3	7.3	3	**4.5**	Low
F	New	Backage / Connector Road	Local					Local
G	New	Backage / Connector Road	Local					Local

Project Type	Project Priority		
	Low	Medium	High
Long-Term	2	2	4
Short-Term	2	2	3
Local	2 Projects (Not prioritized)		



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B	US 41A	Skyline Drive (KY 380)	Intersection Improvement	Short-Term
C	KY 380	Skyline Drive (KY 380)	New Route / Realignment	Long-Term
D	KY 107	KY 507	Intersection Improvement	Short-Term
E	KY 107 KY 695	Main St and Virginia St @ 18th	Intersection Improvement	Short-Term
F	New	Backage / Connector Road	Access Management / New Route	Local
G	New	Backage / Connector Road	Access Management / New Route	Local
H	US 41	US 41 North	Access Management	Short-Term
I	US 41	US 41 (Southeast)	Access Management / Pavement Rehabilitation	Short-Term
J	US 41	US 68 / KY 80	Intersection Improvement	Long-Term
K	US 68B	New Industry Lane and Turtle Creek	Intersection Improvement	Short-Term
L	KY 107	KY 107	Widening	Long-Term
M	US 68	7th Street	Resurfacing and Restriping	Short-Term
N	KY 1007	North Drive	Widening	Long-Term
O	KY 107	Lafayette Road (KY 107)	Widening	Long-Term
P	US 68	West 7th Street	Widening	Long-Term
Q	KY 1007	North Drive	New Route / Extension	Long-Term

Figure 16: Hopkinsville Small Urban Area Study – Recommended Projects

A **Long-term**	**LOCATION** US 41A (Fort Campbell Boulevard) at 21st Street and Walnut Street	**PROJECT PRIORITY:** **MEDIUM**
DESCRIPTION Improve the intersection to remove the multi-legged approaches. (MP 15.0 – MP 15.5)		**COST ESTIMATE** Design: $250,000 ROW: $750,000 Utilities: $100,000 Construction: $ 1,000,000 **Total: $2,100,000**

US 41A at Walnut and 21st Street is a five-legged intersection with some channelized, but no restricted, turning movements. The main movement is along US 41A, which follows a curve with an approximate curvature of 45 degrees. Currently, US 41A carries 18,000 vehicles per day (vpd) and is projected to carry 18,300 vpd in the year 2040. US 41A through this segment has a CRF of 1.3.

The proposed improvements include increasing the radius of the curve on US 41A allowing room to reconfigure the intersection. The eastern leg of 21st Street would be moved south to eliminate a leg at the intersection. Northbound Walnut Street would tie into the west portion of 21st Street, eliminating the direct left turn movement onto US 41A, thereby reducing the number of conflict points at the intersection. Right turns from eastbound 21st Street would have a new free flow lane onto southbound US 41A.

US 41A at 21st Street/Walnut Street

Possible Improvement Concept

B Short-term	**LOCATION** US 41A at Skyline Drive (KY 380)	**PROJECT PRIORITY:** **HIGH**
DESCRIPTION Add additional left turn lane on southbound US 41A to Skyline Drive. (MP 14.145)		**COST ESTIMATE** Design:$100,000 ROW: $75,000 Utilities: $50,000 Construction: $ 175,000 **Total: $400,000**

Left turns from southbound US 41A onto Skyline Drive (KY 380) generate long queues. This section of US 41A has a current vpd of 25,500 to 26,800. Future forecasts estimate this section will carry 28,800 vpd in year 2040. Green signal time for the movement is limited due to the high volume on US 41A and the required time for the through movement. This spot has a CRF of 1.7, and US 41A has a CRF ranging from 1.4 to 1.7. Rear End and Angle crash types were the majority of the crashes reported.

An additional left turn lane would allow a higher capacity for the left turn movements. Minimal work would be required on Skyline as it is already a five lane road and could receive the additional lane with restriping. The US 41A northbound right turn lane would become a yielding movement. This project would not be required if a proposed realignment of Skyline Drive with Country Club Lane is adopted and constructed.

US 41A at KY 380 (Skyline Drive)

Possible Improvement Concept

C Long-term	**LOCATION** Skyline Drive (KY 380) east of US 41A	**PROJECT PRIORITY:** **LOW**

DESCRIPTION	**COST ESTIMATE**
Realign Skyline Drive east of US 41A to meet with Country Club Lane at US 41A. (KY 380 MP 2.652 – MP 3.053)	Design: $500,000 ROW: $1,000,000 Utilities: $100,000 Construction: $ 3,250,000 **Total: $4,850,000**

KY 380 has two offset intersections with US 41A. Country Club Lane is to the north and Skyline Drive to the south. This segment of KY 380 has a CRF between 1.1 and 1.4. It is expected to carry 9,000 vpd in year 2040. Rear End crashes are the majority of crash types. The section of US 41A between these offset intersections has a CRF from 1.4 to 1.7 and carries from 25,500 to 26,800 vpd, more traffic than any other non-interstate route in the study area.

This project would realign KY 380 (Skyline Drive) to the north to meet with the current intersection with US 41A and Country Club Lane. This would eliminate the need for turns onto US 41A to continue along the designated KY 380 routes. Although further analysis would need to be performed, it is believed that this would help alleviate some of the traffic congestion and turn lane queuing that occurs on US 41A between the existing intersections.

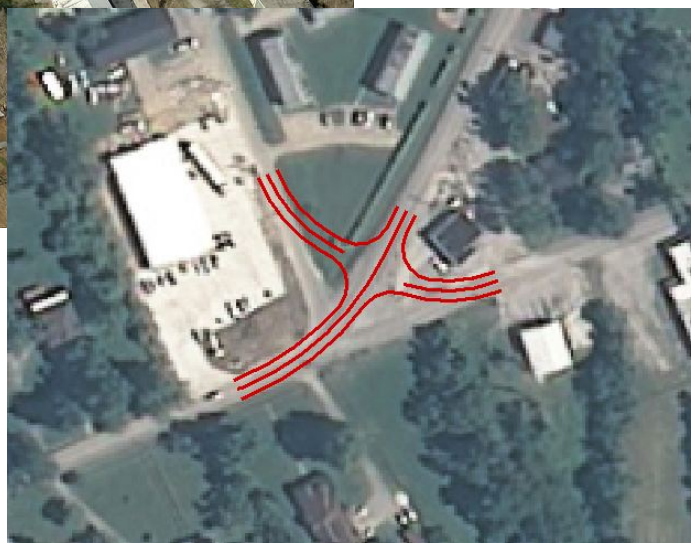
Conceptual Realignment of KY 380 (Skyline Drive) to connect to Country Club Lane

D Short-term	**LOCATION** KY 107 at KY 507	**PROJECT PRIORITY:** **MEDIUM**
DESCRIPTION Realign intersection to remove skewed approach and make KY 107 the through route. (KY 107 MP 19.8 – MP 19.9)		**COST ESTIMATE** Design: $150,000 ROW: $100,000 Utilities $25,000 Construction: $ 250,000 **Total: $525,000**

This intersection has a CRF of 1.4. Angle crashes were the most prevalent type of crash at this spot. The "through" route currently connects KY 107 (the west leg of the intersection) to KY 507 (the east leg), although traffic counts along KY 107 suggest it should be the continuous through route. At this location, KY 107 carries approximately 2,500 to 4,700 vpd. By year 2040, traffic is expected to increase to between 4,000 and 5,300 vpd.

The proposed project would realign KY 107 to intersect with KY 507 in a four-legged intersection. Rozelle Avenue would not necessarily have to be reconnected as an alternative means to accessing KY 107 is provided to the north.

KY 107 at KY 507



Possible Improvement Concept

E **Short-term**	**LOCATION** KY 107 (Main Street and Virginia Avenue) at E 18th Street.	**PROJECT PRIORITY:** **HIGH**
DESCRIPTION Improve end of one-way intersections on Main and Virginia Streets at 18th Street. (MP 18.394 – MP 18. 456)		**COST ESTIMATE** Design: $0 ROW: $0 Utilities: $0 Construction: $ 100,000 **Total: $100,000**

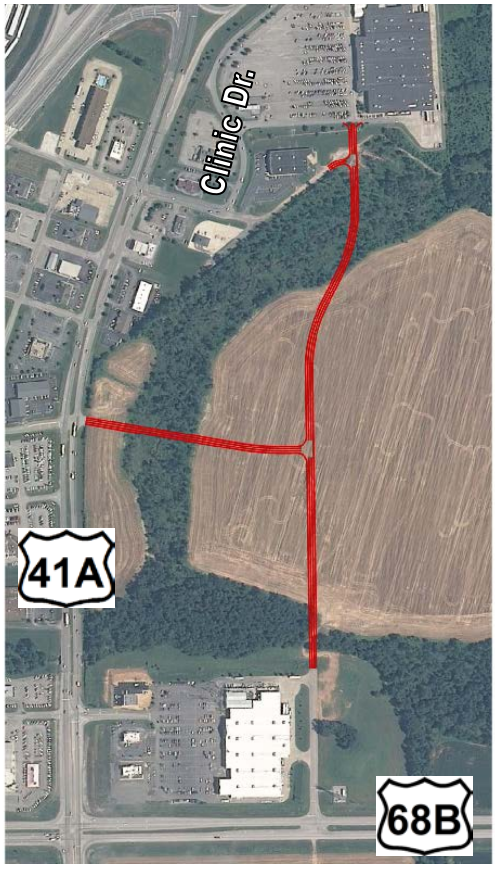
These intersections serve as the southern terminus of the Main Street/Virginia Avenue one-way couplet running through downtown Hopkinsville. There are only painted flush islands for channelization for the transition of one-way to two way traffic. This can be a confusing area for those not familiar with the traffic pattern. Improved channelization with a raised concrete island along with additional overheard signage can help provide a better understanding of the required movements.

Southbound Main Street at 18th Street

F **Local**	**LOCATION** East of US 41A from Clinic Drive (Walmart) to US 68B (Hopkinsville Bypass)	**PROJECT PRIORITY:** **LOCAL**
DESCRIPTION Construct new road from US 68 Bypass along the east side of US 41A as backage road to Walmart.		**COST ESTIMATE** Design: $350,000 ROW: $500,000 Utilities: $50,000 Construction: $3,100,000 **Total: $4,000,000**

The Walmart off Clinic Drive has only a single point of access from US 41A. This creates large turning storage queues southbound on US 41A and on Clinic Drive for turning onto US 41A. This section of US 41A carries 25,500 vpd with an expected future year 2040 vpd of 29,000. The segment has a 1.5 CRF. Additional development is underway along the east side of US 41A.

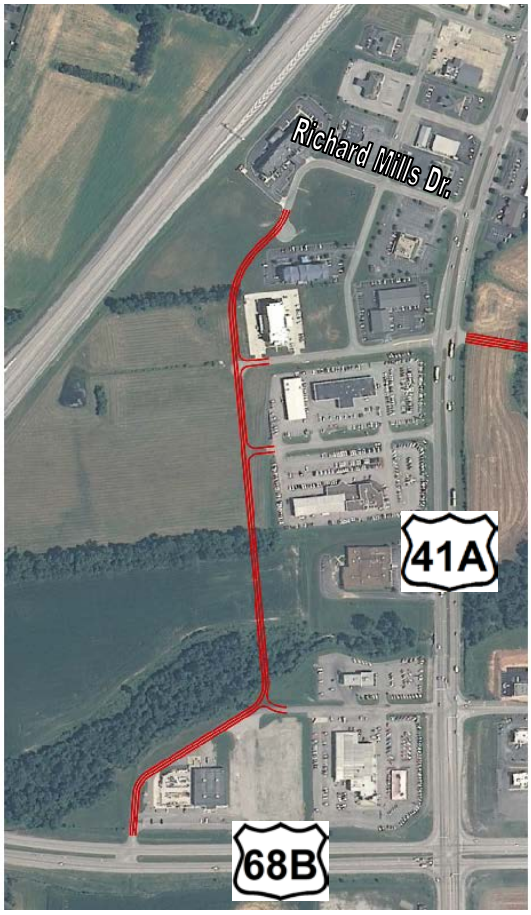
An alternate access point would help alleviate the single chokepoint for the Walmart traffic. The KYTC has plans to improve Clinic Drive as part of a larger US 41A improvement project (KYTC Item No. 2-100.20). A backage road connecting to US 68B would provide an alternative route, eliminating the need for some traffic to use US 41A. Additional access to other side streets can further reduce the need for traffic to use US 41A.



Conceptual Backage Road

G **Local**	**LOCATION** West of US 41A from Richard Mills Drive to US 68B (Hopkinsville Bypass)	**PROJECT PRIORITY:** **LOCAL**
DESCRIPTION Construct new road from US 68 Bypass along the west side of US 41A as backage road as alternative access		**COST ESTIMATE** Design: $350,000 ROW: $400,000 Utilities: $50,000 Construction: $ 2,200,000 **Total: $3,000,000**

A new backage road along the west side of US 41A can provide alternative access to areas and businesses along the west side of US 41A. There are numerous businesses that can be served, eliminating the need for motorists to use US 41A to travel between driveways. The existing driveway on US 68B would make an ideal terminus as it is located approximately ¼ mile from the US 41A intersection and could accommodate a traffic signal in the future, should traffic signal warrants be met.



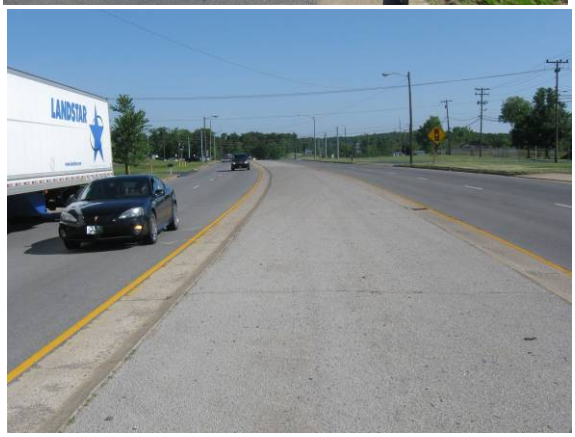
Conceptual Backage Road

H **Short-term**	**LOCATION** US 41 north of downtown	**PROJECT PRIORITY:** **LOW**
DESCRIPTION Conduct Access Management Study for US 41 north of downtown Hopkinsville; consider removing median and improving US 41 north. (MP 13.009 – MP 14.786)		**COST ESTIMATE** Design: $100,000 (study only) ROW: $0 Utilities: $0 Construction: $0 **Total: $100,000**

US 41 north of downtown Hopkinsville has a varied typical section. A narrow, non-traversable median is present on the southern end where curb-to-curb width is approximately 52 to 56 feet. Approaching KY 1682 (Hopkinsville Bypass), the width increases to approximately 75 feet with a 20-foot wide raised, traversable median. This section is predominately commercial and carries from 8,100 to 12,300 vpd. Traffic projections for year 2040 are between 9,600 and 16,500 vpd.

The recommendation is to conduct an Access Management Study to explore opportunities to provide safer and more efficient commercial access. The study should consider cross-section alternatives to make better use of the existing pavement, opportunities for shared business access, and frontage/ backage roads.

US 41 North of Downtown Hopkinsville



I **Short-term**	**LOCATION** US 41 southeast of downtown Hopkinsville, between US 68B and KY 380	**PROJECT PRIORITY:** **LOW**
DESCRIPTION Perform pavement rehabilitation project; remove mountable median and add bike lanes to US 41. (MP 10.395 – MP 11.025)		**COST ESTIMATE** Design: $500,000 ROW: $0 Utilities: $0 Construction: $ 4,000,000 **Total: $4,500,000**

The portion of US 41 to the south of Hopkinsville has a CRF value range of 0.3 to 0.5 and no major geometric deficiencies. This section carries approximately 10,400 vpd and is expected to increase to 16,000 vpd by year 2040. The existing concrete pavement was observed to be damaged and cracked in places resulting in the recommendation of a pavement rehabilitation project. The raised traversable median includes some defined turn lanes at access points, resulting in likely confusion for drivers as traffic is slowing in the through lanes prior to pulling onto the mountable median. Removal of the mountable median and replacing it with a flush median striped as a continuous two-way center left-turn lane would allow for more deceleration length. Existing pavement width could support the addition of bike lanes.

US 41 Southeast of Downtown Hopkinsville

J Long-term	**LOCATION** US 41 at US 68/KY 80 intersection	**PROJECT PRIORITY:** **HIGH**

DESCRIPTION

Reconstruct intersection.
(US 41 MP 11.789 – MP 11.997)

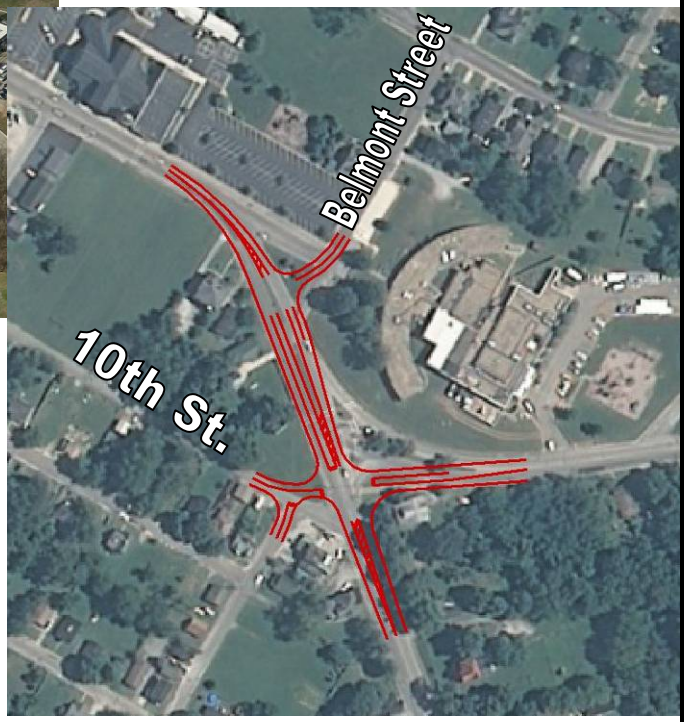
COST ESTIMATE

Design: $300,000
ROW: $250,000
Utilities: $100,000
Construction: $ 2,000,000
Total: $2,650,000

This intersection has a spot CRF value of 2.0. A skewed US 68 approach, limited sight distance, wider than required lanes and proximity of other streets are likely contributing factors. At this location, US 41 currently carries 11,500 vpd. Traffic volumes are expected to increase to 14,000 vpd along this section by year 2040.

Aligning US 68 with the 10th Street intersection would combine two legs to a common location. Providing an additional westbound lane through the intersection would allow more weaving opportunity for traffic from US 68 and safer conditions for turning onto Belmont Street.

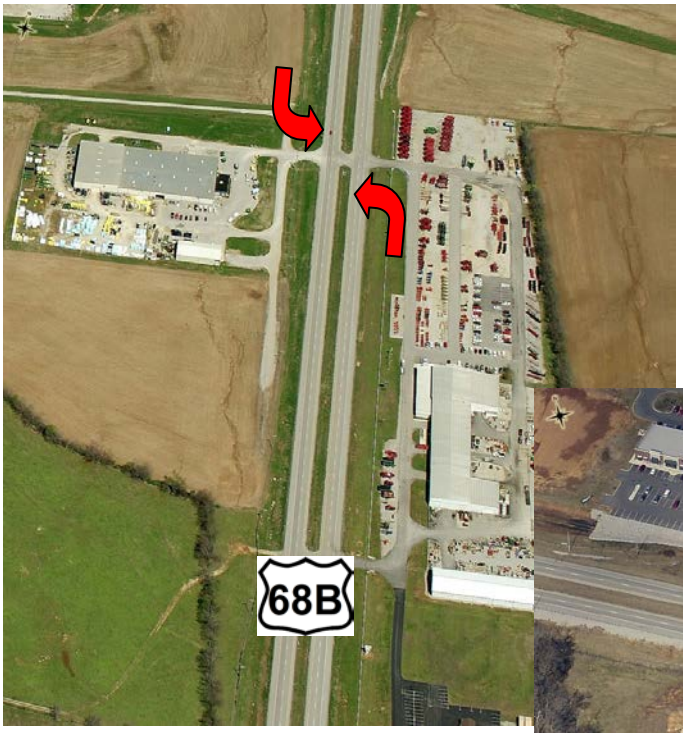
US 41 at US 68/KY 80 intersection



Possible Improvement Concept

K Short-term	**LOCATION** US 68B (Hopkinsville Bypass) at New Industry Lane and US 68B at Turtle Creek Drive	**PROJECT PRIORITY:** **HIGH**
DESCRIPTION Provide left-turn lanes on US 68B (Hopkinsville Bypass) at New Industry Lane and at Turtle Creek Drive. (MP 1.487 – New Industry Lane and MP 4.932 – Turtle Creek Drive)		**COST ESTIMATE** Design: $0 ROW: $0 Utilities: $0 Construction: $500,000 **Total: $500,000**

There are currently no left-turn lanes on US 68B (Hopkinsville Bypass) at the intersection with New Industry Lane which serves large trucks both east and west of US 68B. Providing left turn lanes in both directions on US 68B would provide storage for trucks turning onto New Industry Lane, reducing blockage of the through lane. There is already a westbound left-turn lane on US 68B at Turtle Creek Drive, and the addition of an eastbound left-turn lane will improve safety for access to the commercial businesses north of the Hopkinsville Bypass.



US 68B at New Industry Lane

US 68B at Turtle Creek Drive

L **Long-term**	**LOCATION** KY 107 between 20th and 21st Streets	**PROJECT PRIORITY:** **HIGH**
DESCRIPTION Add additional lane on KY 107 between 20th and 21st Streets. (MP 16.228 – MP 16.439)		**COST ESTIMATE** Design: $100,000 ROW: $50,000 Utilities: $100,000 Construction: $ 500,000 **Total: $750,000**

This section of KY 107 carries approximately 7,500 to 8,100 vpd and has a CRF of 2.0. The majority of crashes along this section are Rear Ends. Traffic volumes are expected to increase to 13,000 vpd in year 2040.

Widening KY 107 to provide a center left-turn lane will improve traffic flow through this section. Providing necessary left turn storage would improve safety and help eliminate the need for through traffic to slow or stop as left turning vehicles yield to the oncoming traffic.

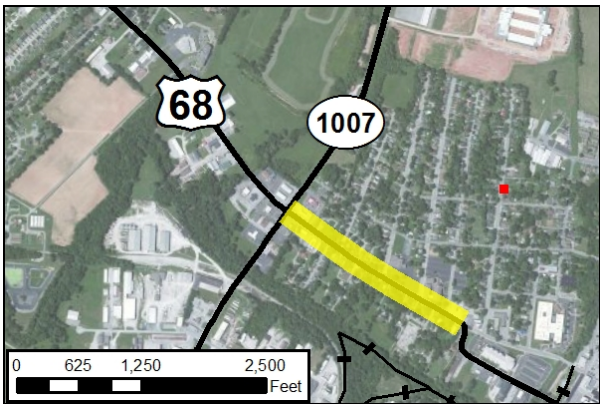
KY 107 between 20th and 21st Streets

M **Short-term**	**LOCATION** US 68 (7th St.) between 9th Street and KY 1007 (North Drive)	**PROJECT PRIORITY:** **MEDIUM**
DESCRIPTION Resurface and stripe 7th street to three lanes between 9th Street and North Avenue. (MP 10.137 – MP 10.539)		**COST ESTIMATE** Design: $0 ROW: $0 Utilities: $0 Construction: $ 150,000 **Total: $150,000**

This portion of US 68 carries 12,800 vehicles per day and has a CRF of 1.8. Numerous driveways are located along this section.

The current pavement width of at least 33 feet would support the addition of a continuous center left-turn lane by means of restriping, and providing some refuge for turning vehicles. The estimated cost includes limited resurfacing to accommodate the restriping.

US 68 (7th St.) west of 9th Street

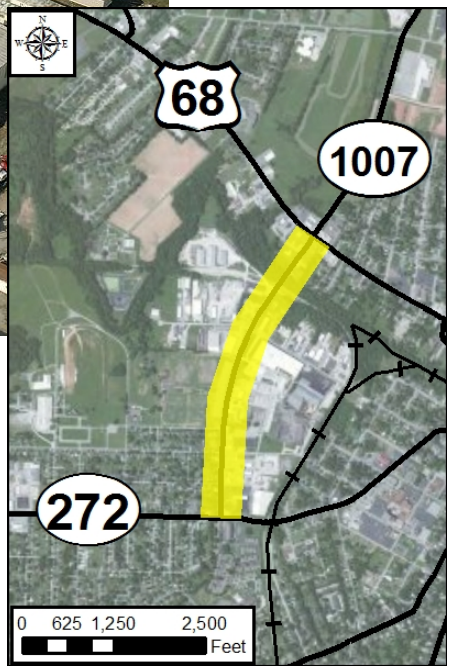


N Long-term	**LOCATION** KY 1007 (North Drive) from KY 272 (Canton Street) to US 68 (7th Street)	**PROJECT PRIORITY:** **MEDIUM**
DESCRIPTION Widen North Drive from Canton Street to US 68 (7th Street) (MP 0 – MP 0.785)		**COST ESTIMATE:** Design: $500,000 ROW: $250,000 Utilities: $250,000 Construction: $ 2,700,000 **Total: $3,700,000**

This section of KY 1007 (North Drive) is a two lane roadway carrying 10,300 vehicles per day, serving a mostly industrial and commercial area. Traffic forecasts for 2040 do not suggest a significant increase in traffic. The roadway has a CRF value of 2.7, with a variety of crash types including Rear End, Angle, Sideswipe, and Opposing Left Turn crashes. This segment currently operates at a LOS of F.

Widening the roadway to three lanes would provide turning lanes for vehicles, thereby improving traffic operations and safety.

KY 1007 (North Drive) north of Canton Street (KY 272)

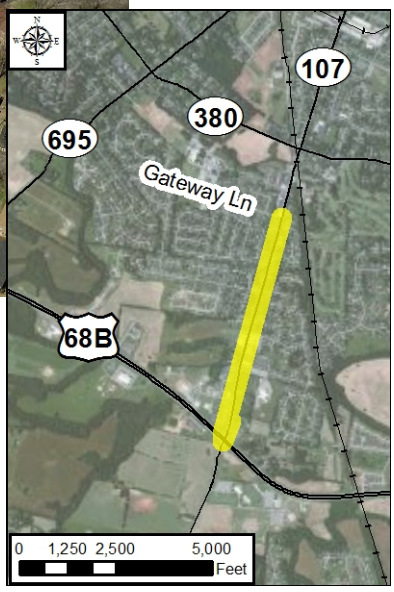


O **Long-term**	**LOCATION** KY 107 between US 68B and Gateway Lane	**PROJECT PRIORITY:** **HIGH**
DESCRIPTION Widen KY 107 from US 68B to Gateway Lane (MP 15.681 – MP 16.823)		**COST ESTIMATE** Design: $500,000 ROW: $2,000,000 Utilities: $1,000,000 Construction: $ 2,500,000 **Total: $6,000,000**

KY 107 north of US 68B (Hopkinsville Bypass) carries approximately 10,000 vehicles per day and is expected to increase to 12,400 vpd by 2040. A portion of the roadway between KY 380 and US 68B has a CRF of over 1.0 and operates at LOS D. This section of roadway serves mostly residential areas with some businesses. It becomes primarily commercial near the intersection of US 68B. There are 78 driveways or entrances between US 68B and Gateway Lane plus eight side streets.

With the numerous access points for residential entrances, widening to provide a continuous center left-turn lane would improve traffic operations. The additional lane would also potentially reduce the number of crashes along the roadway by providing storage for turning vehicles.

KY 107 at Holiday Park Road



P Long-term	**LOCATION** US 68 (7th Street) between KY 91 to KY 1007	**PROJECT PRIORITY:** **HIGH**

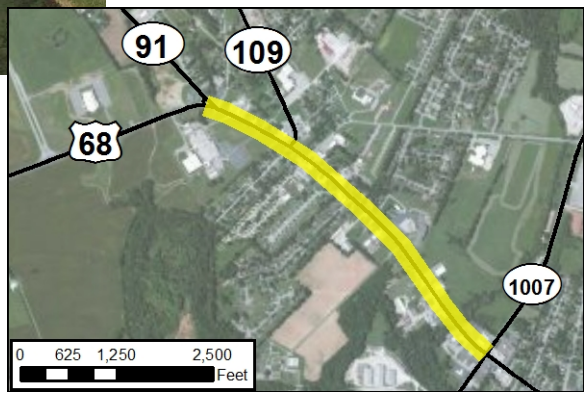
DESCRIPTION
Widen US 68 from KY 1007 to KY 91
(MP 9.221 – MP 10.137)

COST ESTIMATE
Design: $500,000
ROW: $1,500,000
Utilities: $500,000
Construction: $ 2,000,000
Total: $4,500,000

This section of two-lane roadway carries up to 12,800 vehicles per day and operates at LOS D. By year 2040, US 68 will carry 14,000 vpd. It also has a segment CRF of 2.0. There is a mixture of commercial and residential entrances along the roadway. This results in 55 driveways and 13 side street intersections within this one-mile stretch.

The proposed improvements in this area are widening US 68 to a three-lane section and improving the intersection at KY 91 and US 68. Widening the roadway would potentially improve the LOS of the roadway and would help provide increased safety. The improved intersection of US 68 and KY 91 would help minimize the frequency of crashes at that location.

US 68 west of KY 1007 (North Drive)



Q **Long-term**	**LOCATION** KY 1007 (North Drive) at Sanderson Drive	**PROJECT PRIORITY:** **LOW**
DESCRIPTION Extend KY 1007 from Sanderson Drive to the Hopkinsville Bypass (KY 1682) (KY 1007 MP 2.509 to KY 1682 MP 3.937)		**COST ESTIMATE** Design: $250,000 ROW: $400,000 Utilities: $50,000 Construction: $ 750,000 **Total: $1,450,000**

The North Drive portion of KY 1007 currently ends to the north at Sanderson Drive. KY 1007 continues to the east along Sanderson Drive to the intersection with US 41 about 0.4 miles to the east.

North Drive (KY 1007) could be extended north beyond Sanderson Drive to connect to KY 1682, currently a two lane portion of the Hopkinsville Bypass. This concept would provide a more direct connection between the Hopkinsville Community College (as well as other businesses along North Drive) and the Hopkinsville Bypass and Breathitt Parkway, eliminating the need to use Sanderson Drive to access the Bypass via US 41.

Conceptual Extension of KY 1007 (North Drive)

The recommended projects that would result in increased roadway capacity were coded in the Christian County Travel Demand Model to perform a final model run to estimate future year (2040) volume to capacity (V/C) ratios. The V/C ratio is a measure that reflects the ability of a roadway segment to accommodate the demand for travel. A V/C ratio of 1.0 indicates a roadway is operating at its capacity. The results, shown on **Figure 17**, show no roadway segments within the study area are projected to operate above a V/C ratio of 1.0.

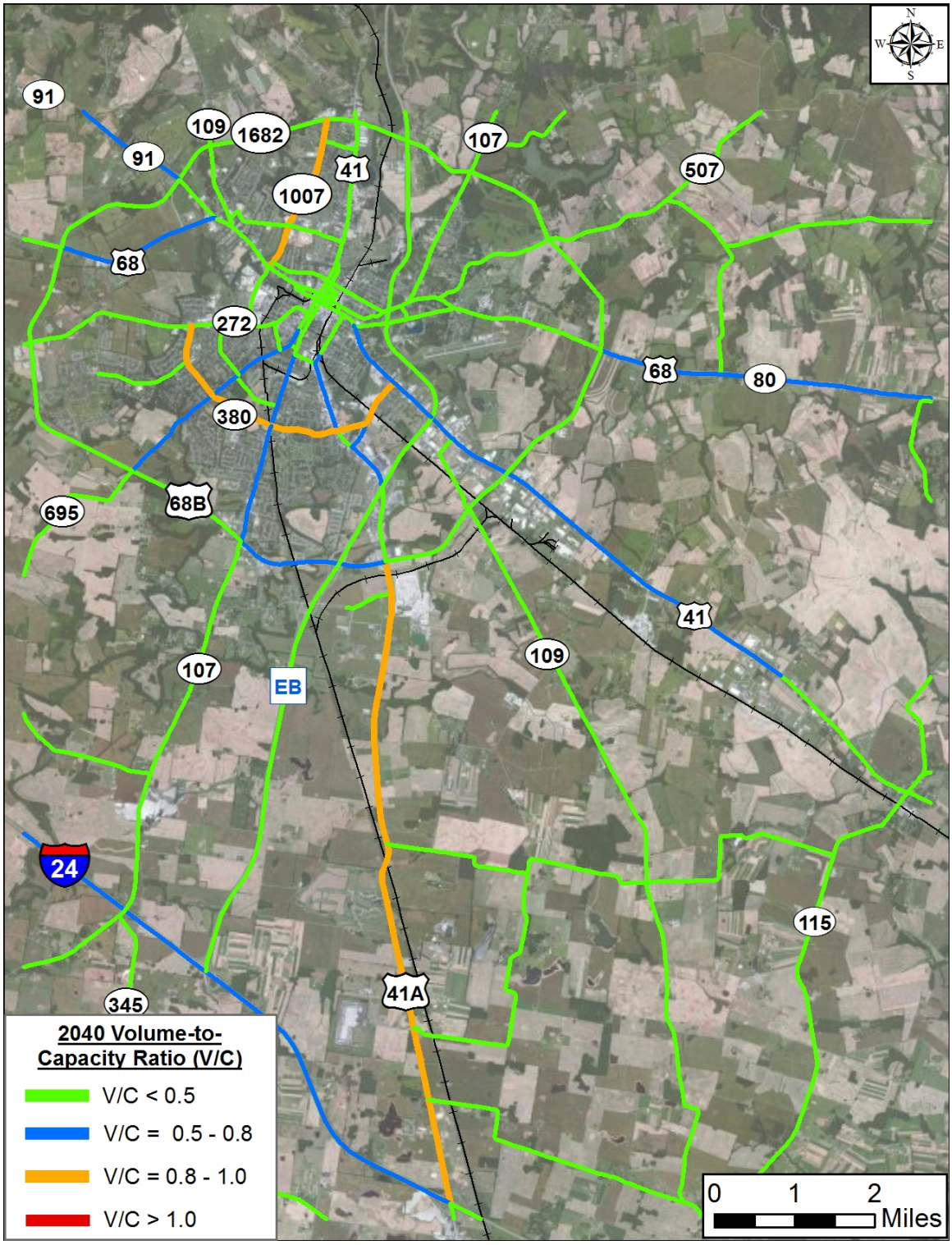


Figure 17: 2040 Volume to Capacity (V/C) Ratios with Recommended Projects