Draft Final Report

I-64 to US 23 Ashland Connector Study

Submitted to

KY Transportation Cabinet

Submitted by

ENTRAN, PLC

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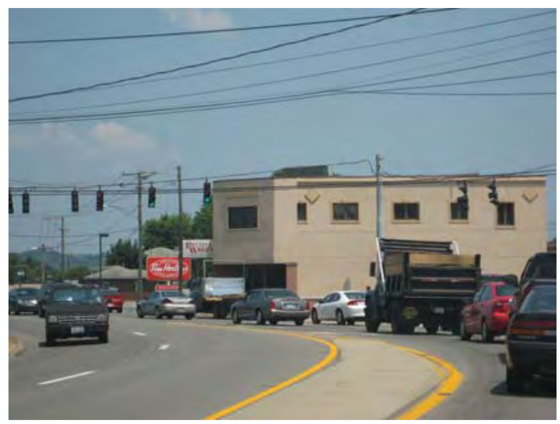

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS

400 East Vine Street
Suite 300
Lexington, KY 40507

(859) 233-2100
www.entran.us

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EXECUTIVE SUMMARY

The Kentucky Transportation Cabinet (KYTC) conducted the I-64 to US 23 Ashland Connector Study to seek improvement strategies for current and anticipated future transportation deficiencies within the western portion of Boyd County. The study demonstrated the need for a new facility to relieve traffic congestion on US 60 through Ashland and to provide more efficient travel routes connecting to US 23 west of downtown Ashland.

The need for an improved transportation corridor between I-64 and downtown Ashland was first identified in the early 1990's. The original concept for the "Ashland Penetrator" route envisioned the project beginning on US 60 near the area known as Meads, paralleling the CSX railroad, and terminating west of downtown Ashland. The Ashland Metropolitan Planning Organization (MPO) added the Urban Penetrator to the Transportation Improvement Program (TIP) in 1996 and it was also included in the KYTC Enacted 1997-2002 Six Year Highway Plan (SYP) in 1996. Construction was scheduled to being in 2001, with an estimated cost of $7,000,000. A project was advertised by KYTC and a consultant team selected, but no project activities took place. The 2003 *Ashland Comprehensive Plan Update* noted that the most significant transportation challenge in Ashland was the need for a major arterial facility in the western part of the community to provide congestion relief to US 60, provide improved access to Town Center Mall and the Wal-Mart shopping center on US 23, and improve circulation. The Ashland Urban Penetrator remained on the FY 2006 – FY 2012 SYP as a scoping study between I-64 and downtown Ashland. The KYTC initiated the current study in 2007, renaming it the I-64 to US 23 Ashland Connector Study. There are no further phases programmed for this project.

The study team worked with a diverse array of local officials, interested individuals, and other stakeholders throughout the course of the study. This group, referred to as the Ashland Connector Advisory Team (ACAT), assisted the study team in defining project goals and issues and identifying both short term and long term improvement projects. Two public meetings were also held over the course of the study. The first public meeting was held in April 2008 to inform the public of the planning study, discuss various environmental and technical issues concerning the project area, and solicit input. The second public meeting was held in November 2008 to summarize the key findings from the study and to present the preliminary short-term and long-range projects developed based on input from the ACAT and feedback from the first public meeting.

A number of improvement alternatives were developed and evaluated during the study. The recommended improvements are summarized on **Figure ES-1**. The short-term improvements, summarized in **Table ES-1**, include potential spot improvements, or projects that can provide much needed benefits at specific locations within the study area. Most of these projects are low-cost, safety oriented improvements that can be implemented in a relatively short time frame.

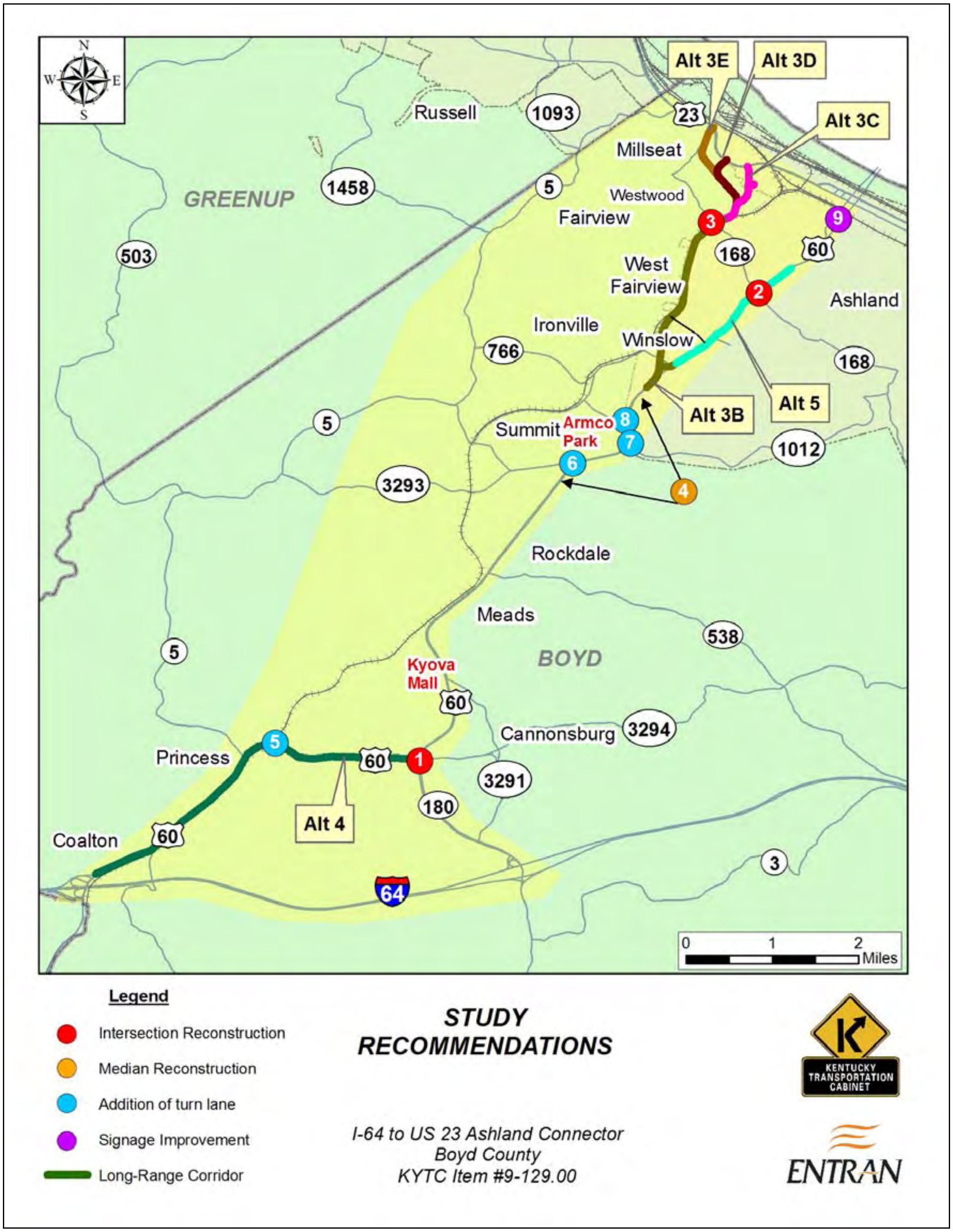

Figure ES-1: I-64 to US 23 Ashland Connector Recommendations

Table ES-1: Recommended Short-Term Improvements

Project #	Roadway / Intersection	Improvement Type	Description	Estimated Cost
1	US 60 @ KY 180	Intersection Reconstruction	Reconstruct grade on approaches	$1,000,000
2	US 60 @ KY 168 (Blackburn Ave.)	Intersection Reconstruction	Realign curved approach leg(s)	$750,000
3	Roberts Drive @ KY 168 (Blackburn Ave.)	Intersection Reconstruction	Improve at-grade railroad crossing on KY 168 west of Roberts Drive	$250,000 - $500,000
4	US 60 from south of KY 716 to KY 1012 (Boy Scout Rd.)	Median Reconstruction	Construct non-traversable median w/ selective median openings	$325,000
5	US 60 @ Paul Coffey Blvd.	Addition of turn lane	Add NB left turn lane and SB right turn lane	$275,000
6	US 60 @ KY 716	Addition of turn lane	Add SB right turn lane	$125,000
7	US 60 @ KY 1012 (Boy Scout Rd.)	Addition of turn lane	Add NB right turn lane	$125,000
8	US 60 @ KY 766	Addition of turn lane	Add SB right turn lane	$125,000
9	US 60	Signage Improvement	Provide additional/improved signage for NB US 60 approaching bridge	$200,000

The recommended long-range corridor alternatives, summarized in **Table ES-2**, represent significant improvements to existing roadways or potential new roadways recommended for further consideration. Three primary projects are shown. Alternative 3, referred to as the "Westwood Connector", includes the construction of a new route between US 60 south of Rose Hill to US 23 west of downtown Ashland. Two options were developed for where the connector could tie into US 60 and four options for where it could connect to US 23. Of these options, Alternative 3B-3C, 3B-3D, and 3B-3E are considered to be preferable due to lower construction costs and right-of-way impacts.

Alternative 4 includes the widening of US 60 to four lanes between the Coalton Interchange at I-64 and the KY 180 intersection. This project is included in the KYTC 2009 Highway Plan with design and right-of-way acquisition programmed in FY 2008-2009.

Table ES-2: Recommended Long-Range Corridor Improvements

Alternative	Length (Miles)	Construction Cost	POTENTIAL RELOCATIONS REQUIRED			
			Commercial	Residential - Single Family	Residential - Multi-family	School Buildings
Alt # 3B-3C	2.86	$ 20,600,000	5	58	5	1
Alt # 3B-3D	2.98	$ 22,680,000	8	66	5	1
Alt # 3B-3E	3.39	$ 24,470,000	11	70	5	1
Alt #4	3.80	$ 15,700,000	3	10	0	0
Alt #5		$ 1,100,000	0	0	0	0

Alternative 5 includes restriping US 60 (13th Street) between Rose Hill and downtown Ashland to three lanes (two travel lanes plus a center left-turn lane). This alternative should be implemented once Alternative 3 is constructed and open to traffic. Alternative 3 will divert traffic from this section of US 60, reducing the traffic volume enough for three lanes to accommodate the demand.

1.0 INTRODUCTION

The I-64 to US 23 Ashland Connector Study was initiated by the Kentucky Transportation Cabinet (KYTC) to seek improvement strategies for current and anticipated future transportation deficiencies within a portion of Boyd County. The project study area, shown in **Figure 1-1**, is completely within Boyd County and is about 24 square miles in size. At its southern boundary, this area includes I-64 between the US 60 and KY 180 interchanges. To the east, the study area follows KY 180 and then US 60 north to US 23. To the west, the boundary begins following US 60 to Princess, then proceeds northeast to the Greenup County line near Bellefonte and follows the county line to US 23. The study area is about 10 miles in length and varies from about 1.5 miles wide at its narrowest point to about 4.4 miles wide along I-64.

1.1 Project History

The need for an improved transportation corridor between I-64 and downtown Ashland was first identified in the early 1990's, at which time KYTC was also exploring the need for and feasibility of an Ashland Bypass. This improved corridor, referred to as the "Urban Penetrator", generally followed the CSX Transportation rail line from US 60 near Meads to US 23 west of downtown Ashland. The Ashland Metropolitan Planning Organization (MPO) added the Urban Penetrator to the Transportation Improvement Program (TIP) in 1996. The TIP, a list of multimodal transportation projects, is a short-range fiscal document that represents the first four years of the long-range plan and the highest transportation priorities of the region.

The Urban Penetrator was first included in the KYTC Enacted 1997-2002 Six Year Highway Plan (SYP) in 1996. The SYP, a fiscally constrained list of projects, represents the near-term KYTC funding commitments for transportation improvements statewide. At the time, $1,000,000 was designated for design in 1998, and right-of-way acquisition ($1,000,000) and utility relocation ($750,000) were listed for 2000. Construction was scheduled to being in 2001, with an estimated cost of $7,000,000. A project was advertised by KYTC and a consultant team selected, but no project activities took place. However, the project remained listed on the SYP.

The 2003 *Ashland Comprehensive Plan Update* included several transportation goals that supported the need for an improved connection through the study area. These goals included planning for a "vehicular bypass around the urban area", encouraging "alternate routes for US 60 commuter traffic", and encouraging "alternate routes for hazardous materials transport outside the urbanized area". The document noted that the most significant transportation challenge in Ashland was the need for a major arterial facility in the western part of the community to provide congestion relief to US 60, provide improved access to Town Center Mall and the Wal-Mart shopping center on US 23, and improve circulation.

More recently, the Ashland Urban Penetrator remained on the FY 2006 – FY 2012 SYP as a scoping study between I-64 and downtown Ashland. The KYTC initiated the current study in 2007, renaming it the I-64 to US 23 Ashland Connector Study. There are no further phases programmed for this project.

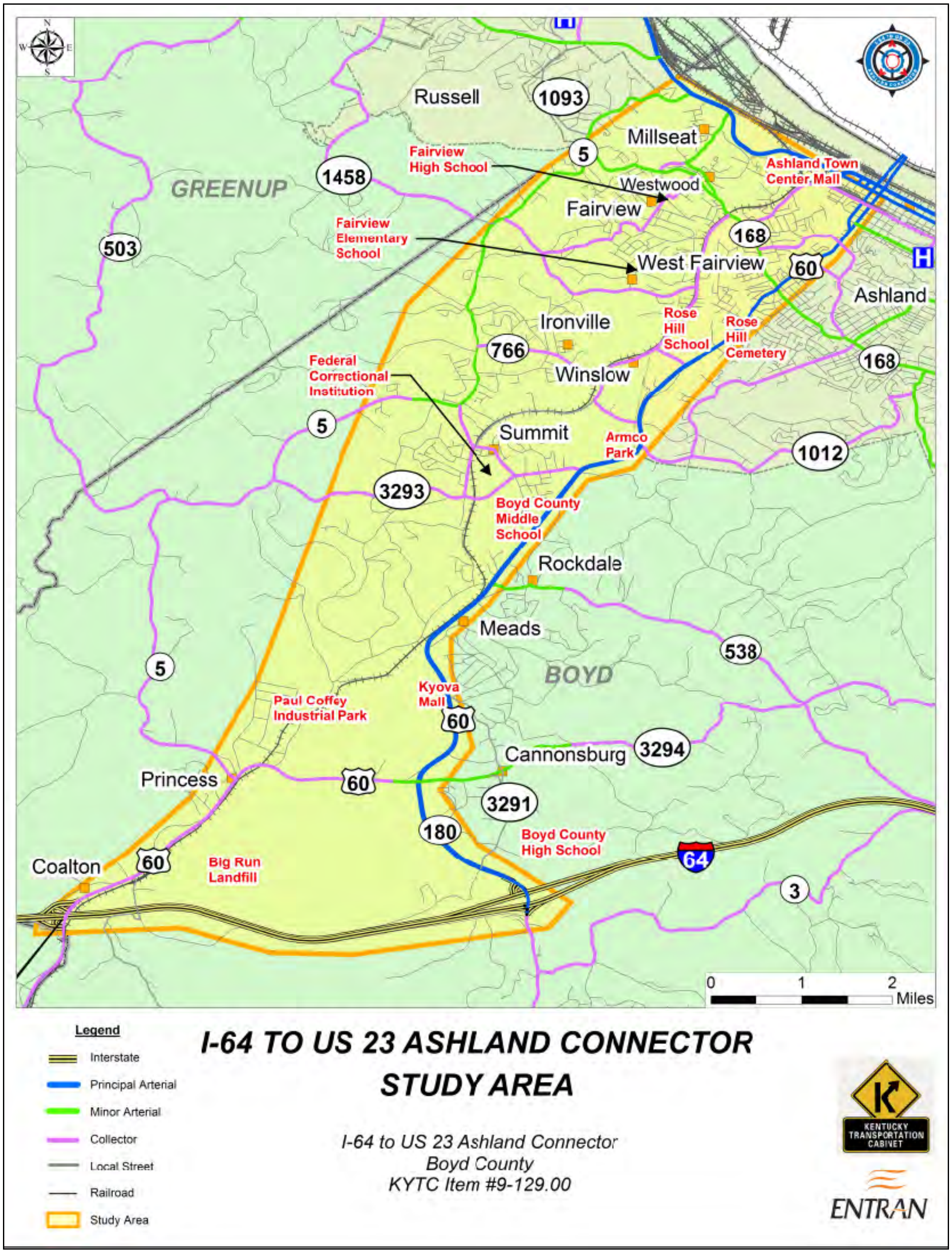

Figure 1-1: I-64 to US 23 Ashland Connector Study Area

1.2 Study Purpose and Need

The purpose of the I-64 to US 23 Ashland Connector Study was to identify community concerns and evaluate project alternatives to improve access and mobility between I-64 and Ashland. The study was intended to help define the location and purpose of the project and better meet federal requirements regarding consideration of environmental issues, as defined in the National Environmental Policy Act (NEPA).

There is a need for improved mobility between I-64 and Ashland. Additionally, the area west of Ashland is densely populated and contains a series of narrow local roads with limited connectivity. Currently, the only direct routes to downtown Ashland from I-64 are US 23 (via the Catlettsburg interchange) and US 60. US 60 is accessed by utilizing either the KY 180 interchange or the US 60 interchange (known locally as the "Coalton" interchange) with I-64. US 60, a signalized arterial, currently carries close to 30,000 vehicles per day (vpd) and has access management issues that tend to increase congestion. This congestion has led to high crash rates within the corridor. South of Ashland, US 60 is four lanes with full outside shoulders and grass median with turn lanes at major intersections. Approaching Ashland, the roadway narrows to four lanes with no shoulder and limited turn lanes. Development along US 23 within and to the west of Ashland has increased travel demand, particularly to the northwest and near Russell.

The primary goals for the study include:

- Discuss the project needs with public officials, resource agencies, the general public and other groups which have an interest in the project.
- Define project goals, needs, and issues
- Identify any known environmental issues, including potential environmental justice issues
- Define project termini (the beginning and ending points of the project)
- Identify and evaluate short and long term projects, including access management, spot improvements, alternate corridors and design criteria

Major issues and concerns identified within the study area and addressed in the study include:

- Mobility and Connectivity
  - Lack of efficient north-south routes between I-64 and downtown Ashland
  - A need to improve connectivity to US 23 and US 60 from surrounding communities
  - Traffic congestion and safety along US 60 and US 23
  - Lack of multimodal facilities, including bicycle and pedestrian facilities. More efficient transit routing is also needed.
  - Truck routing
- Determination of Community Desire and Expectations
  - Project Costs and Schedule
  - Project Termini
- Environmental Issues
  - Community and Residential Impacts

- Environmental Justice – Westwood and Fairview
    - Historical Properties
    - Natural Environment
- Access Management and Land Use
    - US 60 and US 23
    - Access management along any new routes to be proposed

1.3 Public Outreach

Comprehensive public involvement plays a critical role in the success of a planning study. The purpose of the public outreach component of the I-64 to US 23 Ashland Connector Study was to bring different groups of people together to express their ideas, clarify areas of agreement and disagreement, and to develop shared resolutions. KYTC seeks to build partnerships among stakeholders in order to better understand the relationship among problems and to bring more resources and expertise together to develop alternate solutions.

The public involvement component of this study was used to:

- Gauge the interest of the affected communities regarding the desire for a project
- Inform and educate the public on the project
- Identify the needs of the study area
- Identify the project issues and goals
- Identify potential corridor locations

Public involvement during the study was guided by the Ashland Connector Advisory Team (ACAT), made up of local officials, interested individuals, and other stakeholders. Invitations to serve on the ACAT were sent to a diverse array of individuals, and the following volunteered to serve on the ACAT:

Name	Representing
Mr. Phil Biggs	Chairman, FIVCO MPO
Chief Richard Cyrus	Cannonsburg Fire Chief
Ms. Paula Hogsten	Ashland City Commissioner
Capt. Todd Kelley	Police Department - City of Ashland, KY
Mr. James King	Ashland Cyclist Enthusiasts
Ms. Judy McCoy	Boyd County Public Schools-Trans Director
Mr. Bill Musick	Fairview Independent Schools
Mr. Jim Purgerson	Ashland Alliance
Chief Robert Ratliff	Police Department - City of Ashland, KY
Mr. Keith Robinette	Boyd County Road Supervisor
Mr. Kyle Robinson	Boyd County Cooperative Extension District
Mr. Michael Rogers	Ashland Bus System
Mr. Marion Russell	Ashland Public Works Director

Mr. Thomas Saylor	Industrial Authority
Chief Scott Penick	Fire Department - City of Ashland
Ms. Nickie Smith	Riverport Authority
Ms. Cheryl Spriggs	Ashland City Commissioner
J/E Bud Stevens	Boyd County Fiscal Court

Meetings were held with the ACAT at regular intervals over the course of the study and provided opportunities for the study team to provide information and listen to community concerns. Early meetings were held to introduce the study team members, begin to discuss study goals, and solicit input on transportation issues and needs. A group exercise was undertaken at the first meeting with the ACAT 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 some of the known environmental resources within the study area. The following discusses some of the items which were brought up during the exercise.

Transportation Issues

- US 60 north of Rose Hill
  - Lack of left turn lanes
  - High travel speeds
  - Trucks (HazMat)
  - Utility pole setbacks
- Potential impacts to low-income neighborhoods near Millseat

Short Term Projects

- Eliminate left turns from US 23 onto Ohio River Bridges
- New traffic signal on US 60 at Safe Harbor
- Intersection improvements at US 60 @ KY 180
- Delineation of wide medians on portions of US 60

Long Range Projects

- Defined future major corridor
  - US 60 south of Rose Hill through West Fairview and Millseat
  - Connector route from Industrial Parkway to US 60 north of Summit
- Improvements to KY 168 corridor
- US 60 – I-64 to KY 180 (Possible 3 lane)
- US 60 – Rose Hill to Downtown (Possible 3 lane)

As the study progressed, meetings were held to solicit feedback on potential projects. In addition, meetings with local officials and public information meetings were held at key intervals of the project.

The first public meeting was held on April 24, 2008 at the Kyova Mall in Ashland. The purpose of the meeting was to inform the public of the planning study, discuss various environmental and technical issues concerning the project area, and solicit input. The meeting was held in an open house format with KYTC and consultant staff available to answer questions and discuss issues. Forty five (45) members of the public attended the meeting. A sign in table was set up where attendees signed in and were given a project brochure, meeting handout, and questionnaire. The following project exhibits were on display:

- Project Study Area
- Traffic and Safety
- Environmental Resources
- Advisory Committee Trouble Spots
- Advisory Committee Suggested Improvements
- KYTC Planning process
- Six year plan projects
- Aerial Map of Study Area with pictures

The second public meeting was held on November 18, 2008 at the Park Place Building in downtown Ashland. The purpose of this final public meeting was to summarize the key findings from the study and to present the preliminary short-term and long-range projects developed based on input from the ACAT and feedback from the first public meeting. Approximately 138 members of the public attended the meeting. In addition to the exhibits from the first public meeting, the following project exhibits were on display:

- Public Meeting #1 Identified Trouble Spots and Proposed Corridors
- Potential Short-Term Improvement Options
- Potential Long-Range Corridor Alternatives
- Alternative Corridors with Aerial Background

Meeting summaries for all meetings held throughout the I-64 to US 23 Ashland Connector Study are found in **Appendix A**.

2.0 EXISTING CONDITIONS

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

2.1 Roadway Characteristics

At the southern border of the study area, I-64 provides regional east-west connectivity to major destinations within the state, such as Lexington and Louisville, and extending to surrounding states. Two interchanges exist along I-64 within the study area, at US 60 and KY 180. US 60 traverses through rolling terrain to downtown Ashland, where it intersects with US 23.

Detailed roadway information for the major highways within the study area is located in **Table B-1** in **Appendix B**. Additionally, Lane Data, Median Type, Shoulder Width, Functional Classification, Truck Routes, Truck Weight Class, Horizontal Adequacy and Vertical Adequacy maps are located in **Appendix B**. Key information is summarized below.

KY 5 at KY 766

KY 5: State Route 5 (KY 5) is an undivided, two-lane highway with 11-foot lanes. The majority of the roadway has two-foot shoulders and parallels creek beds. From US 60 to the Ashland Urban Limits, the roadway is classified as a Rural Major Collector with 55 mph speed limit. From the Urban Limits to US 23, the roadway is an Urban Minor Arterial with speed limits ranging from 35 to 45 mph.

KY 180: Between I-64 and US 60, KY 180 is a four-lane divided highway with a depressed grass median. The functional classification is a Principal Arterial. Travel lanes are 11-feet wide and shoulder widths are 10 feet wide. The speed limit is 55 mph. KY 180 is part of the National Highway Network and designated with AAA Truck Weight Class.


US 60 at KY 180

US 23X: US 23X is an Urban Principal Arterial located in Ashland's central business district. This four-lane roadway has ten-foot travel lanes with a flush center median. The speed limit varies from 25 mph to 35 mph.

US 23: This divided roadway has four 12-foot wide travel lanes. US 23 parallels US 23X in the downtown area, and is also designated as an Urban Principal Arterial. From Town Center Drive to KY 168, the roadway's terrain is mountainous. The shoulder width varies from 2 feet to 10 feet wide. US 23 is part of the National Highway Network and designated with AAA Truck Weight Class.

US 60: The physical characteristics of US 60 within the study area vary greatly. Between I-64 and KY 180, the facility is classified a Rural Major Collector, and is an undivided roadway with two travel lanes and 10- to 12-foot shoulders. From KY 180 to KY 168, the facility becomes an Urban Principal Arterial with four travel lanes. From KY 168 to the downtown area, the lane width narrows to 10 feet, shoulders are curbed, and the speed limit is reduced to 35 mph.

The Ashland Bus System currently operates five bus routes in the Ashland area. The routes are identified in **Figure 2-1**.

US 60 approaching Ashland

2.2 Traffic Volumes and Volume-to-Capacity Ratios

Existing average daily traffic (ADT) volumes were obtained for all state-maintained roadways within the study area using the KYTC HIS database. **Figure 2-2** shows the ADTs. The list below summarizes the vehicles-per-day (VPD) for the major roadways.

KY 5
- 2,290 VPD (West of US 60)
- 7,920 VPD (near Greenup County line)

KY 180
- 13,300 VPD (north of I-64)
- 33,400 VPD (east of US 31W)

US 23
- 35,600 VPD (at the Mall)

US 60
- 21,400 VPD (just south of Ashland)
- 28,100 VPD (north of KY 538)

The volume-to-capacity (V/C) ratio is a level-of-service measure, comparing the roadway's demand to the roadway's capability. Areas of concern are where the V/C values approach or exceed 1.0, in which limited capacity leads to congestion. As illustrated on **Figure 2-2**, the majority of the roadways are performing adequately, with V/C value of 0.8 or below. Portions of KY 5, KY 766, US 23, and US 60 are currently operating at or near capacity.

Table 2-1 summarizes the truck percentage data available from the KYTC for the major roadways within the study area.

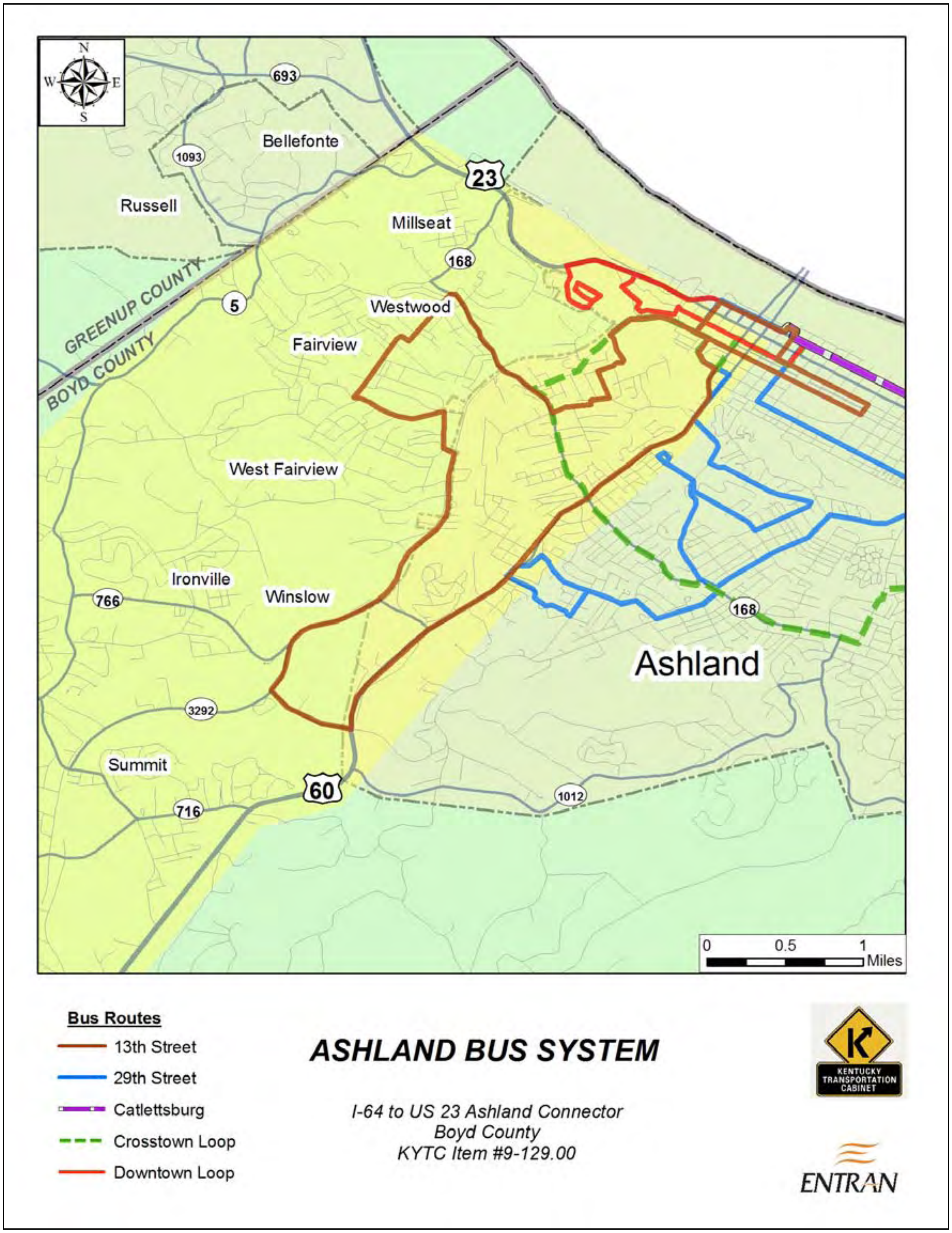

Figure 2-1: Ashland Bus System Routes

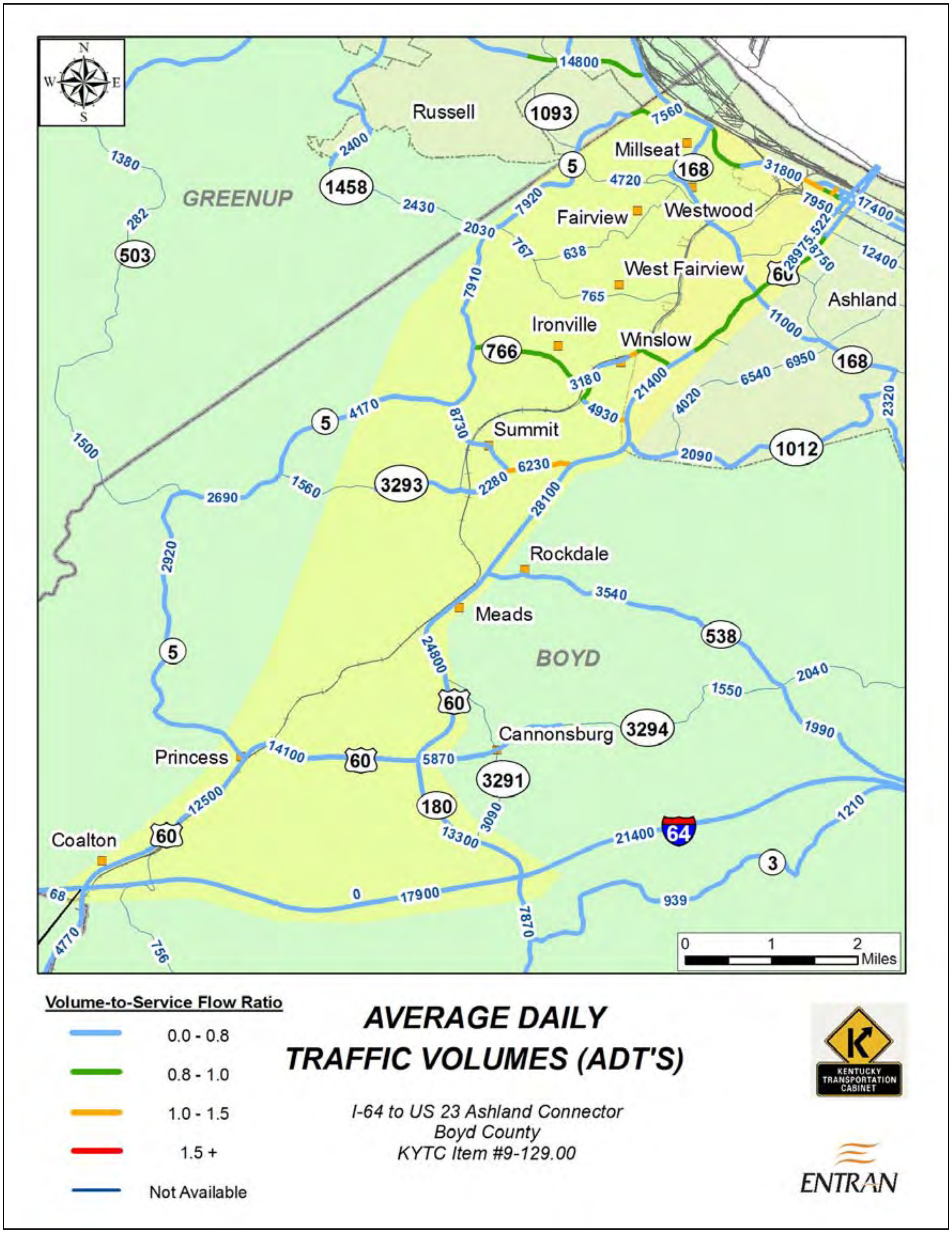

Figure 2-2: Average Daily Traffic Volumes

Table 2-1. Heavy Truck Percentages

Route	Count Station	Section Description	Total Heavy Truck %*	NB / EB %	SB / WB %
US 23	015	South of I-64	16.3	16.1	16.5
	D27	Between KY 538 & KY 3294	11.8	12.3	11.4
	D23	Between KY 3294 & US 60			
	D15	Between US 60 & KY 168	8.0	7.4	8.6
	A54	Between CS 2025 - CS 2024	13.8	13.7	13.8
	A52	Between CS 2024 - US 23X			
	B09	Between US 23X & US 60	7.5	7.8	7.3
	A96	Between US 60 & US 23X			
	B71	Between US 23X & KY 5	5.3	4.9	5.7
	A05	Between KY 5 & Co. Line	3.9	3.8	3.9
KY 5	813	Between US 60 & KY 503	10.0		
	759	Between KY 503 & KY 3293			
	C25	Between KY 3293 & KY 716			
	C08	Between KY 766 & KY 1458	5.0	5.0	5.1
	B29	Between KY 1458 & KY 1093			
	B81	Between KY 1093 & US 23			
KY 180	752	South of I-64			
	C49	at US 60	9.0	8.3	9.7
US 60	043	South of I-64			
	816	Between I-64 & North I-64 Ramps			
	756	Between KY 5 & KY 180			
	C41	Between KY 180 & KY 538	5.1	4.0	6.2
	C39	at KY 538			
	C36	Between KY 538 & KY 716			
	A82	Between KY 1134 & KY 168	5.2	5.1	5.3
	A21	Between KY 168 & US 60-1	3.8	3.5	4.2
	B34	Between US 60-1 & US 23X	11.1 (one-way)		
	A26	Between US 23S & US 60-1			
	B39	Between US 23 & US 23X			
	5	Between US 23 & Bridge	5.0		
US 23X	B16	Between US 23 & 17th St.	3.3	3.0	3.7
	B10				
	A25	Between US 60-1 & US 23	5.8	5.6	6.0

2.3 Crash History

Crash data were collected along existing roadways within the study area for a five-year period (2002 – 2006). A total of 3,548 crashes were reported along the following major routes: KY 5, KY 180, US 23, US 23X and US 60.

A closer review of the data found that four fatal crashes and 388 injury crashes were reported along US 60 during the five years. Eighty-eight percent of all crashes along US 60 were intersection crashes. Rear-end or angle crashes accounted for 72 percent of all crashes along US 60. Along KY 5, three fatalities and 111 injury crashes were reported. Of all the crashes along KY 5, forty-seven percent involved only one vehicle. For KY 180, one fatality and 33 injury crashes were reported for the five years. Twenty-seven percent of the KY 180 crashes occurred at intersections, and sixty-three percent were reported as rear-end or angle crashes.

Critical Rate Factors (CRFs) were also 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 maximum accident rate for which it can be said that crashes are occurring randomly based on roadway characteristics and traffic. A CRF less than 1.0 indicates that crashes occur at random, and 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 2-3**, are listed below.

- KY 5: between US 60 (MP 0.00) and KY 716 (MP 6.862)
- KY 180: between KY 3 (MP 0.00) and US 60 (MP 2.518)
- US 23X: between Greenup Avenue (MP 0.00) and US 23 (MP 1.796)
- US 23: between KY 3 (MP 10.445) and north I-64 ramps (MP 10.667)
- US 23: between 12th Street Bridge (MP 18.643) and Winchester Avenue (MP 18.997)
- US 60: between Carter-Boyd Co. line (MP 0.00) and I-64 overpass (MP 0.195)
- US 60: between KY 168 (MP 10.819) and 13th Street (MP 12.217)

Additionally, roadway spots (a roadway length of less than 0.1 miles) with high crash rates were also identified. These locations, shown on **Figure 2-4**, are as follows:

- KY 5 at KY 3293 (MP 4.677)
- KY 5 at KY 716 (MP 7.007)
- KY 5 at KY 766 (MP 7.532)
- KY 5 at KY 1458 (MP 9.247)
- KY 168 at Roberts Drive (MP 6.756)
- KY 180 at I-64 (0.650)
- US 23 at I-64 (MP 10.695)
- US 60 at Lexington Avenue (MP 0.135)
- US 60 at Central Avenue (MP 0.298)
- US 60 at Winchester Avenue (MP 0.448)
- US 60 at KY 180 (MP 4.073)
- US 60 at Winslow Road (MP 9.774)
- US 60 at KY 168 (MP 10.810)
- US 60 at Pollard Road (MP 11.597)
- US 60 at Central Avenue (MP 12.048)
- US 60 at Carter Avenue (MP 12.150)

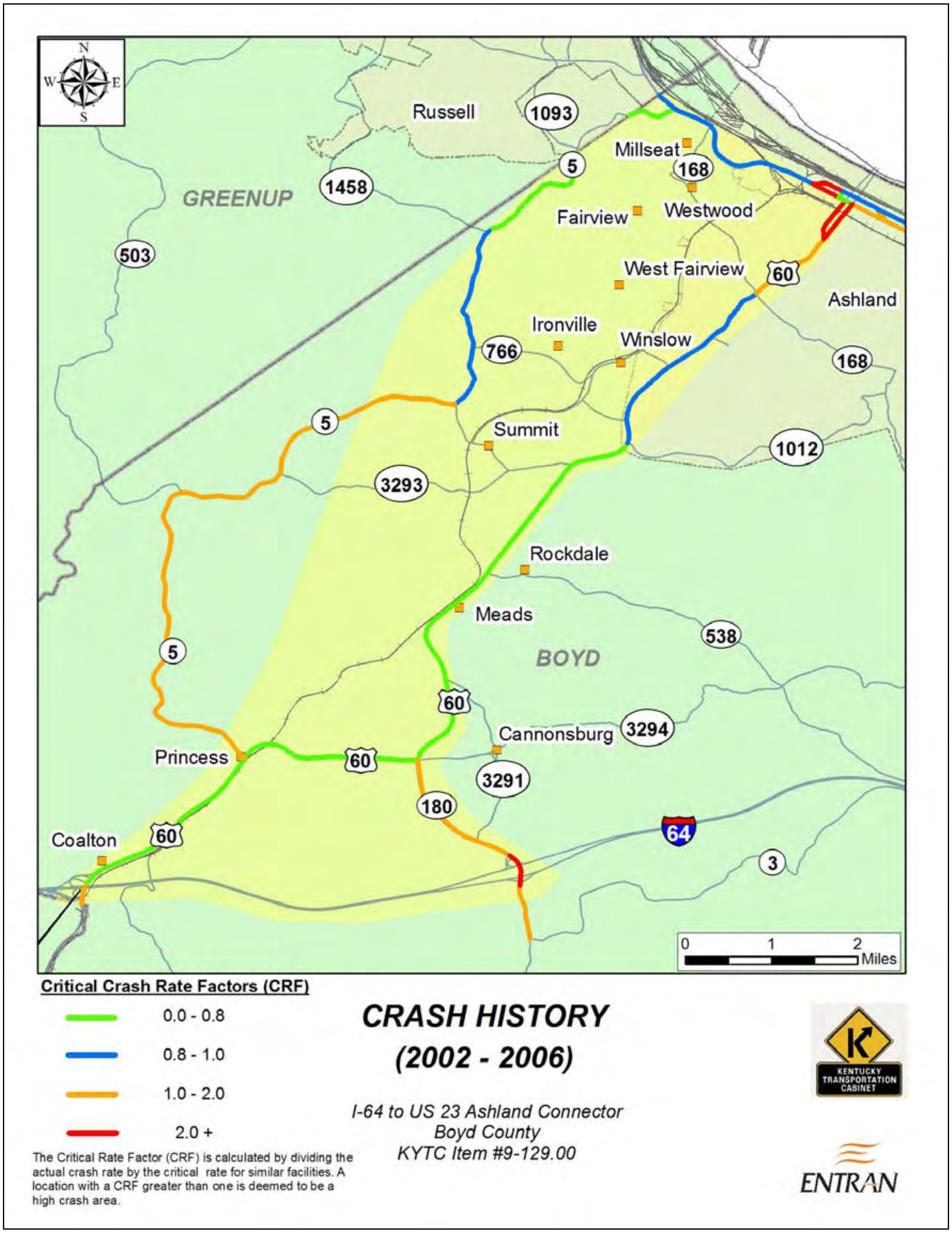

Figure 2-3: Crash History and Segments with High Crash Rates

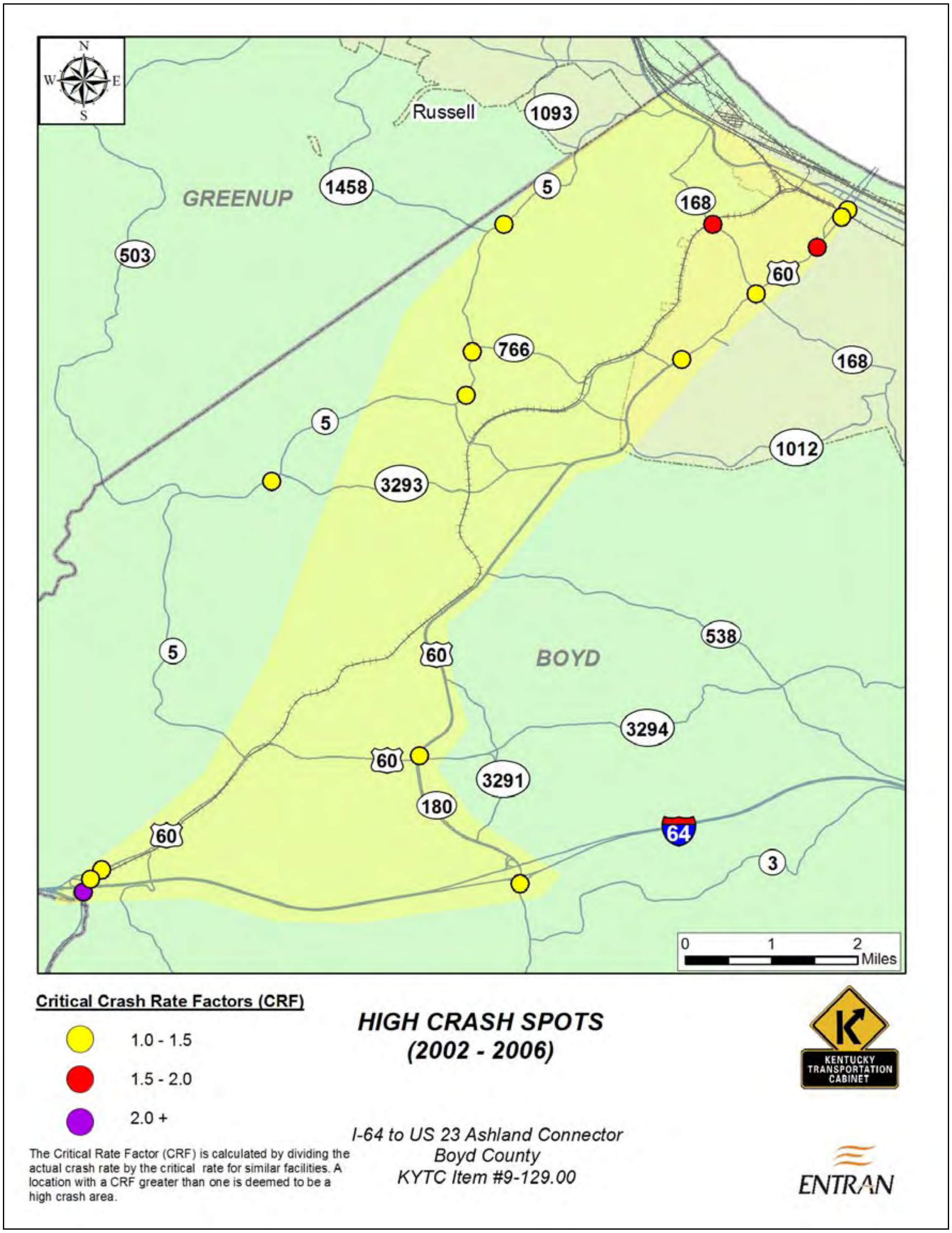

Figure 2-4: High Crash Spots

3.0 ENVIRONMENTAL RESOURCES AND ISSUES

Environmental resources and issues of concern identified in the project study area include those related to both the natural and human environment, and included the following: streams, floodplains, wetlands, ponds, water supplies, threatened, endangered and special concern species and habitat, woodland and terrestrial areas, parks, social and economic resources, historic and archaeological resources, hazardous materials concerns, agriculture, mining, environmental justices, and additional concerns. A brief summary of the environmental resources and issues requiring additional consideration in the project study area is presented below, with additional resource and issue information provided in the project *Environmental Overview*, included in **Appendix C**.

3.1 Resource Agency Coordination

A total of 120 letters were sent to federal, state, and local agencies to solicit input and comments on the I-64 to US 23 Ashland Connector Study. Twenty-one agencies responded, and their responses are included in **Appendix C**, **Attachment B**. The following agencies provided input or comments on the study:

- United States Fish and Wildlife Service (USFWS)
- Kentucky State Nature Preserves (KSNPC)
- Kentucky Department of Fish and Wildlife Resources (KDFWR)
- Kentucky Environmental and Public Protection Cabinet, Department for Environmental Protection (KEPPC-DEP) Clearing House
    - Division of Water
    - Division of Waste Management
    - Division of Air Quality
    - Kentucky Heritage Council
    - Department for Natural Resources
    - Division of Mine Reclamation and Enforcement
- Kentucky Bicycle and Bikeway Commission
- Kentucky Geological Survey (KGS)
- Centers for Disease Control and Prevention (CDC), Division of Emergency and Environmental Health Services
- Kentucky Cabinet for Economic Development
- Kentucky Cabinet for Health and Family Services
- Ashland Fire Department
- Boyd County Sheriff
- Kentucky Department of Education, Division of Facilities Management
- Department of Military Affairs
- Kentucky Heritage Council
- Kentucky Division of Waste Management (KDWM)
    - Underground Storage Tank Branch
    - Solid Waste Branch
- Kentucky Department of Agriculture
- Federal Aviation Administration (FAA)

- Kentucky Natural Resources Conservation Service (NRCS) Office

3.2 Natural Environment

Figure 3-1 presents a summary of the significant natural environment features located within the study area. Discussion on these features is found in the following sections.

Surface Streams

Through a combination of review of information from the Kentucky Environmental and Public Protection Cabinet Division of Water, United States Geological Survey (USGS) 7.5' topographic quadrangles and on-site field survey, it was determined that no Special Use Waters and no high quality stream corridors occur in the project study area. It was also determined that a total of 55 USGS blue-line streams occur in the project study area in two watersheds; the East Fork Little Sandy River and the Ohio River Near Greenup watersheds. The most prominent surface stream feature in the study area is the East Fork Little Sandy River, which flows east to west through the project study area. Additionally, numerous ephemeral non-USGS streams were identified in the study area during the September 2007 on-site field survey. A comprehensive stream survey and impact assessment, including evaluation of avoidance and minimization measures, will need to be conducted as this project further develops. Unavoidable impacts to the Little Sandy River and other USGS and/or ephemeral features will require coordination with the U.S. Army Corps of Engineers and the Kentucky Division of Water (KDOW).

Floodplains

Based on review of Federal Emergency Management Agency (FEMA) 100-Year floodplain information from the Kentucky Office of Technology Division of Geographic Information, 100-Year floodplains occur along a number of streams in the project study area. Avoidance and minimization of floodplain encroachment will need to be evaluated as this project further develops for compliance with Executive Order 11988 and United States Department of Transportation floodplain policies, and coordination and review of the project by Kentucky Division of Water (KDOW) and the local floodplain coordinator will need to be conducted if floodplain encroachment does occur.

Wetlands

Review of National Wetland Inventory (NWI) information from the U.S. Fish and Wildlife Service indicated that a total of 19 NWI-mapped wetlands occur in the project study area, most of which were located along the East Fork Little Sandy River and other FEMA 100-year floodplain areas. During the 2007 on-site field survey of the project study area, many of the NWI mapped wetlands were confirmed to be present, and a number of additional non-NWI-mapped wetlands were observed. Most of the wetlands were noted to be low-quality features associated with roadside ditches and drainage swales, however, several moderate quality wetlands were observed along the East Fork Little Sandy River. No extensive, high quality wetlands were noted in the study area. A comprehensive wetland survey and impact assessment, including evaluation of avoidance and minimization measures, will need to be conducted as this project further develops. Unavoidable wetland impacts will require coordination with the U.S. Army Corps of Engineers and the Kentucky Division of Water.

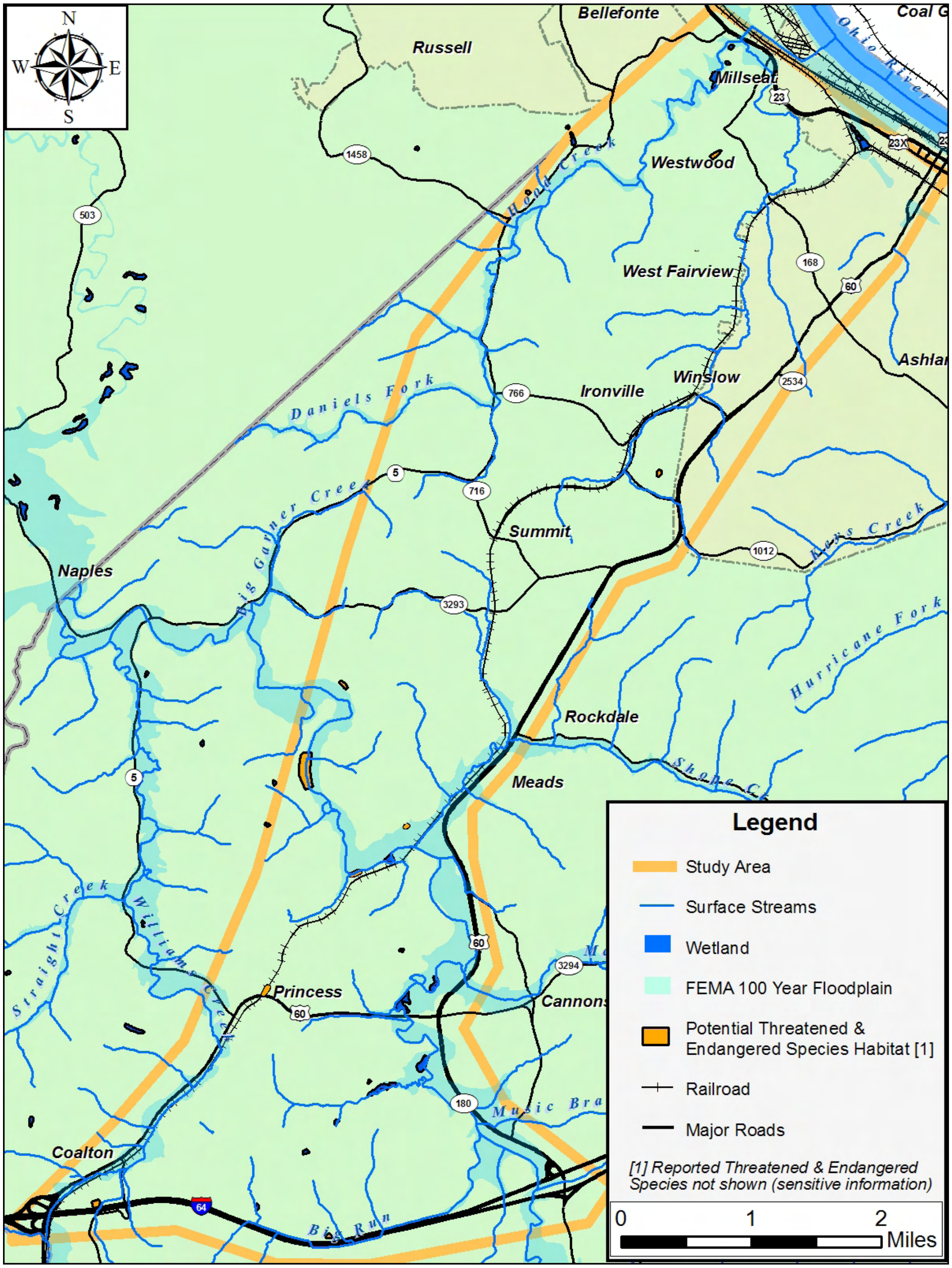

Figure 3-1: Significant Natural Environment Features

Groundwater Resources and Public Water Supplies

Review of information from the Kentucky Geologic Survey (KGS) and Kentucky Division of Water (KDOW) indicated that no wellhead protection areas, public water supplies, springs or karst areas occur in the project study area. Information from KGS and KDOW indicated that approximately 157 water wells occur in the study area, most of which were identified as monitoring wells, and that the northern half of the study area occurs in a Source Water Assessment and Protection Program area (SWAPP). As the project further develops, water wells encountered within the construction limits of an alternative selected for development will need to be sealed per Kentucky Transportation Cabinet standard specifications.

Threatened, Endangered and Special Concern Species

Information concerning the occurrence of federal and state threatened, endangered and special concern species and unique habitats in the project vicinity obtained from the United States Fish and Wildlife Service (USFWS), the Kentucky State Nature Preserves Commission (KSNPC) and the Kentucky Department of Fish and Wildlife Resources (KDFWR), indicated that no unique habitats occur in the study area, but that a total of 20 listed fish, mammals, birds and freshwater mussels were reported to occur or have suitable habitat in the general project area. Five of these listed species were reported to have occurrences of individuals from within the project study area boundaries, and included two federal species of management concern (salamander mussel and trout perch) and three state special concern species (little spectaclecase mussel, yellow troutlily and gray treefrog). No known occurrences of any federal threatened or endangered species were reported from within the study area boundaries. During the September 2007 on-site field survey of the project area, potential habitat for the federal endangered Gray and Indiana bats, as well as potential habitat for several mussel and fish species, listed above, was observed. Due to the occurrence of potential habitat for listed species in the project study area, a more thorough survey for these species should be conducted as the project further develops.

3.3 Human Environment

A summary of the significant human environment features in the study area is shown in **Figure 3–2**.

Public Parks - Section 4(f) and Section 6(f) Facilities - Through a combination of review of project aerial photographs, USGS maps, information from the National Park Service and on-site field surveys, a total of eight public parks were identified in the project study area. If any of these facilities are affected by the proposed project, then evaluation and coordination with the Federal Highway Administration will be necessary. Two of the above-listed facilities were additionally identified as having received grant assistance from the Land and Water Conservation Fund (LWCF), and, if impacted, would require evaluation and approval by the National Park Service.

Social and Economic Resources - Through a combination of review of information from the Environmental Systems Research Institute (ESRI) and on-site field survey, the following social and economic resources were identified in the project study area: 18 schools, institutions and learning centers, 38 churches, 15 cemeteries, three fire departments, three shopping centers/urban mall complexes, two public golf courses, one industrial park, and two federal facilities. These facilities are shown on Figure 4-2. Impacts to these social and economic resources will have to be taken into consideration once the project further develops.

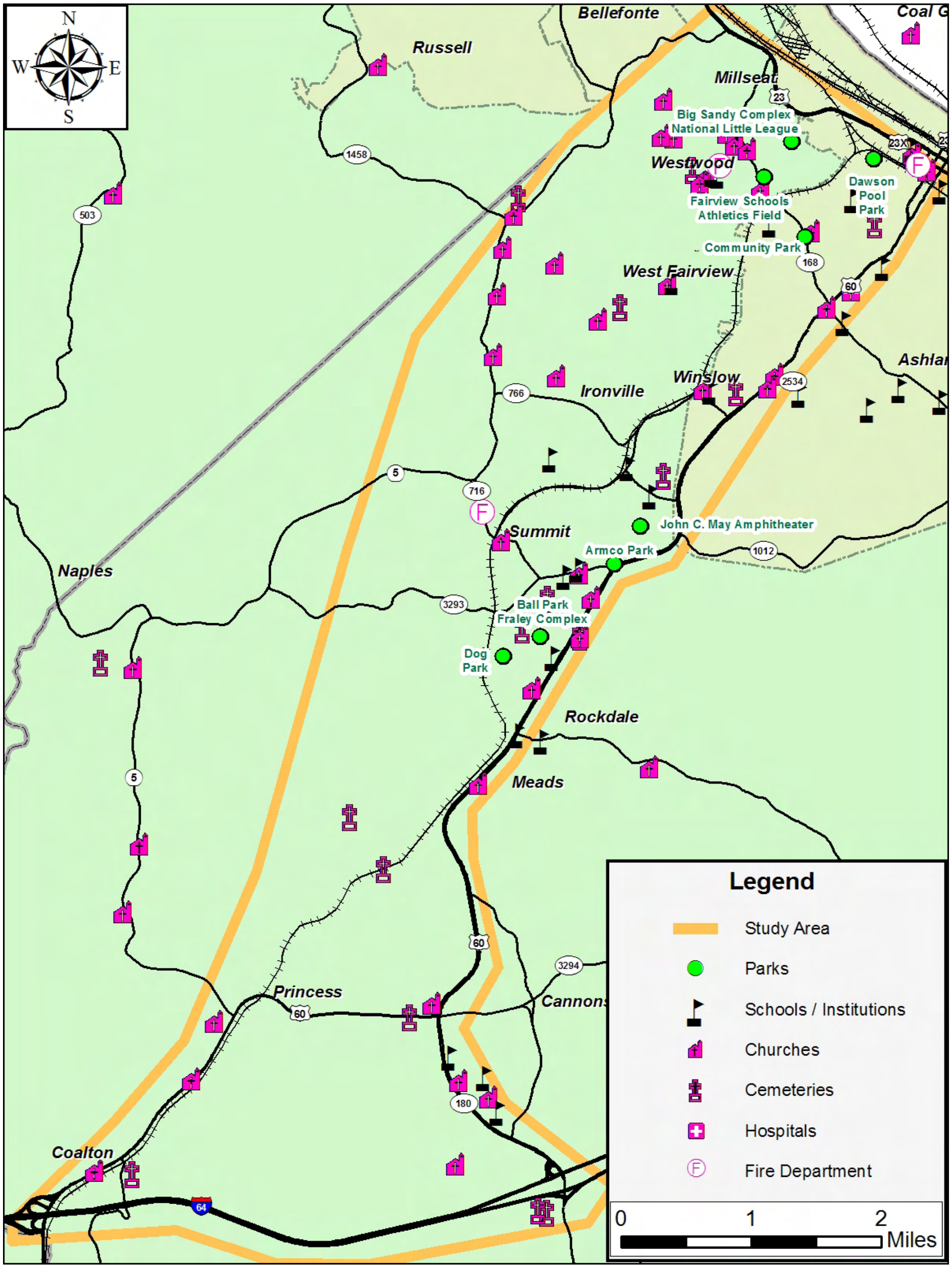

Figure 3-2: Significant Human Environment Features

Historic and Archaeological Resources - Section 106 and Section 4(f) Resources

Historic Resources - Cultural historic investigations indicated that the following historic resources occur in the project study area: a total of four National Register of Historic Places (NRHP) listed resources, a total of four historic resources determined to be eligible for inclusion on the NRHP, and a total of six districts and 26 individual properties determined to be potentially eligible for inclusion on the NRHP (pending additional research and consultation with the State Historic Preservation Office). These resources are shown on **Figure 3-3**. Section 106 review under the Historic Preservation Act and evaluation and coordination with the Federal Highway Administration under Section 4(f) of the Department of Transportation Act of 1966 will be required if any of these resources are impacted by the project. Additional information concerning historic resources in the project study area is provided in the project *Historic Resources Overview* in **Appendix D**.

Archaeological Resources - Archaeological studies indicated that approximately five percent of the project study area has been previously surveyed for archaeological resources, and review of information from the Kentucky Office of State Archaeology indicated that a total of three archaeological sites occur in the project study area. The study also noted that nearly half of all recorded archaeological sites in Boyd County have been found on floodplains or on stream terraces, suggesting that similar areas, along with upland flats located in ridge line saddles, within the project study area would have the greatest potential for the occurrence of archaeological resources. A more thorough survey for archaeological resources in the project study area should be conducted as the project further develops. Additional information concerning archaeological resources in the project study area is provided in the project *Archaeological Overview* in **Appendix E**.

Agriculture

Review of information from the Kentucky Natural Resources Conservation Service indicated that prime farmland soils occur at a number of locations throughout the project study area, primarily in low-lying, level stream bottomlands, and in level areas along chief transportation corridors. The 2007 on-site field survey revealed that the occurrence of agricultural land in the project study area was relatively sparse (estimated to account for less than ten percent of the total land area encompassed by the study area), and mostly in hay production. In response to a request for information, the Kentucky Department of Agriculture acknowledged the project, but offered no specific comments. Once the project further develops, coordination with the local Natural Resources Conservation Service office will be necessary to determine if the project will result in adverse impacts to farmland.

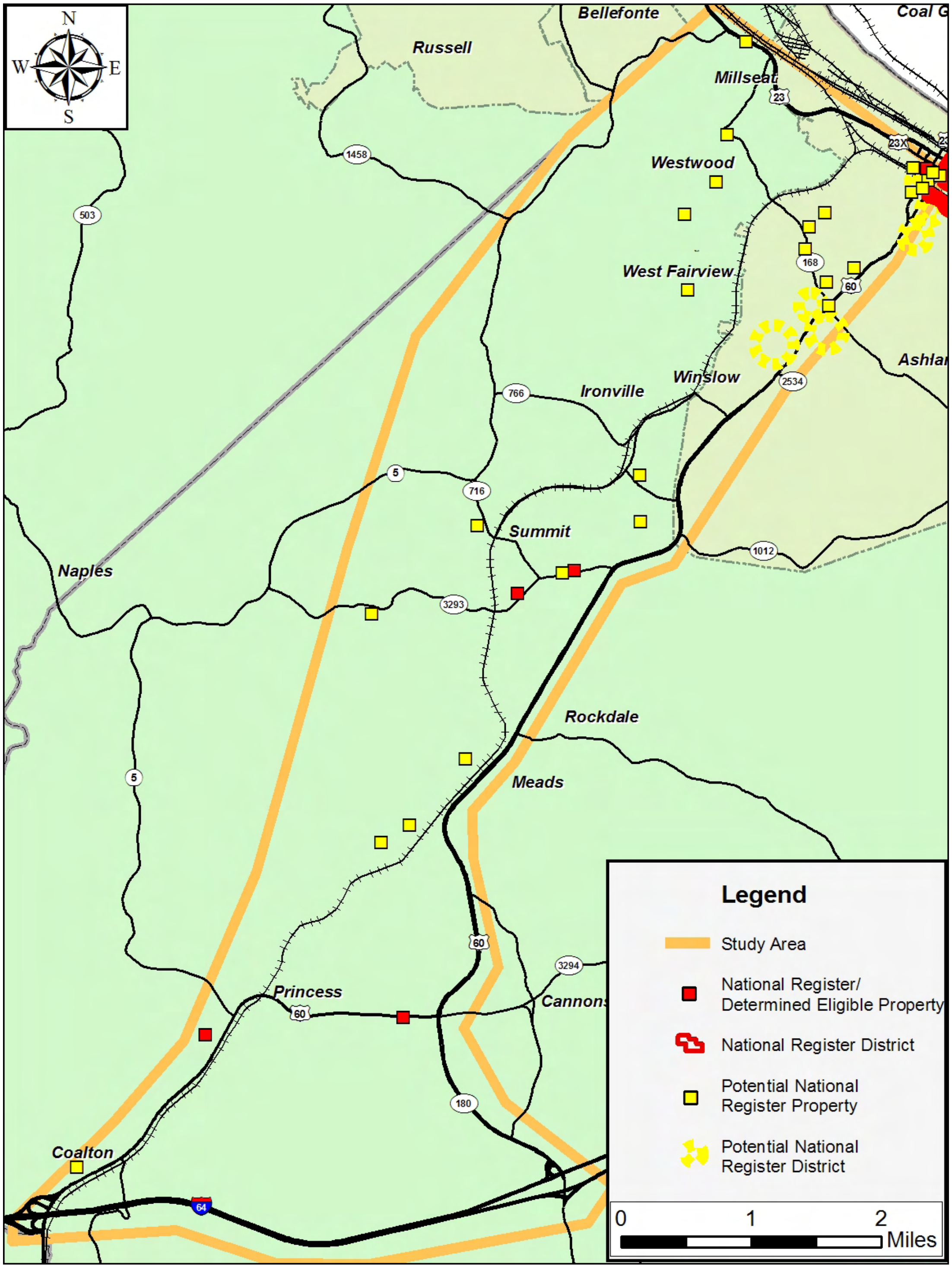

Figure 3-3: Cultural-Historic Resources

Hazardous Materials Concerns

A summary of the significant hazardous materials concerns in the study area is shown in **Figure 3–4**.

Underground Storage Tanks (UST's) - The occurrence of UST's in the project study area was determined through a combination of review of information from the Kentucky Division of Waste Management (KDWM) Underground Storage Tank Branch, the USEPA Envirofacts Data Warehouse for hazardous waste information and on-site field survey. In December 2007, KDWM reported that 39 facilities with UST's occur in the project study area. In general, the types of facilities with UST's included: gas stations, transportation, manufacturing, wholesale, service, government, information services, agriculture, and construction facilities. A Phase I survey for UST's in the project study area will need to be conducted as the project further develops.

USEPA Regulated Sites - A total of 46 USEPA regulated properties were identified in the project study area as hazardous materials concerns through review of information from KDWM and the USEPA Envirofacts Data Warehouse. Of the 46 USEPA regulated properties identified in the project study area, 13 of the sites were Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Superfund properties and 33 were Resource Conservation and Recovery Information System (RCRIS), Toxic Release Inventory (TRI) or Brownfields properties. As a result, a Phase I survey for hazardous materials concerns in the project study area will need to be conducted as the project further develops.

Oil and Gas Wells - Through a combination of review of information from the Kentucky Office of Technology Division of Geographic Information and on-site field survey, a total of approximately 111 oil and gas wells were identified in the project study area. A more thorough survey for oil and gas wells should be conducted once the project further develops and any oil and gas wells determined to be impacted by the project will need to be sealed per KYTC standard specifications.

Landfills - Review of information from KDWM Solid Waste Branch indicated that eight known landfills occur in the project study area. A Phase I survey for hazardous materials concerns associated with these landfill sites will need to be conducted as the project further develops.

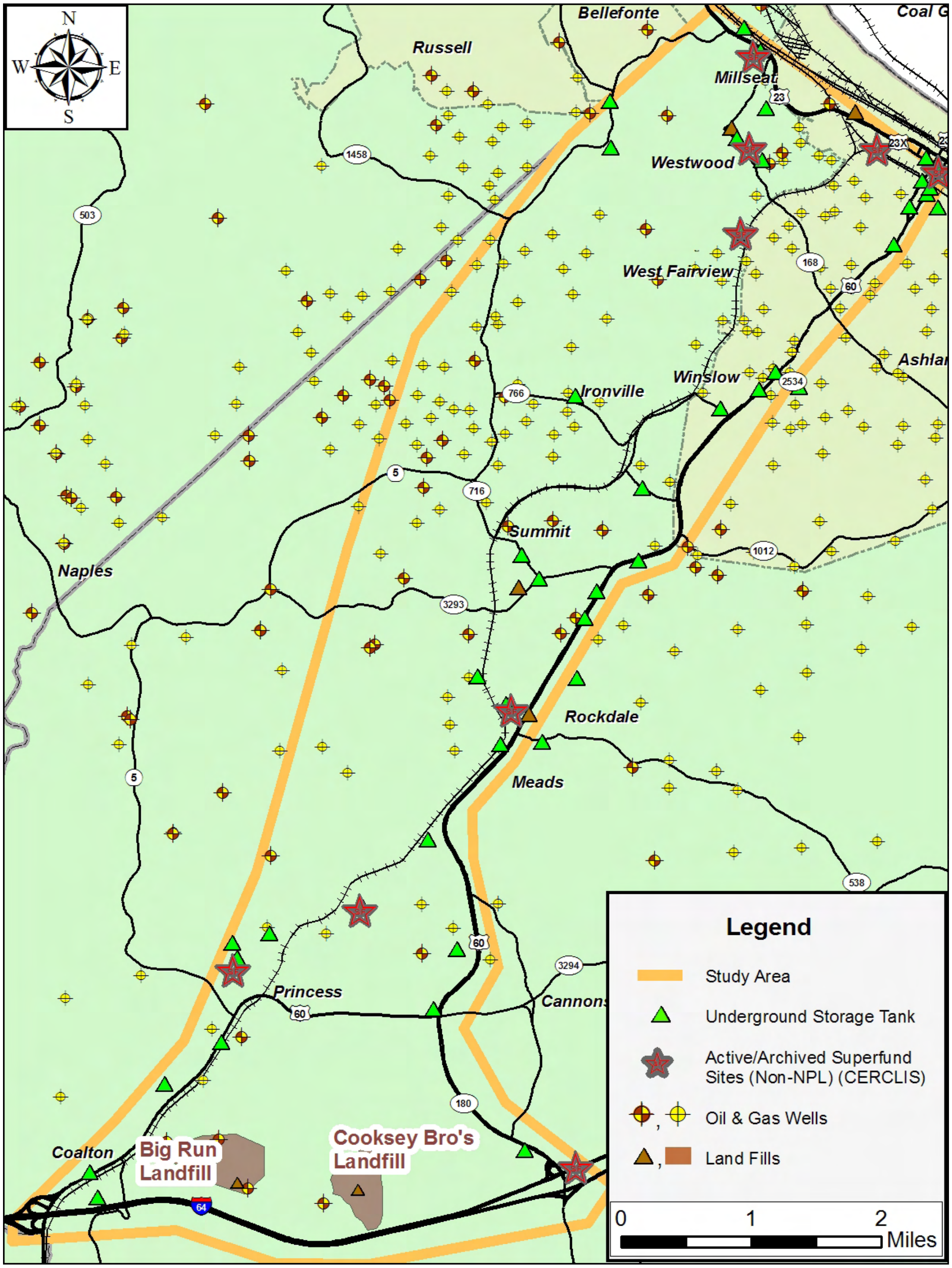

Figure 3-4: Hazardous Material Concerns

Geotechnical Issues

A geotechnical overview investigation conducted for the project in November and December of 2007 indicated that the study area has been extensively mined for coal, especially in the areas near the town of Princess and at several locations west of US 60. The study also indicated that bedded materials near surface elevations in the study area would be susceptible to landslides. The study recommended that available mining records be reviewed and that terrace deposits be avoided due to the potential for settling. The study also recommended that measures to increase safety such as flatter slopes, promotion of surface/subsurface drainage, re-vegetation and construction of retaining walls, be included in the design of the project. Additional information concerning geotechnical issues within the study area is found in the *Geotechnical Overview* in **Appendix F**.

Mines and Quarries

Mines and quarries in the project study area, shown in **Figure 3-5**, were identified through a combination of review of information from the Kentucky Department for Natural Resources Division of Mine Reclamation and Enforcement, the Kentucky Office of Technology Division of Geographic Information and on-site field survey of the study area. No active mining operations were determined to occur in the study area, although, a total of 18 inactive mine sites were identified from secondary sources. Two active quarries were identified in the southern portion of project study area in the vicinity of Princess. Impacts to previously mined or quarried areas in the study area will need to be taken into consideration for the development of project alternatives once the project further develops.

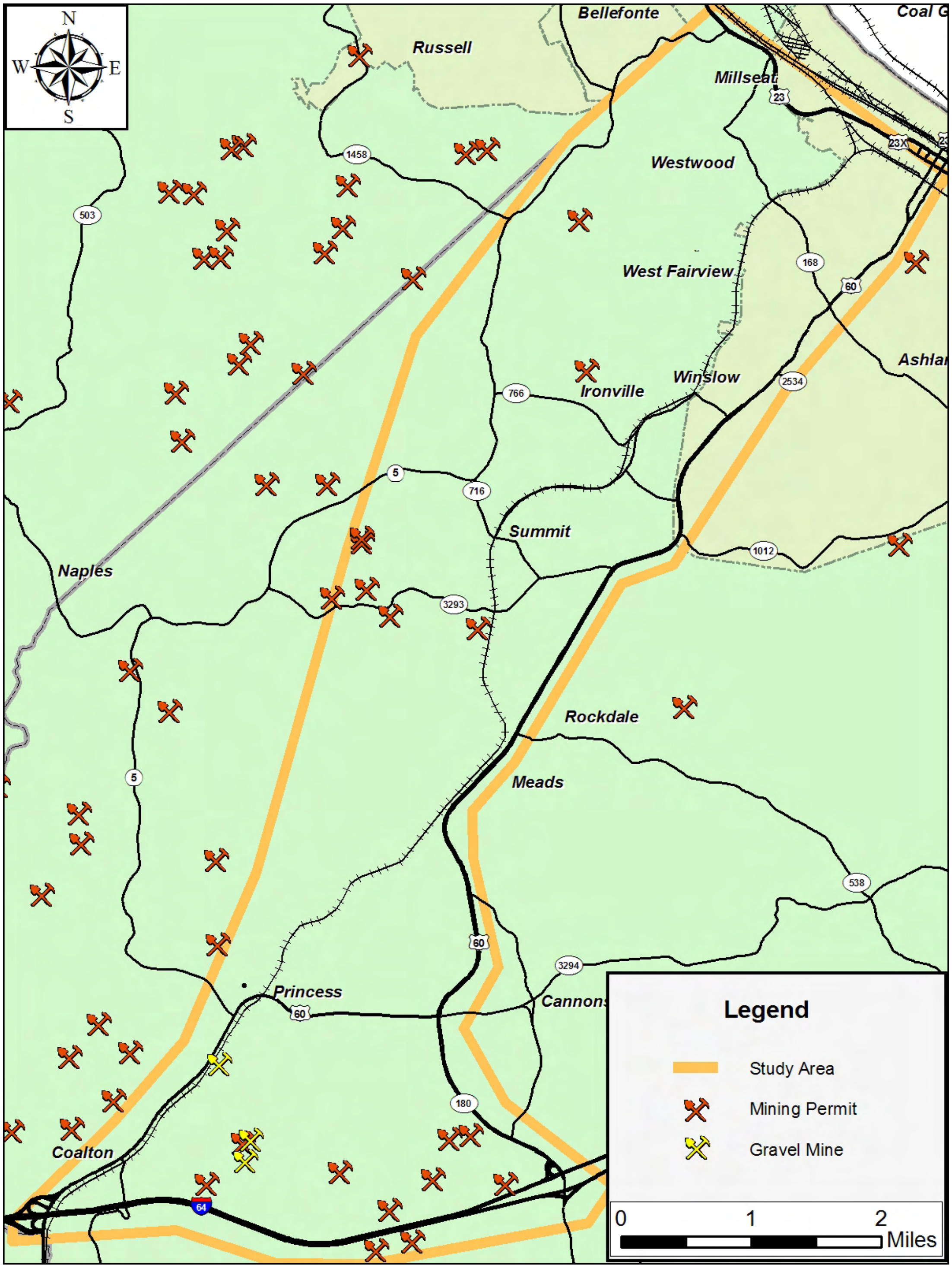

Figure 3-5: Mines and Quarries

3.4 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 a May 2008 report entitled *Environmental Justice and Community Impact Report*. The EHI report concluded that Environmental Justice populations above the state and county averages occur in several Census Tracts and Block Groups in the study area generally in proximity to the City of Ashland, and the communities of Summit, Westwood and Fairview. The occurrence of these Environmental Justice populations in the project study area should be taken into consideration as the project further develops. Additional information concerning Environmental Justice issues in the project study area is provided in the project *Environmental Justice Overview* in **Appendix G**.

3.5 Additional Items of Concern

Air Quality - Boyd County is currently (June 2008) reported by the USEPA as a non-attainment area for Particulate Matter (size < 2.5 micrometers), and a PM2.5 analysis will need to be conducted as this project further develops.

Noise - The study area includes a number of sensitive noise receptors, including parks, schools, churches, golf courses and residential neighborhoods. A project specific traffic noise impact analysis will need to be conducted to identify and mitigate traffic noise impacts as this project further develops.

Utility Corridors - A number of major utility corridors, as well as the CSX rail road, occur within the project study area. These facilities will require consideration as this project further develops.

4.0 FUTURE CONDITIONS

In order 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 Boyd County.

4.1 Population Projections

According to projections provided by the Kentucky State Data Center, Boyd County's population is in decline. Projections developed in 2004 (available during the study) suggested that population would decrease between 2005 and 2010, but would increase slightly between 2010 and 2030. More recent population projections, released in April 2009, indicate that Boyd County will continue to lose population for the foreseeable future. These recent population projections are summarized in **Figure 4-1**.

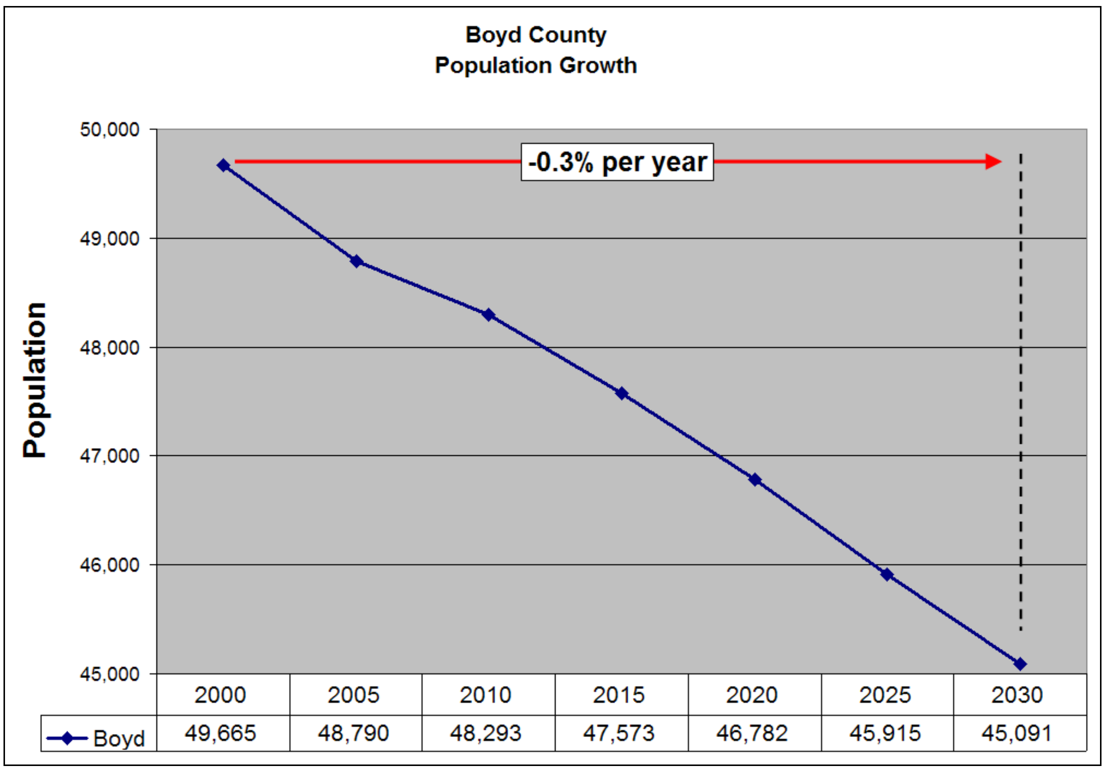

Figure 4-1: Boyd County Population Forecasts
(Source: Kentucky State Data Center, April 2009)

The Kentucky State Data Center predicts that Boyd County will continue to lose population at an average rate of 0.3 percent per year. The estimated population in July 2008 was 48,560 and is expected to decrease to 45,091 by the year 2030.

4.2 Committed Projects

A number of transportation improvements are currently underway or are programmed for implementation in Boyd County within the coming years. These projects, most of which were listed in the KYTC FY 2006 – FY 2012 SYP, that are located within the study area are summarized in **Figure 4-2**.

Work on the I-64 interchange at KY 180 (KYTC Item #9-60.00 and #9-60.01) began in the summer of 2006 and was completed in 2008. This project included reconstructing the interchange and correcting sight distance issues on KY 180.

The KYTC initiated a congestion mitigation project in 2007 to construct turn lanes at various locations along US 60 north of KY 180 (KYTC Item #9-199.00). Crash data from this study were provided to KYTC to assist in determining priority locations for left-turn lane needs between KY 180 to KY 716.

Two intersection reconstruction projects are planned within the study area. The first project includes reconstructing the KY 766 intersection with Dawson Lane (KYTC Item #9-8302.00 and #9-8201.00). The second project includes adding left-turn lanes and a new traffic signal and realigning the US 60 intersection with Highland Avenue (KYTC Item #9-993.00).

One additional project has been introduced that was not listed in the FY 2006 – FY 2012 SYP. Originally listed on the Kentucky House version of the 2008 Highway Plan, the project includes widening US 60 to four travel lanes between the I-64 interchange near Coalton to the KY 180 intersection. The 2009 Highway Plan, enacted by the Kentucky Legislature in March 2009, includes funding for this project beginning with design in FY 2009.

The only remaining projects in the vicinity of the study area, not shown on **Figure 4-2**, include two pavement rehabilitation projects along I-64 from west of the US 60 interchange to the KY 180 interchange (KYTC Item #9-2019.00) and from the KY 180 interchange to the West Virginia state line (KYTC Item #9-1018.00). These projects will not add capacity to I-64 but will provide for resurfacing and corrections to adjacent fill slopes to remedy existing slide issues.

4.3 Traffic Forecasts

The KYTC maintains a regional travel demand model, covering all of Boyd and Greenup County, developed using the TransCAD travel demand software. The model uses socioeconomic data, namely households and employment, to estimate current and future traffic volumes along all major roadways within the two-county area. The model was updated in 2007 and early 2008 by the KYTC Division of Planning with the assistance of a consultant, and has a base year of 2007 and forecast year of 2030. The updated travel demand model was made available for use in the study in late April 2008.

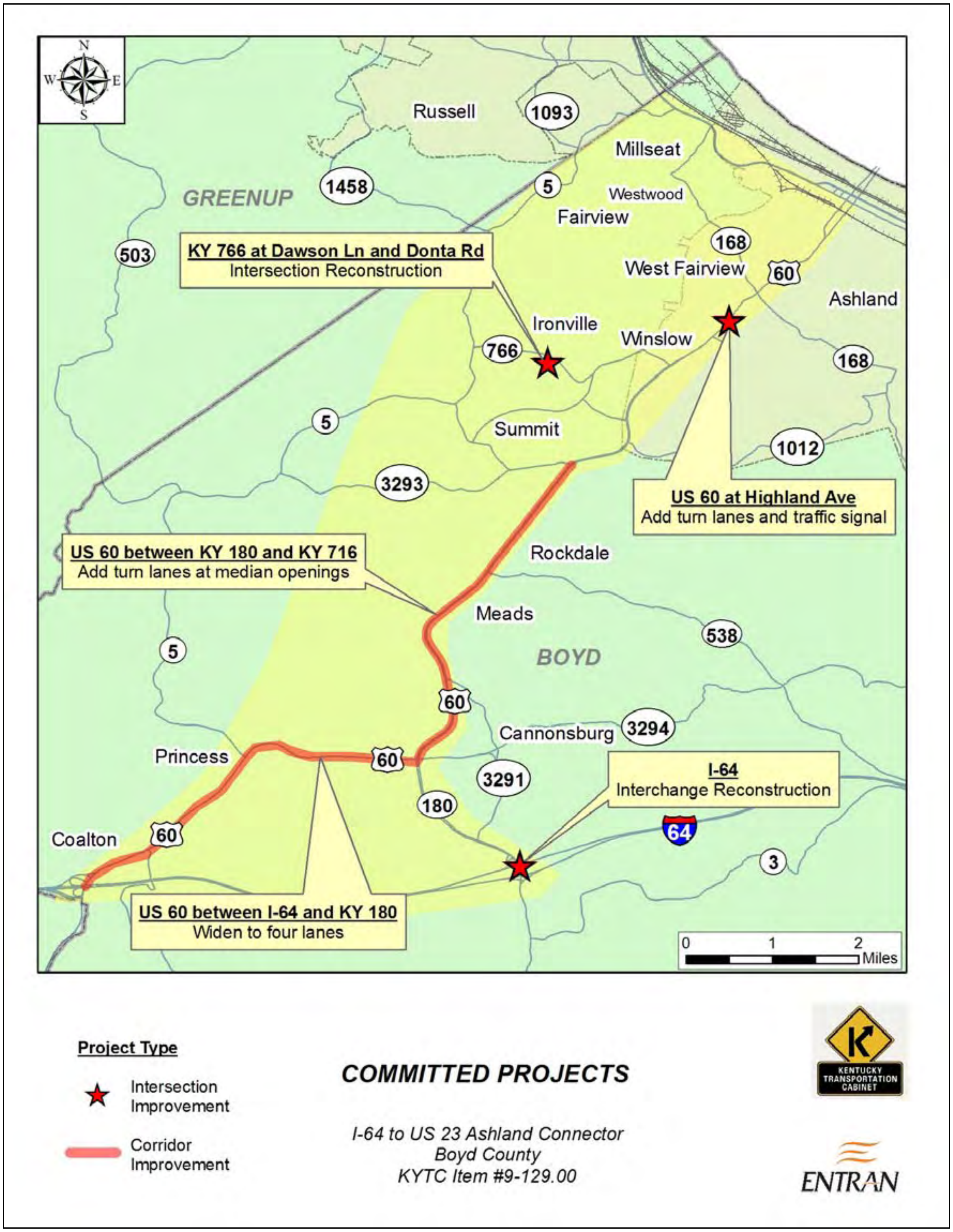

Figure 4-2: Programmed Transportation Improvements
(Source: KYTC Six-Year Plan FY 2006- FY 2012 and 2009 Highway Plan)

The updated 2008 version of the model includes revised socioeconomic data forecasts. **Table 4-1** presents a comparison of the data contained in the 2002 version of the model and the 2008 (current) version. The previous version of the model indicated a 16.9 percent increase in population and 12.4 percent increase in employment between 2000 and 2025. These forecasts included negative population growth in and around Ashland and Catlettsburg, low growth near Russell, and significant growth in rural Greenup County and in Boyd County south of I-64. Employment growth in the 2002 version of the model was focused on the areas adjacent to the Industrial Parkway and north of I-64 in Greenup County (there was no growth elsewhere in the model area).

Table 4-1: Socioeconomic Data Comparisons between the 2002 and 2008 Ashland MPO Regional Travel Demand Models

Model	Year	Population	Employment
2002 Model	2005	86,643	35,954
	2025	101,289	40,396
	Growth	*16.9%*	*12.4%*
2008 Model	2007	86,504	47,675
	2030	86,055	69,333
	Growth	*-0.5%*	*45.4%*

Figure 4-3 presents a summary of the estimated population growth in the current version of the regional travel demand model, disaggregated by traffic analysis zone (TAZ). A TAZ is a geographic area within a demand model that is based on U.S. Census blocks and is used to allocate socioeconomic data (namely households and employment) throughout a model area. The updated 2008 version of the model predicts a 0.5 percent decline in population between the 2007 base year and 2030.

The TAZ's shaded in dark gray in **Figure 4-3** depict areas where population is expected to decrease between 2007 and 2030. Negative growth is anticipated all along the US 23 corridor, in and around Ashland and Catlettsburg in Boyd County and near Russell in Greenup County. Moderate growth, shaded in pink, is anticipated in the middle portion of the study area and to the west and south. Significant population growth, in red and dark red, is expected near the south end of the Industrial Parkway (KY 67) in Greenup County and in Boyd County south of I-64.

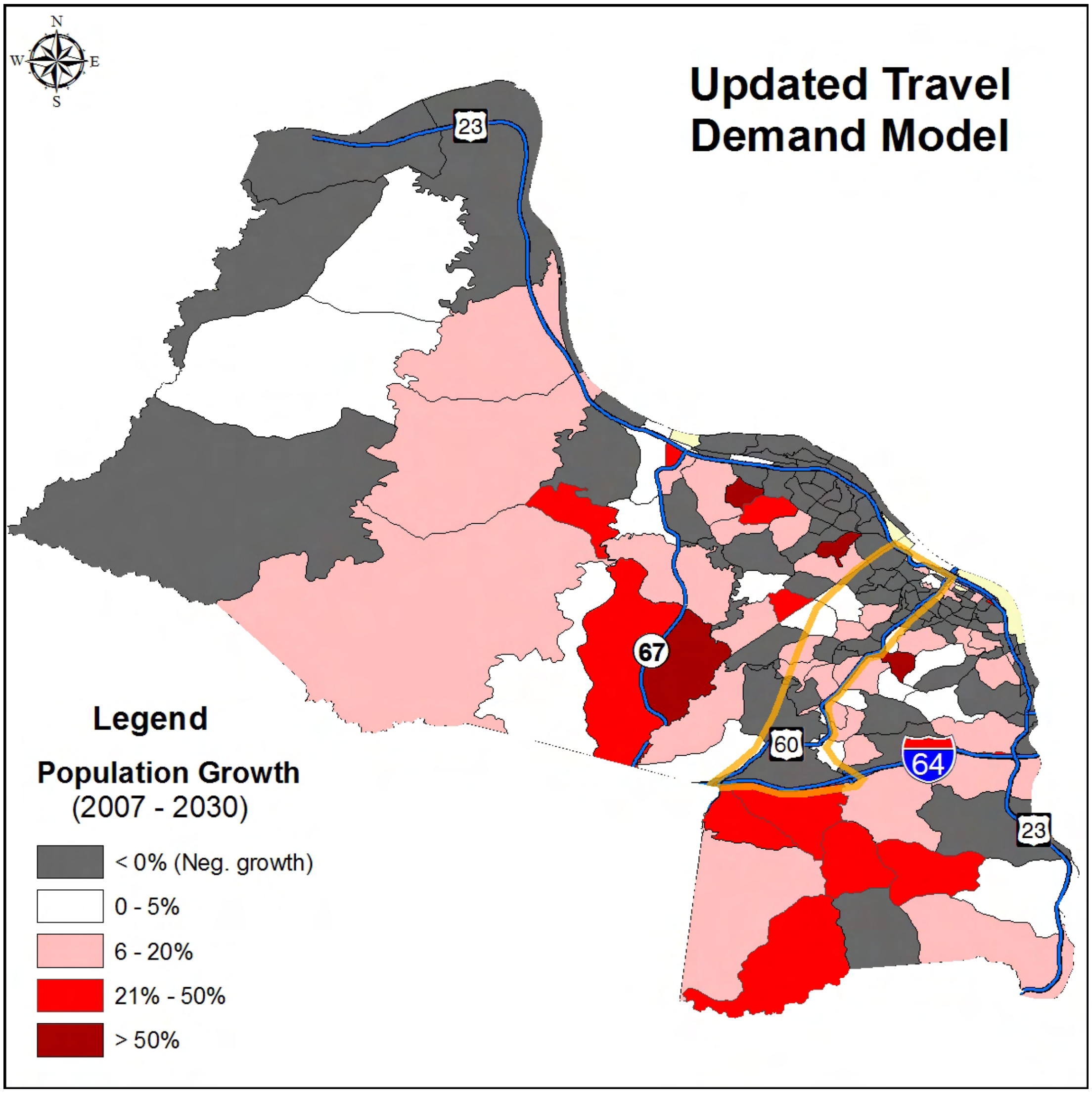

Figure 4-3: Population Growth in Boyd County and Greenup County (Source: Ashland MPO Regional Travel Demand Model, 2008)

Employment growth, shown in **Figure 4-4**, is higher in the current version of the model, with an increase of 45.4 percent anticipated by 2030. Base year 2007 employment is also significantly higher in the updated 2008 model than in the previous 2002 version. Negative employment growth is anticipated southwest of Ashland and near Catlettsburg, but significant growth is anticipated elsewhere in the study area, near the south end of the Industrial Parkway, and near Russell.

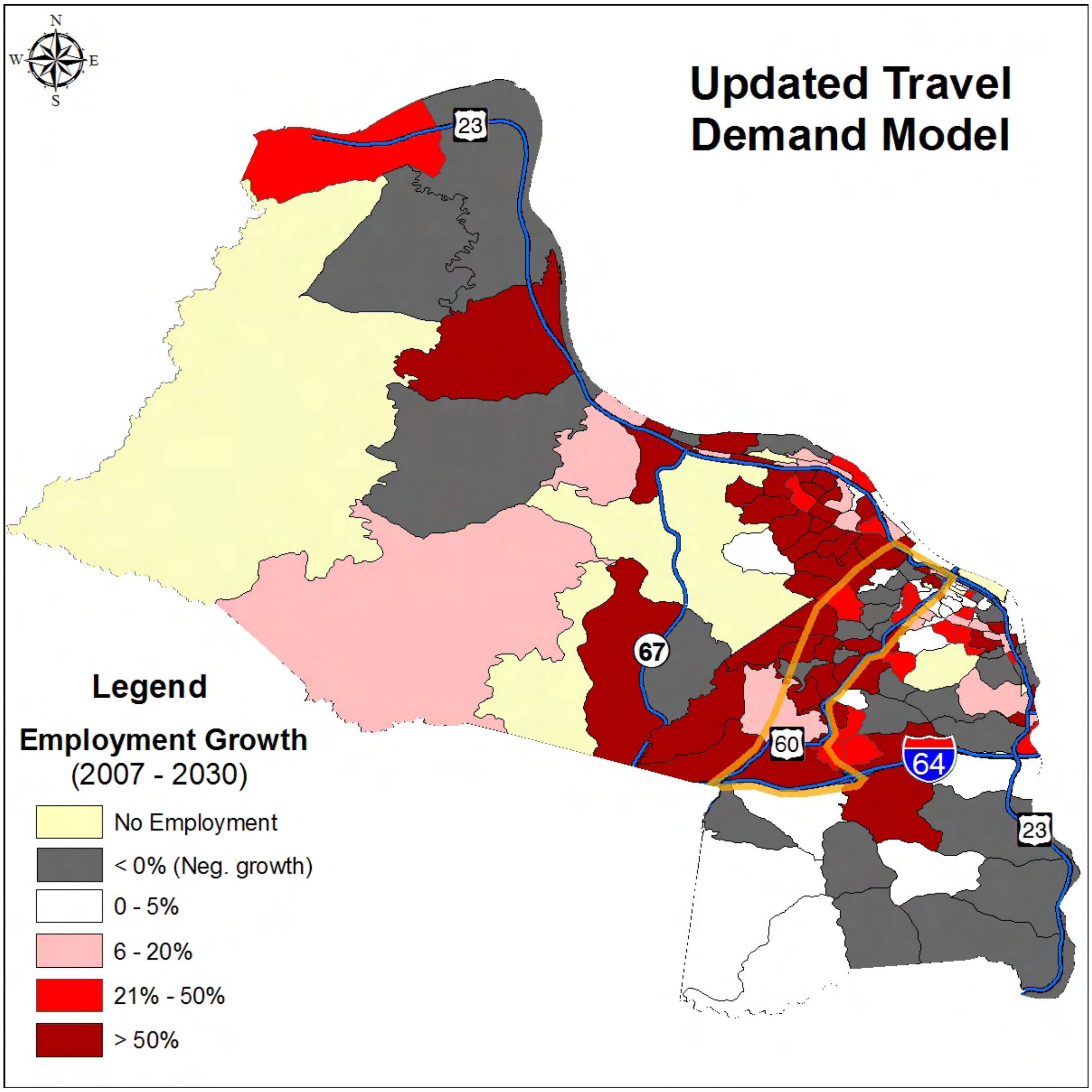

Figure 4-4: Employment Growth in Boyd County and Greenup County (Source: Ashland MPO Regional Travel Demand Model, 2008)

The KYTC Division of Planning provided all model files for the updated travel demand model in April 2008. The model was used to develop a 2030 No-Build daily traffic assignment, depicted in **Figure 4-5**. The average daily traffic volumes shown represent typical weekday traffic volumes expected in 2030. Volume to Capacity (V/C) ratios were calculated to determine where congestion would likely be an issue in the future, assuming no improvements are implemented prior to 2030. A V/C ratio of 1.0 indicates a roadway segment will operate at its intended capacity. V/C ratios exceeding 1.0 indicate a roadway will carry more traffic than it was intended to, resulting in congestion during some periods of the day.

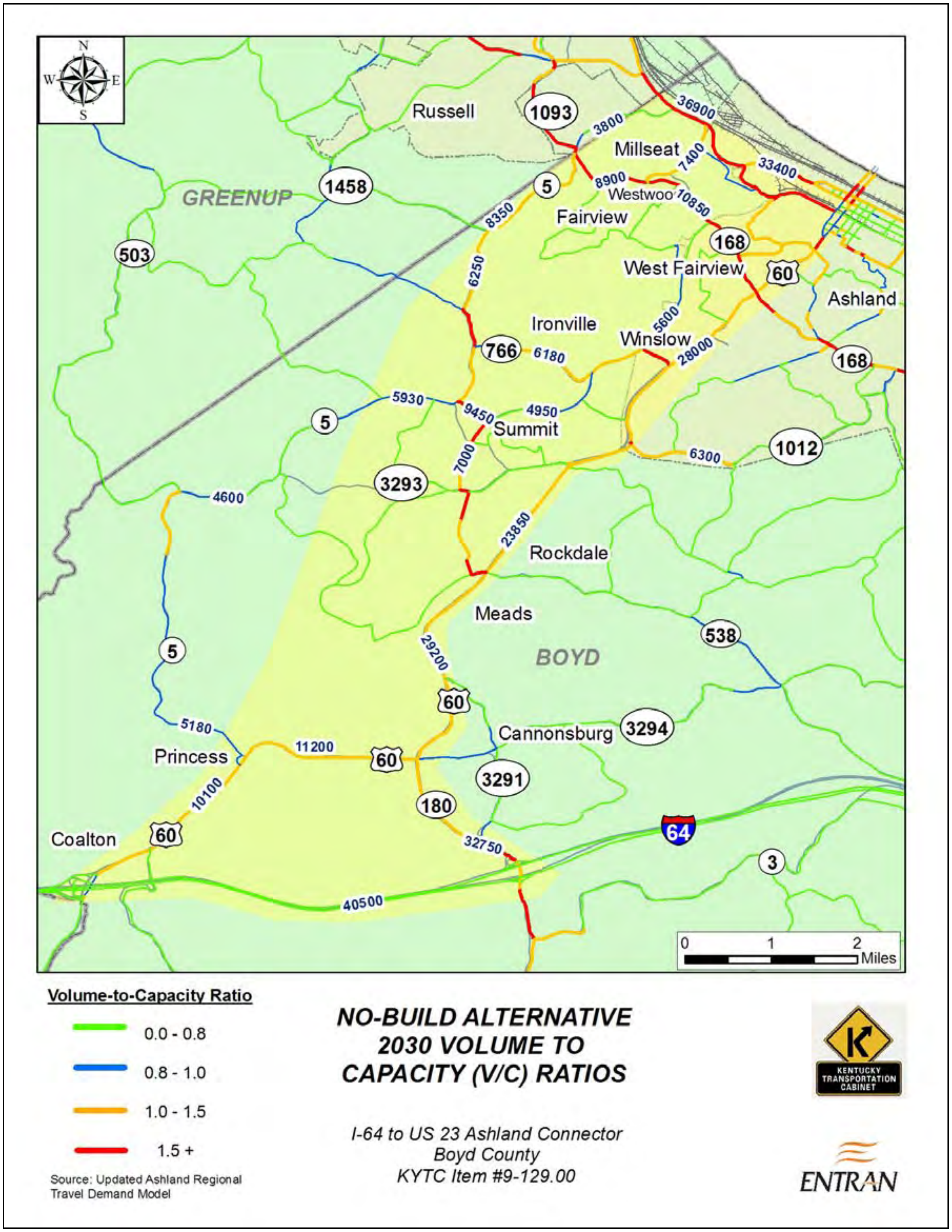

Figure 4-5: 2030 No-Build 2030 Traffic Forecasts

In general, the 2030 traffic volumes forecast by the updated travel demand model tend to be similar to or in some cases lower than existing traffic volumes within much of the study area. This is consistent with what would be expected with decreasing populations in Boyd County and limited areas of employment growth. However, the model predicts significant growth along I-64, KY 180, KY 5, and portions of US 60 south of Ashland, as shown in **Figure 4-6**.

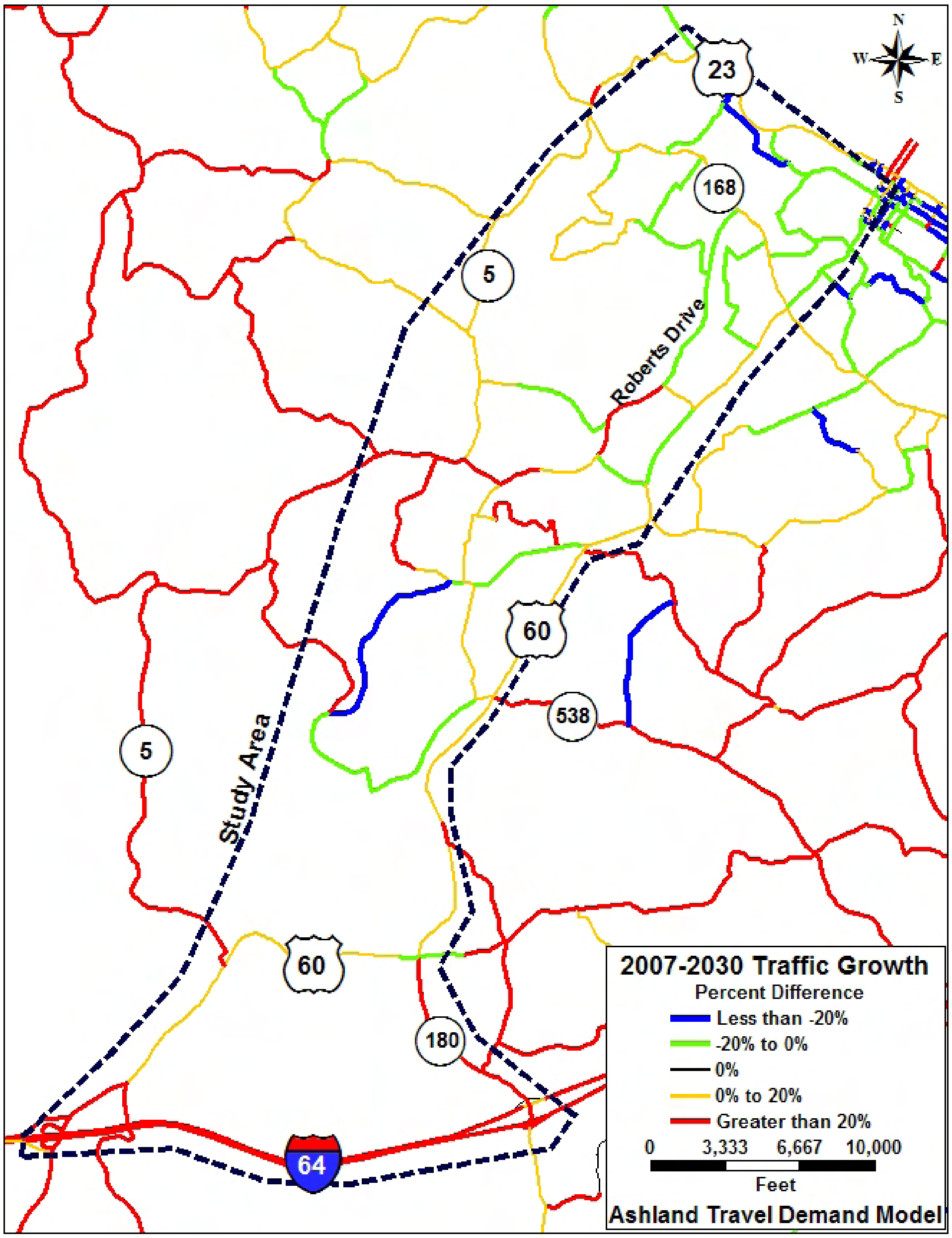

Figure 4-6: Percent Increase between 2007 and 2030 Traffic Assignments

Traffic along US 23 within the study area is not expected to increase significantly but much of this section is already at or near capacity. I-64 between the US 60 and KY 180 interchanges is expected to grow by nearly 126 percent between 2007 and 2030, and KY 180 north of US 23 is expected to increase by 146 percent. North of the KY 180 intersection, traffic volumes on US 60 are expected to increase by approximately 18 percent. All of US 23, US 60, and KY 180 are anticipated to experience V/C ratios greater than 1.0, indicating they will be congested during some portions of the day.

The regional travel demand model was also used to estimate future travel patterns and to evaluate potential improvement alternatives. (More discussion on the evaluation of alternatives is found in **Chapter 5**.) **Figure 4-7** presents a summary of the origins for daily trips traveling along US 23 in the vicinity of Town Mall, west of downtown Ashland. These results were developed by performing a "select-link" analysis using the TransCAD software. The select-link analysis provides information on the sources of every trip that uses any given link in the model network. Based on output from the regional travel demand model, the vast majority of the trips along this section of US 23 begin in Ohio and cross one of the Ohio River bridges from Ironton or Coal Grove. Unfortunately, no travel alternatives exist for these trips other than US 23.

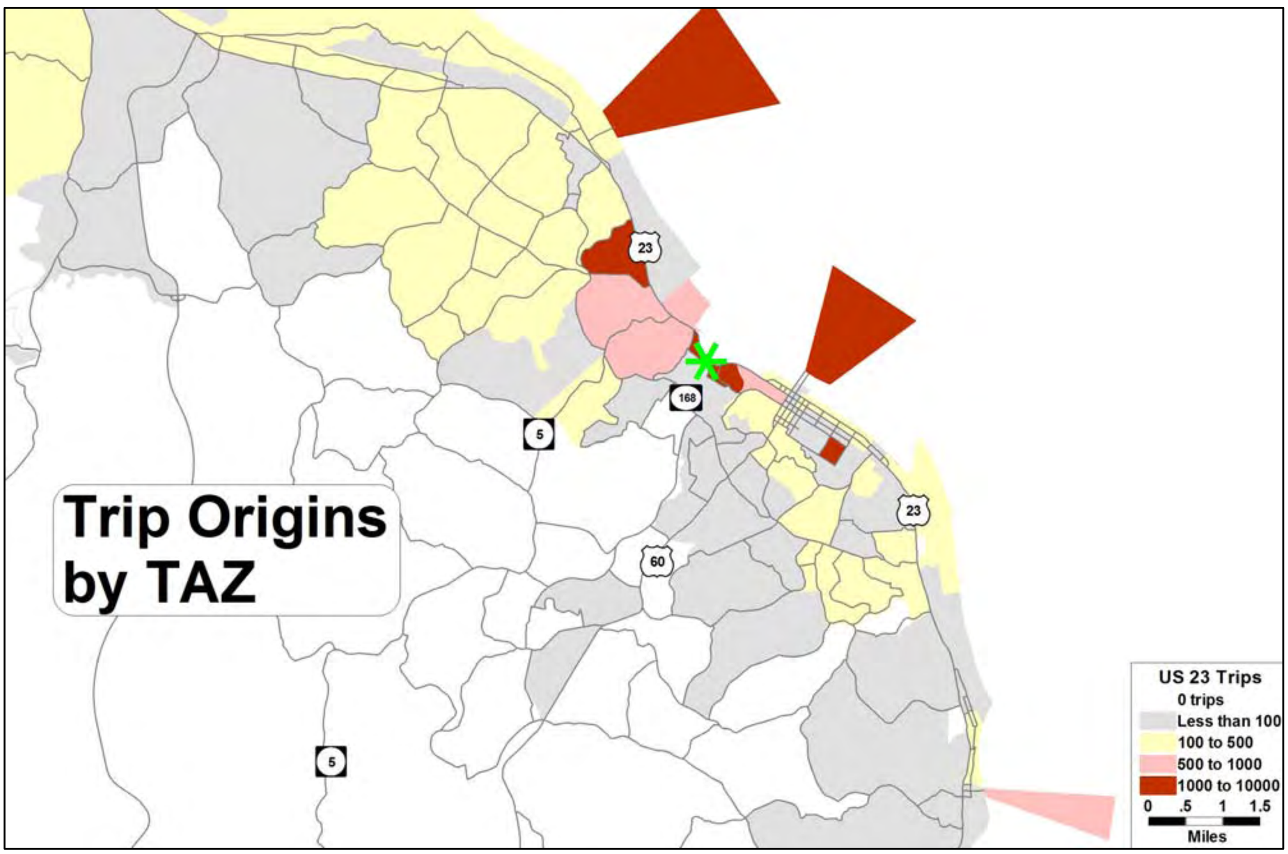

Figure 4-7: 2030 Travel Patterns for Trips Destined for US 23 west of Downtown Ashland

Figure 4-8 presents similar findings for trips that travel along US 60 just north of the KY 168 intersection and south of downtown Ashland. This location was selected as it is near the north end of the narrow four-lane section, a segment recommended for improvement by the ACAT. The majority of trips that travel this section each day begin across the Ohio River from downtown Ashland or west of the network model area on I-64. This suggests that a new corridor could possibly divert some trips from this section of I-64, provide that such a corridor could provide similar or improved travel opportunities.

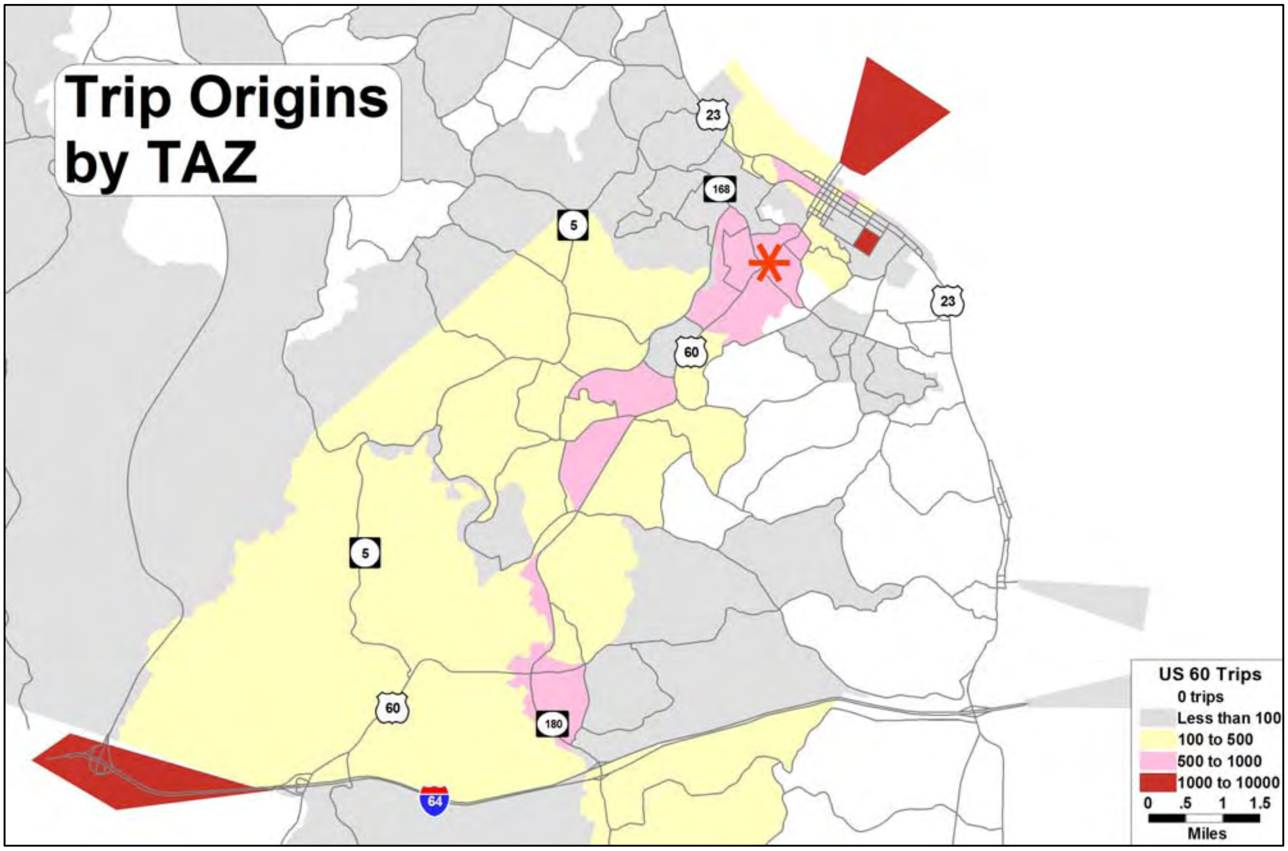

Figure 4-8: 2030 Travel Patterns for Trips Destined for US 60 south of Downtown Ashland

5.0 DEVELOPMENT OF ALTERNATIVES

A number of transportation alternatives were developed and evaluated in the I-64 to US 23 Ashland Connector Study. This includes both short-term projects that could potentially be implemented in the near term with minimal cost and long-range corridor alternatives that would require significant resources to implement. This chapter discusses how improvement concepts were conceived and then developed into feasible roadway improvement projects.

5.1 Stakeholder Input

One of the primary goals of the public involvement component of the study was to solicit input on the location of existing transportation deficiencies and needed improvements. To that end, the first meeting with local officials was used as an opportunity to ask focused questions concerning locations that could be considered "trouble spots" and areas where new or significantly improved routes are warranted. **Figure 5-1** presents the results from the identification of trouble spots.

Three locations were mentioned as being an issue along US 60. The segment with the traversable median, north of Armco Park and south of Rose Hill Cemetery, was discussed because of significant turning traffic and the presence of signage in the median. The median, while traversable, causes confusion among some drivers who decelerate rapidly to enter the median or even attempt to turn left out of the left travel lane. Two intersections along US 60 were discussed as needing significant improvement, including the KY 168 (Blackburn Avenue) and KY 180 intersections.

Along US 23, three problem spots were mentioned. The first was the area around Town Center Mall. Left turns were prohibited from westbound US 23 some time ago in an effort to improve traffic flow in the area, but the circuitous travel required to access the mall is confusing for those unfamiliar with the area. At the onset of the study, it was noted that the existing signage indicating no left turns are allowed and how to access the mall by turning right was too small to be legible from a distance. The KYTC replaced the signs during the study with larger, more legible versions. The second location was west of the new Wal-Mart on River Hill Drive. This section lies in a long curve and is on a grade approaching the KY 168 intersection. The final location was outside the study area, near the 47th Street Park.

The final problem spot mentioned at the first meeting with local officials was the area near the KY 168 intersection with Roberts Drive. The CSX rail line runs parallel to Roberts Drive and crosses KY 168 at-grade just west of the Roberts Drive intersection. The grade crossing is at a much higher elevation than the KY 168 approaches and Roberts Drive, which restricts sight distance.

The ACAT was asked to complete a similar exercise early in the study, the results of which are shown in **Figure 5-2**. Two segments of US 60 were discussed, including the segment between Rose Hill and Ashland Community College and near the KY 5 intersection and Paul Coffey Boulevard. The northern segment through Ashland is a narrow, four-lane section with no shoulders. Some of the issues discussed along this portion of US 60 included a lack of turn lanes, high travel speeds, significant truck volumes, and minimal utility pole setbacks. Issues with the segment near KY 5 and Paul Coffey Boulevard involved the need for turn lanes at Paul Coffey Boulevard to accommodate trucks.

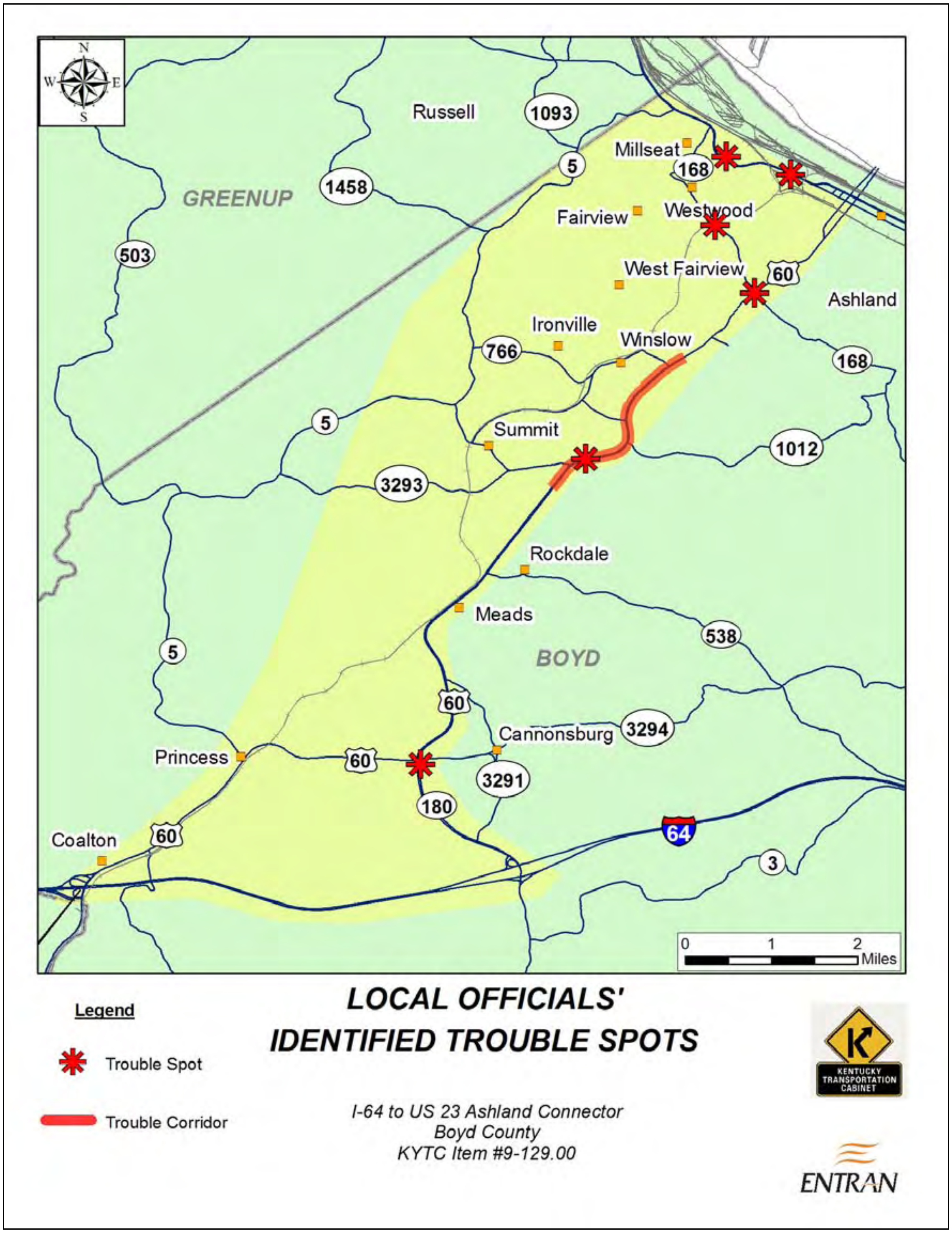

Figure 5-1: Trouble Spots Identified by Ashland Local Officials

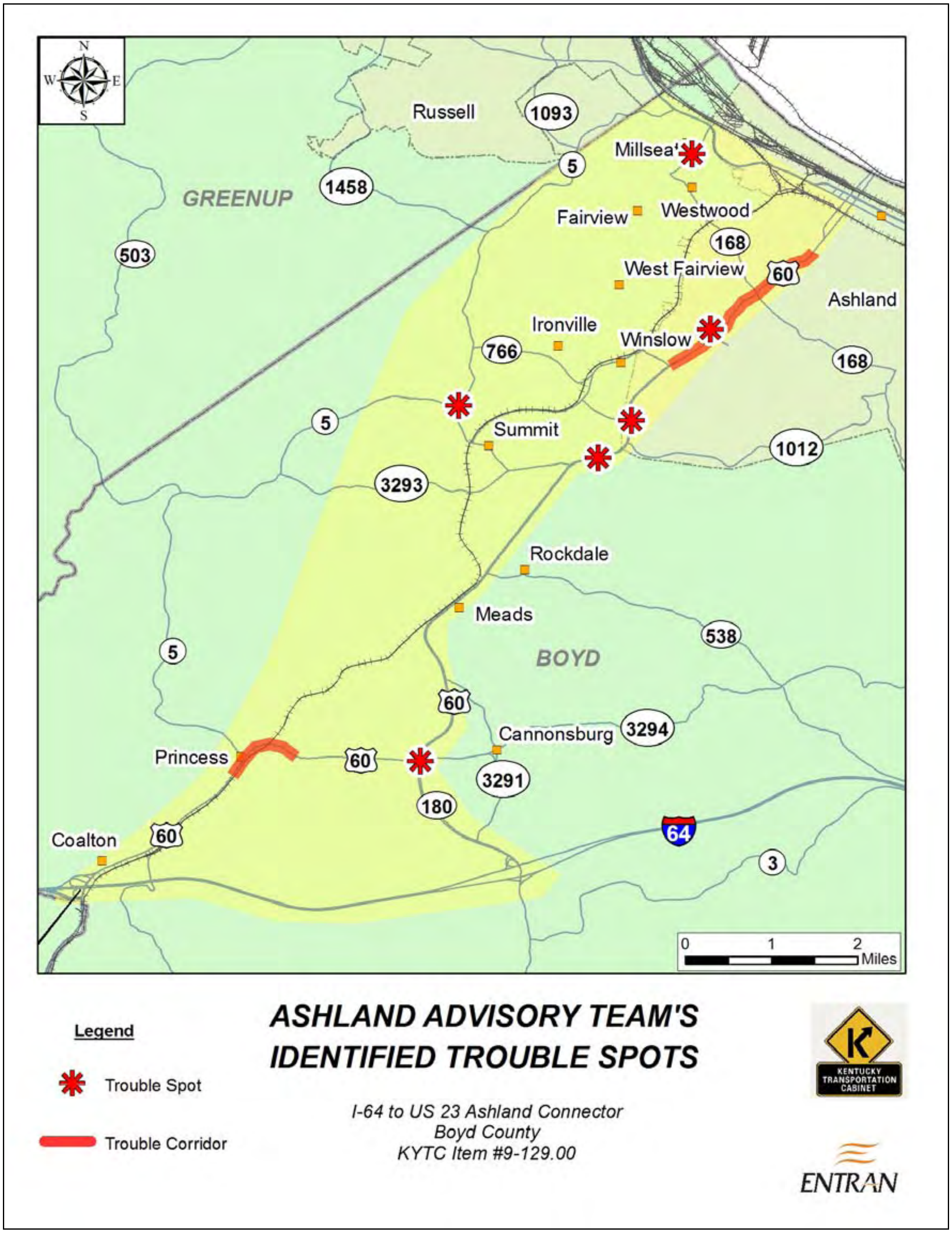

Figure 5-2: Trouble Spots Identified by the Ashland Connector Advisory Team (ACAT)

Several trouble spots were identified by the ACAT, including the US 60 intersections with KY 180, KY 716 (Summit Road), Highland Avenue, and KY 168. Other locations mentioned included the KY 5 intersection with KY 716 and KY 168 near Millseat, south of US 23.

At those early meetings, the local officials and ACAT were also asked to identify potential new routes for consideration in the study. The local officials' suggestions are shown on **Figure 5-3**. Two new routes were recommended. The first begins on US 60 near the community of Princess and near the intersection with KY 5. The route runs northeast and connects to KY 168, tying into US 23 at or near the existing US 23/KY 168 intersection. The second route begins on US 60 north of Armco Park and south of Rose Hill Cemetery and runs northeast, roughly paralleling the existing CSX rail line and Roberts Drive, connecting to US 23 near Town Center Mall. The local officials also suggested intersection improvements at the US 60 intersections with KY 180, KY 716, and KY 168.

At the first ACAT meeting, the attendees worked in groups to identify a number of potential new or improved routes and spot improvements, shown on **Figure 5-4**. A recommendation was made to consider widening US 60 between the I-64 Coalton interchange and KY 180, perhaps adding a center turn lane to create a three-lane section. A similar improvement was also recommended for the section between Rose Hill Cemetery and the Ashland Community College, restriping the exiting narrow four-lane section as a three-lane section with a continuous center left-turn lane. Improvements to the entire KY 168 corridor were suggested. Two new routes were discussed, including a connection from US 60 to Industrial Parkway (outside the study area) and a new route connecting US 60 north of Armco Park to US 23 near the KY 5 intersection. Intersection improvements were recommended at the US 60 intersections at KY 180, KY 716, and US 23.

At the conclusion of the first ACAT meeting, the attendees were asked to put additional thought into needed improvements or potential new routes for discussion at the next meeting. At the second meeting, attendees again worked in groups to refine those concepts and to develop a brief list of projects for further consideration. The results of these discussions are shown on **Figure 5-5**. The ACAT's recommendations included improvements to US 60 between I-64 and KY 180. Three new routes (or route combinations) were recommended for further consideration. Two options that used much of the existing KY 5 corridor were suggested, including one using the KY 716 corridor and another using the KY 766 corridor to connect to an improved KY 5. An additional recommended route connects to US 60 north of Armco Park, roughly paralleling the existing CSX rail line and Roberts Drive, connecting to US 23 near Town Center Mall. This corridor could also connect to US 23 west of River Hill Drive and the Wal-Mart development or use the KY 168 corridor to connect to US 23.

The ACAT's recommended corridors were presented to the public at the first public meeting on April 20, 2008. The purpose of this meeting was to provide information concerning the existing conditions within the study area, discuss study activities to date, and to provide an opportunity for the public to voice their concerns and suggest additional locations for which they felt improvements are needed. **Figure 5-6** presents the public's input. The public recommended two new routes not previously discussed, including an improved connection from US 60 near Princess and KY 5 to US 60 north of the Kyova Mall and a new route from US 60 north of the Kyova Mall to US 23 near the KY 5 intersection.

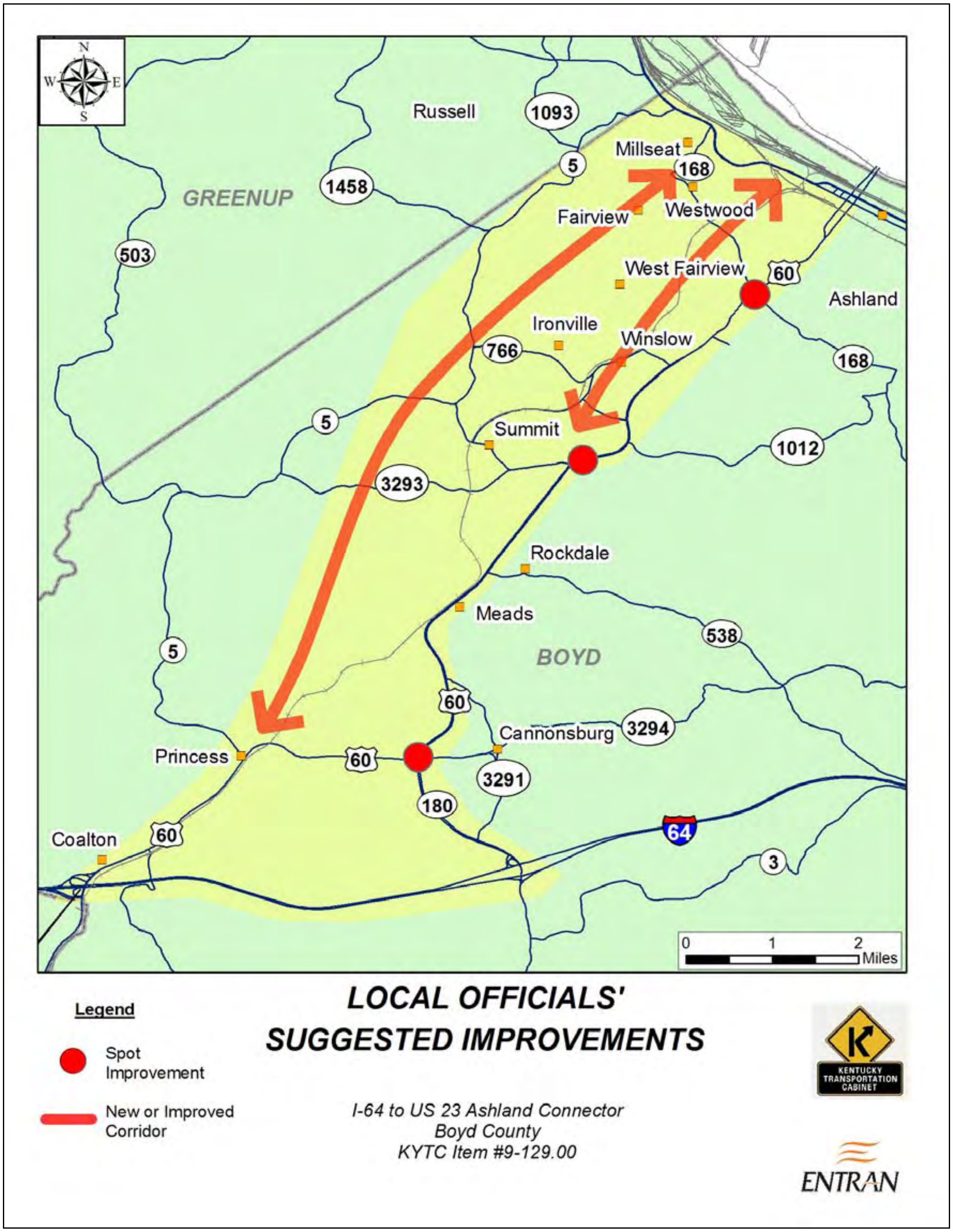

Figure 5-3: Suggested Improvements Identified by Ashland Local Officials

Figure 5-4: Suggested Improvements Identified by the Ashland Connector Advisory Team (ACAT)

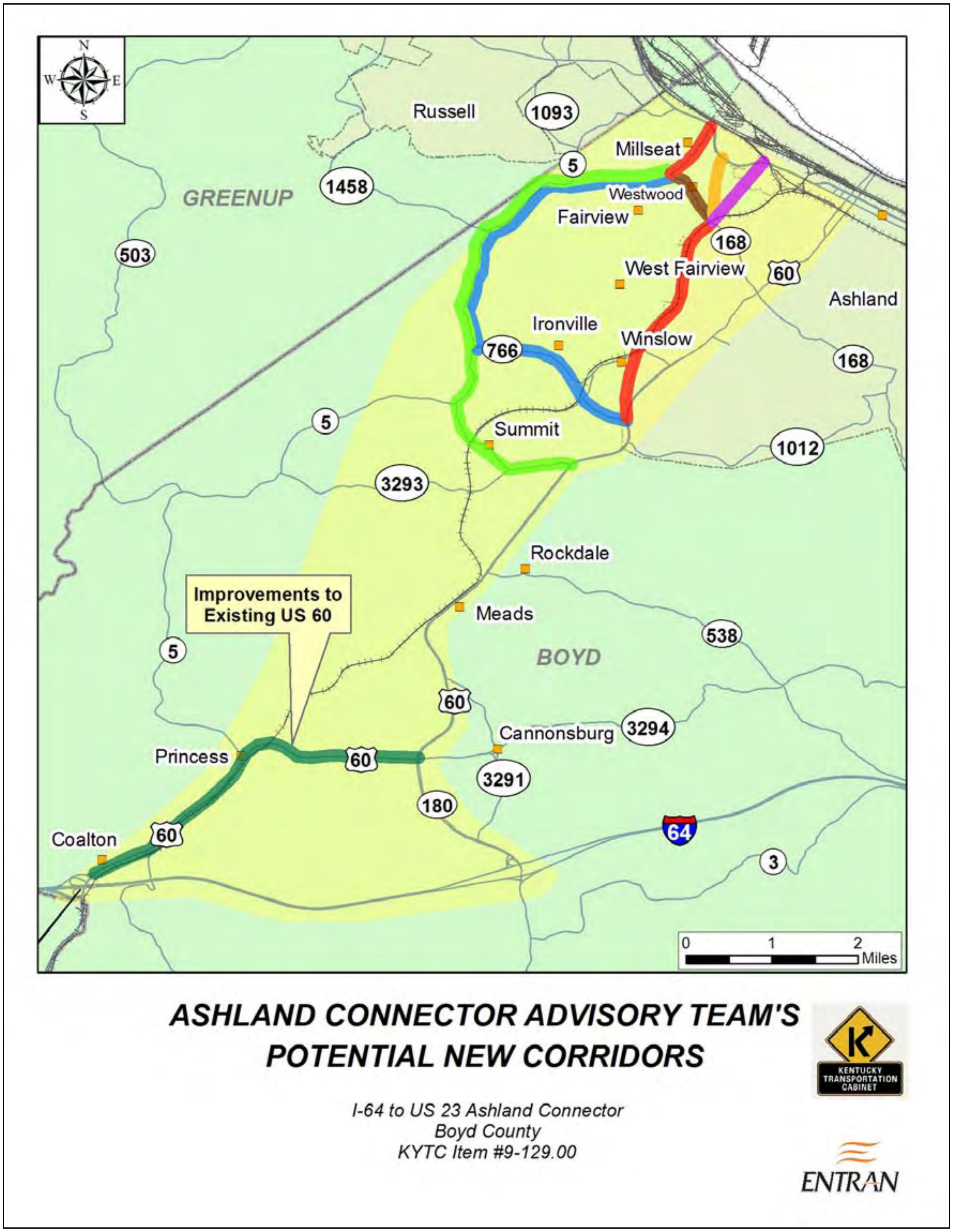

Figure 5-5: Potential New Routes Identified by the Ashland Connector Advisory Team (ACAT)

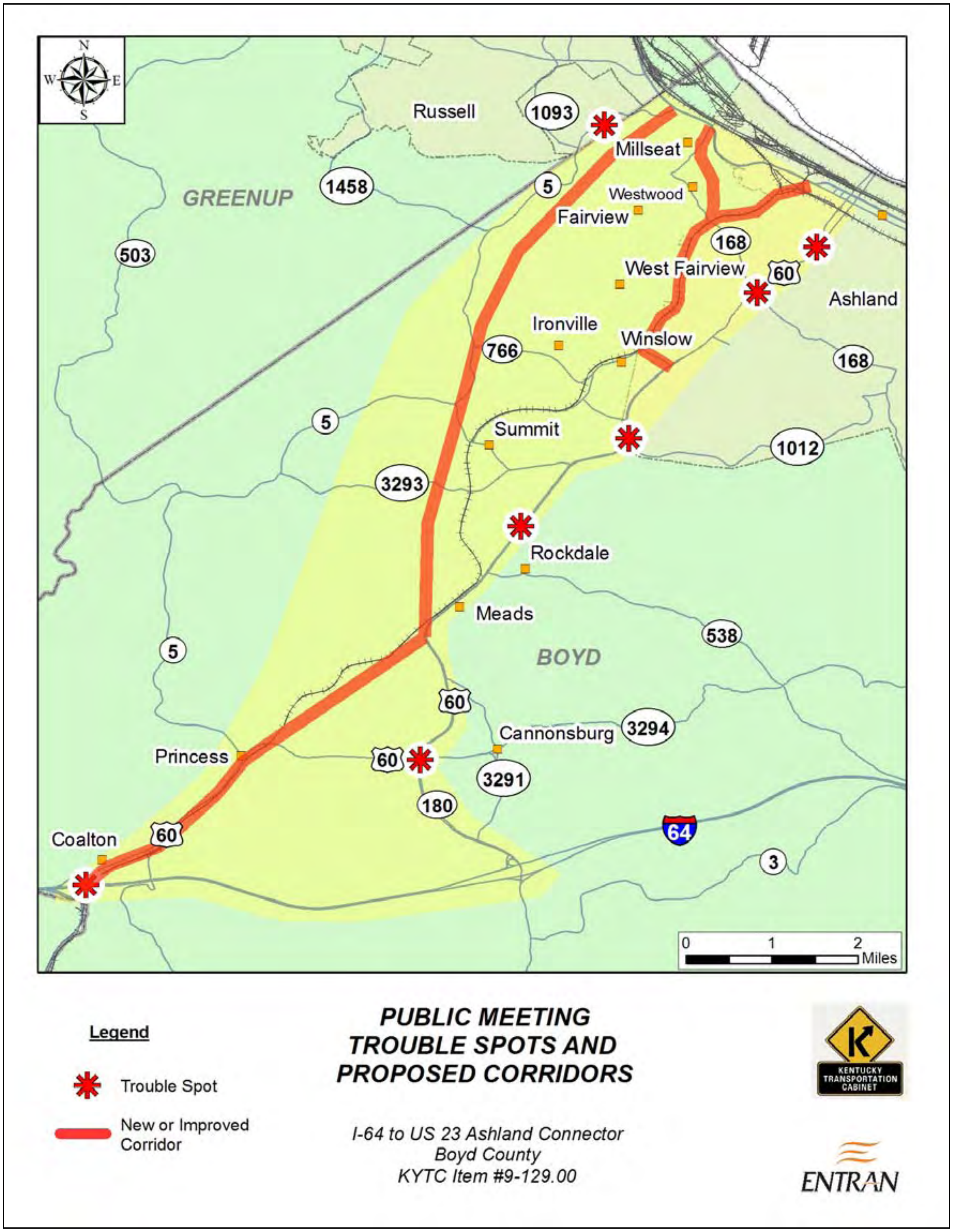

Figure 5-6: Trouble Spots and Potential New Routes Identified at the First Public Meeting

5.2 Short-Term Improvement Alternatives

A number of short-term improvements (also referred to as "spot improvements") were developed based on stakeholder input, investigation of crash data, and site reconnaissance. These projects, most of which were developed to improve traffic safety, are shown on **Figure 5-7**. Descriptions of each of these projects follow.

Intersection Reconstruction

US 60 at KY 180: This intersection lies in a curve along KY 180 and US 60, and the alignment currently has significant superelevation (i.e. banking of the roadway) of approximately 9 percent to accommodate the travel speeds. The improvement is to reconstruct the north-south approaches of KY 180 and US 60 to decrease the amount of necessary superelevation.

KY 168 at Roberts Drive: There is an at-grade crossing of the CSX rail line on KY 168 immediately west of the Roberts Drive intersection. This grade crossing is at a much higher elevation than the street approaches, resulting in poor sight distance. Fifty-six (56) crashes were reported between 2002 and 2006 along KY 168 in this area. Over 41 percent were rear end crashes and approximately 23 percent resulted in one or more injuries. The improvement is to raise the grades on KY 168 and Roberts Drive to better match the elevation of the grade crossing.

US 60 at KY 168 (Blackburn Avenue): The US 60 approaches to this five-legged intersection are skewed as buildings are located adjacent to the right-of-way at the southwest and northeast corners. The building located in the southwest corner is eligible for inclusion on the National Register of Historic Properties. The improvement is to realign the US 60 approaches by moving the US 60 alignment slightly to the east, resulting in the removal of the building (or portions of the building) on the northeast corner. It was suggested that closing the Algonquin Avenue approach, which forms the fifth leg of the intersection to the southwest, be given consideration.

Median Reconstruction

US 60 between KY 716 (Summit Road) and KY 1012 (Boy Scout Road): This section of US 60 has a raised, traversable median and is fronted by various commercial developments. The "roll" curb forming the raised median causes some drivers to slow significantly before mounting the median. Approximately 25 percent of the crashes that occurred over the five years between 2002 and 2006 were angle crashes (involving one or more turning vehicles) and another 40 percent were rear end crashes. The improvement is to replace the traversable median with a non-traversable median with selective median openings and turn lanes.

Addition of Turn Lane(s)

US 60 at Paul Coffey Boulevard: There were 13 reported crashes at the US 60 intersection with Paul Coffey Boulevard between 2002 and 2006, and seven (54 percent) of those were rear-end crashes. Significant truck traffic utilizes this intersection to access the industrial park. The improvement is to add a northbound left-turn lane and a southbound right-turn lane to better accommodate truck traffic.

US 60 at KY 716 (Summitt Road): There were 25 reported crashes on the southbound approach to the US 60 intersection with KY 716 between 2002 and 2006, and 19 (76 percent) of those were rear-end crashes. Right-turning traffic at this intersection sometimes uses the shoulder to decelerate while moving out of the traffic stream. The improvement is to add a southbound right-turn lane.

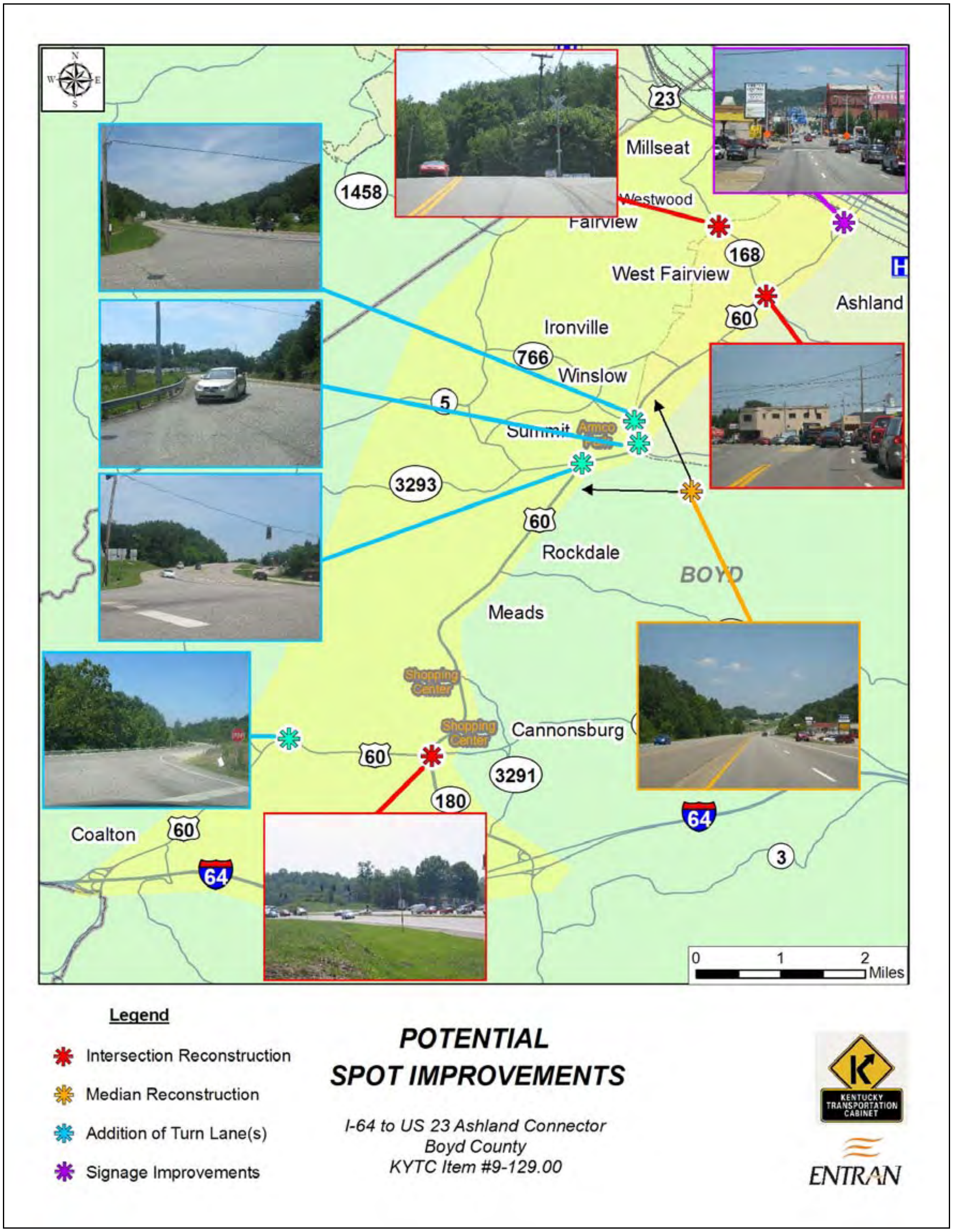

Figure 5-7: Preliminary Short-Term Improvement Alternatives

US 60 at KY 1012 (Boy Scout Road): There were 14 reported crashes on the northbound approach to the US 60 intersection with KY 1012 between 2002 and 2006, and eight (57 percent) of those were rear-end crashes. Right-turning traffic at this intersection sometimes uses the shoulder to decelerate while moving out of the traffic stream. The improvement is to add a northbound right-turn lane.

US 60 at KY 766 (Bob McCullough Drive): There were 27 reported crashes on the southbound approach to the US 60 intersection with KY 766 between 2002 and 2006, and 14 (52 percent) of those were rear-end or same-direction sideswipe crashes. Right-turning traffic at this intersection sometimes uses the shoulder to decelerate while moving out of the traffic stream. The improvement is to add a southbound right-turn lane.

Signage Improvement

US 60 (13th Street) approaching downtown Ashland: As drivers are approaching the 13th Street intersection with US 23, there is no signage to indicate which lanes lead to the bridge to Coal Grove, OH. However, opportunities for improved signage are limited. The improvement is to provide overhead signage directing bridge traffic to use the middle lanes and traffic destined for northbound US 23 (Winchester Avenue) to use the left lane. Consideration was also given to restriping the northbound US 60 (13th Street) approach to US 23 in order to provide a left-turn only and shared through and left-turn lane for traffic turning left onto northbound Winchester Avenue.

A summary of the Short-Term Improvement Alternatives is provided in **Table 5-1**.

Table 5-1: Summary of the Short-Term Improvement Alternatives

Roadway / Intersection	Improvement Type	Description	Estimated Cost
US 60 @ KY 180	Intersection Reconstruction	Reconstruct grade on approaches	$1,000,000
US 60 @ KY 168 (Blackburn Ave.)	Intersection Reconstruction	Realign curved approach leg(s)	$750,000
Roberts Drive @ KY 168 (Blackburn Ave.)	Intersection Reconstruction	Improve at-grade railroad crossing on KY 168 west of Roberts Drive	$250,000 - $500,000
US 60 from south of KY 716 to KY 1012 (Boy Scout Rd.)	Median Reconstruction	Construct non-traversable median w/ selective median openings	$325,000
US 60 @ Paul Coffey Blvd.	Addition of turn lane	Add NB left turn lane and SB right turn lane	$275,000
US 60 @ KY 716	Addition of turn lane	Add SB right turn lane	$125,000
US 60 @ KY 1012 (Boy Scout Rd.)	Addition of turn lane	Add NB right turn lane	$125,000
US 60 @ KY 766	Addition of turn lane	Add SB right turn lane	$125,000
US 60	Signage Improvement	Provide additional/improved signage for NB US 60 approaching bridge	$200,000

5.3 Long-Range Corridor Alternatives

The long-range corridor alternatives for the I-64 to US 23 Ashland Connector Study were developed based on stakeholder outreach and a comprehensive investigation of existing conditions. These alternatives, shown on **Figure 5-8**, involve both improvements to existing sections of the transportation corridor between I-64 and the city of Ashland as well as new routes. For the purpose of discussion and comparison, the alternatives will be split into two different groups: the South Alternatives (Alternative 1 and 4) located on the I-64 end of the project, and the North Alternatives (Alternatives 2, 3 and 5) located on the US 23 end near Ashland. (These two groups correspond to the two large exhibits shown at the second public meeting held on November 18, 2008.) Specific alignments have not yet been developed, but planning level alignments have been estimated in order to examine the feasibility for constructing a roadway within each corridor and to estimate costs, likely impacts, and potential relocations. For purposes of this study, a four-lane divided typical section was assumed for all projects, with the exception of Alternative 5.

South Alternatives

The alternatives at the southern end of the project corridor seek to improve the existing two-lane US 60 between the I-64 Coalton interchange and the four-lane section of US 60. This two-lane road is the preferred route for vehicles traveling between Ashland and I-64 to and from the west. Input from the first public meeting suggests many drivers choose to travel this unimproved section of US 60 to get to I-64, instead of using KY 180, because the US 60 route decreases travel distance by about 2 miles (3.8 miles versus 5.8 miles).

Alternative 1, referred to as the "Princess Connector", was proposed by the public as an improved connection between I-64 and US 60 through the Paul Coffey Industrial Park. As shown on **Figure 5-9**, two potential corridors were developed, and both alternatives begin at an existing sharp curve just south of the Paul Coffey Industrial Park and take off on a new route from that point. Both alternatives end at a tangent on the multilane section of US 60, approximately half a mile to the north of the Kyova Mall.

Alternative 1A runs parallel and to the northwest of the existing CSX railroad line along the first half of its alignment. After crossing the East Fork of the Little Sandy River, it then travels over an existing golf course while running parallel to the Meade/Springer Road. Finally, the alignment bridges over the CSX railroad line before tying into US 60. The first half of the alignment involves some impacts to the Paul Coffey Industrial Park. An overpass bridge would be needed for Lynn Avenue to maintain the existing connection between the west and east sides of this industrial park. Impacts on this area would involve the relocation of one commercial building and significant impacts to three other parcels at the industrial park. Along the second half of the alignment, the proposed road encroaches into the floodplain for the East Fork of the Little Sandy River. The proposed road would have to keep well above the flood plain elevation for the river, which according to FEMA, ranges between 593 and 595 feet for this section of the river. Along this second half of the alignment, Alternative 1A stays clear of two potentially historic houses adjacent to the Meade/Springer Road, but it may impact several trees on the golf course that are considered "bat habitat". Finally, the alignment crosses over the CSX railroad with a twin-bridge structure before tying back into US 60. An estimated two commercial and one residential relocation would be required along the last section of this alternative immediately after bridging over the railroad. The estimated construction cost for this alternative is $24 million.

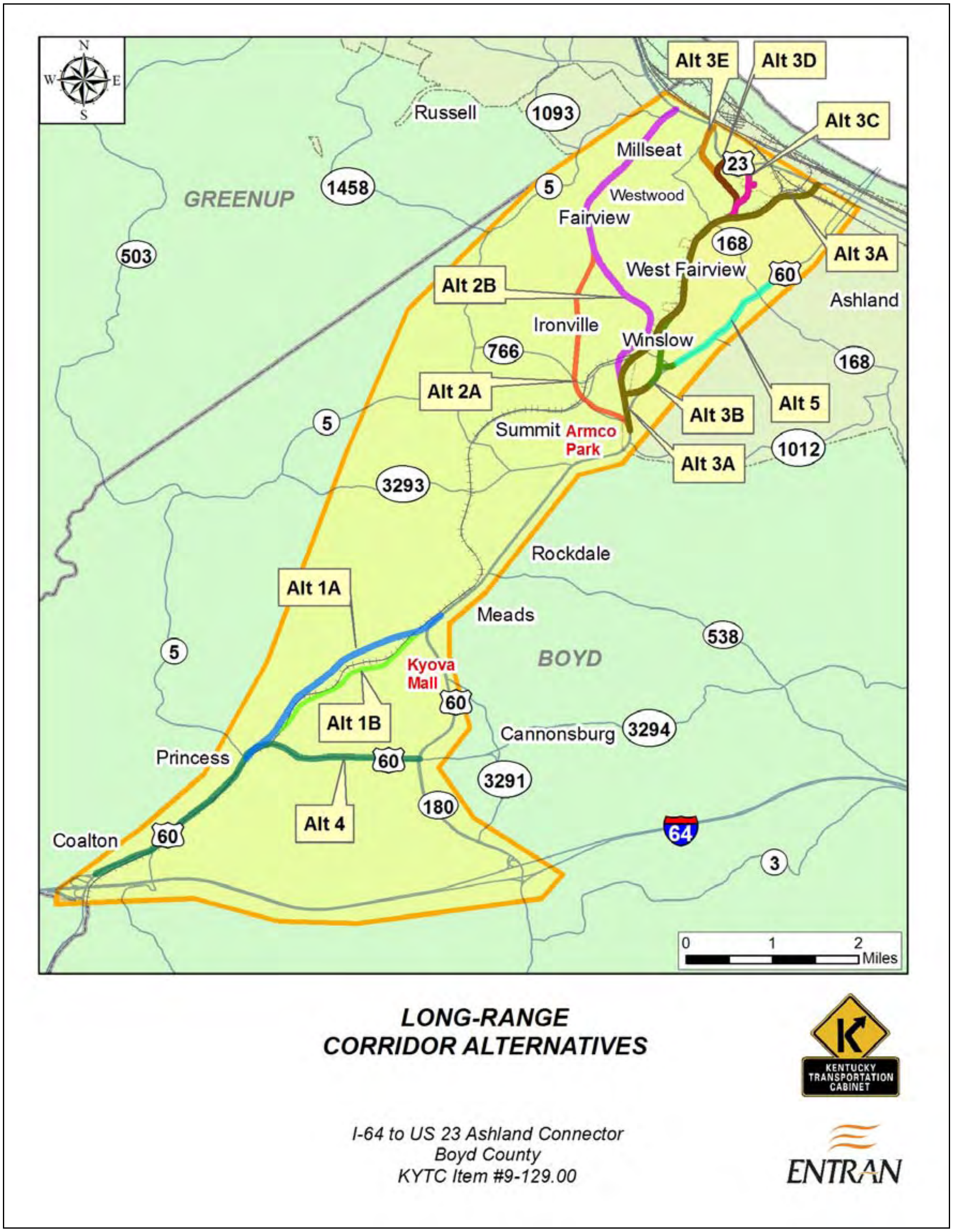

Figure 5-8: Preliminary Long-Range Corridor Alternatives

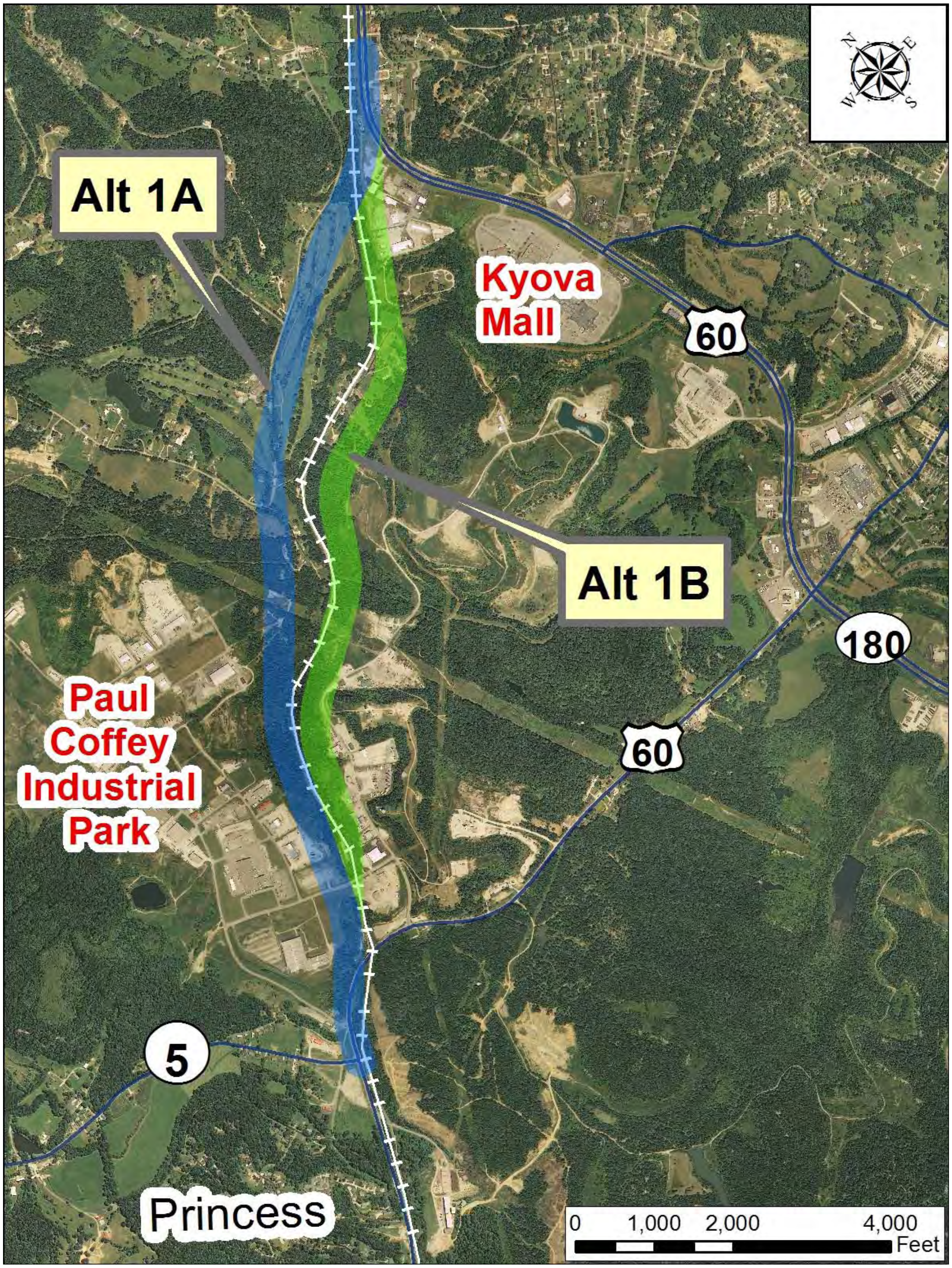

Figure 5-9: Alternative 1

Alternative 1B begins at the same point as 1A but it soon crosses over the CSX railroad line in the vicinity of Lynn Avenue. After the crossing, it runs parallel and to the southeast of the CSX line for the remainder of the alignment. The crossing over the railroad will need to be studied in much more detail in future phases of design to determine the best way to bridge over the CSX line. This crossing represents a challenge because there is an existing railroad tunnel at the point where Alternative 1B crosses over the railroad. If geotechnical studies determine that excavating material over this tunnel is not a viable option, the existing short tunnel would have to be removed entirely and a set of twin bridges would be needed for the proposed alignment to bridge over the railroad. It was assumed for purposes of this study that this last option would be the case and the existing tunnel would have to be removed and a set of twin bridges would be required to cross over the railroad. As is the case with Alternative 1A, an overpass bridge may also be needed for Lynn Avenue at this location to maintain the existing connection between the two sides of the industrial park. After the railroad line is crossed, Alternative 1B mimics the alignment of the railroad as closely as possible, following the contours along a hillside on the east section of the industrial park to minimize excavation and right of way impacts. This alternative also encroaches into the floodplain for the East Fork of the Little Sandy River, although not as much as Alternative 1A. The profile for this alternative would also need to be well above the floodplain as well. Finally, the alignment ties back into US 60 at the same point as Alternative 1A. However, its right of way impacts along the last section of this alignment would be higher than those of Alternative 1A, requiring an estimated four commercial and one residential relocation along this last section. The estimated construction cost for this alternative is $25.6 million.

The two Alternative 1 corridors studied have many similarities and further studies would be needed to be able to make a clear choice between the two. Factors unknown at this time would need to be explored in more detail, such as the feasibility of a cut over the railroad tunnel on Alternative 1B or the exact amount of environmental impacts likely to occur with the construction of Alternative 1A. From the presentaly available information, Alternative 1A seems to be preferable over Alternative 1B. It yields a lower construction cost and involves less relocations. It also offers a much straighter alignment without the multiple reverse curves used for Alternative 1B, this last one being much more controlled by the twists and turns of the existing railroad alignment.

Alternative 4, shown on **Figure 5-10**, involves the widening of the existing two-lane portion of US 60, from the I-64 Coalton interchange to the intersection with KY 180 at Cannonsburg. The alignment for Alternative 4 would follow the existing road closely. The existing alignment appears to comply with 55 mph standards for its entire length, even at the sharpest curve on the road located along the south boundary of the Paul Coffey Industrial Park. All widening would have to be done to the northwest of the existing road for about the first half of this alignment to avoid impacts to the existing CSX railroad line running parallel to US 60 along this section. The existing bridge over the CSX line may remain in place if it is found to be structurally and functionally sound. In that case, only a parallel bridge would be needed to accommodate the additional lanes. For this study, it was assumed that the bridge would need to be replaced with a set of twin bridges for the widened road. The existing bridge over East Fork of the Little Sandy River, considered a potentially historic bridge, would have to be replaced with a set of twin structures. Alternative 4 would result in an estimated three commercial and 10 residential relocations. The estimated construction cost for this alternative is $15.7 million.

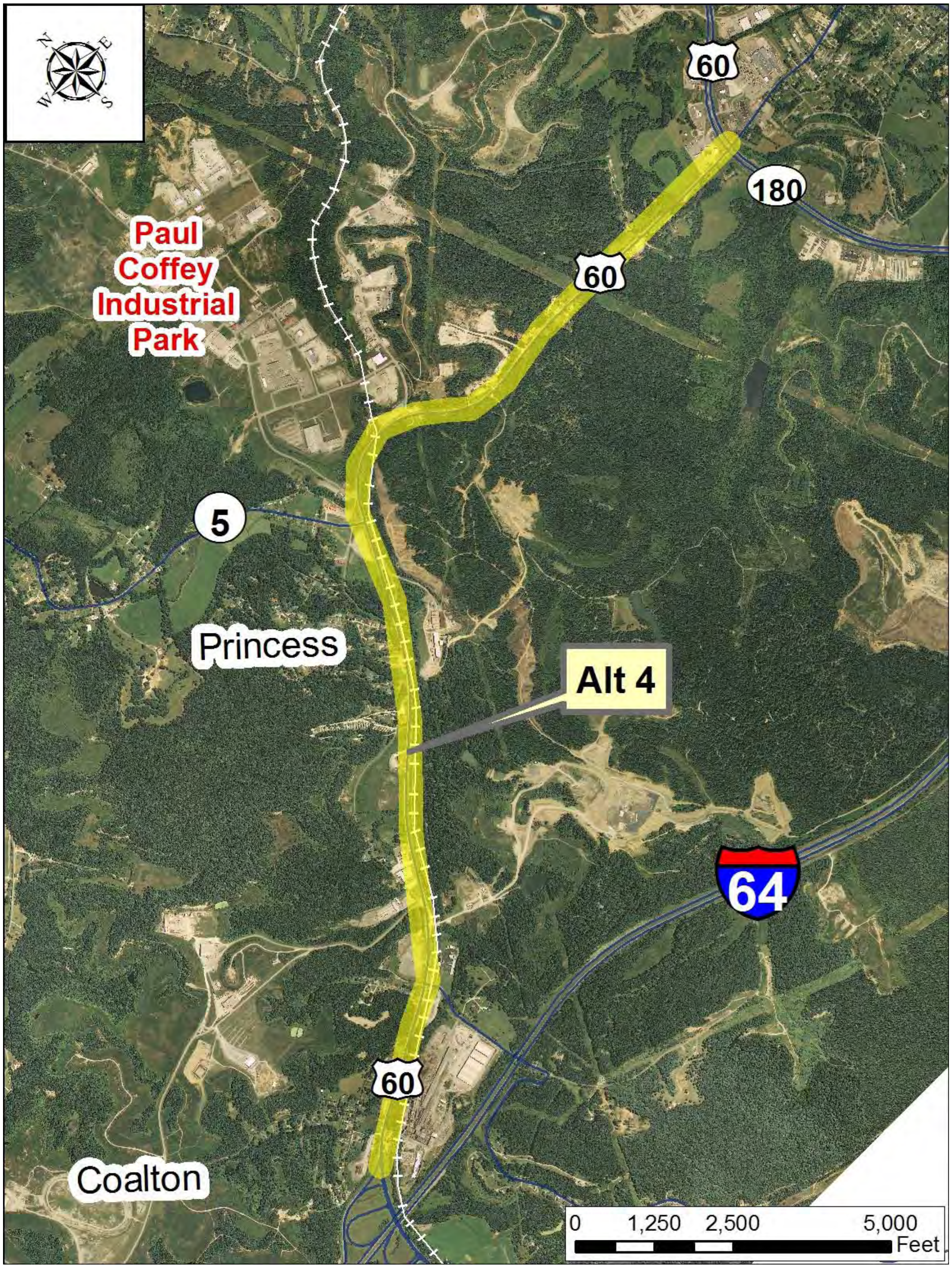

Figure 5-10: Alternative 4

North Alternatives

The alternatives at the northern end of the project corridor provide new connecting routes between US 60 south of Ashland and US 23 west of downtown. The intent of these alternatives is to alleviate congestion along the existing US 60 by diverting a significant amount of traffic to a new connector road (Alternatives 2 and 3). In turn, the reduction of traffic along the existing US 60 may create an opportunity to restripe US 60 from the existing four-lane section to a 3-lane urban typical (Alternative 5).

Alternative 2, referred to as the Bellefonte Connector, begins on US 60 near its intersection with KY 766, located at the north boundary of ARMCO Park, and end at the intersection of US 23 with KY 5. As shown on **Figure 5-11**, two alternatives were developed to study an entirely new corridor for the new connector road that did not use any existing routes. The alignments for these alternatives generally wrap around various hillsides following the outer boundaries of established Ashland neighborhoods (West Fairview, Fairview and Westwood). The main goals behind the planning-level alignments that were developed were to minimize earthwork costs, reduce right of way impacts and avoid splitting existing neighborhoods.

Alternative 2A follows the existing KY 766 for about half a mile, veering off to the north after crossing the CSX railroad line and a blue line stream. A set of twin bridges would be used to cross over both the railroad and the stream. On the west side of the railroad the alignment wraps around a hillside, it then cuts through a second hill and, afterwards, runs roughly parallel and to the west of Hood Creek all the way to the KY 5 intersection. This alternative involves an estimated two commercial and 91 residential relocations. The estimated construction cost for this alternative is $48 million.

Alternative 2B starts at the KY 766 intersection and then follows to the north cutting through a hill, generating a very large amount of excavation on this first cut (up to three million cubic yards). After the cut, the alignment crosses over the CSX railroad line and the blue line stream with a set of twin bridges. On the other side of the crossing, the alternative wraps around a hillside and joins the Alternative 2A alignment near Hood Creek, sharing a common alignment all the way to the end at US 23. This alternative involves an estimated one commercial and 111 residential relocations. The estimated construction cost for this alternative is $60 million.

Alternative 2A offers a number of advantages compared to Alternative 2B. It would cost about 20 percent less than Alternative 2B, mainly due to the large cut at the beginning of Alternative 2B. It also potentially follows a better, less curvy alignment than that for Alternative 2B. Finally, it would involve fewer right of way relocations. Its main disadvantage would be the potential impacts it could cause to a historical structure and a vocational school located on opposite sides of KY 766 near US 60. Both these buildings would be spared with Alternative 2A, but the encroachment into these two properties and their future access to the higher new connector road may be problematic. Further studies with more detailed mapping would be needed to determine the extent of these issues.

Alternative 3, referred to as the Westwood Connector, consists of a large number of possible corridors. As shown on **Figure 5-12**, this set of alternatives follows Roberts Drive for a significant portion of their alignments. The differences between the alternatives have to do with their termini. Essentially, they comprise a single corridor alternative along the existing Roberts Drive, with two possible beginning points and four possible ending points.

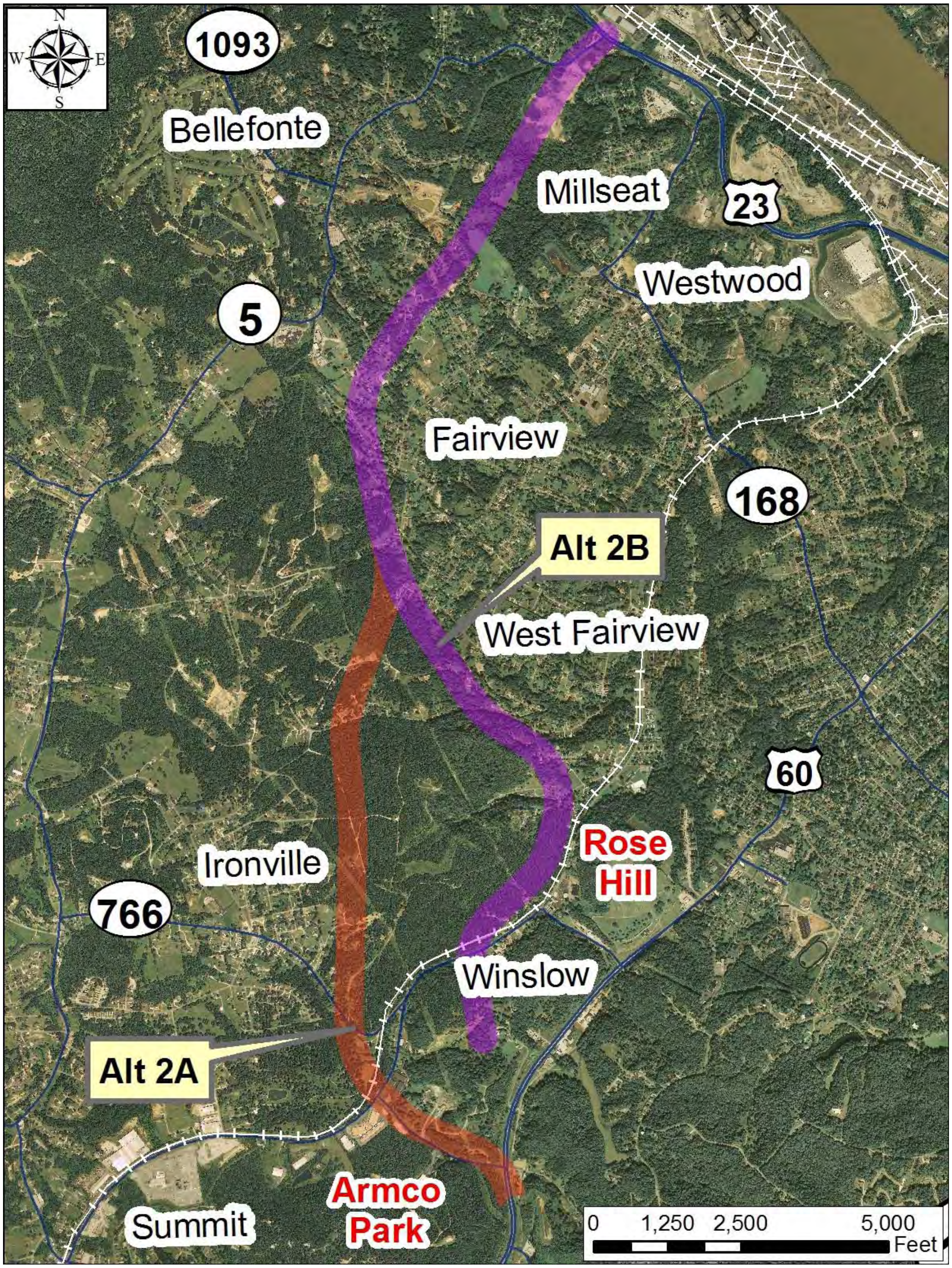

Figure 5-11: Alternative 2

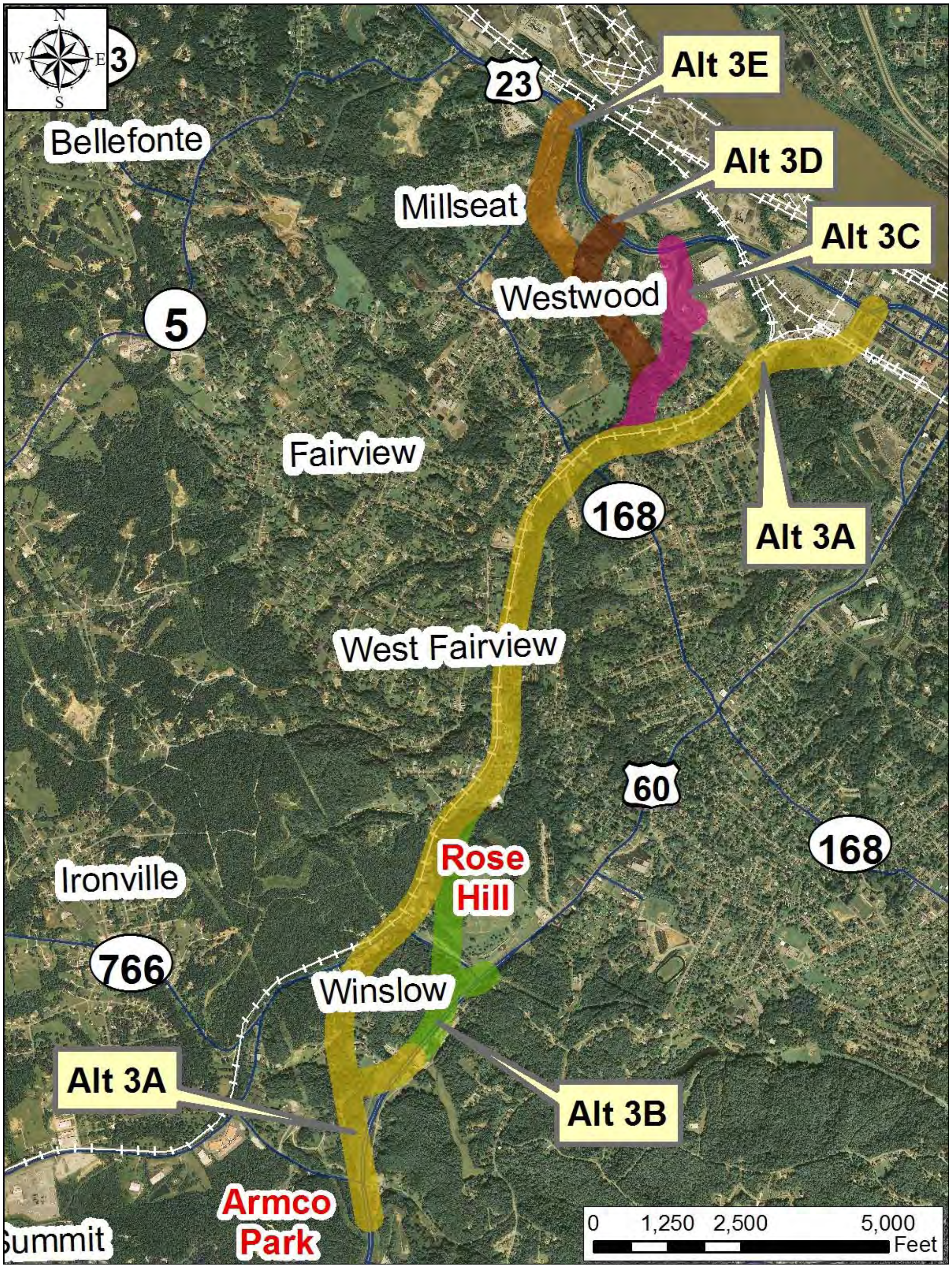

Figure 5-12: Alternative 3

There is a limited number of suitable areas where an alignment can be fit that connects the existing US 60 with Roberts Drive without introducing significant environmental or right of way impacts. The following two alignments have been investigated in this area:

1. Alternative 3A avoids significant environmental and right of way impacts at the cost of requiring a significant amount of excavation. It shares its beginning point and its first half mile with the alignment for Alternative 2B, described a few paragraphs above. As was the case with Alternative 2B, Alternative 3A begins at the KY 766 intersection and then heads north, cutting through a hill and generating a very large amount of excavation with this cut (up to three million cubic yards). By making this cut, the alignment completely avoids impacts to Armco Park and the Rose Hill cemetery. However, this alignment causes major impacts to the Rose Hill School located on Roberts Drive.

2. Alternative 3B has a different beginning point with the intent of avoiding the large cut at the beginning of Alternative 3A. It starts on US 60 just to the south of the Rose Hill Cemetery and immediately crosses to the west side of the cemetery before heading north. The initial intent was to squeeze this alignment between the Rose Hill cemetery and the Rose Hill school and avoid impacts to both. As it turns out, due to the limited space available, those impacts would be unavoidable. The final alignment for Alternative 3B through this area, if pursued, would have to be moved further to the west over the Rose Hill School, taking the whole school parcel to avoid encroaching into the larger cemetery parcel. Again, more accurate mapping will be needed to determine how far west the alignment would need to be moved.

The middle section is common among all the Alternative 3 alignments, running parallel and to the east of the existing CSX railroad line, following along Roberts Drive until its intersection with KY 168 (Blackburn Avenue). This middle section of the corridor involves the acquisition of many residential and commercial buildings that sit close to Roberts Drive along the east side of the road. Additionally, the final right of way impact could be more significant than current estimates due to the partial control access nature of the proposed connector. The provision of frontage roads to maintain the conventional 1,200-foot access spacing would likely require the relocation of additional buildings along this area.

North of the KY 168 intersection, the Alternative 3 alignment continues on a course parallel to the CSX railroad line until it splits into four different optional directions:

1. Alternative 3A continues further parallel to the railroad line until, near the end, it breaks east steering around the Ashland Town Center shopping mall. Alternative 3A ends at the intersection of US 23 with Greenup Avenue.

2. Alternative 3C bridges over the CSX railroad line just north of the KY 168 intersection. It then wraps around two hillsides in an attempt to avoid impacts to existing residences. Finally, it ties to River Hill Drive joining this road until its intersection with US 23. This road was recently relocated during the construction of the Wal-Mart development.

3. Alternative 3D breaks from Alternative 3A at the same location as Alternative 3C. It bridges over both the railroad and a blue line stream, continuing west through an existing baseball field complex. Finally, it curves to the north to intersect US 23.

4. Alternative 3E follows the same alignment as Alternative 3D for the first 0.6 miles. It then continues west and ends at the intersection of KY 168 (Hoods Creek Pike) with US 23. This switch to the west results in three additional crossings over the mentioned blue line stream, which would require two additional sets of twin bridges as compared to Alt 3D.

Alternative 5, shown on **Figure 5-13**, involves overlaying and restriping US 60 (13th Street) between Rose Hill and downtown Ashland to three lanes (two travel lanes plus a center left-turn lane). This alternative, must be combined with Alternative 2 or Alternative 3 because both of those alternatives can potentially divert future traffic from this section of US 60, reducing the traffic volume enough for three lanes to accommodate the demand. The estimated construction cost for this alternative is $1.1 million and it would not require any additional right of way.

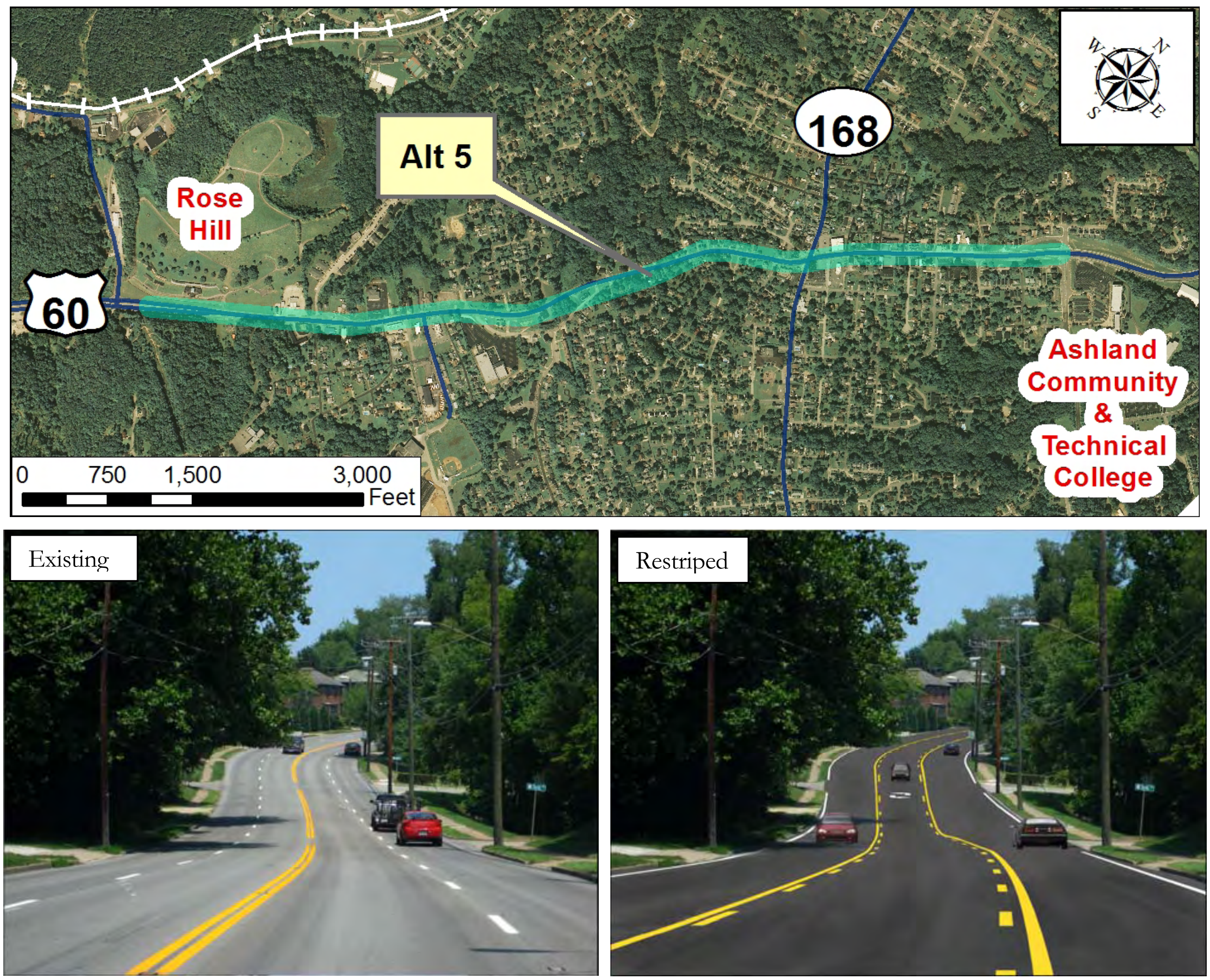

Figure 5-13: Alternative 5

Table 5-2 presents a summary of all the alternatives as well as combinations of alternatives in the case of Alternative 3.

Table 5-2: Summary of the Long-Range Corridor Alternatives

Alternative	Length (Miles)	Construction Cost	POTENTIAL RELOCATIONS REQUIRED			
			Commercial	Residential - Single Family	Residential - Multi-family	School Buildings
Alt # 1A	2.50	$ 23,960,000	3	2	0	0
Alt # 1B	2.49	$ 25,570,000	7	4	0	0
Alt # 2A	4.23	$ 48,360,000	2	91	0	0
Alt # 2B	4.25	$ 60,300,000	1	111	0	0
Alt # 3A	3.73	$ 37,790,000	8	65	17	1
Alt # 3B	3.15	$ 24,560,000	8	62	17	1
Alt # 3A-3C	3.44	$ 35,820,000	5	61	5	1
Alt # 3A-3D	3.55	$ 37,900,000	8	69	5	1
Alt # 3A-3E	3.96	$ 41,690,000	11	73	5	1
Alt # 3B-3C	2.86	$ 20,600,000	5	58	5	1
Alt # 3B-3D	2.98	$ 22,680,000	8	66	5	1
Alt # 3B-3E	3.39	$ 24,470,000	11	70	5	1
Alt #4	3.80	$ 15,700,000	3	10	0	0
Alt #5		$ 1,100,000	0	0	0	0

6.0 EVALUATIONS OF THE LONG-RANGE CORRIDOR ALTERNATIVES

The I-64 to US 23 Ashland Connector Study resulted in a number of short-term and long-term alternatives to improve travel opportunities between I-64 and US 23 west of downtown Ashland. This chapter summarizes the evaluation methodology and results for evaluating the long-range corridor alternatives.

6.1 Traffic Forecasts

The regional travel demand model, discussed in detail in Chapter 4, was used to estimate the future demand for travel along each of the new routes proposed over the course of the study. A representative corridor was developed for each new route and was modeled as a four-lane roadway. The estimated future traffic volumes were then compared to the 2030 No-Build (No-Action) alternative to determine the impacts each alternative may have on future travel conditions throughout the study area, including the amount of traffic that may be diverted from existing roadways to the new routes.

The 2030 traffic forecasts and estimated volume to capacity (V/C) ratios for Alternative 1 are shown on **Figure 6-1**. Alternative 1, also referred to as the Princess Connector, would be expected to carry approximately 11,300 vehicles per day (VPD) in 2030. Much of US 60 north of the connector will be over capacity in this scenario, but US 60 between KY 180 and the connector will be at or below capacity.

Figure 6-2 depicts the 2030 forecasts for Alternative 2, the Bellefonte Connector. The connector route is expected to serve 13,100 VPD on its north end near KY 5 and US 23 to 17,100 VPD at the south end near US 60.

The 2030 traffic forecasts for Alternative 3, the Westwood Connector, are shown on **Figure 6-3**. As modeled, this corridor would carry approximately 9,300 VPD at the south end near US 60 and 18,600 VPD approaching US 23.

The 2030 traffic forecasts for Alternative 4, which includes widening US 60 between I-64 and the KY 180 intersection to four lanes, is shown on **Figure 6-4**. A widened US 60 would be expected to serve 17,900 VPD north of the I-64 interchange and 19,000 VPD near KY 180.

Table 6-1 presents a summary of the 2030 forecasts, by alternative, for the major roadways of interest in the study area, including I-64, KY 180, US 60, KY 5, KY 168, and US 23. These forecasts are compared to the 2030 No-Build traffic volumes in an effort to estimate how much traffic may divert to the new connector routes from existing facilities. With respect to KY 180, Alternative 1 reduces travel demand on the section immediately north of the I-64 interchange by 11 percent, and Alternative 4 reduces traffic along this section by over 20 percent. These alternatives also reduce traffic volumes along I-64 between the US 60 Coalton interchange and the KY 180 interchange, with Alternative 1 reducing demand by about 10 percent and Alternative 4 by 21 percent.

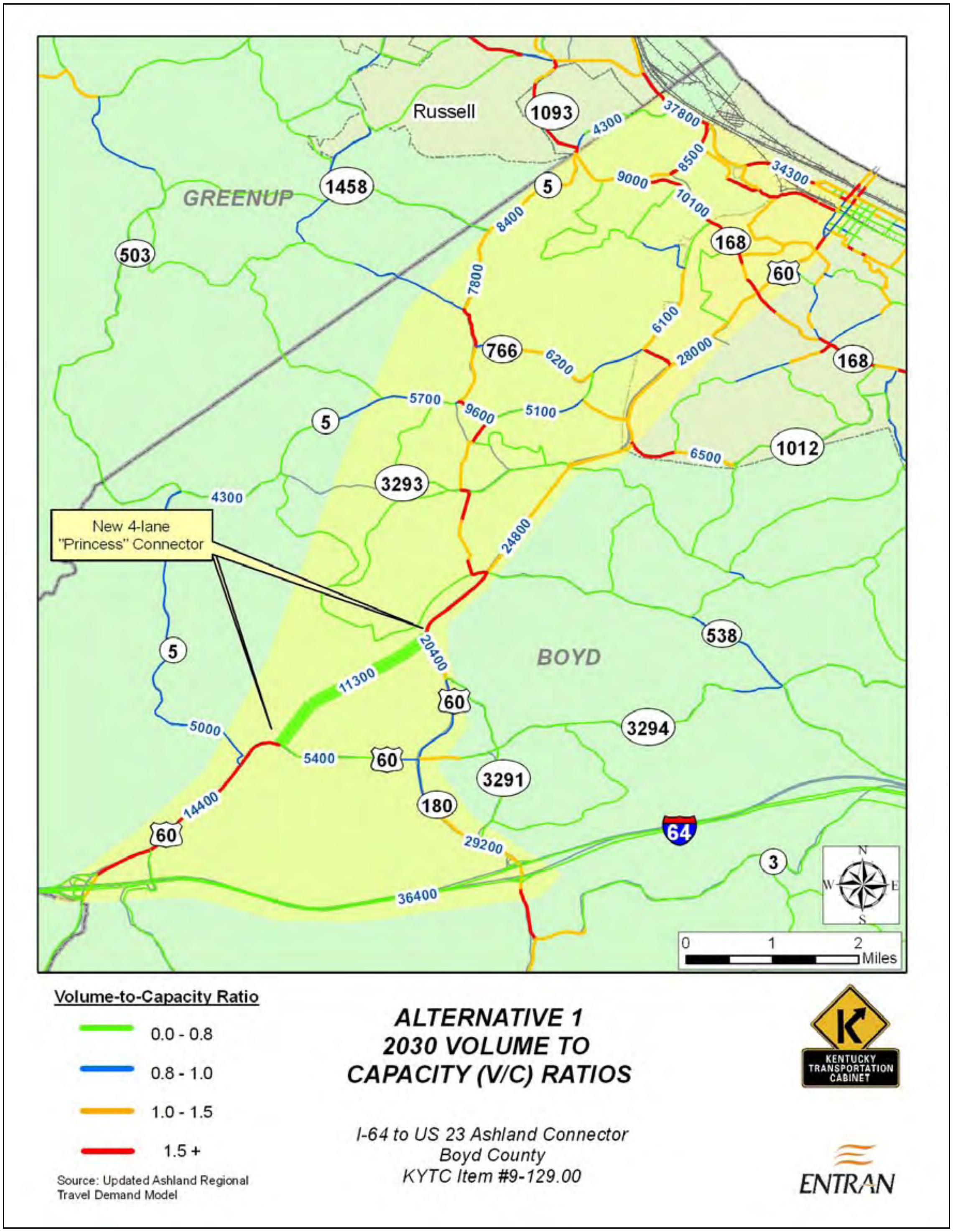

Figure 6-1: 2030 Traffic Forecasts for Alternative 1

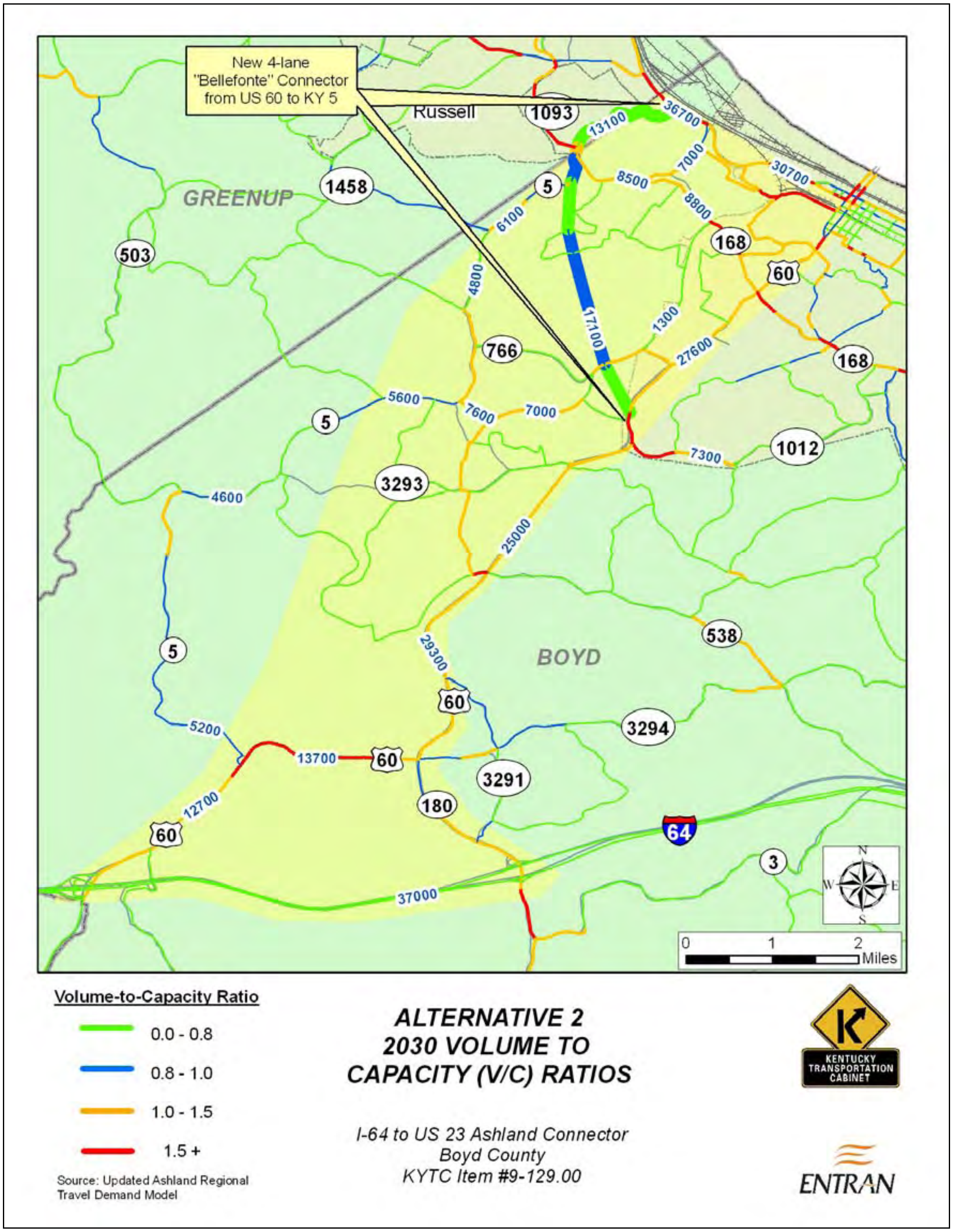

Figure 6-2: 2030 Traffic Forecasts for Alternative 2

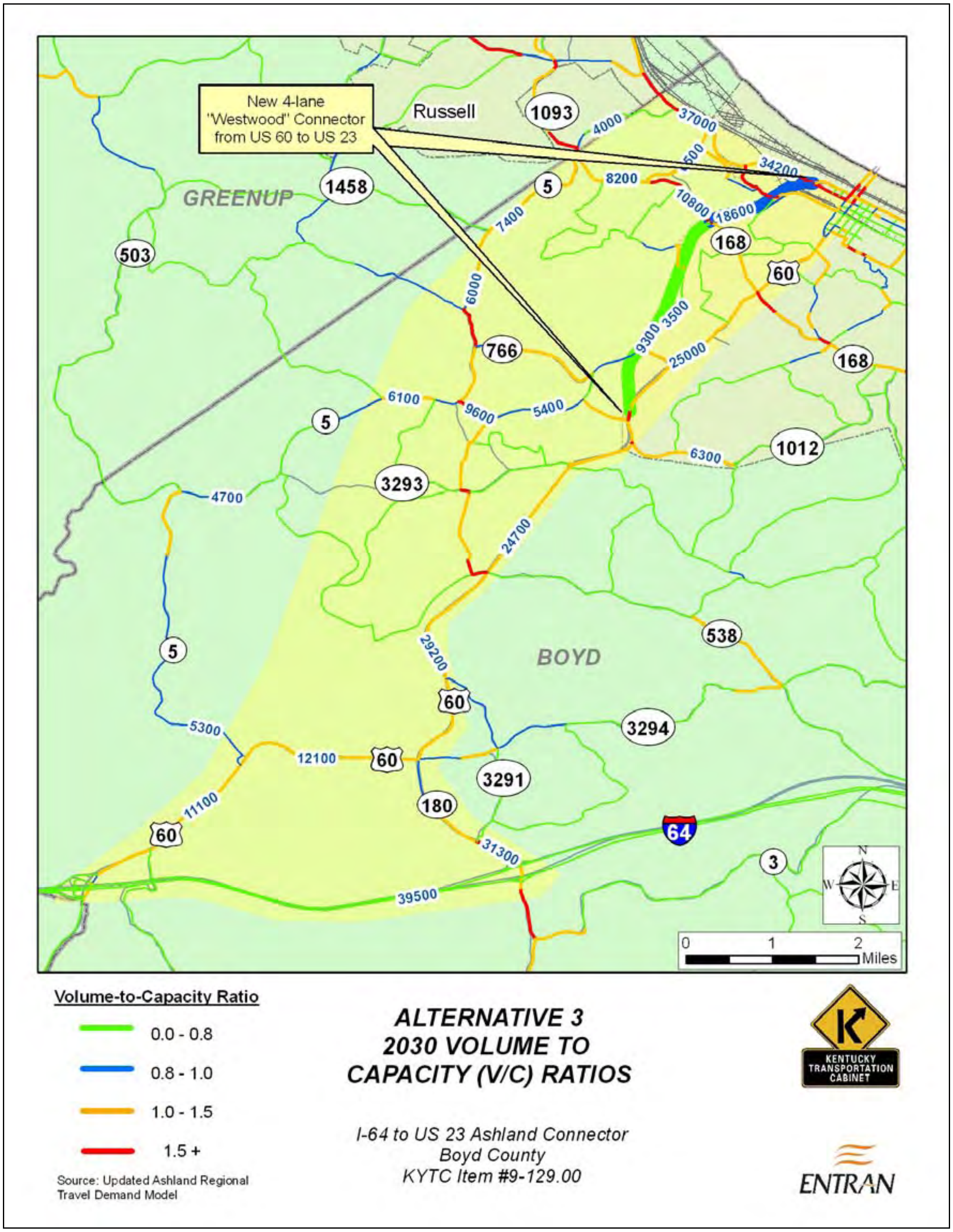

Figure 6-3: 2030 Traffic Forecasts for Alternative 3

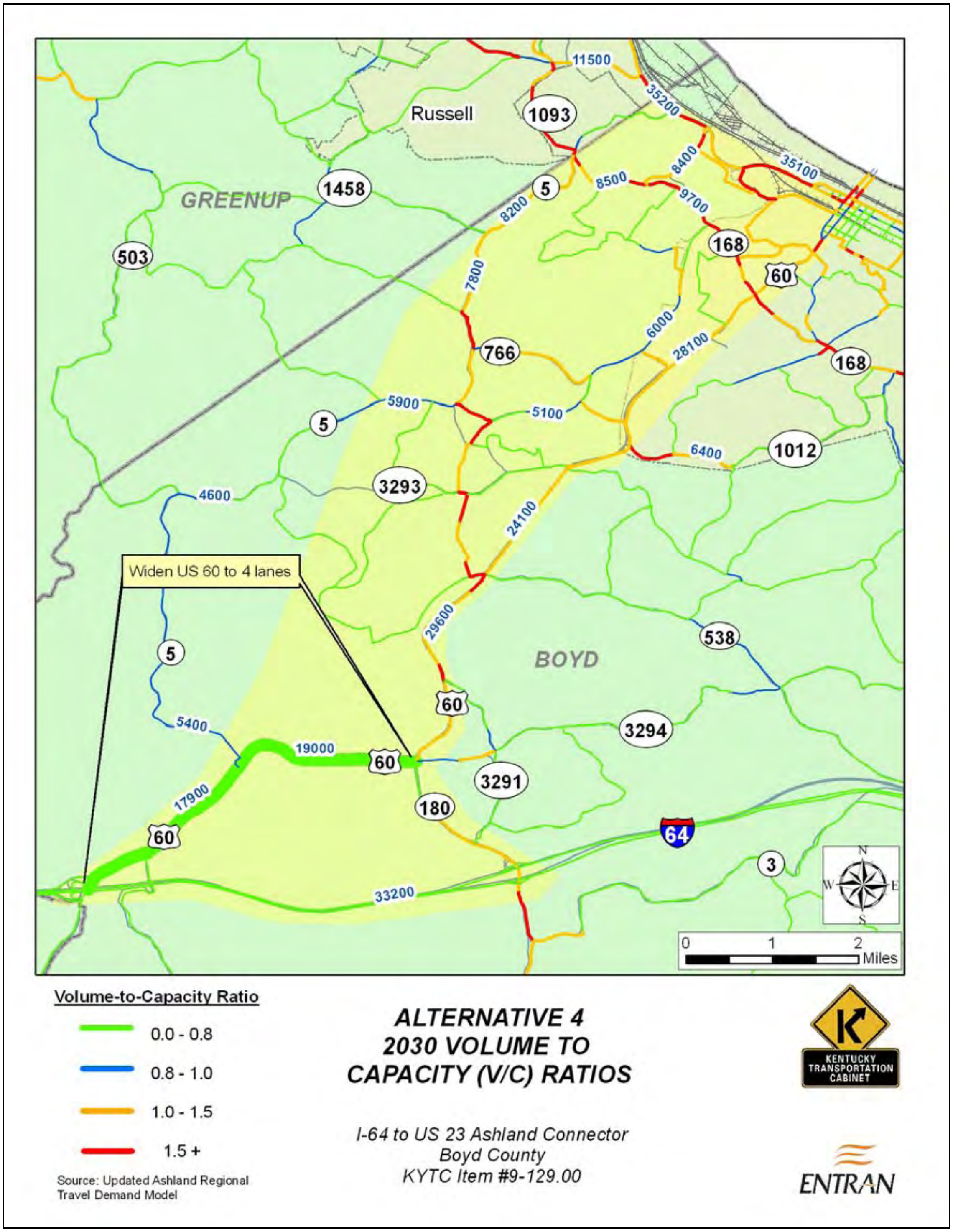

Figure 6-4: 2030 Traffic Forecasts for Alternative 4

Table 6-1: 2030 Traffic Forecasts and Traffic Diversion from Major Roadways in the Study Area

Roadway	Segment	No-Build	Alt 1	Growth	Alt 2	Growth	Alt 3	Growth	Alt 4	Growth
I-64	West of US 60	47,000	47,100	0.2%	45,900	-2.3%	47,000	0.0%	47,200	0.4%
	Between US 60 & KY 180	40,500	36,400	-10.1%	37,000	-8.6%	39,500	-2.5%	32,000	-21.0%
	East of KY 180	41,400	41,200	-0.5%	40,600	-1.9%	39,900	-3.6%	41,300	-0.2%
KY 180	North of I-64	32,800	29,200	-11.0%	29,700	-9.5%	31,300	-4.6%	26,100	-20.4%
US 60	North of I-64	10,100	14,200	40.6%	12,700	25.7%	11,200	10.9%	17,900	77.2%
	West of KY 180	9,200	8,400	-8.7%	12,600	37.0%	11,900	29.3%	21,100	129.3%
	North of KY 180	25,300	17,200	-32.0%	23,700	-6.3%	22,900	-9.5%	25,800	2.0%
	South of KY 766	27,300	27,700	1.5%	31,800	16.5%	29,200	7.0%	27,600	1.1%
	North of KY 168 (Blackburn Ave.)	27,700	28,000	1.1%	27,000	-2.5%	26,200	-5.4%	27,900	0.7%
	South of 12th Street	33,000	32,900	-0.3%	32,000	-3.0%	29,800	-9.7%	33,400	1.2%
KY 5	North of US 60	5,200	4,900	-5.8%	5,100	-1.9%	5,200	0.0%	5,300	1.9%
	South of US 23	3,800	4,200	10.5%	13,100	244.7%	4,000	5.3%	4,000	5.3%
KY 168	South of US 23	6,400	9,900	54.7%	5,300	-17.2%	7,700	20.3%	8,800	37.5%
	West of US 60	10,700	9,900	-7.5%	8,600	-19.6%	6,900	-35.5%	9,900	-7.5%
US 23	West of KY 5	35,100	35,700	1.7%	38,100	8.5%	36,100	2.8%	35,200	0.3%
	East of KY 168 (Hoods Creek Rd.)	30,300	28,300	-6.6%	28,700	-5.3%	29,100	-4.0%	37,100	22.4%
	At Towne Mall	33,400	34,300	2.7%	30,600	-8.4%	34,200	2.4%	35,000	4.8%
	North of I-64	33,200	33,000	-0.6%	33,800	1.8%	33,300	0.3%	33,300	0.3%

All alternatives increase traffic on US 60 north of the I-64 Coalton interchange. Alternative 1 would increase traffic along this section of US 60 (and therefore the use of the interchange) by nearly 40 percent, and Alternative 4 would increase traffic along this section by nearly 77 percent. Only Alternative 3 significantly reduces travel demand along US 60 approaching downtown Ashland, with an expected decrease of nearly 10 percent. This represents traffic that would divert from this section of US 60 to the proposed connector route. Alternative 2 decreases the demand for travel along this section of US 60 as well, but only by three percent.

Two alternatives reduce travel demand along the southern section of KY 5, with Alternative 1 resulting in a reduction of approximately six percent and Alternative 2 a reduction of about two percent. Traffic diversion from KY 168 varies by alternative. Each alternative reduces traffic on the section immediately west of US 60, with Alternative 3 resulting in the greatest reduction of over 35 percent. Only Alternative 2 reduces travel demand along the section immediately south of US 23 (17 percent).

As none of the proposed connector routes provide a true east-west alternative for travel along US 23, the amount of diversion from US 23 is minimal. Alternatives 1, 2, and 3 result in a slight decrease in travel along the section east of KY 168. Alternative 2 also decreases 2030 traffic volumes along the section adjacent to Town Center Mall by approximately eight percent.

Alternative 5 was not modeled as a standalone project as a three-lane section on US 60 north of Rose Hill Cemetery would not be capable of accommodating existing demand, let alone 2030 traffic. Therefore, Alternative 5 was modeled in combination with Alternative 3 to determine a best case scenario for potential diversion of traffic from US 60. Alternative 1 was also included in this scenario based on suggestions received by the ACAT, including widening US 60 between I-64 and the proposed Princess Connector. The results of this scenario are shown on **Figure 6-5**.

This scenario suggests a significant amount of US 60 traffic would divert to a proposed connector paralleling the existing route, particularly if the capacity were reduced on US 60 as would occur if it were restriped as a three-lane section. Traffic volumes along the section of US 60 south of KY 168 would decrease to approximately 14,000 VPD, which could be accommodated reasonably well with a three-lane section. Much of this traffic diverts to the proposed Alternative 3 connector, increasing traffic in that corridor to over 22,000 VPD. Widening US 60 south of the Princess Connector also increases travel demand along that section as well as along the proposed connector.

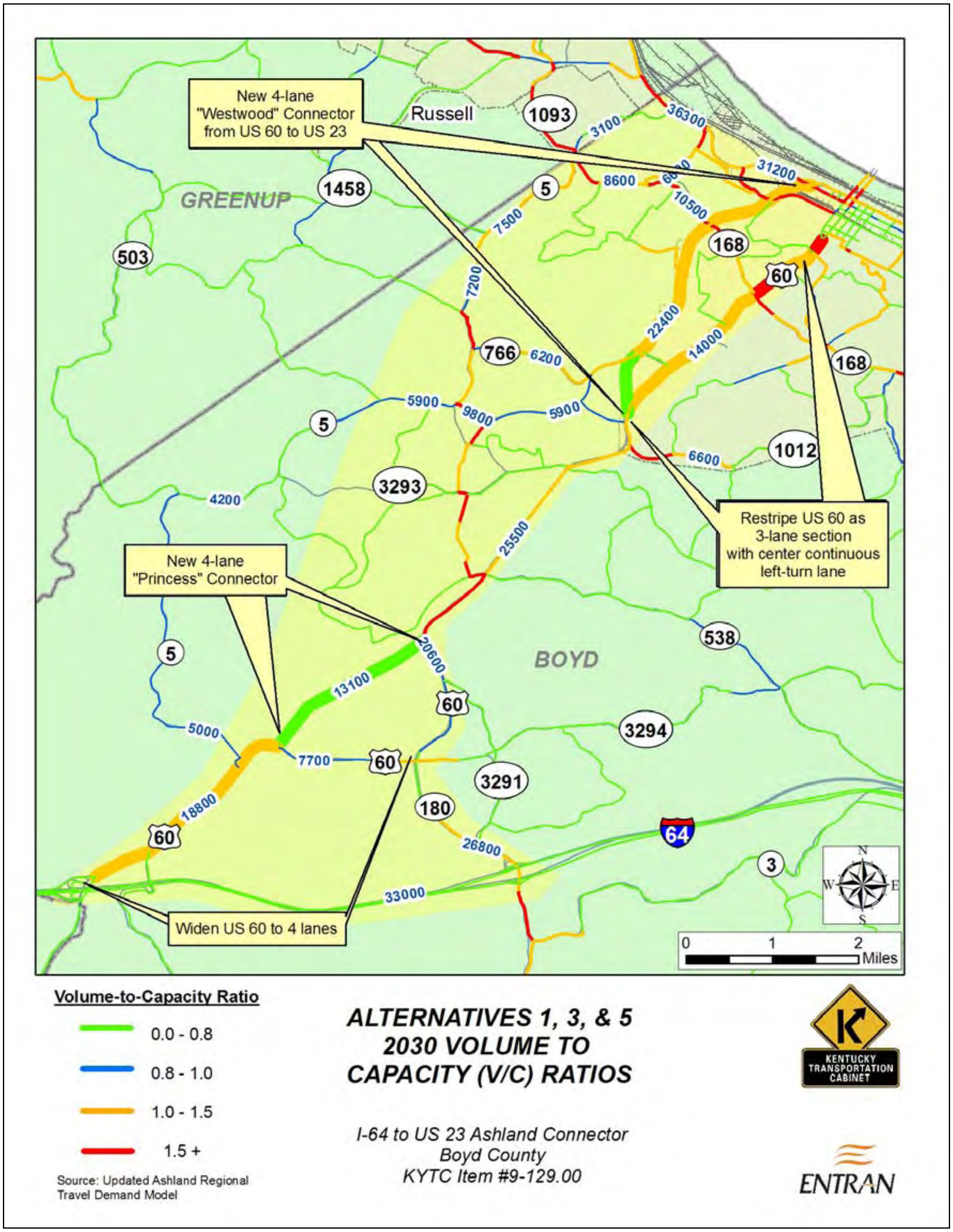

Figure 6-5: 2030 Traffic Forecasts for a Combination of Alternatives 1, 3, and 5

6.2 Evaluation Methodology and Results

A comprehensive approach was utilized to provide some insight as to which alternatives perform better than others. This evaluation process was not intended to necessarily determine which corridors should be pursued for further study, but rather provide a relative comparison between all alternatives in terms of traffic relief, adverse impacts, and public sentiment. Each alternative was evaluated based on 10 criteria that were based on the Purpose and Need for the study and input from the ACAT. These criteria and how they were applied are as follows:

1. **Connectivity between I-64 and downtown Ashland** – Based on the Purpose and Need Statement, this criterion considers how much traffic relief would be likely for existing routes or how much traffic can be diverted from existing routes and how much traffic might be carried by the proposed alternative.
2. **Traffic volume on new corridor** – Based on the highest traffic volume carried by any segment of a proposed alternative corridor.
3. **Traffic diversion from US 60** – Based on the estimated amount of traffic that could be diverted from US 60 near Rose Hill Cemetery (north of KY 716), the beginning of the narrower four-lane section. Traffic volumes were compared to the No-Build Alternative.
4. **Environmental impacts** – Includes a number of potential impacts to the natural environment (i.e. impacts to streams, encroachment on wetlands, etc.) and the manmade environment (i.e. proximity to historic sites, parks, etc.)
5. **Community impacts** – Considers the adverse effects that a new route may introduce, such as dividing an existing community, impacting community resources (i.e. churches, schools, etc.) or requiring a significant number of residential relocations within a densely populated area. Also considers the potential benefits that could be realized by a community, such as increased mobility from additional travel alternatives.
6. **Business relocations** – Based on estimates of the total number of businesses that would be taken by each alternative.
7. **Residential relocations** - Based on estimates of the total number of residences that would be taken by each alternative.
8. **Public input** – Based on the results of the questionnaire from the second public meeting, where attendees were asked if they were in favor of or opposed each alternative.
9. **ACAT input** - Based on the results of a group exercise where the ACAT was divided into groups and asked if they were in favor of or opposed each alternative.
10. **Construction cost** – Based on the total estimated construction cost.

Actual values that could be quantified or estimated for each alternative, such as construction cost or relocations, were used where possible. Average values were used where alternatives have multiple options, such as in the case of Alternative 1, 2, and 3. Where actual measures were not possible to estimate, the potential level of impacts were rated as high (significant adverse impacts), medium (some impacts), or low (little or no impact). With respect to public input, favorable responses were given a score of "10" and negative responses a "0", and the average scores were used in the evaluation. A summary of the values used in this process are summarized in **Table 6-2**.

Table 6-2: Summary of the Application of the Evaluation Criteria

CRITERIA	Connectivity between I-64 and Downtown Ashland	Traffic Volume on New Corridor	Traffic Diversion from US 60	Environmental Impacts	Community Impacts	Business Relocations	Residential Relocations	Public Input	ACAT Input	Total Construction Cost
SCALE	H, M, L	Vehicles per Day (VPD)	28,020	H, M, L	H, M, L	Approx. number of businesses	Approx. number of homes	Based on input from Public Mtg #2	Based on input from ACAT Mtg #3	Average cost
No Build	L	0	0	L	M	0	0	0	0	$0
Alternative 1	M	11,300	20	M	M	5	3	3.33	2.5	$24,800,000
Alternative 2	M	17,100	420	H	H	2	101	4.29	0	$54,300,000
Alternative 3	H	18,600	3,020	H	M	8	85	8.95	10	$31,200,000
Alternative 4	M	7,800	-80	M	M	3	10	4.74	10	$15,700,000
Alternative 5*	H	22,400	14,020	L	L	0	0	7	5	$1,100,000

Alternatives that provided significant congestion relief to US 60 south of downtown Ashland, providing a feasible travel alternative, were ranked high in terms of connectivity between I-64 and downtown Ashland. Those that provided some congestion relief to US 60 were rated a medium. Traffic diversion from US 60 was compared to raw model output from the regional travel demand model for the No-Build Alternative, and Alternative 5 resulted in the highest level of diversion. Most other alternatives, with the exception of Alternative 3, resulted in little or no diversion.

In general, the alternatives that require significant new construction result in more adverse effects in terms of environmental and community impacts and were rated high or medium in those categories. Alternative 3 would require the highest number of business relocations, and Alternative 2 and Alternative 3 would result in the most residential relocations. Alternative 5, which requires no new construction, has no impacts in these areas. However, Alternative 5 must be combined with Alternative 2 or Alternative 3 in order to be feasible.

The public indicated overwhelming support for Alternative 3 at the second public meeting (17 respondents were in favor and two in opposition to Alternative 3), giving it an average score of 8.95. Alternative 5 was also given relatively strong support, with an average score of seven. The ACAT gave unanimous support to both Alternative 3 and Alternative 4, but were in complete opposition to Alternative 2 and showed little support for Alternative 1.

The values in **Table 6-2** were normalized on a scale of 0 (zero) to 10 by giving the best performer for each criterion a score of 10, and the worst performer a score of 0. The alternatives that fell between the best and worst performers were given scores based on their relative performance. Those that were near the bottom received scores closer to 0, and those that were near the top received scores closer to 10. The results are shown in **Table 6-3**.

Table 6-3: Alternative Scores Based on Application of the Evaluation Criteria

Criteria	Connectivity between I-64 and Downtown Ashland	Traffic Volume on new Corridor	Traffic Diversion from US 60	Environmental Impacts	Community Impacts	Business Relocations	Residential Relocations	Public Input	ACAT Input	Total Construction Cost
SCALE	0 - 10 (lowest to highest connectivity)	0 - 10 (least to most traffic)	0 - 10 (minor to major reduction)	0 - 10 (major to minimal impacts)	0 - 10 (major to minimal impacts)	0 - 10 (major to minimal relocations)	0 - 10 (major to minimal relocations)	0 - 10 (least to most favorable)	0 - 10 (least to most favorable)	0 - 10 (high to low cost)
No-Build	0.0	0.0	0.1	10.0	5.0	10.0	10.0	0.0	0.0	10.0
Alternative 1	5.0	5.0	0.1	5.0	5.0	3.8	9.7	3.3	2.5	5.4
Alternative 2	5.0	7.6	0.4	0.0	0.0	8.1	0.0	4.3	0.0	0.0
Alternative 3	10.0	8.3	2.2	0.0	5.0	0.0	1.5	9.0	10.0	4.3
Alternative 4	5.0	3.5	0.0	5.0	5.0	6.3	9.0	4.7	10.0	7.1
Alternative 5*	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	5.0	9.8

The scores from **Table 6-3** were summed and the alternatives were ranked based on those scores. The results are summarized in **Table 6-4**.

Table 6-4: Preliminary Evaluation Results

Alternative	*Total Score*	*RANK*
No-Build	45.1	3
Alternative 1	39.8	5
Alternative 2	20.4	6
Alternative 3	40.3	4
Alternative 4	50.6	2
Alternative 5*	81.8	1

*Note: Alternative 5 must be combined with Alternative 2 or 3.

Alternative 5 was the strongest performer in the preliminary evaluation of alternatives. Again, it should be noted that Alternative 5 is not a standalone alternative and would require Alternative 2 or Alternative 3 to be constructed before US 60 could be restriped to a three-lane section. Alternative 4 was the second best performer, and the No-Build Alternative was the third best.

The ACAT was asked to prioritize the evaluation criteria prior to the evaluation process. The meeting attendees were divided into groups and asked to indicate how important each criterion was to the community, on a scale of 1 to 5. The results are summarized in **Table 6-6**.

Table 6-5: ACAT's Input on the Importance of the Evaluation Criteria

Evaluation Criterion	Group 1	Group 2	Group 3	Group 4	Average Rating
Divert traffic from existing US 60	5	5	2.5	5	**4.4**
Minimize the number of residential relocations	4	4	3	3	**3.5**
Minimize the number of business relocations	4	3	5	4	**4.0**
Minimize community disruption	4	3	3	4	**3.5**
Minimize environmental impacts	4	5	1.5	3	**3.4**
Public input/support	4	5	4	4	**4.3**
Minimize Cost	3	3	4	4	**3.5**

The ACAT indicated that diverting traffic from existing US 60 was the most important criterion to consider, followed by public input/support and minimizing the number of business relocations. This input was considered in the evaluation process by applying the ACAT's priorities to the score in **Table 6-3**. Each raw score was multiplied by the ACAT's average criteria rating divided by the maximum possible score of 5. The results are shown in **Table 6-6**.

Table 6-6: Alternative Scores Based on Application of the Evaluation Criteria with ACAT's Input

Criteria	Connectivity between I-64 and Downtown Ashland	Traffic Volume on new Corridor	Traffic Diversion from US 60	Environmental Impacts	Community Impacts	Business Relocations	Residential Relocations	Public Input	ACAT Input	Total Construction Cost
ACAT Factor	5	4.4	4.4	3.4	3.5	4	3.5	4.3	4.3	3.5
No-Build	0.0	0.0	0.0	6.8	3.5	8.0	7.0	0.0	0.0	7.0
Alternative 1	5.0	4.4	0.1	3.4	3.5	3.0	6.8	2.9	2.2	3.8
Alternative 2	5.0	6.7	0.3	0.0	0.0	6.5	0.0	3.7	0.0	0.0
Alternative 3	10.0	7.3	1.9	0.0	3.5	0.0	1.1	7.7	8.6	3.0
Alternative 4	5.0	3.1	0.0	3.4	3.5	5.0	6.3	4.1	8.6	5.0
Alternative 5*	10.0	8.8	8.8	6.8	7.0	8.0	7.0	6.0	4.3	6.9

The scores from **Table 6-6** were summed and the alternatives were ranked once again based on those scores. The results, representing the final evaluation results, are summarized in **Table 6-7**.

Table 6-7: Final Evaluation Results

Alternative	*Total Score*	*RANK*
No-Build	***32.3***	**4**
Alternative 1	***30.0***	**5**
Alternative 2	***17.2***	**6**
Alternative 3	***33.1***	**3**
Alternative 4	***38.9***	**2**
Alternative 5*	***63.6***	**1**

*Note: Alternative 5 must be combined with Alternative 2 or 3.

Alternative 5 remained the best performer among the alternatives, followed again by Alternative 4. However, Alternative 3 scored better than the No-Build Alternative and ranked third once the ACAT's priorities were applied to the evaluation process.

7.0 RECOMMENDATIONS

The I-64 to US 23 Ashland Connector Study resulted in a number of short-term and long-term recommendations to improve travel opportunities between I-64 and US 23 west of downtown Ashland. This chapter summarizes the recommendations from the study and provides some suggestions on direction for future study.

7.1 Short-Term Improvement Alternative Recommendations

All of the Short-Term Improvement Alternatives received favorable public support at the second public meeting and are recommended for implementation. These ten projects range in cost from $125,000 to $1 million, with a total cost of $3.2 million to $3.4 million.

The intersection improvement projects are the most expensive short-term projects. The US 60 intersection with KY 180 is expected to cost approximately $1 million to reconstruct, and the US 60 intersection with KY 168 approximately $750,000. There are options to be explored further for the Roberts Drive intersection with KY 168 and the railroad grade crossing west of the intersection. Any increases to the grades along KY 168 will certainly improve the situation and lack of adequate sight distance at the rail grade crossing. An ultimate "fix" for the area will cost as much as $500,000.

The turn lane projects are expected to cost approximately $125,000 each, with the Paul Coffey Boulevard project expected to cost $275,000 as it includes two turn lanes. The projects on US 60 north of KY 180 should be implemented as soon as funding is available. The turn lane project at the US 60 intersection with Paul Coffey Boulevard should not be implemented if the US 60 widening is to occur in the foreseeable future.

The signage improvement on US 60 approaching downtown Ashland may cost up to $200,000 if overhead signage is provided. Other signage may be added at a lower cost. Opportunities for increased signage are limited on the US 60 approach to Winchester Avenue and the bridge, but this improvement will eliminate some of the confusion for motorists unfamiliar with the area.

Most of the short-term improvement alternatives were recommended to address existing safety issues. As such, they may be eligible for Highway Safety Improvement Program (HSIP) funding. Otherwise, other traditional funding sources will be required.

7.2 Long-Range Corridor Alternative Recommendations

One South Alternative and one North Alternative are recommended for further study. The following sections discuss the rationale behind these recommendations, as well as recommendations for the future consideration of Alternative 5.

South Alternatives

The Alternative 1 options have a significantly higher construction cost than Alternative 4. However, both Alternative 1 corridors provide for a shorter connection between I-64 and the four-lane section of US 60, resulting in 1.1 miles less overall distance between Ashland and the Coalton interchange compared to

Alternative 4. With respect to right of way impacts, the Alternative 1 options will likely cause significant disturbance through the Paul Coffey Industrial Park. However, overall impacts are in line with those of Alternative 4. The figures for both Alternative 1A and 1B only reflect the estimated costs and relocations involved with the new corridors. They do not take into account the improvements that would also be needed along the two-lane portion of US 60 between the industrial park and I-64. When those improvements are considered, the overall right of way impacts for the Alternative 1 options end up being in line with those for Alternative 4.

Alternative 1 finished in the bottom half of the evaluation process. Finally, input expressed at public involvement meetings and the opinion of the ACAT both favor keeping improvements to US 60 along the existing route. Therefore, based on all these reasons, Alternative 1 is not recommended for further development and Alternative 4 is recommended for further consideration.

North Alternatives

The Alternative 2 corridors have a higher construction cost than Alternative 3. Alternative 2 also involves many more single family residential relocations than Alternative 3. However, when the right of way cost is calculated in more detail, Alternative 2 ends up being very similar to Alternative 3. The Alternative 3 options involve more commercial relocations and take more apartment complex buildings than Alternative 2. With respect to cost, each apartment building could be the equivalent of four or more single unit residences and the same applies to commercial relocations. Taking this into account, the overall right of way impact of Alternative 2 is comparable to that of Alternative 3. Therefore, when comparing Alternative 2 and Alternative 3, the main factors that come into play for choosing a preferred alternative are the construction cost and determining which of these two different routes better addresses the traffic issues along US 60 and best meets the overall traffic needs of the area. Based on these two factors, Alternative 3 offers the best solution to Ashland's transportation problems at a lower construction cost.

Alternative 2 finished last in the evaluation process. In addition, Alternative 2 did not receive public support at the second public meeting (only Alternative 1 received less support). The ACAT unanimously voted against Alternative 2. Therefore, Alternative 3 is recommended for further consideration.

There are some issues that must be considered during subsequent phases of study for Alternative 3. With respect to the beginning point, Alternative 3A is much more expensive than Alternative 3B. The large cut at the beginning of Alternative 3A drives up the cost by more than $13 million compared to Alternative 3B. Any Alternative 3 combination will be much less expensive using Alternative 3B at the beginning. As for the alternative ending points studied, Alternatives 3C, 3D and 3E involve significantly less right of way impacts than Alternative 3A. The Alternative 3A corridor, the closest to downtown Ashland, takes 12 apartment complex buildings that are unaffected by the other alignment options, as well as two large commercial buildings near its intersection with US 23.

From all the options analyzed in this study, the preferable Alternative 3 options with respect to construction cost and right of way impacts are 3B-3C, 3B-3D and 3B-3E. From all these, Alternative 3B-3C seems to offer the best solution because it would end the new connector road at an existing busy intersection closer to downtown than the other alternatives. If option 3B-3D were to be built, it would result in a series of three signals closely spaced along US 23 that would further disrupt through traffic along this route. At any rate, selecting the best of these three options will only be possible after further studies are conducted for each of these routes using more accurate mapping.

Alternative 5 should be implemented once Alternative 3 is constructed and open to traffic. Output from the regional travel demand model suggests restriping the narrower four-lane section of US 60 north of Rose Hill Cemetery would be feasible if significant portions of the traffic along that corridor were diverted elsewhere. However, there are no feasible alternatives currently available that could carry the additional traffic. Once Alternative 3 is available, some of the traffic from existing US 60 will move to that route, making the restriping feasible.