KY 715 Alternatives Study

Item No. 10-8200.00

Wolfe County

FINAL REPORT

February 2010

Kentucky
UNBRIDLED SPIRIT

KENTUCKY TRANSPORTATION CABINET

ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

KENTUCKY TRANSPORTATION CABINET

KY 715 ALTERNATIVES STUDY, WOLFE COUNTY

Reconstruction/Relocation of KY 715
from KY 11 in Wolfe County
to the Bert T. Combs Mountain Parkway in Wolfe County

February 2010

The Kentucky Transportation Cabinet (KYTC) has undertaken this planning study to gather information and to develop and evaluate alternatives for the possible reconstruction or relocation of a portion of KY 715 from KY 11 near the Lee County line to the Bert T. Combs Mountain Parkway in Wolfe County.

KY 715 is functionally classified as a Rural Major Collector and is a State Secondary route. This portion of KY 715 is a two-lane undivided highway with narrow lanes, narrow shoulders, many horizontal and vertical curve deficiencies, and poor passing sight distance. Since KY 715 closely follows the hilly to mountainous terrain, there are many sharp curves and steep grades that do not meet current state design guidelines for rural collectors. This includes 28 (87.5%) of the 32 horizontal curves and 45 (91.8%) of the 49 vertical curves along the study segment that do not meet minimum design guidelines.

Project Purpose and Need

The primary purpose of the proposed KY 715 project is to improve connectivity between KY 11 and the Mountain Parkway. While KY 715 has geometric deficiencies, both KY 11 and KY 15 at the Mountain Parkway, the two proposed project termini, are constructed to higher design standards. Therefore, KY 715 is currently incompatible with the two major facilities it connects. Connectivity can be improved by addressing geometric deficiencies on KY 715, increasing safety on KY 715, and improving access to the Mountain Parkway.

The following secondary goals could provide additional benefits:

- Continue the London to Ashland Corridor;
- Improve access to area attractions;
- Accommodate bicycles/pedestrians; and
- Provide mobility/relief due to major incidents along I-75.

Typical Corridor View along KY 715

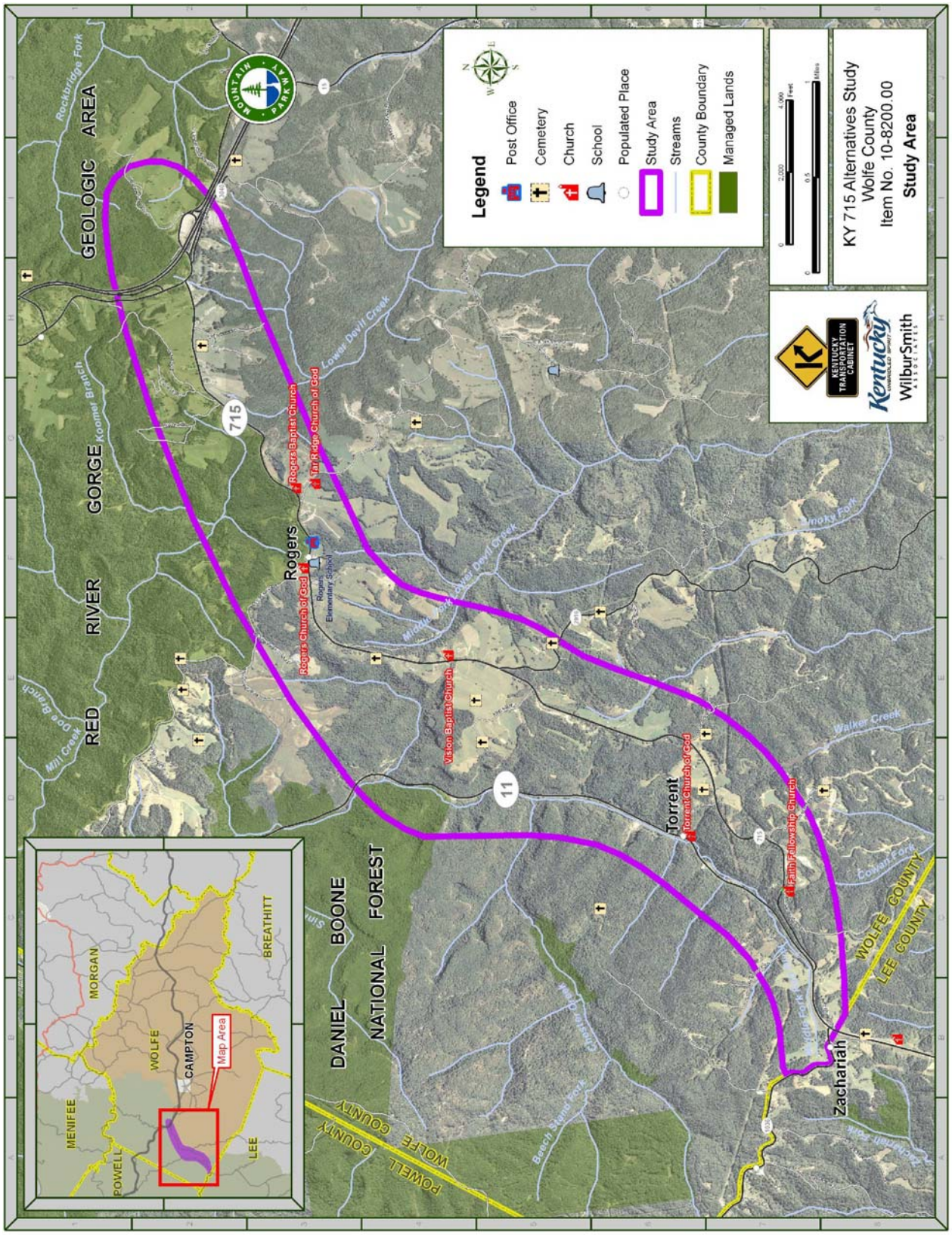
Traffic Characteristics

Existing traffic volumes along KY 715 in the study area range between 235 to 2,760 vehicles per day (vpd). Existing truck percentages are approximately 9 percent of the total traffic along the study route. The study portion of KY 715 operates at Level of Service (LOS) A near KY 11 and LOS C for the remainder of the route.

Assuming no transportation improvements, the 2030 average daily traffic (ADT) is estimated to range from 370 near KY 11 to 4,400 vpd near Rogers Elementary School, based on a historic compounded annual growth rate. KY 715 is expected to continue operating at LOS A and C.

Crash Data

Crash records were obtained for major state routes for a five-year period from 2002 to 2006. The Critical Rate Factor (CRF) was used to compare the frequency of crashes to average crash rates on similar roads in the state. A CRF greater than 1.00 indicates that crashes may not be due to random circumstances. Two high crash spots were found along the southern portion of KY 715, including the intersection of KY 715 and KY 15.


Legend
Post Office
Cemetery
Church
School
Populated Place
Study Area
Streams
County Boundary
Managed Lands
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Study Area
KENTUCKY TRANSPORTATION CABINET
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GEOLOGIC AREA
RED RIVER GORGE
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Rogers
Torrent
Zachariah
Rockbridge Fork
Koomer Branch
Lower Devil Creek
Middle Fork Lower Devil Creek
Walker Creek
Cowan Fork
Beech Stand Fork
Mill Creek
Dee Branch
Rogers Church of God
Rogers Baptist Church
Tar Ridge Church of God
Vision Baptist Church
Torrent Church of God
Faith Fellowship Church
WOLFE COUNTY
LEE COUNTY
POWELL COUNTY
715
11
MORGAN
MENIFEE
POWELL
WOLFE
CAMPTON
LEE
BREATHITT
Map Area

Environmental Issues

A number of environmental factors and sensitive land uses were identified through the course of this study, including:

- Portions of the Daniel Boone National Forest, DBNF, are in the study area. Its boundary is on the western edge of KY 715
- Considerable tourist traffic uses KY 715 due to the close proximity of the DBNF, Natural Bridge State Park, and Red River Gorge.
- Another major attraction and sensitive resource is Muir Valley Nature Preserve, a privately-owned preserve and well-known rock climbing venue.
- Middle Fork Red River is designated as a cold water habitat and thus, is a Special Resource Water and should be avoided.
- Potential habitats exist for threatened and endangered species, including the Indiana bat, Virginia big-eared bat, gray bat, and white-haired goldenrod.
- Hazardous materials or UST sites are located in the study area.
- Several cemeteries are located throughout the corridor.
- There is a small wastewater treatment plant in the Rogers area.
- There is minimal farmland and no prime farmland in the study area.
- There is potential disruption to services in the Rogers community which could be detrimental since there are no other similar services or amenities nearby.
- Rogers Elementary School is located on existing KY 715.
- The study area clips the Red River Gorge National Historic District at its most northern and eastern point.
- Potential historic and archaeological sites may exist. However, it appears that most structures would not be eligible for the National Register of Historic Places.
- One potential historic structure is an abandoned railroad tunnel beneath KY 715 at approximately Milepoint 1.100.
- Numerous oil and gas wells are located in the study area. Many are abandoned and not identifiable in the field. Therefore, encountering an active or abandoned well within the study area is possible.

Typical Cliff line Habitat in study area

Public Involvement

A public meeting was held on January 29, 2008 during the first round of public involvement. Survey responses from the first public meeting indicated that 84% of the respondents believe that KY 715 needs to be improved.

Preserving homes, personal properties, and business and commercial properties were primary concerns to the public. Also mentioned often as primary concerns were churches, cemeteries, Rogers School, farmland, and scenic areas.

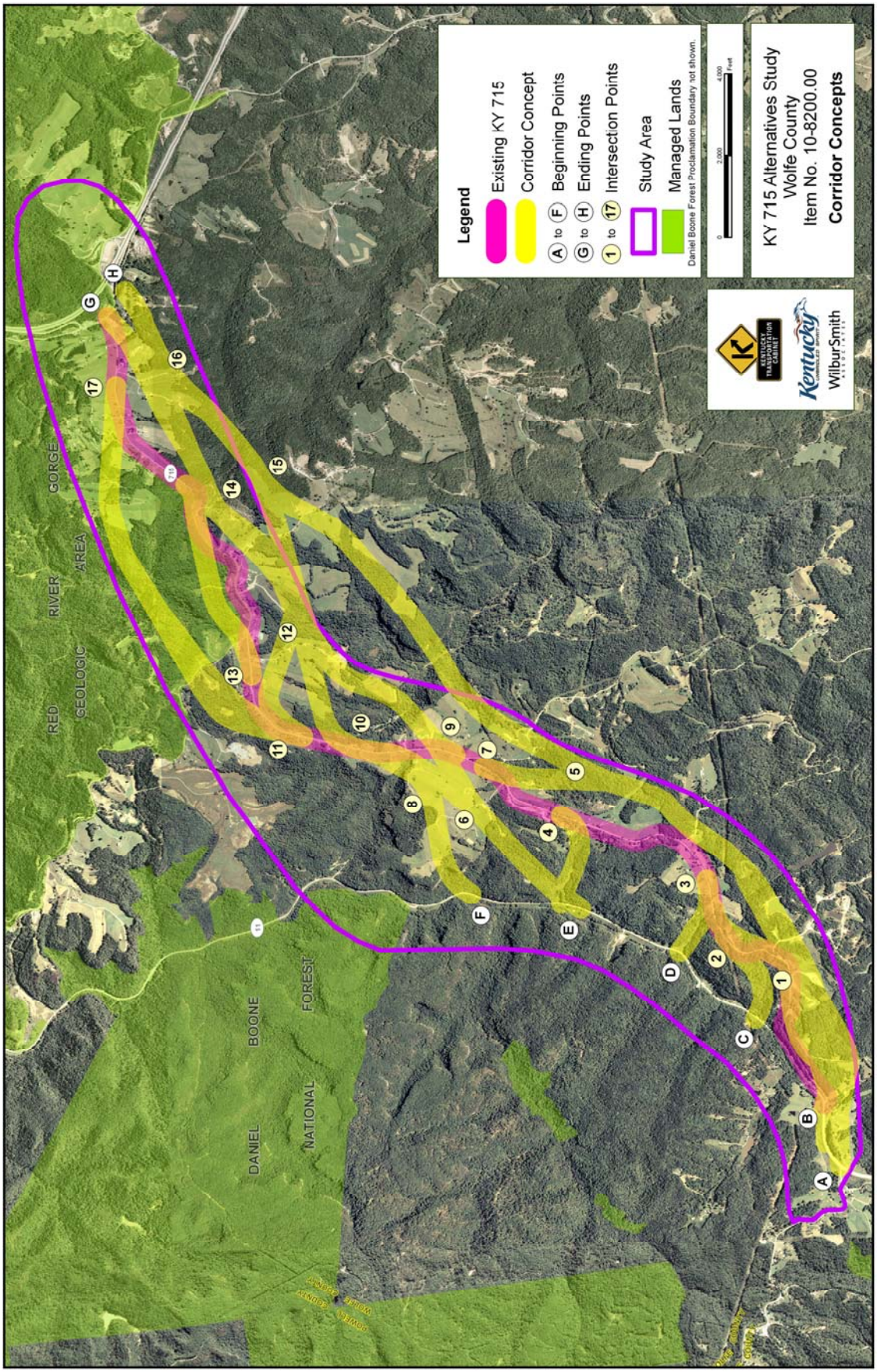
The top five transportation problems along KY 715 were identified as sharp curves, narrow shoulders, large trucks, poor visibility, and high speeds. Several specific problem locations were identified by attendees, and these were considered during the study.

Alternatives Evaluation Process

Initially, 14 corridor concepts and 10 potential spot improvements were developed. A map of the corridor concepts is shown on the following page.

A tiered evaluation process was undertaken to evaluate the proposed alternatives. First, the corridor concepts were analyzed as part of a Level 1 Screening process using preliminary information and the project purpose and goals to perform a quantitative and qualitative evaluation. Findings were presented to the project team, and 11 of the corridor concepts were not recommended for further study because they did not adequately meet the Level 1 criteria.

This resulted in three corridor alternatives, and one Practical Solution alternative (Alternative 1P) for further consideration.


Legend
Existing KY 715
Corridor Concept
A to F Beginning Points
G to H Ending Points
1 to 17 Intersection Points
Study Area
Managed Lands
Daniel Boone Forest Proclamation Boundary not shown.
KY 715 Alternatives Study
Wolfe County
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Corridor Concepts
WilburSmith
Kentucky
DANIEL BOONE NATIONAL FOREST
RED RIVER GEOLOGIC AREA
CORGE

As part of the Level 2 Screening process, environmental and geotechnical assessments were then conducted for the remaining four Alternative Corridors, a Spot Improvements Alternative, and the No Build Alternative.

Local citizens, public officials, and representatives of government resource agencies were then given the opportunity to react to the proposed improvement alternatives through a second round of public involvement activities.

Results of the Level 2 Screening were summarized and presented to the project team for discussion.

Recommendations

The result of the final project team meeting was the recommendation of two "build" alternative corridors for consideration in the next phase of project development.

- Alternative C: Combination of a new route from KY 11 to existing KY 715 (north of KY 2016) and then improve along existing KY 715 to KY 15.
- Alternative A: Improve KY 715 along the existing roadway.

Maps showing these two alternatives are located on the following pages.

Alternative C is the most cost-effective, full-build alternative since it utilizes much of existing KY 11, which would not be reconstructed. However, Alternative A would address all of the deficiencies along the study corridor. While Alternative A or C could be built to "practical design" standards, Alternative A may be the most "practical solution," which is an important KYTC initiative.

The location of the new portion of Alternative C should be adjusted to give KYTC more flexibility to minimize impacts (to homes, personal property, and the environment) and maximize benefits (constructability and cost).

Each alternative was divided into individual construction segments, which were then prioritized.

Consideration should be given to partial access-control of any portion of the proposed improvement that is on new alignment.

Typical Section

Two cross-sections were used to prepare planning level cost estimates: one that would fully comply with KYTC design guidelines and one that is consistent with KYTC's current "practical solutions" initiative, as follows:

- The first cross-section assumed two 12-foot wide lanes, turn lanes at major intersections, 8-foot wide shoulders (with 6-foot paved) and a 10-foot wide clear zone for rural areas. For planning purposes, an urban section was assumed for the community of Rogers with 12-foot wide lanes, 4-foot wide sidewalks and 2-foot curb and gutters.
- The second cross-section (i.e., the "practical solution" option) assumed two 11-foot wide lanes, 4-foot wide shoulders (with 2-foot paved), and a 6-foot wide clear zone in rural areas. The urban section would include 11-foot wide lanes, 4-foot wide sidewalks, and 2-foot curb and gutters through Rogers.

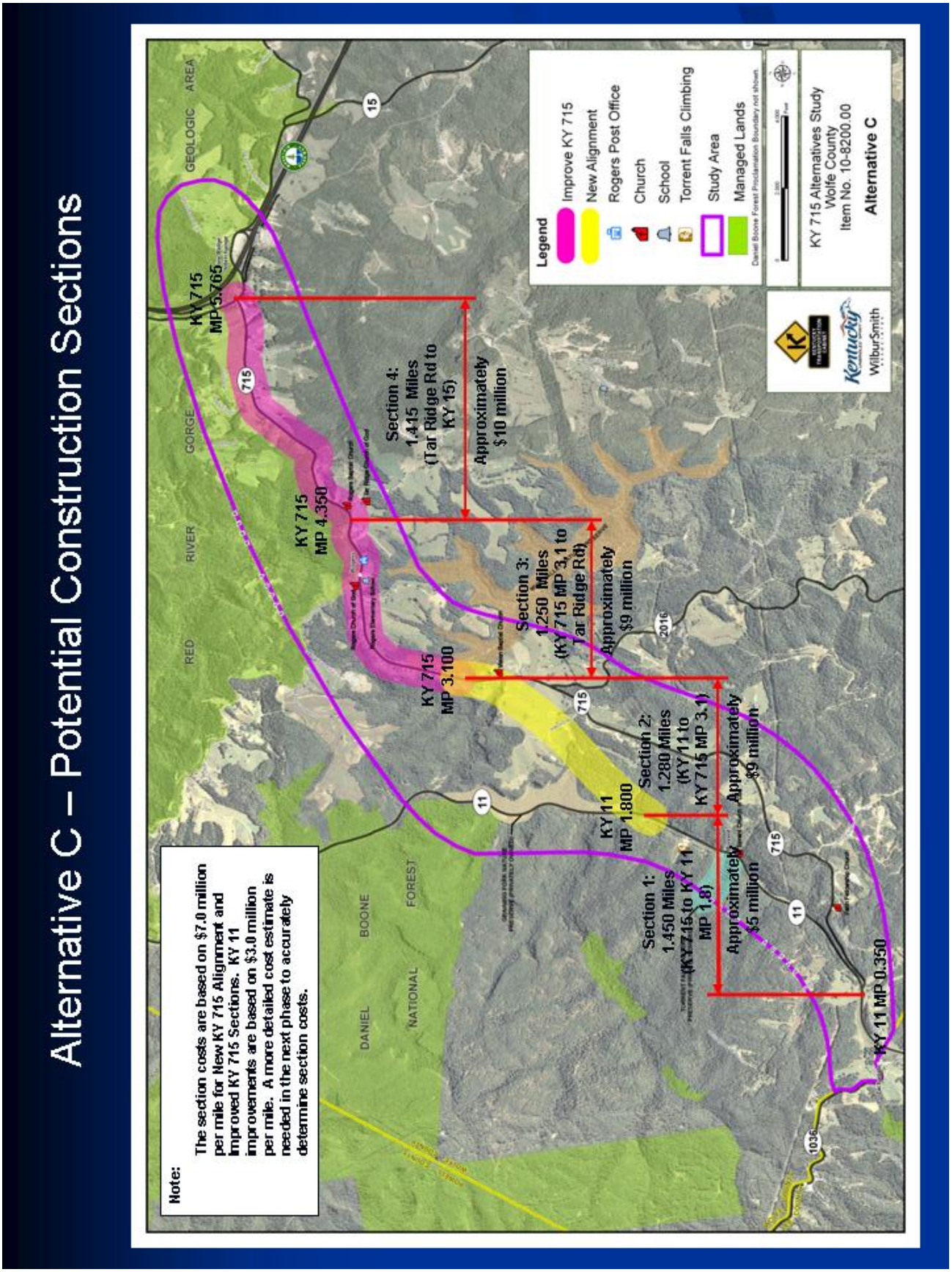
While these may provide some guidance, it is recommended that the typical section be further considered in the next phase. This would depend in part on a KYTC decision regarding the future importance of KY 715 as part of the London to Ashland corridor. Therefore, specific geometric parameters should be defined during future design phases of the project as more detailed information becomes available.

Cost Estimates

For Corridor Alternative A, the cost estimate to meet full design guidelines is approximately $41 million, and the cost estimate for a "practical solution" option is $34 million, as shown below:

KY 715 Cost Estimate: Alternative A (2009 $)

Phase of Project Development	Full Design	Practical Solution
Design	$4,000,000	$3,000,000
Right-of-Way	$5,000,000	$4,000,000
Utility Relocation	$3,000,000	$3,000,000
Construction	$29,000,000	$24,000,000
Total	**$41,000,000**	**$34,000,000**


Alternative C – Potential Construction Sections
Note:
The section costs are based on $7.0 million per mile for New KY 715 Alignment and Improved KY 715 Sections. KY 11 improvements are based on $3.0 million per mile. A more detailed cost estimate is needed in the next phase to accurately determine section costs.
KY 715 MP 5.765
KY 715 MP 4.350
KY 715 MP 3.100
KY 11 MP 1.800
KY 11 MP 0.350
Section 1: 1.450 Miles (KY 715 to KY 11 MP 1.8)
Approximately $5 million
Section 2: 1.280 Miles (KY 11 to KY 715 MP 3.1)
Approximately $9 million
Section 3: 1.250 Miles (KY 715 MP 3.1 to Tar Ridge Rd)
Approximately $9 million
Section 4: 1.415 Miles (Tar Ridge Rd to KY 15)
Approximately $10 million
Legend
Improve KY 715
New Alignment
Rogers Post Office
Church
School
Torrent Falls Climbing
Study Area
Managed Lands
Daniel Boone Forest Proclamation Boundary not shown
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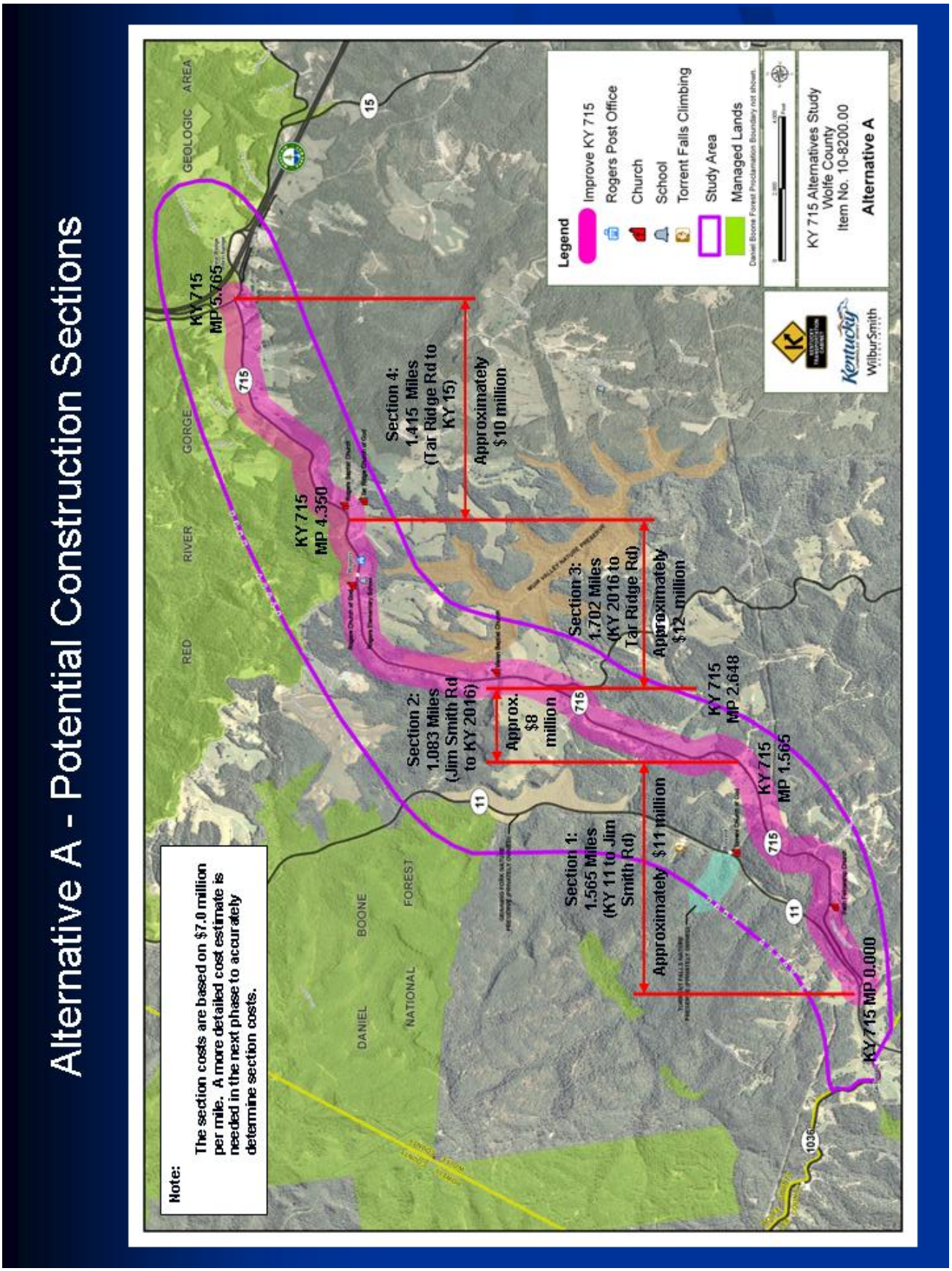
Alternative C
Kentucky
WilburSmith
GEOLOGIC AREA
GORGE
RIVER
RED
DANIEL BOONE NATIONAL FOREST


Alternative A - Potential Construction Sections
Note:
The section costs are based on $7.0 million per mile. A more detailed cost estimate is needed in the next phase to accurately determine section costs.
Legend
Improve KY 715
Rogers Post Office
Church
School
Torrent Falls Climbing
Study Area
Managed Lands
Daniel Boone Forest Proclamation Boundary not shown.
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Alternative A
Kentucky
WilburSmith
KY 715 MP 5.765
KY 715 MP 4.350
KY 715 MP 2.648
KY 715 MP 1.565
KY 715 MP 0.000
Section 1: 1.565 Miles (KY 11 to Jim Smith Rd)
Approximately $11 million
Section 2: 1.083 Miles (Jim Smith Rd to KY 2016)
Approx. $8 million
Section 3: 1.702 Miles (KY 2016 to Tar Ridge Rd)
Approximately $12 million
Section 4: 1.415 Miles (Tar Ridge Rd to KY 15)
Approximately $10 million
DANIEL BOONE NATIONAL FOREST
RED RIVER GORGE GEOLOGIC AREA
11
15
715
1036

For Corridor Alternative C, the cost estimate to meet full design guidelines is approximately $33 million, and the cost estimate for a "practical solution" option is $26 million, as shown below:

KY 715 Cost Estimate: Alternative C (2009 $)

Phase of Project Development	Full Design	Practical Solution
Design	$3,000,000	$3,000,000
Right-of-Way	$4,000,000	$3,000,000
Utility Relocation	$3,000,000	$3,000,000
Construction	$23,000,000	$17,000,000
Total	**$33,000,000**	**$26,000,000**

No funds are scheduled at this time in the Six-Year Plan for the design or construction of this project.

Construction Sections

For Corridor Alternative A, preliminary construction sections are as follows (priorities in parentheses):

- Section 1 – From KY 11 to Jim Smith Road (Priority 1)
- Section 2 – From Jim Smith Road to KY 2016 (Priority 3)
- Section 3 – From KY 2016 to Tar Ridge Road (Priority 4)
- Section 4 – From Tar Ridge Road to KY 15 (Priority 2)

For Corridor Alternative C, suggested construction priorities are as follows (priorities in parentheses):

- Section 1 – Minor widening on KY 11 from KY 715 to approximately 1.800 (Priority 4)
- Section 2 – From KY 11 to/just north of KY 2016 at about MP 3.100 (Priority 1)
- Section 3 – From KY 2016 or MP 3.1 to Tar Ridge Road (Priority 3)
- Section 4 – From Tar Ridge Road to KY 15 (Priority 2)

These construction sections and priorities are presented here as guidance for the next phase of project development. However, it is recommended that the final termini and priorities for construction sections should be determined in the next phase, depending on the selected alternative and based on more detailed information.

Spot Improvements

Concurrent with the recommendation for Alternatives A and C, lower cost, short-term spot improvements were prioritized, as follows:

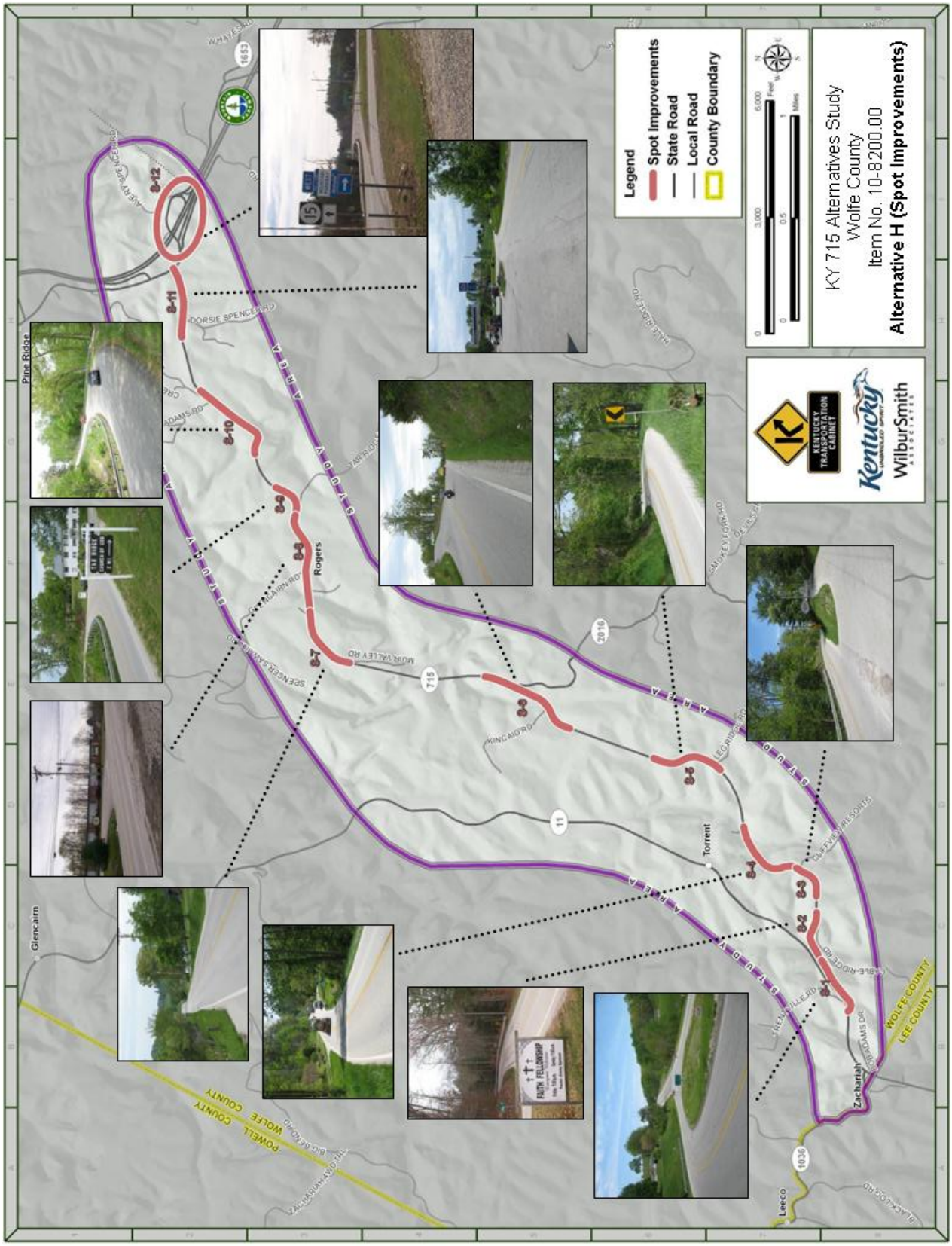
1. Spot S-10: Spruce Gap Curve - Includes Booth Road Intersection
2. Spot S-8: Includes Glencairn Road Intersection
3. Spot S-6: Includes Intersection with Kincaid Road and KY 2016
4. Spot S-2: Includes Cable Ridge Road Intersection
5. Spot S-3: South of entrance to Cliffview Resorts
6. Spot S-5: Includes intersection with Leg Ridge Road
7. Spot S-4: North of entrance to Cliffview Resorts
8. Spot S-9: Includes Tar Ridge Road Intersection
9. Spot S-1: Includes KY 11 and Trentville Road Intersections
10. Spot S-7: South of Glencairn Road
11. Spot S-11: Includes KY 15 Intersection

These are recommended for implementation as funds become available, if full implementation of the corridor improvement is delayed. Any such improvements should be implemented to be consistent with a future improvement of the entire KY 715 segment, as applicable.

A map of the spot improvements is located on the following page. The total cost for all the recommended spot improvements is approximately $22.8 million.

Spot S-12, improving the KY 15/Mountain Parkway interchange (Exit #40), ranked near the bottom of the public survey. Therefore, it does not appear to be a major concern for local residents and highway users.

The KYTC should continue to review these spot improvement locations and should have the flexibility to revise the project description and/or the priorities in the future, as needed, based on the level of available funds and changing conditions over time.


Legend
Spot Improvements
State Road
Local Road
County Boundary
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Alternative H (Spot Improvements)
Kentucky
KENTUCKY TRANSPORTATION CABINET
WilburSmith
Pine Ridge
Rogers
Glencairn
Torrent
Zachariah
Leeco
WOLFE COUNTY
LEE COUNTY
POWELL COUNTY
715
11
1036
1653
2016

Construction Considerations

A number of issues were identified through the course of this study that should be considered in future design and construction phases, as follows:

- Erosion and Sediment Control: Measures should be utilized to control erosion and sedimentation during and after the commencement of earth-disturbing activities. A *Best Management Practices for Construction Activities* guide is available from the Kentucky Division of Conservation.
- Air Quality: According to the Kentucky Environmental and Public Protection Cabinet, Division of Air Quality, the following Kentucky Administrative Regulations apply to the proposed project: (1) 401 KAR 63:010 Fugitive Emissions; (2) 401 KAR 63:005 Open Burning; (3) the Clean Air Act; and (4) Title 23 and Title 49 of the United States Code. Applicable local government regulations should also be considered.
- Waste Management: Solid wastes that occur as part of the construction process should be disposed of at a permitted facility. Underground storage tanks and other contaminants should be properly addressed as they are encountered.
- Traffic Operations: Maintenance of traffic and residential access should be preserved throughout the construction process.
- Geotechnical Considerations: The project may encounter pre-landslide or post-landslide hazards. Also, some sandstones and siltstones will crumble where they are uncemented. Cut slopes in the Corbin Sandstone may be required to be flatter than normal because of the sandstone being poorly cemented and friable. Erosion of exposed slopes is also of concern.
- Oil and Gas Wells & Abandoned Mines: There are numerous oil wells and gas wells in the area, as well as potential underground voids left from previous deep mining activity.
- Abandoned Railroad Tunnel: The abandoned tunnel that runs under existing KY 715 may have stability issues related to the material over the tunnel.

Information

Additional information regarding the KY 715 Alternatives Study can be obtained from the following KYTC Division of Planning staff members:

- Keith Damron, P.E., Director
- Steve Ross, P.E., Branch Manager
- Jill Asher, P.E., Team Leader
- Charlie Spalding, Project Manager

The following address and phone number can be used to reach these individuals:

Division of Planning
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622
Phone: (502) 564-7183

Study documents can be viewed at the following website:

http://www.planning.kytc.ky.gov/planning_studies.asp

KY 715 ALTERNATIVES STUDY

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LIST OF APPENDICES (ON CD)

1. INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) has undertaken this Alternatives Study to develop and evaluate alternatives for a proposed improvement of KY 715 in Wolfe County, Kentucky from KY 11, near the Lee County line, to the Mountain Parkway (see **Figure 1.1**).

The purpose of this study is to:

- Identify known issues, concerns, and constraints, including safety, traffic, social, environmental, and geotechnical considerations;
- Develop the preliminary project "purpose and need" and other goals for the proposed project;
- Listen to and share information with local officials, government agencies, other interested parties, and the public;
- Establish logical termini for the proposed project;
- Develop and evaluate project alternatives based on project purpose and need, including the "No Build" altenative, spot improvements along the existing route, possible changes to the KY 15-Mountain Parkway interchange, and "Build" alternatives for reconstruction or relocation; and
- Make project recommendations.

Through this Alternatives Study, the KYTC ensures that future improvements to KY 715 will address identified transportation needs and that project development decisions are compatible with federal requirements as defined in the National Environmental Policy Act (NEPA).

A. Background

The KY 715 Alternatives Study was identified as Item No. 10-8200.00 in a May 5, 2006 Addendum to the February 2005 Recommended Six-Year Highway Plan FY 2005-2010 (generally referred to as the Six-Year Plan). This project was characterized as a "Scoping Study" and described as a "design study for KY 715 between Zachariah and the Mountain Parkway." KY 715 is a link in the proposed "London to Ashland Corridor", for which a programming study was conducted by the KYTC Division of Planning in July 2006.

B. Project Location

The proposed project is located in southeastern Kentucky south of the Mountain Parkway just west of the KY 15-Mountain Parkway split (Exit 43) near Campton.

The study area, shown in **Figure 1.1**, lies within Wolfe County, Kentucky, with the southern terminus at KY 11 just north of the Wolfe-Lee County Line and the northern terminus at or near the KY 15-Mountain Parkway interchange (Exit 40).

Wolfe County is a predominantly rural county with a population of about 7,000. The county seat is Campton, located about 5 miles from the study corridor. The small community of Rogers is located along KY 715. While not a census-designated place, Rogers does have a post office, an elementary school, several homes, and a few small businesses.

KY 715 represents the eastern boundary of the Daniel Boone National Forest proclamation boundary, and it is located just east of the Red River Gorge and about three miles east of Natural Bridge State Park.

The terrain in the study area is hilly to mountainous with clifflines on either side of portions of existing KY 715.

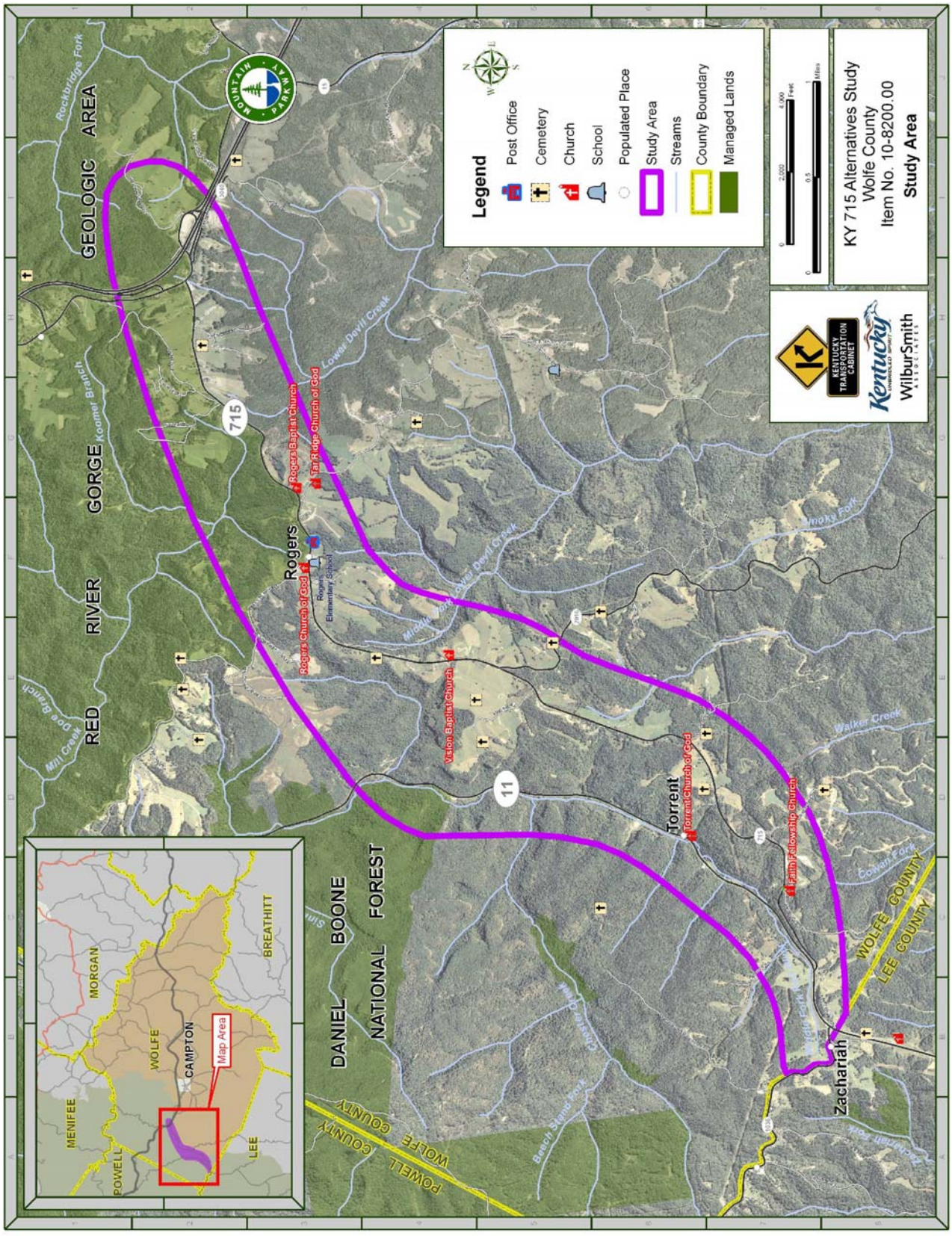


Figure 1.1 – Study Area

C. Programming and Schedule

The KY 715 study was funded in the FY 2005-2010 Six-Year Highway Plan with committed planning funds of $250,000.

Subsequent phases of project development, including Design, Right-of-Way Acquisition, Utility Relocation, and Construction, are not scheduled in the most recent approved Six-Year Highway Plan.

2. EXISTING CONDITIONS

Characteristics of KY 715 and the other state highways in the study area (see **Figure 1.1**) are identified in the following sections. Information is included about highway systems, geometric characteristics, bridges, traffic conditions, crash history, and planned highway improvements. Roadway information is summarized from the KYTC Highway Information System (HIS) database. Photographs of some features in the study area are contained in **Appendix A**.

Major route segments considered in this analysis are presented in **Table 2.1**. These four routes are the primary traffic carriers and were, therefore, deemed most important to the overall transportation system within the study area. In addition, portions of these roadways would be directly affected by or linked to any proposed KY 715 improvement in Wolfe County from KY 11 near Zachariah to KY 15 and the Bert T. Combs Mountain Parkway (KY 9000).

Table 2.1 – Major Study Area Routes

Route	Begin MP	End MP
KY 715	0.000	5.975
KY 11	0.000	3.500
KY 15	13.200	14.500
Mountain Parkway (KY 9000)	39.700	41.000

A. Highway Systems

Highway systems information for these major route segments is shown in **Table 2.2**, including the State Primary Road System, Functional Classification System, National Highway System (NHS), National Truck Network (NN), Designated Truck Weight Class, and others. Major highway systems information is summarized here:

- State-maintained roads in Kentucky are categorized under the State Primary Road System, ranging from the highest order classification to the lowest as follows: State Primary Routes, State Secondary Routes, Rural Secondary Routes, and Supplemental Roads.

  The study portion of KY 715 is currently classified as a State Secondary Route.

  State Secondary Routes are those routes which are considered to be shorter distance routes of regional significance with both access to land use activity and mobility as their functions. These routes generally serve smaller cities and county seats within a region.

- One of 13 functional classification categories is assigned to each state-maintained road in Kentucky, based on the function that each road provides and whether it is an urban or rural road. These are classified from highest to lowest function and by geographic designation as: Rural Interstate, Urban Interstate, Other Rural Freeways and Expressways (Principal Arterial), Other Urban Freeways and Expressways (Principal Arterial), Other Rural Principal Arterial, Other Urban Principal Arterial, Rural Minor Arterial, Urban Minor Arterial, Rural Major Collector, Rural Minor Collector, Urban Collector, Rural Local, and Urban Local.

  The study portion of KY 715 is currently classified as a Rural Major Collector.

- The NHS includes the Interstate Highway System and other significant Principal Arterial roads important to the nation's economy, defense, and mobility. In the study area, the only NHS route is the Mountain Parkway.

Table 2.2 – Highway Systems
KY 715 Alternatives Study
KYTC Item No. 10-8200.00

State Primary System	National Truck Network (NN)	National Highway System (NHS)	Functional Classification	Truck Weight Class	Appalachian Development Highway System	Bike Route	Coal Haul (annual tons)	Extended Weight System	Forest Highway System	Scenic Byway System
KY 715: MP 0.000 to MP 5.975										
State Secondary	No	No	Rural Major Collector	AAA	No	Yes [1]	None	No	No	No
KY 11: MP 0.000 to MP 3.500										
State Primary	No	No	Rural Minor Arterial	AAA	No	Yes [1]	55,453	Yes	No	Yes [2]
KY 15: MP 13.200 to MP 14.500										
State Secondary	No	No	Rural Major Collector	AAA	No	Yes [1]	None	No	No	No
KY 9000/Bert T. Combs Mountain Parkway: MP 39.700 to MP 41.000										
State Primary	Yes	Yes	Rural Principal Arterial	AAA	Yes	No	5,977	Yes	No	No

Source: KYTC HIS database, October 2007
[1] Midland Kentucky Tour
[2] Red River Gorge Scenic Byway

- The NN includes roads specifically designated for use by commercial trucks with increased dimensions (102 inches wide; 13 feet, 6 inches high; semi-trailers up to 53 feet long; and trailers up to 28 feet long – not to exceed two trailers per truck).

  In the study area, the only NN route is the Mountain Parkway.

- Kentucky Revised Statutes impose weight limits on the state-maintained highway system. There are three weight classification limits: AAA – 80,000 lbs. maximum gross vehicle weight; AA – 62,000 lbs. maximum gross vehicle weight; and A – 44,000 lbs. maximum gross vehicle weight. [NOTE: For special circumstances, occasional exceptions may be granted for over-dimensional or overweight vehicles by permits issued by the KYTC, Division of Motor Carriers.]

  The study portion of KY 715 has a weight classification of AAA.

B. Geometric Characteristics

Geometric characteristics for major routes in the study area are shown in **Table 2.3**, including the number of lanes, lane widths, shoulder widths, percent sight passing distance, shoulder types, route speed limits, roadways type, local terrain, and pavement type. The study portion of KY 715 has the following characteristics:

- A combination of two 8 to 9 foot lanes
- 2-foot shoulders of either earth or combination type
- An undivided highway cross section
- Rolling
- Includes both High Flexible and Mixed Bituminous pavements
- Posted speed limits ranging from 35 to 55 mph

Typical lanes and shoulders along KY 715

C. Bridges

According to the KYTC, a bridge structure is eligible for federal rehabilitation funds when it meets two criteria: (1) the bridge has a sufficiency rating below 50.0 and (2) the bridge is considered either structurally deficient or functionally obsolete.

- Structurally deficient bridges are those which may not be able to carry the weight they were originally designed to carry.
- Bridges are considered functionally obsolete if they do not meet geometric current design standards.

There is one structure (Bridge No. B00026) located on KY 715 on the outer perimeter of the study area. This bridge, located at MP 5.975, is 240 feet long with a sufficiency rating of 92.1. It is not listed as structurally deficient or functionally obsolete in the KYTC State Bridge Inventory (March 2006). However, located on the northern side of KY 15, it provides an overpass of the Mountain Parkway and is not in the immediate study area.

One other bridge is located on a route of consideration for this study. Bridge No. B00053 is located along KY 9000 at MP 40.47 and provides an overpass of KY 15. According to the KYTC State Bridge Inventory (March 2006), this structure has a sufficiency rating of 67.9 and is functionally obsolete, but not structurally deficient.

Table 2.3 – Geometric Characteristics
KY 715 Alternatives Study
KYTC Item No. 10-8200.00

Begin MP	End MP	Length (miles)	Number of Lanes	Lane Width (feet)	Shoulder Width (feet)	Shoulder Type	% Passing Sight Distance	Speed Limit (mph)	Roadway Type	Terrain Type	Pavement Type
KY 715: MP 0.000 to MP 5.975											
0.000	5.765	5.765	2	9	2	Combination	0	55	Undivided	Rolling	High Flexible
5.765	5.975	0.210	2	8	2	Earth	0	35	Undivided	Rolling	Mixed Bituminous
KY 11: MP 0.000 to MP 3.500											
0.000	0.358	0.358	2	10	9	Bituminous	5	55	Undivided	Rolling	High Flexible
0.358	3.500	3.142	2	10	4	Bituminous	5	55	Undivided	Rolling	High Flexible
KY 15: MP 13.200 to MP 14.500											
13.200	14.048	0.848	2	9	2	Combination	6	55	Undivided	Rolling	High Flexible
14.048	14.500	0.452	2	10	2	Combination	N/A	55	Undivided	Rolling	High Flexible
KY 9000/Bert T. Combs Mountain Parkway: MP 39.700 to MP 41.000											
39.700	41.000	1.300	4	12	10	Bituminous	N/A	70	Divided	Rolling	Composite

Source: KYTC HIS database, October 2007

D. Traffic and Operational Measures

Existing (Year 2007) and estimated future (Year 2030) traffic and operational conditions for each major route in the study area have been identified and are discussed in the following subsections.

1. Existing Traffic Volumes (Year 2007)

Existing traffic volumes (Year 2007) for segments of the study area routes were summarized based primarily on information provided in the HIS database. Existing truck percentages were determined for the study area routes using HIS data and/or KYTC default values, which are based on the functional classification of the segment.

Year 2007 traffic characteristics for all major state routes in the study area are shown in **Table 2.4** and **Figure 2.1**.

Traffic volumes along KY 715 in the study area range from 235 to 2,760 vehicles per day (vpd). Existing truck percentages are approximately 9 percent of the total traffic along the study route.

2. Existing Level of Service (Year 2007)

The level of service (LOS) is a qualitative measure of highway traffic conditions, as defined in the *2000 Highway Capacity Manual* published by the Transportation Research Board. Individual levels of service characterize these conditions in terms of speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined and given letter designations from A to F, with LOS A as the best condition, representing free flow conditions, and LOS F as the worst condition, representing severe congestion and/or time delays. Typically, a minimum of LOS D is considered acceptable in urban areas and LOS C is considered acceptable in rural areas.

Northbound View of KY 715 Entrance to Rogers Elementary

Table 2.4 and **Figure 2.1** show the existing LOS for segments of each route in the study area. The study portion of KY 715 operates at LOS A near KY 11 to LOS C for the remainder of the route.

3. Estimated Future Traffic (Year 2030) Based on Historic Growth

Year 2030 traffic was estimated using historic growth rates based on KYTC's historic traffic counts for each study area route. Future transportation improvements were not taken into consideration.

Traffic along KY 715 was forecast with a compounded annual growth rate of 2.05 percent through Year 2030, resulting in an increase of nearly 60 percent from Year 2007 to Year 2030. Projected future year traffic volumes, as shown in **Table 2.4** and **Figure 2.2**, range from 370 vpd near KY 11 to 4,400 vpd near Rogers.

4. Estimated Future Level of Service (Year 2030) Based on Historic Growth

Level of Service is expected to remain the same along the study portion of KY 715 through the Year 2030, that is, LOS A near KY 11 and LOS C for the remainder of the route.

The estimated future LOS is shown for the study area in **Figure 2.2** and **Table 2.4**.

Table 2.4 – Traffic Characteristics
KY 715 Alternatives Study
KYTC Item No. 10-8200.00

Begin MP	End MP	2007 ADT	% Trucks	2007 LOS	Growth Rate	2030 ADT	2030 LOS
KY 715: MP 0.000 to MP 5.975							
0.000	2.648	1,130	8.6	C	2.05%	1,800	C
2.648	4.007	1,710	8.6	C	2.05%	2,730	C
4.007	5.765	2,760	8.6	C	2.05%	4,400	C
5.765	5.975	235	0.0	A	2.05%	370	A
KY 11: MP 0.000 to MP 3.500							
0.000	0.350	2,610	12.1	C	2.05%	4,160	C
0.350	3.500	1,740	10.7	B	2.05%	2,770	C
KY 15: MP 13.200 to MP 14.500							
13.200	14.048	545	8.0	B	2.05%	870	B
14.048	14.500	1,160	8.0	B	2.05%	1,850	C
KY 9000/Bert T. Combs Mountain Parkway: MP 39.700 to MP 41.000							
39.700	40.468	8,220	13.4	A	2.05%	13,110	B
40.468	41.000	8,220	13.4	A	2.05%	13,110	B

Source: KYTC HIS database, October 2007
Level of Service (LOS) calculations based on HCS+ software package

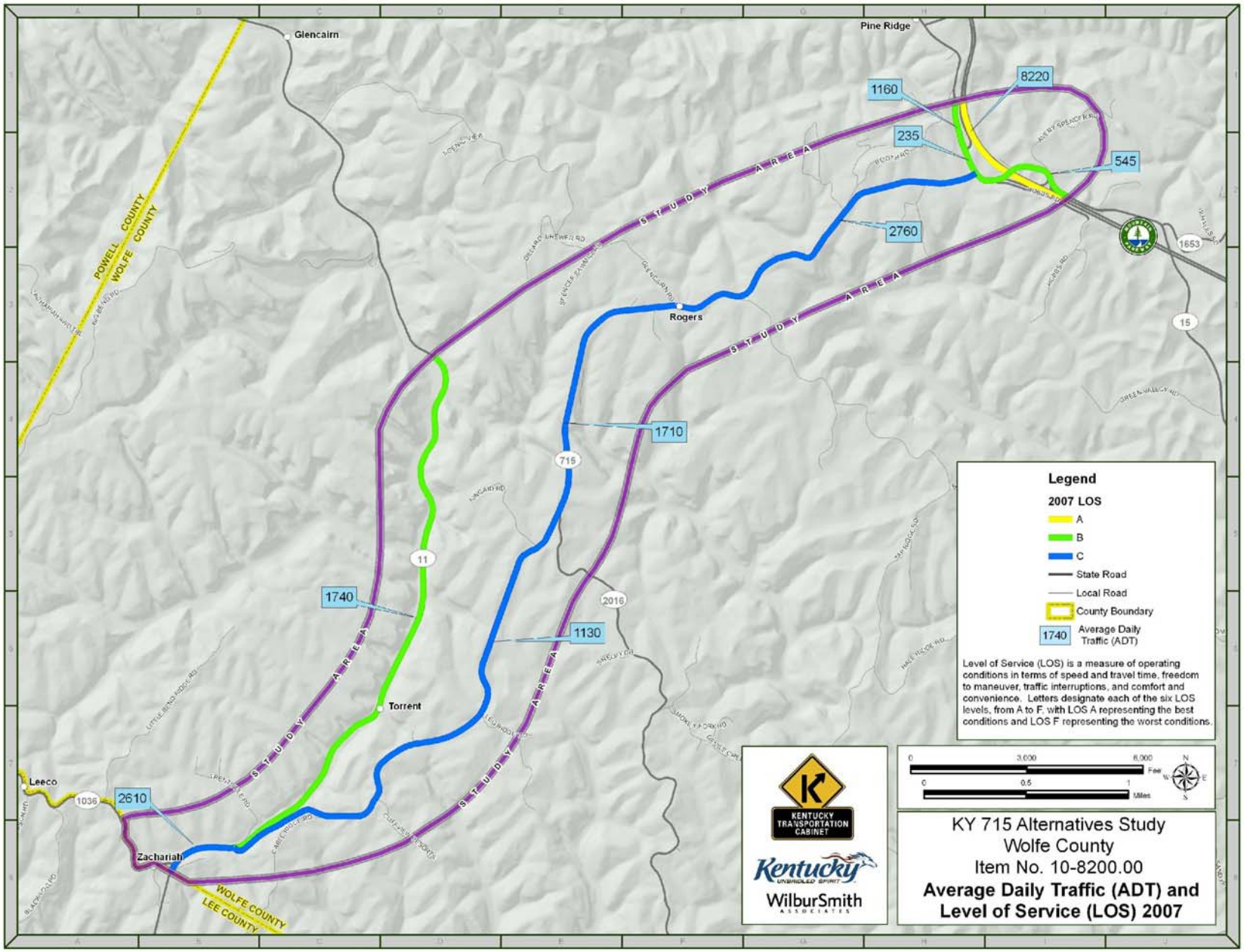


Figure 2.1 – 2007 Average Daily Traffic and Level of Service

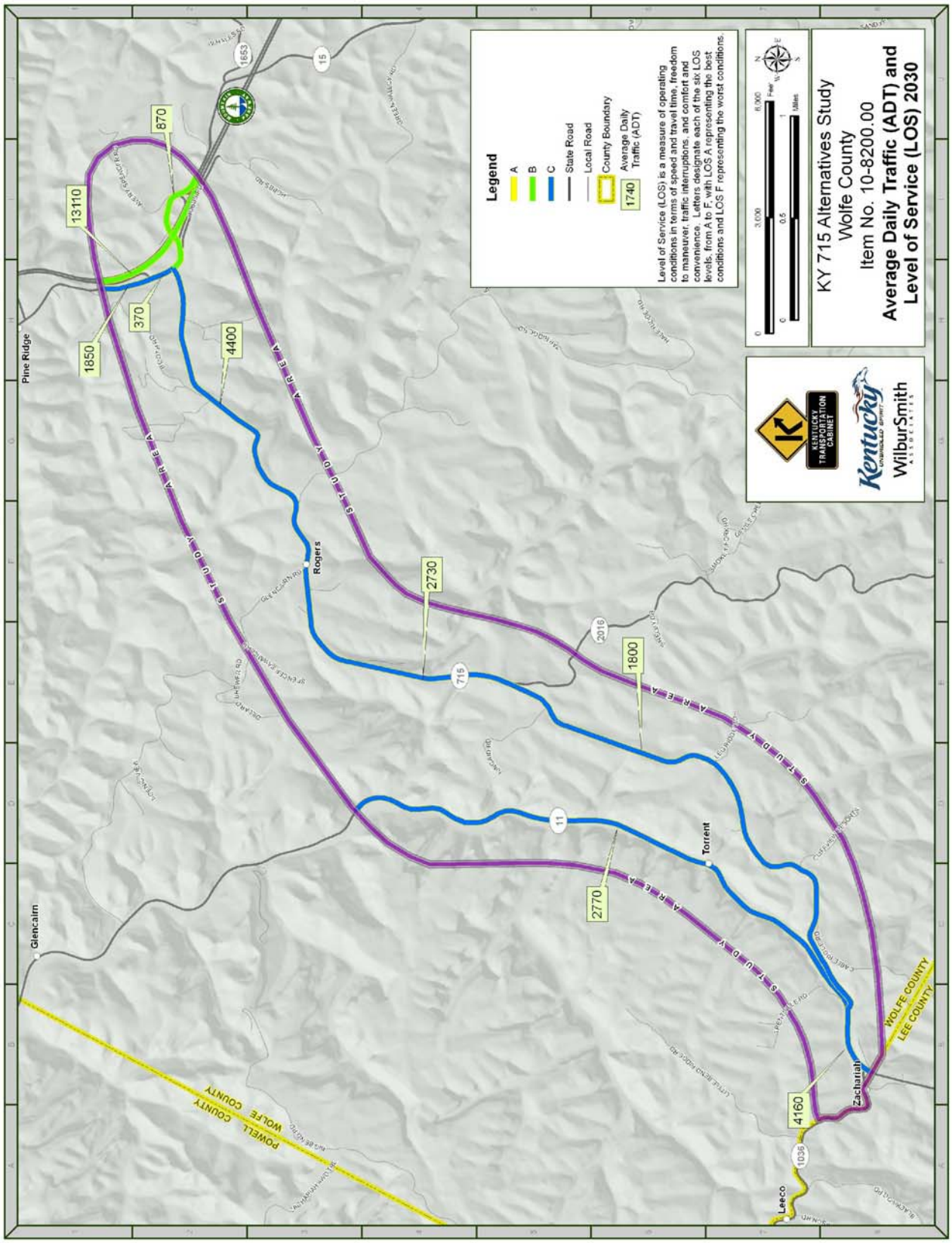


Figure 2.2 – 2030 Average Daily Traffic and Level of Service

E. Crash Analysis

Crash records were collected from KYTC for major state routes in the project area for a five year period (2002 to 2006). The location of crashes with valid milepoint designations in the KYTC database are shown by spots (0.1 miles length) and segment locations in **Table 2.5**. **Figure 2.3** displays the severity and location of crashes and the identified "high crash" segments and spots. A spot location or segment of roadway is considered to be a "high crash" location when its crash rate is higher than the average crash rate for similar roads in the state (usually based on functional classification). This is measured by the critical rate factor (CRF), which is the ratio of the crash rate to the average crash rate for similar roads. If the CFR is greater than 1.0, crashes may not be occurring randomly, so additional investigation is needed. The CFR calculation was based on formulas published by the Kentucky Transportation Center associated with the University of Kentucky.

As part of the crash analysis, each crash was classified into one of three categories based on the degree of severity: fatal, injury, or property-damage-only. During the period studied, there were five fatal, 16 injury (two incapacitating, ten non-incapacitating, four possible injury), and 29 property-damage-only crashes reported along KY 715 between KY 11 and the Mountain Parkway. Only events that occurred within the study area boundary are shown on **Figure 2.3**. Therefore, a fatal crash near the Mountain Parkway southbound exit to KY 715 is not shown.

Two high crash spots were identified along the southern portion of the study corridor. The intersection of KY 715 and KY 15 was determined to be a high crash spot and is part of the high crash segment identified between the KY 715/KY 15 intersection and the Mountain Parkway.

F. Adequacy Ratings

The KYTC HIS database provides an adequacy rating percentile for many major routes. The composite rating is based on the condition, safety, and service component scores of the route. The Condition Index is based solely on the condition of the road's pavement; the Safety Index is based on lane width, shoulder width, median widths, alignment, and critical CRF; and the Service Index is based on the volume-to-capacity (V/C) ratio and type of access control.

Table 2.6 and **Figure 2.4** depict adequacy ratings and percentiles assigned to major study area routes. For this study, the percentiles are grouped into four categories: 0 to 24.9; 25 to 49.9; 50 to 74.9; and 75 to 100. As shown, the adequacy ratings of routes in the study area are either in the lowest percentile (0 to 24.9%) or the second lowest (25 to 49.9%). Safety is the primary issue, followed by pavement condition. If a road or road segment falls into the lowest percentile group, a problem may exist at that location that merits further investigation.

G. Programmed Highway Improvements in the Study Area

While no improvements are programmed for this portion of KY 715, four other projects are programmed for Wolfe County in KYTC's *2008 Recommended Highway Plan*, as follows:

- $972,000 for design, right-of-way, utility relocation, and construction for bridge replacement on KY 191 over Red River at Hazel Green (Item No. 10-1086.00)
- $4.19 million for right-of-way and utility relocation for the reconstruction of KY 205 from the Breathitt County line to the Mountain Parkway (Item No. 10-8101.00)
- $260,000 for design on the hill and curve correction on KY-191 between Hazel Green and KY-205 (Item No. 10-8102.00)
- $170,000 for construction on route CR-1019 for the replacement of the bridge on Stovall Road (Item No. 10-8303.00)

Table 2.5 – Crash Segments and Spots
KY 715 Alternatives Study
KYTC Item No. 10-8200.00

Spot / Segment	Route	Location		Length	ADT	Crashes						CRF
		BMP	EMP			Fatal	Incap.	Non-incap.	Possible	PDO	Total	
KY 715: MP 0.000 to MP 5.975												
Segment	KY 715	0.000	2.648	2.648	1,130	2	2	4	2	11	21	0.93
Segment	KY 715	2.648	4.007	1.359	1,710	1	0	1	2	6	10	0.54
Segment	KY 715	4.007	5.765	1.758	2,760	1	0	5	0	11	17	0.51
Segment	KY 715	5.765	5.975	0.210	233	1	0	0	0	1	2	**1.06**
Spot	KY 715	1.000	1.100	0.100	1,130	0	1	1	0	1	3	**1.09**
Spot	KY 715	1.700	1.800	0.100	1,130	0	0	1	1	2	4	**1.46**
Spot	KY 715	2.700	2.800	0.100	1,710	0	0	1	0	2	3	0.88
Spot	KY 715	4.700	4.800	0.100	2,760	0	0	0	0	3	3	0.68
KY 11: MP 0.000 to MP 3.500												
Segment	KY 11	0.000	0.350	0.350	2,610	0	0	0	0	1	1	0.10
Segment	KY 11	0.350	5.200	4.850	1,740	1	3	4	1	8	17	0.32
KY 15: MP 13.200 to MP 14.500												
Segment	KY 15	13.100	14.048	0.948	545	0	0	1	2	7	10	**1.52**
Segment	KY 15	14.048	15.000	0.952	1,160	0	0	1	1	5	7	0.64
Spot	KY 15	14.000	14.100	0.100	800	0	0	0	0	4	4	**1.72**
Spot	KY 15	14.800	14.900	0.100	1,160	0	0	1	1	2	4	**1.44**
KY 9000/Bert T. Combs Mountain Parkway: MP 39.700 to MP 41.000												
Spot	Combs	40.000	40.100	0.100	8,220	0	0	2	0	3	5	**1.30**

Source: Crash records taken from CRASH database for 2002-2006
CRF Analysis procedure defined by Kentucky Transportation Center

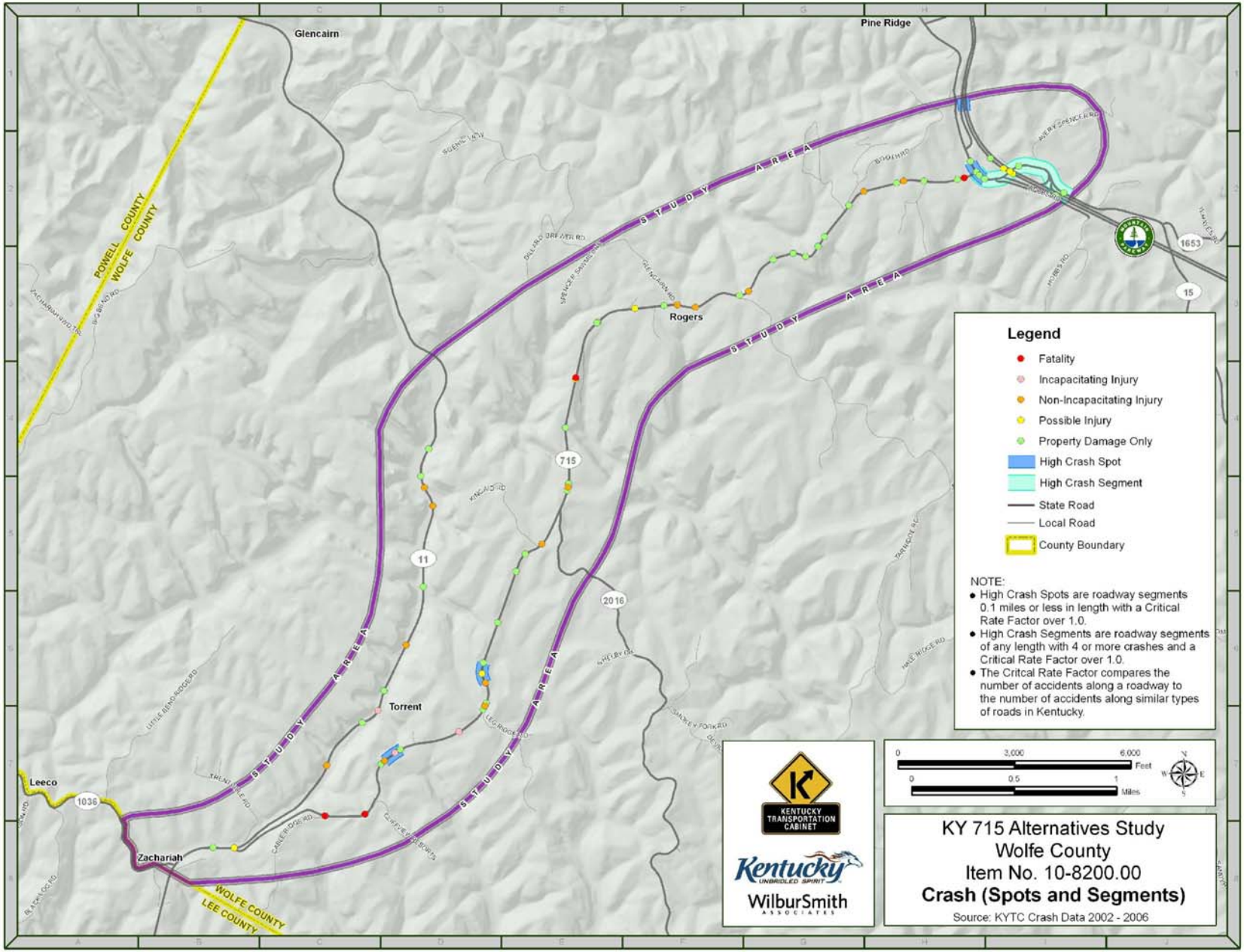


Figure 2.3 – KY 715 Crash Locations and Data

Table 2.6 –Adequacy Ratings
KY 715 Alternatives Study
KYTC Item No. 10-8200.00

Begin MP	End MP	Section Length (miles)	Safety Component	Maximum Possible Safety Component	Service Component	Maximum Possible Service Component	Condition Component	Maximum Possible Condition Component	Composite Adequacy Rating	Composite Adequacy Percentile
KY 715: MP 0.000 to MP 5.975										
0.000	5.765	5.765	34.5	55.0	15.0	15.0	24.0	30.0	73.5	32.47
5.765	5.975	0.210	11.5	55.0	15.0	15.0	9.0	30.0	35.5	0.45
KY 11: MP 0.000 to MP 3.500										
0.000	3.500	3.500	28.5	45.0	20.0	25.0	30.0	30.0	78.5	47.78
KY 15: MP 13.200 to 14.500										
13.200	14.048	0.848	29.5	55.0	15.0	15.0	24.0	30.0	68.5	18.66
14.048	14.200	0.152	31.9	55.0	15.0	15.0	30.0	30.0	76.9	41.04
KY 9000/Bert T. Combs Mountain Parkway: MP 39.700 to 41.000										
39.700	40.468	0.768	29.6	35.0	30.0	30.0	35.0	35.0	94.6	94.60
40.468	41.000	0.532	35.0	35.0	30.0	30.0	35.0	35.0	100.0	100.00

Source: KYTC HIS database, October 2007

Definitions

Safety Component	The safety component is evaluated based on lane width, shoulder width, median widths, alignment, and critical crash rate factors.
Maximum Possible Safety Component	The maximum possible safety component is the best safety score a facility of this type could receive.
Service Component	The service component considers the route's volume-to-capacity ration and access control.
Maximum Possible Service Component	The maximum possible service component is the best service score a facility of this type could receive.
Condition Component	The condition component considers only the condition of the road's pavement.
Maximum Possible Condition Component	The maximum possible condition component is the best condition score a facility of this type could receive.
Composite Adequacy Rating	A numerical score from 0 to 100 evaluating the current condition of a roadway segment based on congestion (service), safety, and pavement condition.
Composite Adequacy Percentile	Adequacy Composite Percentile compared to similar facilities in KY.

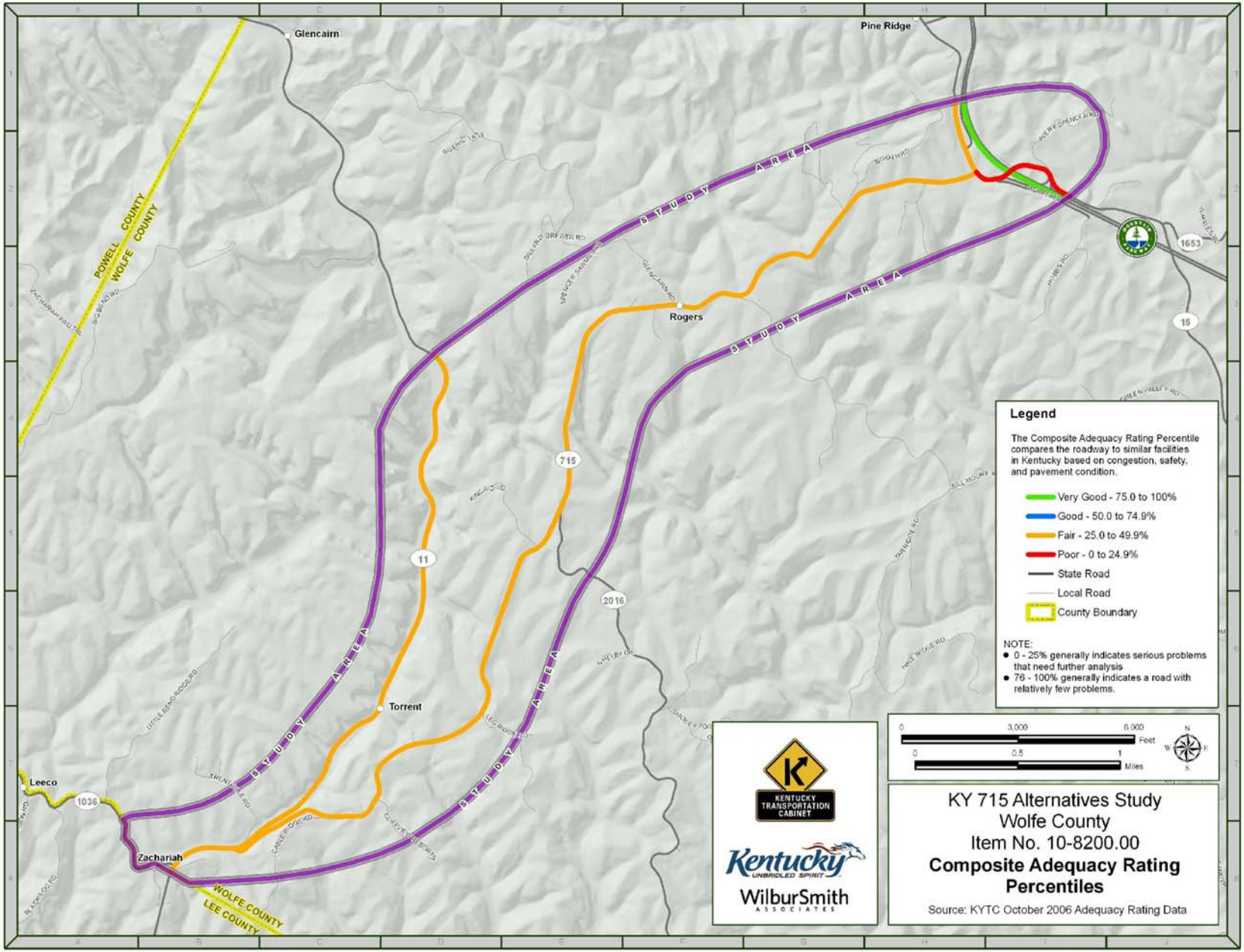


Figure 2.4 – KY 715 Adequacy Rating Percentiles

3. ENVIRONMENTAL OVERVIEW

Environmental Components

Natural Environment

Human Environment

This chapter provides a summary of the KY 715 Environmental Overview which identified issues in the study area related to the natural and human environment. The full Environmental Overview is included as **Appendix B**. As part of the Environmental Overview, the project team performed data analysis and field surveys of the project area to identify key environmental features associated with the KY 715 Alternatives Study. The following sections present the findings of these investigations. A map detailing the environmental features is presented in **Figure 3.1**.

A. Natural Environment

1. Aquatic Resources

Aquatic resources within the study area include Middle Fork Red River, Middle Fork Lower Devil Creek, Mill Creek, Koomer Branch, Lower Devil Creek, and Walker Creek. Unnamed tributaries of the above rivers and creeks are also located within the study area. A search of the Kentucky Division of Water (KDOW) website indicated that Middle Fork Red River, which runs parallel to KY 11 within the study area, is designated as a cold water habitat and, thus, is a Special Resource Water. This resource should be avoided.

Alternatives deviating significantly from existing KY 715 could impact these aquatic resources. Stream crossings may require US Army Corps of Engineers Section 404 and Kentucky Division of Water Section 401 permits.

National Wetland Inventory (NWI) mapping revealed several wetlands scattered throughout the study area. Only one wetland is immediately adjacent to KY 715. If any wetlands are potentially impacted by a proposed alternative, they should be delineated and their jurisdictional status determined.

2. Flora

The study area lies within the Mixed Mesophytic Forest region of the Appalachian Plateau. It has a rich overstory and is dominated by a mixture of deciduous trees including American beech (*Fagus grandifolia*), magnolias (*Magnolia* sp.), oaks (*Quercus* sp.), sugar maple (*Acer saccharum*), tuliptree (*Liriodendron tulipifera*), and white ash (*Fraxinus americana*). Eastern hemlock (*Tsuga canadensis*) is also common in the area.

A review of *Kentucky's Big Trees,* published in 1995 by the Kentucky Division of Forestry, listed no national or state champion trees within the study area.

3. Endangered Species

Portions of the Daniel Boone National Forest (DBNF) are located within the study area, in addition to other forested areas not part of the National Forest. The US Fish and Wildlife Service (USFWS 2005) lists four federal endangered species for Wolfe County: Indiana bat (*Myotis sodalis*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), gray bat (*Myotis grisescens*), and white-haired goldenrod (*Solidago albopilosa*). A review of the Kentucky State Nature Preserves Commission (KSNPC) website (2007) concurred with the USFWS listings. The Kentucky Department of Fish and Wildlife Resources (KDFWR) website (2007) concurred with the Indiana and Virginia big-eared bat listings.

White-haired goldenrod (*Solidago albopilosa*) is endemic within the proclamation boundary of the DBNF in Powell, Menifee, and Wolfe counties in Kentucky and is restricted within this narrow range to rock shelter habitats. In some literature, these rock shelters have been referred to as "rockhouses" which are defined as overhanging recesses in vertical sandstone cliffs. As of 2005, the Red River Gorge in the Daniel Boone National Forest contained all known occurrences of the species. The species prefers partial shade behind the drip line on ledges and in rock shelters where it appears to thrive in dry to damp sandy soil. Extensive cliffline habitat for this species exists within the study area, especially along both sides of KY 11.

Typical Cliffline Habitat in Study Area

All forested areas in the project corridor, both within and outside the DBNF, provide summer roost habitat for the Indiana bat. The abandoned railroad tunnel near Torrent may provide winter habitat for the Indiana bat, as well as year-round habitat for the gray bat and Virginia big-eared bat. Sections of forested cliffline throughout the corridor provide suitable habitat for the Virginia big-eared bat and white-haired goldenrod.

The most prominent sections of cliffline habitat are along KY 11 on the west side of the road within the DBNF. These clifflines are visually spectacular. Additional cliffline habitat exists in the northern portion of the project area, east of KY 715 overlooking the creek bottoms. Although not as significant as those along KY 11, these sections of exposed rock may provide additional habitat for Virginia big-eared bat or white-haired goldenrod.

Cliffline habitat within the DBNF should be avoided as impacting them could constitute a Section 4(f) impact. Impact to cliffline habitat would also be potentially adverse to threatened and endangered species. Impacts to cliffline habitats outside the DBNF would represent a potentially adverse impact to threatened and endangered species.

Following the development of viable alternatives, a biological assessment should be conducted to comply with Section 7 of the Endangered Species Act.

B. Human Environment

1. Population

The study area is located just west of the City of Campton, in Wolfe County, Kentucky. The study area lies within Census Tract 9902, Block Group 2 (CT 9902 BG 2).

Because KY 715 is an important connector between KY 11 in Lee County and the Mountain Parkway, US Census data for both Wolfe and Lee county are presented, as shown in **Table 3-1**.

Table 3-1: Population Data for the Study Area (2000)

	KENTUCKY	LEE COUNTY	WOLFE COUNTY	CAMPTON	CT 9902 BG 2
Total:	4,041,769	7,916	7,065	424	1,039

Source: US Bureau of Census

According to US Census data, Wolfe County had a population of 7,065 in 2000, an 8.6 increase from 1990. However, the Kentucky State Data Center estimated that the Wolfe County population had declined to 6,908 residents by 2005.

2. Socioeconomic

Rogers Elementary School

The study area is very rural in nature with pastures located throughout the corridor. Single-family homes are dispersed throughout the corridor. Housing density is highest near the study area's northern terminus, as well as around the community of Rogers. Rogers has several churches, a post office, gas station, convenience store, Rogers Elementary School and a small wastewater treatment plant.

Rogers is not a census-recognized population center; the only recognized place in Wolfe County is Campton, which is about 3 miles east of the northern terminus of the project. The community of Rogers is a close-knit and isolated neighborhood. Due to this, care should be taken to minimize impacts to this community.

Other "communities" consist of homes clustered along KY 715 or along intersecting roadways, most notably Creech Road and Booth Road near Pine Ridge, Tar Ridge Road, Rogers-Glencairn Road, Tolsen Road, Big Andy Ridge Road (KY 2016), and Whisman Road.

Other than the school, community facilities along the KY 715 corridor consist primarily of churches. Churches include Rogers Baptist Church, Naomi Primative (*sic*) Baptist Church, Rogers Church of God, Vision Baptist Church and Faith Fellowship Church. Torrent First Church of God is located along KY 11.

Several cemeteries are also located throughout the corridor.

Large segments of the study area are in the Daniel Boone National Forest (DBNF). Created in 1937, the forest now contains approximately 2.1 million acres within its proclamation boundary, of which 706,000 acres are owned and managed by the US Forest Service. Individual tracts have been acquired as they become available, which has resulted in pockets of private, county, and state-owned land located within the National Forest.

Vision Baptist Church

The Daniel Boone National Forest is the only national forest located completely within Kentucky and is one of the most popular national forests in the South, receiving over 5 million visitors annually. The area combines natural resource conservation with opportunities for public recreation, including hiking, rock climbing, backpacking, hunting, and fishing.

KY 715 receives considerable tourist traffic due to the proximity of the Daniel Boone National Forest, the National Bridge State Park, and Red River Gorge areas. KY 11, which intersects with KY 715 near the study area's southwestern boundary, is included as part of a designated scenic byway.

Despite numerous horizontal and vertical sight deficiencies, both roadways are designated bicycle routes and are used for bicycle race and tour routes, including the annual transcontinental Race Across America. The Bluegrass Cycling Club, a Lexington-based

organization that organizes bicycle rides/races across central Kentucky, also utilizes KY 715 and KY 11 for events. These include the Pedals and Blooms Festival race in June and the Red River Rally in October. Because KY 715 is a route frequently used by bicyclists for organized events or recreational rides, this group's needs should be considered.

3. Local Economy

The school systems for Wolfe and Lee counties are the major county employers. The largest industries employing Wolfe and Lee county residents are education, health and social services; manufacturing; and retail.

Wolfe County's labor market area (within a 60-minute driving range of the county seat) is comprised of Lee, Estill, Powell, Clark, Montgomery, Menifee, Morgan, Johnson, Magoffin, and Breathitt counties. Unemployment rates in Wolfe and Lee counties are higher than national, state, and labor market area rates, as shown in Table 3-2. Unemployment rates in Wolfe County reached 10.1 percent in 2005, but decreased the following year to the lowest rate the county has experienced since 2002.

Table 3-2: Unemployment Rates 2002-2006 (%)

YEAR	UNITED STATES	KENTUCKY	LABOR MARKET AREA	LEE COUNTY	WOLFE COUNTY
2002	5.8	5.7	7.1	7.6	8.3
2003	6.0	6.3	7.8	9.1	9.8
2004	5.5	5.5	7.3	7.8	9.8
2005	5.1	6.0	7.4	7.7	10.1
2006	4.6	5.7	6.9	7.4	9.6

Source: Kentucky Cabinet for Economic Development

Over half (51.5 percent) of Wolfe County residents work outside the county, while 41.5 percent of Lee County residents work outside the county, perhaps due to a higher number of major businesses and industries in Lee County. Wolfe County residents have a shorter mean travel time to work (33.8 minutes) than Lee County residents (35.4 minutes). Both counties have a longer mean travel time to work than the state average of 25.3 minutes.

4. Agricultural Activity

Several farms are present in the study area; however, most of the land is forested. There is no prime farmland and no farmland in the study area is located in an agricultural district listed with the Kentucky Environmental and Public Protection Cabinet, Division of Natural Resources, Department of Conservation. No prime or statewide important soils are located in the study area.

Wolfe County contains 371 farms, a decrease of 11 percent since 1997. This drop in the number of farms is consistent with declining agricultural activities in Kentucky as a whole. Despite this decrease in the number of farms in the county, the amount of Wolfe County land in farms has increased 2 percent to 59,660 acres and the average farm size has increased 14 percent to 161 acres since 1997.

The majority of Wolfe County farmland is woodland (48.6 percent), with cropland (30.7 percent), pasture (13.7 percent), and other uses (7.0 percent) comprising the remainder. The top crop items in the county are forage (land used for hay and haylage, grass silage, and greenchop), tobacco, corn (for grain and silage), and apples. Cattle and calves are the top livestock items. Cattle were observed on several properties during the field reconnaissance.

Of Wolfe County farmers, only 46.0 percent list "farming" as their primary occupation. This indicates that the majority of farmers in the county likely farm as a means of supplementing household income.

Wolfe County ranks 100th out of Kentucky's 120 counties in terms of the total value of agricultural products sold. The average per farm market value of agricultural products sold in 2002 was $2,504, a 36 percent decrease from 1997.

5. Underground Storage Tanks/Hazardous Materials

Sites with hazardous material issues were identified within the study area boundary. UST sites can still represent a significant liability and cleanup costs. Future alternatives should consider the potential liability and costs associated with UST sites.

A database search resulted in the identification of three facilities potentially located within the study area boundary. The Wiser Oil Company is listed on the UST database as being located on KY 11 but was not located during the site visit. If improvements are limited to KY 715, the facility will not be impacted by construction activities.

Apex Mining, a coal mine, is listed on the MINES database and is located along KY 715. The status of this mine is unknown. This facility was not located during the site reconnaissance.

Beans Grocery is located on KY 1036 and is listed on multiple databases. The statewide UST database lists two 1,000-gallon gasoline USTs as "Verified Removal." The USTs were installed in 1971 or 1972 and were removed in 1998. This property is also listed on the SB193 database as being the known location of soil and/or groundwater contamination. Additionally, the property is listed on the PSTEAF database as a Rank 6 facility. Beans Grocery is currently closed according to an interview with a neighbor. The property is located just inside the study area boundary. The proposed corridor improvements are not anticipated to impact this property.

Multiple unmapped orphan sites were identified by the database search. Further investigation revealed that two orphan sites, Rogers General Store and Rogers Elementary School, are located within the study area. Rogers General Store is listed on the UST database and is currently operating as The Hitching Post. Information provided suggests that multiple tanks were removed from the location in 1994. No evidence of past tank locations was observed during the field observation. Rogers Elementary School, listed on the NPDES database, is also located within the study area along KY 715. The remaining orphan sites were eliminated based on city, and road/street location.

Marathon Station at KY 15

One abandoned gas station and two active gas stations were observed within the study area. The two active stations, operated by Marathon and Ashland respectively, are located near the KY 15-Mountain Parkway Interchange. The abandoned station is also located near the KY 15-Mountain Parkway Interchange. Multiple underground storage tanks, as well as additional above ground storage tanks, are located at the

two active facilities. No tanks were observed at the abandoned facility; however, there is a possibility of encountering past tank locations on this property.

Numerous oil and gas wells are located throughout the study area. Many of these wells are abandoned and not identifiable in the field. The probability of encountering an active or abandoned well within the study area is possible.

Though no active or abandoned mines were observed during the field visit, there is still a chance of encountering a mine within the study area. Apex Mining, a surface coal mine, is potentially located along KY 715.

Sites with hazardous material issues were identified within the study area boundary. If the proposed road construction does in fact impact the UST sites, liability and cleanup costs should be considered. Future alternatives should also consider the potential to encounter an active or abandoned mine or well within the study area boundary.

A cluster of oil and injection wells are clustered at the southern end of the project corridor at the Wolfe/Lee County line. An additional small cluster of wells is located due north of this site, well off KY 11 and within the DBNF boundaries. Impacting these two sites would represent an economic red flag to acquire and cap the wells

6. Air Quality

Wolfe County, Kentucky is located in the Appalachian Intrastate Air Quality Control Region. The county is currently in attainment for all transportation related pollutants, so no transportation measures are currently required in this area. At the present time, the project is entirely state-funded and is not in the Kentucky Statewide Transportation Improvement Program (STIP).

Sensitive receptors for air pollutants exist near the project's northern terminus, where housing and development density is highest. Sensitive receptors are also located around the community of Rogers. Residences are clustered along KY 715 in Rogers, which also contains a post office, an elementary school, and several churches. Other "communities" consist of homes located near one another along KY 715. Improvements to roadways within the study area should have minimal impact on air quality.

Regardless of roadway changes within the study area, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to significantly reduce Mobile Source Air Toxic (MSAT) emissions between 2000 and 2020.

No formal air quality analysis has been performed for the proposed project or its associated study area. Study alternatives are not anticipated to have a negative cumulative impact upon air quality. However, once project alternatives are developed and environmental documentation progresses, a determination should be made whether MSATs will be exempt from analysis or require a qualitative analysis.

7. Noise

Identifying noise receptors and their associated "activity category" from the aforementioned noise-sensitive locations above, might dictate the possible design orientation or location of future build alternative corridors. Noise receptors can be described as specific locations of any property or outdoor activity that is considered to contain noise-sensitive land use.

By evaluating existing geographical spatial data and making a field visit to the study area, some unique areas were found that could potentially be affected by the construction of a new route or by reconstructing KY 715 along the existing alignment. These include the Daniel Boone

National Forest, Rogers Elementary School, congested residential areas, subdivisions, churches, cemeteries, and potential historic areas.

The Daniel Boone National Forest boundary is located within the study area along the western edge of KY 715, from exit 40 to the north continuing south, until reaching Walker Branch Road near the community of Torrent. From this location, the forest boundary completely covers the remaining study area boundary. Depending upon the designated "activity category" of the Daniel Boone National Forest, noise related issues relating to transportation improvements could vary greatly.

While the Daniel Boone National Forest is the dominant noise-sensitive element, there are other locations within the study area boundary which also contain noise sensitive elements.

Residences Close to Existing KY 715

The community of Rogers seems to contain the most transportation-related noise receptors within the study area. Different types of "activity categories" can be located within this community. Noise sensitive structures are located within a one-mile radius of Rogers, including churches, residential areas, cemeteries, and a school.

The community of Torrent is located within the southern-half of the study area, adjacent to KY 11 and paralleling the Middle Fork Red River. This small community contains three (3) churches and three (3) cemeteries located within a one-mile radius. This also includes noise sensitive sites found adjacent to KY 715. One unique observation regarding KY 11 was the heavy truck traffic traversing this route during the field visit, although the truck volumes do not appear to be substantial.

Located near Exit 40 at the northern side of the study area boundary, three potential historic structures and one cemetery are located near the KY 715/KY 15 intersection. While residential areas are somewhat sparse in this area, potential highway construction combined with higher traffic volumes from the Mountain Parkway could create the threat for elevated noise in this location.

The community of Zachariah is located near the intersection of KY 715 and KY 1036 at the bottom of the study area boundary. Residential housing is the only noise-related concern found within this location. Three historic structures, one cemetery, and one church are located just outside the study area boundary along KY 1036 and KY 715 in Lee County. While not in the study area, these structures could become impacted with future highway construction nearby.

Outside of the main noise-sensitive areas previously mentioned (Daniel Boone National Forest, Rogers, Torrent, Exit 40, and Zachariah), the remaining study area is largely void of any real transportation-related noise considerations. A few cemeteries were found along local roads within the center of the study area. County roads feeding east and west throughout the study area contain small amounts of residential dwellings scattered along both sides of the road. Residences are generally not grouped within a cluster, so they probably would not warrant further noise impact consideration.

8. Cultural Resources

This is a planning-level assessment of potential historic or archaeological issues or impacts, so more detailed investigations will be required in future phases of project development if the proposed project is selected for advancement. The purpose is to identify any potential historic

or archaeological concerns as part of a proposed improvement to KY 715 between KY 11 and the Mountain Parkway in Wolfe County.

Historical

There are no properties that have been previously surveyed within the KY 715 corridor study area. However, three previously surveyed properties are located just outside the project area in the small town of Zachariah. It does not appear that any of the properties in Zachariah would be affected by the proposed project.

Former Business

Within the study area, there are approximately 30 structures over the age of 50 years that would have to be documented in a Cultural Historic study. These structures are located mainly along existing KY 715 and other side roads. Buildings along KY 715 are single homes, churches, schools, and businesses. Most of the houses appear to date from the early to middle part of the twentieth century. From an initial "windshield" field review, it appears that most structures would not be eligible for listing on the National Register of Historic Places (NRHP).

One potential historic structure is an abandoned railroad tunnel that goes beneath KY 715 at approximately Milepoint 1.100. The railroad is said to have dated back to the mid-1880s, first as the Kentucky Union Railroad to ship coal from eastern Kentucky. In the late 1890s, it was operated as the Lexington and Eastern Railroad to provide tourist access to Natural Bridge and a resort hotel at Torrent in the late 1890s. It was purchased by Louisville and Nashville Railroad in 1910, but traffic declined and the railroad was abandoned after a highway was built to provide access to the area in the mid-1920s.

Single Residence

There are no individual properties within the KY 715 project area that are listed on the National Register of Historic Places; however, the project area does clip the edge of the Red River Gorge National Historic District at its most northern and eastern point. This district was added to the NRHP list in 2003. It contains 372,170 acres, two buildings, and two other structures.

Archaeology

With regard to archaeological sites, the Area of Potential Effect (APE) does not contain any known sites. However, it is highly likely that archaeological sites would be encountered within the project area.

Historic sites would most commonly be found along existing KY 715 and other smaller side roads. The numerous drainages and ridge tops also signal a high likelihood for prehistoric sites. In addition, six historic cemeteries lie within the project area (i.e., these cemeteries contain burials that are over 50 years old).

C. Section 4(f)

The study area crosses into the Daniel Boone National Forest (DBNF) managed lands and the proclamation boundary. Any impacts to the Daniel Boone National Forest would invoke Section 4(f) under the Department of Transportation Act on 1966 (recodified in 1983) (49 USC 1653(f)).

Currently, the project does not anticipate converting any National Forest land to roadway right-of-way; however, any impacts to National Forest land would invoke Section 4(f).

Section 4(f) was amended in 2005 to allow approval of transportation projects with a *de minimis* impact (defined as impacts that do not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f)). Acquisition of small portions of land from the Daniel Boone National Forest may be determined to be *de minimus* by the Federal Highway Administration (FHWA). However, forested land within the DBNF also provides habitat for threatened and endangered species, so a *de minimis* impact cannot be assumed, regardless of the minor nature of the impact.

Close coordination with the US Forest Service will be required if the project proposes to take any National Forest land, as this agency may have environmental requirements additional to those required by the Federal Highway Administration.

D. Tabular Summary of Potential Impacts

Table 3.3 summarizes potential impacts in the study area.

Table 3.3 – Summary of Potential Impacts

RESOURCE OR STATUTE	IMPACT
Air Quality	None
Streams and Rivers	Middle Fork Red River is a Special Resource Water and should be avoided. Other streams include Middle Fork Lower Devil Creek, Mill Creek, Koomer Branch, Lower Devil Creek and Walker Creek. Impacts to other streams may require USACE Section 404 or KDOW Section 401 permitting.
Wetlands	Wetlands potentially impacted should be delineated and jurisdictional status determined. Impacts may require USACE Section 404 and KDOW Section 401 permitting.
Threatened & Endangered Species	Federally listed species include Indiana bat, gray bat, Virginia big-eared bat, and white-haired goldenrod. Favorable habitat includes mature forest, caves, clifflines and stream corridors. Habitat is abundant in the study area. A biological assessment should be conducted.
Community	Rogers is a small isolated community containing churches, school, post office, convenience store and wastewater treatment plant. Impact to any of these community features would be detrimental to the residents. The needs of bicyclists should be accommodated.
Section 4(f)	The Daniel Boone National Forest comprises a large portion of the study area. All land west of KY 715 lies within the proclamation boundary of the National Forest. Land east of KY 715 and south of Walker Creek is also within the National Forest proclamation boundary. Impacts to the National Forest should be avoided where feasible.
UST/Hazardous Materials	Two active and one inactive gas station, as well as numerous oil and gas wells are present throughout study area. One surface mine noted from database but not observed in site reconnaissance. Impacts to these features may represent liability and/or clean-up costs.

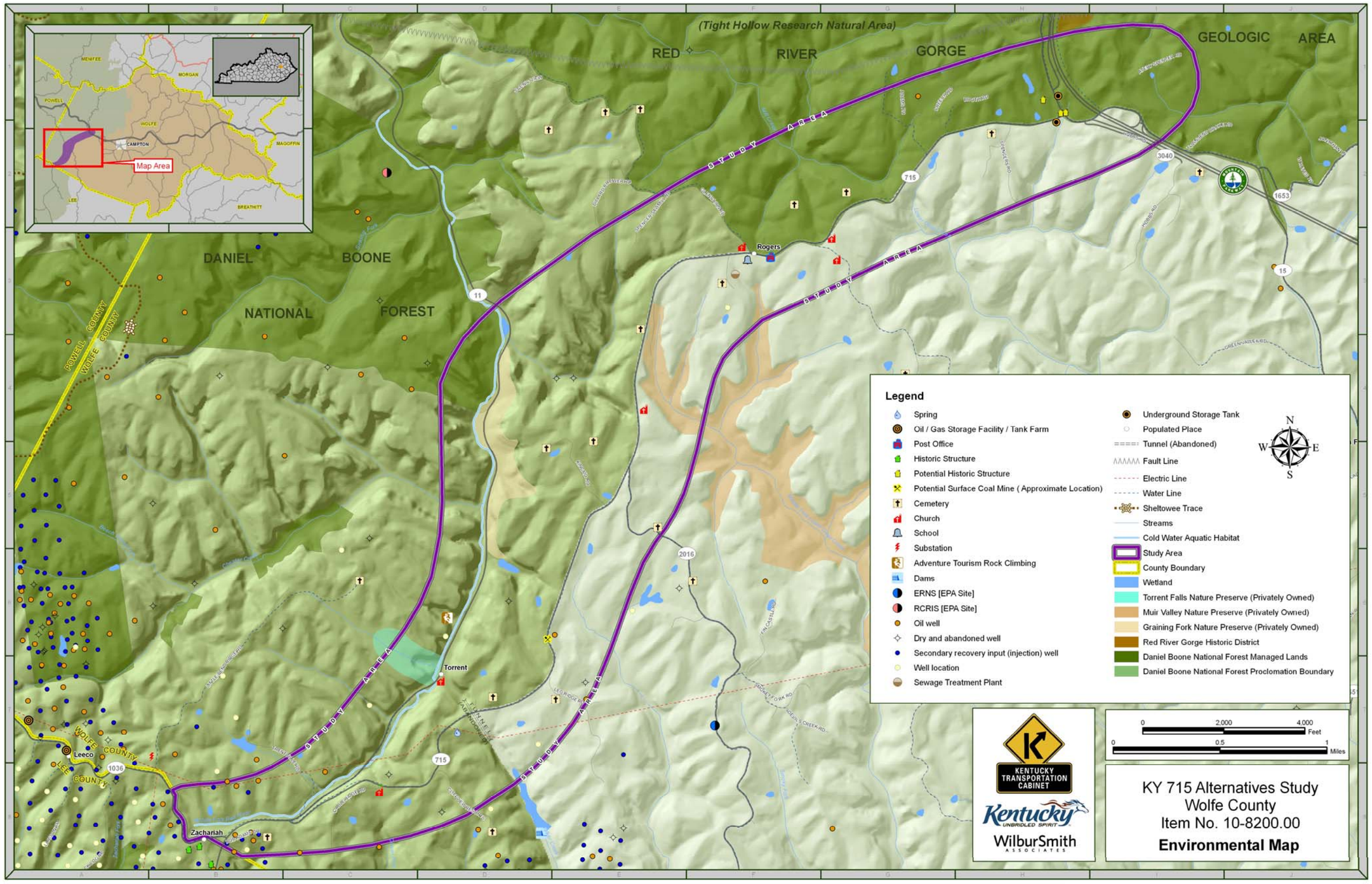


Figure 3.1 – Environmental Footprint

4. GEOTECHNICAL OVERVIEW

A. SITE VISIT OBSERVATIONS

This chapter summarizes findings from the Geotechnical Overview report completed for the KY 715 Alternatives Study. The full report is included as **Appendix C**.

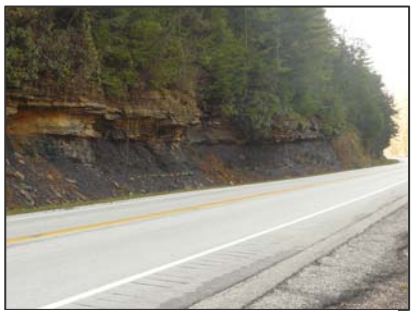
As part of the Geotechnical Overview, a site visit was conducted to identify geotechnical issues along study area portions of KY 715, KY 11 and most of the KY 715 crossroads. In the study area, KY 11 tends to parallel Middle Fork Red River in a low-lying area; therefore, grades on KY 11 are relatively flat/gentle. Conversely, existing KY 715 follows the hilltops and is therefore more rolling and at higher elevations. The slopes between the valleys and hilltops tend to be quite steep and rocky. The land use along existing KY 715 is primarily a mix of residential and pasture/farmland. Several farm ponds were also observed. A significant portion of the land on both sides of KY 11 is wooded with occasional rock cuts along the eastern roadway shoulder. Most of the land between KY 715 and KY 11 is thickly wooded. Several small creeks/branches and wet weather ditches occupy the lower elevations of the study area.

Rocky Hilltop East of KY 11 near Daniel Boone National Forest

Rolling Pasture North of KY 1036 near Zachariah, Kentucky (Also Depicts Typical KY 715 Terrain)

Rock Cut Slope along Southeastern Side of KY 11 near KY 715

Several cut slopes associated with KY 715 or private development give an indication of the soil overburden thickness along the hilltops. While the soil overburden appears to be less than 10 feet thick in these cut slopes, no rock outcropping was observed on the hilltops along KY 715 to the north of its intersection with Cliffview Resorts Road. The depth to rock adjacent to KY 11 is anticipated to be less than 5 feet based on the exposed rock present in Middle Fork Red River and along the roadway shoulders.



Rock Cut Slope with Zachariah Coal Bed off KY 11, North of Torrent, KY

Cut Slope off KY 715 near Cliffview Resorts Road

Residual Soil over Weathered Rock off Spencer Subdivision Road near Rogers

Attempts were made to locate an abandoned tunnel under KY 715 that is reportedly about ¼-mile south of Leg Ridge Road, as discussed in **Section J** of this chapter. However, as the tunnel is apparently located on private property, it was not possible to access this area during the site reconnaissance.

B. TOPOGRAPHY

As noted previously, much of the land adjacent to KY 715 is characterized by rolling hills. The valley occupied by KY 11 and the Middle Fork of Red River has gentle grade transitions and lies within an elevation range bounded by a minimum of 850 feet at the northern end of the study area to a maximum elevation of 1,150 feet near Zachariah. The slopes between the valleys and hilltops are quite steep with significant elevation differences (typically about 100 to 200 feet) over short distances. The elevations along existing KY 715 range between 1,120 feet near its intersection with KY 11 and 1,260 feet near the its intersection with Kincaid Road. The relief of the study area, shown with 20-foot contour intervals, is depicted in the Topographic Overview included in the full Geotechnical Overview Report in **Appendix C**.

C. GEOLOGIC OVERVIEW

Based on the published U.S. Geological Survey Geologic Quadrangle for the existing alignment, the study area is located in the Pennsylvanian System of the Eastern Kentucky Coal Field physiographic province. The Pennsylvanian System consists largely of sandstone, siltstone, and shale. Coal beds and thin marine shale and limestone units are widespread and occur in most parts of the stratigraphic section. These deposits indicate that, in Pennsylvanian time, Kentucky was near sea level and alternately covered by lakes, extensive swamps, shallow bays, and estuaries.

While it is not located within the study area, a fault that extends approximately east-west in the Daniel Boone National Forest is less than ¼-mile north of the study area. The Kentucky Geological Survey identifies this fault as the Glencairn Fault.

D. GEOLOGIC FORMATIONS

The study area is underlain by several different geologic formations, including the Upper and Lower Members of the Breathitt Formation, Corbin Sandstone Member of the Lee Formation, Newman Limestone and associated quaternary alluvium along the valley bottoms. The approximate locations of these formations are shown on the Geologic Map included in the full Geotechnical Overview Report in **Appendix C**.

The Breathitt Formation is comprised mostly of shale, but other materials are present including siltstone, sandstone and coal. In the study area, the Zachariah coal bed is identified near the base of the Upper Member of the Breathitt Formation. The Corbin Sandstone Member of the Lee Formation is typically a poorly cemented, cross-bedded sandstone that is often found between the Upper and Lower Members of the Breathitt Formation. The Gray Hawk coal bed is found within the Corbin Sandstone. The Newman Limestone is believed to be an older formation that underlies the other identified geologic formations. More complete descriptions of these formations were provided by the KYTC Geotechnical Branch.

According to available geologic mapping, the present KY 715 alignment is underlain by the Upper Member of the Breathitt Formation. Sloping areas adjacent to KY 715 are underlain by the Lower Member of the Breathitt Formation and Corbin Sandstone Member of the Lee Formation. Most of the KY 11 alignment is underlain by alluvium. Newman Limestone is also near surface near the northern portion of KY 11 in the study area. Near the southern end of the study area, KY 11 is underlain by the Breathitt Formation and Corbin Sandstone.

E. UNDERGROUND OPENINGS AND SPRINGS

Available mapping indicates that no sinkholes are present within the study area, and no signs of sinkhole activity were observed during the site visit.

According to published mapping of the Kentucky Geological Survey, nearly all of the study area has a very low karst potential (i.e., karst features are rare or absent). The only portion of the study area with appreciable potential for karst features is the small area along KY 11 where the Newman Limestone is exposed or near the surface.

Based on published mapping, a spring is located a few hundred feet southwest of the previously mentioned tunnel under KY 715. This spring was not observed during a site visit.

F. SOIL SURVEY

Available soil survey mapping from the United States Department of Agriculture (USDA) indicates that four major soil units are present within the study area: the Gilpin silt loam, Gilpin-Shelocta complex, Helechawa-Rock outcrop complex, and Shelocta-Gilpin complex. According to the Unified Soils Classification, the residual soils derived from the weathering of in-place bedrock are typically fine-grained (CL-ML, CL, ML) with plasticity indices of about 3 to 20 percent. Some clayey sands/gravels (SC, GC) and silty sands/gravels (SM, GM) are also present in the relatively thin overburden. The depth to bedrock is typically less than 5 feet.

These soils would generally appear suitable for use as roadway fill. As noted by the USDA, the most notable feature of these soils may be their relatively low pH values which are often between 3.5 and 5.5. The acidic nature of these soils may create an environment that can be conducive to corrosion of steel.

G. SURFACE OR DEEP MINING ACTIVITIES

No surface or deep mining activities were observed in the field or on published digital maps or reports reviewed by WSA for this study. However, the Environmental Overview indicates that an abandoned surface coal mine may be present in the study area about ¼-mile to the north of the intersection of KY 715 and Leg Ridge Road. The KYTC Geotechnical Branch identified another abandoned underground coal mine near Torrent, Kentucky. Both of these mine locations are less than ½ mile apart.

H. OIL, GAS AND WATER WELLS

Based on published maps, 10 of the 13 oil wells and all 10 of the secondary recovery injection wells in the study area are located near the southern terminus in or near Zachariah. According to the Kentucky Geologic Map Information Service, these wells are typically 1,000 to 1,400 feet deep.

I. UNDERGROUND STORAGE TANKS

According to the Division of Waste Management, Kentucky Environmental and Public Protection Cabinet, there are 11 underground storage tanks (UST) in the project area and 5 of these are active. One UST is undergoing corrective actions.

J. ABANDONED TUNNEL

Based on published maps, there is an approximately 1,000 feet long tunnel under KY 715 about ¼-mile south of Leg Ridge Road. This tunnel was reportedly built for railroad access associated with mining activities in the area, but it has since been abandoned. As previously mentioned, this tunnel was not observed during the site visit; no information is available on its present condition.

K. GEOTECHNICAL ISSUES AND RECOMMENDATIONS

Geotechnical concerns have been cited by the KYTC Geotechnical Branch and Kentucky Geological Survey. The most significant challenges are as follows:

- Slope stability: The Corbin Sandstone will tend to be friable and may require flatter slopes than is typically used for a rock slope. Stability of major cuts into hillsides would require close scrutiny before and during construction to minimize risk of failure due to groundwater seepage, unfavorably jointed bedrock, and layers of weak materials.
- Unidentified coal mines: It is possible that unidentified coal mines may exist in the study area. The impacts to design and construction costs could be significant based on when and where such mines may be discovered. Based on areas of anticipated coal mining activities, avoiding new alignments in the vicinity of Torrent is recommended. The risk of new alignments intersecting undocumented mine activity elsewhere in the study area (away from Torrent) does not appear to be quantifiable.
- Water, oil and gas wells: Avoidance of routes that would pass in close proximity to water, oil, and/or gas wells is strongly recommended.
- Abandoned tunnel: Significant changes to grades adjacent to the abandoned tunnel under KY 715 may adversely affect existing and new road embankment. Alternatives utilizing minimal earthwork operations near this structure are recommended.

The shallow depth to bedrock across the study area may adversely affect cut/fill quantities, increase excavation costs, and result in additional engineering design and inspection requirements. Deeper cuts will extend into bedrock requiring potentially mixed face (i.e., soil/rock) slope designs, and/or they will encounter zones of weathered rock that require special consideration. Where shale is more prevalent, ripping by larger equipment may be feasible. Areas comprised mostly of limestone will likely require blasting to allow efficient excavation.

It appears that some alternatives would involve construction of structures at stream crossings. While construction of these structures may be adversely impacted by shallow groundwater or weak bearing soils, the long-term impact of corrosion should also be considered. Concerns over corrosion can likely be mitigated by a complete geotechnical exploration and incorporating corrosion resistance measures into the design of structures.

When considering development of alignment alternatives for a new connection between KY 715 and KY 11, it is advisable that potential routes off KY 11 follow the flatter valley slopes upwards toward KY 715. The aforementioned concerns should be considered, especially avoidance of areas in the vicinity of Torrent. Significant cuts will be comprised almost entirely of rock and may create significant right-of-way requirements should slopes need to be flattened, such as cited by the KYTC Geotechnical Branch regarding the Corbin Sandstone or where weathered rock zones in the Breathitt Formation are encountered.

L. LIMITATIONS

These evaluations are based on reviews of available published information and limited site reconnaissance over a large study area. As such, the geotechnical recommendations are necessarily broad and by no means comprehensively cover all potential geotechnical issues that may be associated with this project. Detailed geotechnical exploration should be performed for the final selected alignment in accordance with KYTC guidelines.

5. ENVIRONMENTAL JUSTICE OVERVIEW

This chapter presents a summary of the findings of an Environmental Justice assessment conducted by the Kentucky River Area Development District (KRADD) to identify community characteristics within the KY 715 study area.

A 1994 Executive Order directed every Federal agency to make Environmental Justice part of its mission. Regarding transportation projects, there are three fundamental environmental justice principles: (1) avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations; (2) ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and (3) prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The primary methodology for the KY 715 Environmental Justice assessment was a review of the US Census data for the study area. The defined study area in Wolfe County, shown in **Figure 1.1**, encompasses portions of Census Tract 9902. Following a review of key information, Kentucky River Area Development District staff met with local officials and community members to review information, maps and data related to the study area. Staff also drove the corridor to visually identify potential environmental justice concerns. The intent of these activities was to confirm previous conclusions and solicit input regarding environmental justice.

Statistics were compiled for key environmental justice issues – Race, Poverty Level, and Age Group – and are summarized in the following sections.

A. Population by Race

Census Tract 9902 contains a minority population slightly higher than the county average, but less than the state and national averages; however, the Block Groups warrant further discussion. Three of the four Block Groups in the Census Tract cover the study area. The majority of the study area is within Block Group 2, with a small percentage in Block Group 1 and 3.

Within Wolfe County, the predominant minority population is Asian, which comprises 0.4% of the county population. Census Tract 9902 has a percentage of Asian population of 0.71%, which is somewhat higher than the county average. The Census Tract percentage is comparable to that of the state average of 0.72%. Block 3 contains the Asian population for the Census Tract of 3.54%; Block Groups 1 and 2 show no Asian population. Since almost all of the project area lies within Block Group 2, it appears that the project will not have a major impact on the Asian population that exists in Block Group 3.

Although there are other minority populations in Wolfe County, Asian is the only minority population represented in the census data for Census Tract 9902.

Consideration of this data and meetings with local officials and community members confirmed that a small concentration of Asian persons is located in the study area, but the proposed project will not have a disproportionate effect on minorities.

B. Population by Poverty Level

The defined study area within Wolfe County encompasses portions of Census Tract 9902. The percentage of persons below the poverty level for Census Tract 9902 is 38.41%, which is only slightly higher than the county percentage of 35.22%. Census Block Groups 1, 2, and 3 have a percentage of persons below the poverty level of 35.26%, 56.08%, and 25.58% respectively. This is considerably higher than the national percentage of 12.05% and the state percentage of

15.37%. Block Group 2 has the highest percentage of persons below poverty in Wolfe County. These percentages are comparable to many surrounding counties in this particular section of eastern Kentucky.

This issue was discussed with local officials and community members with the following conclusions. While there are concentrations of persons below the poverty level in the study area, it is not anticipated that the proposed project would have a disproportionate effect on these populations. Nonetheless, future project development efforts should be sensitive to this issue.

C. Population by Age Group

As indicated previously, the defined KY 715 study area within Wolfe County is within Census Tract 9902. Census Tract 9902 and Block Group 3 percentages for the aging population are consistent with those of the county, state, and nation. Block Group 1 and 2 percentages are slightly lower at 8.93% and 7.24% respectively. Based on the census data and other discussions, there seem to be no significant concentrations of a specific age group in this Census Tract.

Discussions with local officials and community members resulted in the conclusion that additional concentrations of persons age 65 and over are not located in the study area; therefore, it is anticipated that the proposed project would not have a disproportionate effect on persons age 65 and over.

D. Conclusions

Based on a review of the data, a field review, and discussions with local officials and community members, it appears that improvements to KY 715 would not have a disproportionate impact on any environmental justice populations. Further, there appear to be no special communities or family clusters in the study area that would require special consideration. Nonetheless, future project development efforts should be sensitive to this issue should additional information be found that is contradictory to these findings.

6. INITIAL CABINET, PUBLIC, AND AGENCY INVOLVEMENT

Throughout the course of the KY 715 Alternatives Study, the local citizens, public officials and representatives of government resource agencies were given the opportunity to provide input for the study. This chapter describes the first KYTC project team meeting and the first round of public and agency involvement. It also presents the comments and input received as a result of those efforts. Other KYTC Project Team meetings and activities during the second round of local, public, and agency involvement are summarized in **Chapter 10** as they relate to the development and evaluation of alternatives.

Public and Agency Involvement

Project Team Meetings

Local Elected Officials and Other Stakeholders Meetings

Public Information Meetings

Public Comment Surveys

Resource Agency Coordination

Meeting minutes are presented in **Appendix D**. Additional materials related to public meetings are included in Public Meeting Notebooks on file with KYTC.

A. Project Team Meeting (November 14, 2007)

The first Project Team Meeting was held on November 14, 2007, at the KYTC District 10 Office building in Jackson, Kentucky. The project team convened to discuss the purpose, goals and objectives of the proposed project; review preliminary existing conditions data for the study corridor; and identify study needs. The meeting minutes are included in **Appendix D.**

The project was added to the Six Year Plan by the legislature, and it was first identified as a segment of the proposed Ashland to London corridor. During the meeting, the study area was expanded to include an evaluation of the interchange with the Mountain Parkway.

Key issues identified in the meeting were the community of Rogers, Rogers Elementary School, the Daniel Boone National Forest, Red River Gorge, truck traffic, bicycle route designation, and tourism traffic.

B. Local Officials and Stakeholders Meetings

As part of the initial public involvement, a meeting was scheduled with local officials and stakeholders in December 2007. The purpose of this meeting was to provide information about the project, discuss potential project issues and concerns, and solicit input. The meeting minutes are included in **Appendix D**.

Input was received from the County Judge-Executive that an improvement to KY 715 is needed to provide improved access for people living in the area. He noted the worst safety problem area was a curve near Leg Ridge Road. Other issues included school access, access for tourism large trucks on KY 715, and impacts to the Daniel Boone National Forest and the homes and businesses along the existing road. It was noted that KY 715 is a bike route and an equine trail.

C. Public Information Meeting - Round I

A public meeting was held during the first round of public involvement for this project. The meeting was held at Rogers Elementary School on January 29, 2008. The meeting was designed to inform the public and solicit questions and comments regarding local issues and potential locations for the possible reconstruction or relocation of KY 715. In addition to the information presented in this chapter, material related to the first round of public involvement meetings is included in a separate Public Meeting Notebook on file with the KYTC Division of

Highway Design and Division of Planning. Minutes of this public meeting may be found in **Appendix D**.

General project information displays, such as project location, traffic volumes, crash information and preliminary environmental maps, were presented for review and comment. Potential corridor alternatives for KY 715 had not yet been identified and, therefore, were not included in the meeting materials.

Members of the project team gave a short presentation explaining the overall project development process, a proposed typical timeline, the current status of the project, next steps, and the preliminary project goals and issues, which ran on a continuous loop for the duration of the meeting for those who were not present for the presentation.

Attendees were given the opportunity to identify areas to avoid and potential corridors for an improved KY 715 alignment. In this forum, attendees were also able to ask questions and provide comments one-on-one with KYTC, ADD, and consultant staff.

1. 1. General Comments

Attendees were invited to ask questions or express their concerns and ideas one-on-one with KYTC, ADD, and consultant staff. General comments included the following:

- Various safety problems were repeatedly identified and discussed (these were noted for future investigation).
- Truck traffic is a problem, especially through Rogers.
- Multiple participants expressed concern that farmlands and homes would be taken if a new route were chosen.

2. 2. Map Exercise

Two tables were set up with study area for attendees to identify specific issues, existing problems with KY 715, and potential alignments for a new route. The points identified included the following.

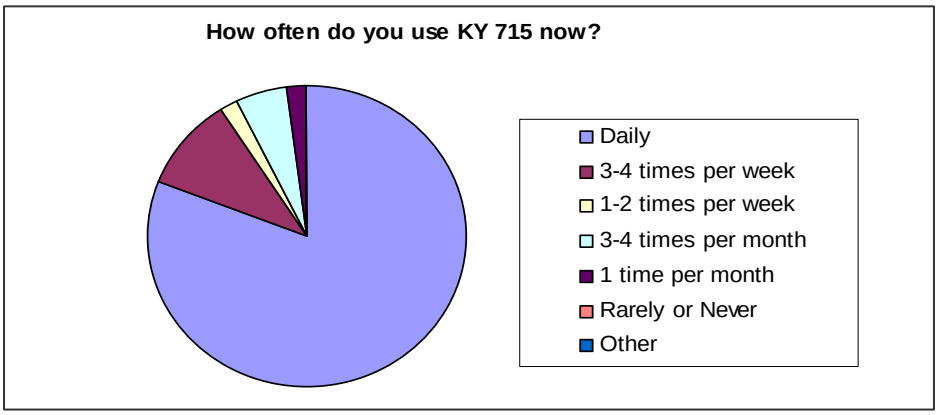
- Map Input
  - One road name correction
  - The name of one area (Andy Ridge) along KY 2016
  - Four family cemeteries
- Existing problems:
  - Five locations with perceived safety/crash problems, including one area with three fatalities within the last year
  - One location on a local road (Glencairn Road) with no drainage which results in standing water when it rains
- Potential Alignments:
  - One proposed alternative that would locate part of KY 715 east of the existing route

3. 3. Public Comment Survey Responses

As part of the public meeting handout, the KYTC supplied a survey form so that citizens of the area could provide input on the project. The results from all surveys received as part of the initial public involvement process are summarized in the following paragraphs.

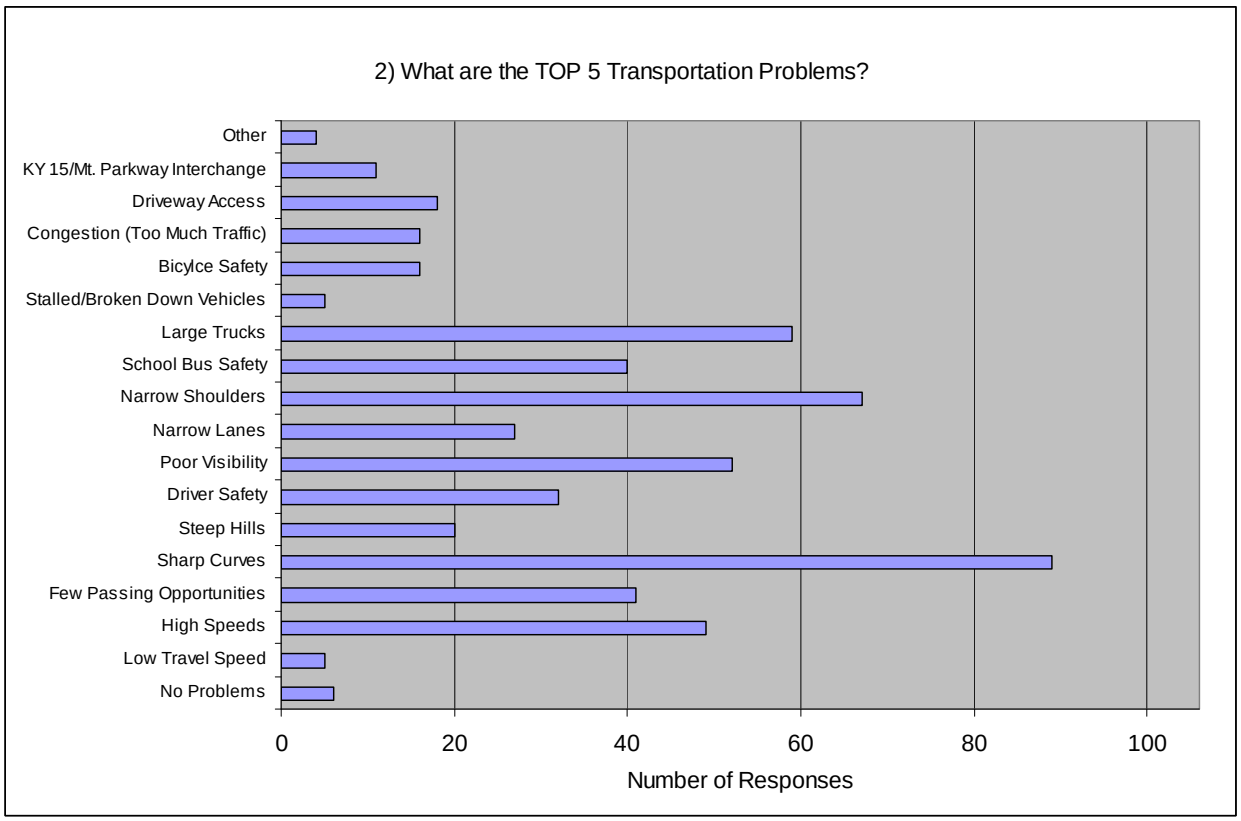
Eighty percent (80%) of the survey respondents said that they drive the study portion of KY 715 daily, as shown in **Figure 6.1**.

Figure 6.1 – Public Meeting Survey: Travel Frequency



Eighty-four percent (84%) of survey respondents (93 of 111) indicated that KY 715 needs to be improved. The most frequent reasons given for improvements include safety, speed, trucks, visibility, safety at Spruce Gap Curve, safety and access at Rogers School, and poor roadway geometrics (curves, road width, and shoulders). The top five transportation problems along KY 715 were identified as sharp curves, narrow shoulders, large trucks, poor visibility, and high speeds, as shown in **Figure 6.2**.

Figure 6.2– Public Meeting Survey: Top Five Problems



KY 715 improvements proposed most often were (1) straightening the road/eliminating sharp curves, (2) widening the road, (3) adding/widening shoulders, (4) spot improvements, and (5) control/remove truck traffic.

As shown in **Table 6.1**, the most sensitive resources (i.e., to be considered or avoided if KY 715 is improved) were identified as (1) homes/personal properties and (2) businesses/commercial properties. Also mentioned often were (3) other resources (mainly Rogers School, cemeteries, and churches), (4) prime farmland and (5) scenic areas.

Table 6.1 – Public Meeting Survey: Sensitive Resources

Homes or Personal Properties	Businesses/ Commercial Property	Natural Areas or Wildlife Habitats	Recreational Areas or Parks	Historic or Archaeological Sites
41	35	12	6	8
37%	32%	11%	5%	7%

Hazardous Waste Sites	Scenic Areas	Prime Farmland	Other (Primarily Rogers School, Cemeteries, Churches)
1	12	16	21
1%	11%	14%	19%

D. Resource Agency Coordination - Round I (January 2008)

Many local, state and federal resource agencies, with diverse areas of public responsibility, were included in this planning process. Input was solicited through written requests by letter on two occasions. For the first round of resource agency coordination, each agency was sent a copy of the study area map, maps showing traffic and volume/service flow data for 2006 and 2030, a crash information map highlighting critical rate factors, and an environmental footprint map.

Resource Agencies

Local Agencies
Local Interest Groups
KYTC Division Offices
Other State Agencies
Federal Agencies

This section describes the input received from these organizations during the first round. The remainder of recipients did not provide a response. Copies of the informational letter distributed by the KYTC and response letters from the various resource agencies are located in **Appendix E** and are summarized below.

The following agencies responded by offering comments or concerns regarding the project:

- Daniel Boone National Forest, US Department of Agriculture Forest Service – The boundary shown on the State maps indicate that National Forest Service (NFS) lands within the Red River Gorge Geologic Area are included in the study area. This land shown as NFS-owned in the northeast portion of the study area is actually privately owned and beyond the limits of the Red River Gorge Geologic Area; this may raise unnecessary concern. The design of the project should include measures to protect municipal water sources. Design should also provide free wildlife movements and limited fragmentation of habitats; wildlife-friendly passages should be incorporated to reduce vehicle/wildlife encounters.

The Land and Resource Management Plan (Forest Plan) provides direction for activities occurring on NFS lands. Action on these lands must be consistent with the Forest Plan before an easement is granted. Of the 62 NFS acres in the project area, four Prescription Areas (Cliffline, Riparian, Source Water Protection, and Habitat Diversity Emphasis) require more specific plan direction. Should any alternative impact NFS lands, additional coordination will be necessary.

- Department for Public Health, Kentucky Cabinet for Health and Family Services – The Department has only general concerns related to the areas of change/relocation of existing sewage treatment plants, private onsite sewage disposal systems, private water supplies, and public water supplies. The Wolfe County and Lee County Health Departments should be included early in the study process.
- Department of Fish & Wildlife Resources, Kentucky Environmental and Public Protection Cabinet – The Kentucky Fish and Wildlife Information System indicates that the federally endangered Virginia big-eared bat (*Corynorhinus townsendii virginianus*), gray bat (*Myotis grisescens*), and Indiana bat (*Myotis sodalis*) are known to occur within close proximity to the project area. Due to the close proximity of several federally listed species, the Kentucky Transportation Cabinet should work closely with the US Fish and Wildlife Service to avoid and/or minimize impacts to federally listed species. It appears that the proposed project has the potential to impact wetland habitats. The extent and quality of wetland habitats in the project area should be determined. Planning should include measures designed to eliminate and/or reduce impacts to wetland habitats. If impacts cannot be avoided, mitigation should be properly designed and proposed to offset the losses. The appropriate US Army Corps of Engineers office and the Kentucky Division of Water should be contacted prior to any work within the waterways or wetland habitats of Kentucky.
- Department of Health and Human Services, US Public Health Service – As project alternatives are developed, considerations must be given not only to injuries from vehicular crashes, but also to pedestrian-vehicular interactions along with other potential human health impacts such as the respiratory health of communities living and working along the corridor. Collaboration with county and state public health officers during this Planning Study should be considered. This planning study should include development of an adequate and safe pedestrian infrastructure, including ADA accessibility, and providing for safe and convenient walking and crossing for all ages and abilities. Sufficiently marked lanes for bicyclists, as well as appropriate speed transitions and signage for vehicles, should be included.

  During the NEPA process, Air Quality, Water Quality/Quantity, Wetlands and Flood Plains, Hazardous Materials/Wastes, Non-Hazardous Solid Waste/Other Materials, Noise, Occupational Health and Safety, Land Use and Housing, Environmental Justice, and any other health related topic which may be associated with the proposed project should be considered. Mitigation plans that are protective of the environment and public health should be described in the Planning Study where warranted.
- Department of Vehicle Enforcement, Kentucky Justice and Public Safety Cabinet – This agency has no concerns for the planning study at this time.
- Kentucky Department of Military Affairs – No issues or concerns affecting the study area have been identified at this time.
- Division for Air Quality, Kentucky Environmental and Public Protection Cabinet - Precautions should be taken to prevent particulate matter from becoming airborne,

including covering open-bodied trucks and avoiding depositing earth onto paved roadways. Open burning is prohibited for all but the express purposes detailed in the Open Burning Fact Sheet. The project must meet the conformity requirements of the Clean Air Act and the transportation planning provisions of Titles 23 and 49 of the US Code. The division suggests investigating local government requirements as well.

- Division of Conservation, Kentucky Environmental and Public Protection Cabinet – There are no agricultural districts or PACE easements established in the study area; therefore, land enrolled in the Agricultural District Program or the PACE program will not have to be mitigated by the Department of Transportation. The loss of farmland should be addressed. Every year, pressure imposed by utility right-of-ways, urban expansion, and new roads reduce the land available for agricultural use in the Commonwealth. Soil Survey - Powell and Wolfe Counties (NRCS 1993) could be utilized to identify farmland designations. It is available through the Division of Conservation. Soil survey information can also be downloaded from these web sites: http://soildatamart.nrcs.usda.gov or http://websoilsurvey.nrcs.usda.gov

  There is concern regarding the control of erosion and sedimentation during and after earth-disturbing activities. It is recommended that Best Management Practices (BMPs) be utilized to prevent nonpoint source water pollution. This would protect the water quality and aquatic habitat of the perennial and intermittent streams that this project could impact. Best Management Practice for Construction Activities contains information about the BMPs most appropriate for this project and is available through the Wolfe County Conservation District, the Kentucky Division of Water, or the Division of Conservation. The Kentucky Erosion Prevention and Sediment Control Field Guide is available at http://water.ky.gov/sw/nps/Publications.htm

- Division of Waste Management, Kentucky Environmental and Public Protection Cabinet – No known landfills occur in the study area; a list of facilities throughout Wolfe County and their current status is included with the response letter. There are 11 underground storage tanks (UST) in the project area, 5 of these are active. One UST is undergoing corrective actions. No specific comments are offered by the division at this time.

- Division of Water, Kentucky Environmental and Public Protection Cabinet – A substantial portion of Middle Fork of the Red River (CAH) follows KY 11 along its route. Also, Chester Creek (Exceptional Water) could be affected by construction near its mouth. KY 715 does not appear to impact any special waters. Best Management Practices (BMPs) should be used to alleviate any fugitive sedimentation and siltation from reaching any creeks in the general area. The 401 Water Quality Certification (WQC) section needs to be contacted about this section of road. It might be useful to have Alan Grant (Supervisor, 401 WQC) in the mix for these types of projects. It is unlikely that construction will impact groundwater in the area; however, if groundwater is impacted, those impacts are likely to be minimal and transient. No stream construction permit is required, per KRS 151.250.

- Division of Structural Design, Geotechnical Branch, Kentucky Transportation Cabinet – The study area is underlain by Quaternary Alluvium, Upper and Lower Members of the Breathitt Formation, Corbin Sandstone Member of the Lee Formation and the Newman Limestone. Cut slopes in the Corbin Sandstone may be required to be flatter than normal because of the sandstone being poorly cemented and friable. Erosion of exposed slopes is also of concern.

  Oil and gas wells are present in the study area and should be avoided. A more detailed evaluation should be completed to identify all wells within the study area before selecting any alignment corridor. An abandoned tunnel exists in the vicinity of Torrent. An

Underground Coal mine adit in the Zachariah Coal bed is also identified just west of the Tunnel entrance. Underground mining has probably occurred in the area of the tunnel and perhaps over the tunnel. The Branch recommends avoiding the tunnel with any corridor because of stability issues of the material over the tunnel. Underground mines and strip mines may be encountered in the Zachariah Coal bed throughout the Project Study Area. It is preferred to avoid mined areas with any corridor if at all possible.

- Kentucky Airport Zoning Commission – No adverse affects to air navigation are anticipated due to developments in the study area. If any structure or construction equipment exceeds 200 feet in height, a permit from this office will be required.
- Kentucky Department of Agriculture – No comments are offered on the proposed project at this time.
- Kentucky Department of Education – A copy of the resource agency letter was forwarded to the Wolfe County Board of Education in response to the request for input.
- Kentucky Geological Survey – The study area is in the Eastern Kentucky Coal Field physiographic region, underlain by gravel, sand, silt, clay, sandstone, shale, siltstone, coal, and minor concentrations of siderite and limonite. Karst features should not be encountered. The study area will likely encounter pre- or post-landslide hazards in underclays and shales; these could be initiated or accentuated by removal of material at slope bases. Slopes and loads should be evaluated. Some sandstones and siltstones may crumble where they are uncemented. Unconsolidated sediments will be encountered at or near stream drainage areas. There may be resource conflicts such as prior ownership to oil and gas wells or coal property for mining. The study area may contain deep mining areas with underground voids, a possible subsidence hazard. No construction-suitable stone is found in the study area; however, a good quality limestone is located to the north. The Glencairn Fault lies in the northeastern end of the study area at the KY 715/KY 15 intersection and traveling north along the Combs Parkway. There is probable peak ground acceleration due to earthquake ground motion of 0.09g. There is a low potential for slope liquefaction or failure in unconsolidated sediments.
- Kentucky State Nature Preserve Commission, Kentucky Environmental and Public Protection Cabinet – Numerous rare species of plants and animals occur in the Daniel Boone National Forest adjacent to the project area. The Kentucky Transportation Cabinet should coordinate closely with the USDA Forest Service to assure that no populations of rare species (including those in aquatic systems downstream from the project area) are impacted on the National Forest. A substantial amount of biological inventory work will likely be necessary to assure that no populations of rare species will be impacted. Populations of some of the species known in the Daniel Boone National Forest may also be present in suitable habitats on the opposite side (southeast) of the project study corridor on private land; any populations present on private land will also need to be detected and avoided. The abandoned Torrent Railroad Tunnel is used by rare bats for roosting and hibernating.
- Kentucky State Police – An improved KY 715 corridor would benefit the area by lowering traffic collisions, improving traffic flow, and increasing safety for school buses and the general motoring public. Widening and adding shoulders will make traffic enforcement efforts more feasible for Troopers.
- Natural Resources Conservation Service, US Department of Agriculture – This project may create potential impacts to prime farmland soils and other farmlands of statewide significance. If federal funds are used to convert important farmlands to non-agricultural

uses, Form NRCS-CPA-106 must be submitted. A file containing the GIS information for Wolfe County soils was attached with the response letter.

- Office of Special Programs, Kentucky Transportation Cabinet – The study area roadway is part of the Midland state-designated bike route, and parallels KY 11, which is part of the Red River Gorge Scenic Byway. Proper bicycle accommodations should be considered including signage, paved shoulders, and rumble strips. Paved shoulders also provide a refuge for pedestrians who may need to use this road to reach their destination. Continue studying ways to improve sight distance, sharp curves, and hills to improve safety for all users. All standards and guidelines pertaining to bicycle safety should be strictly followed.

7. PROJECT PURPOSE AND NEED

The general scope of the KY 715 Alternatives Study is to consider the improvement and/or potential realignment/relocation of KY 715 in Wolfe County, Kentucky between KY 11 and the Mountain Parkway (KY 9000).

The primary purpose of the proposed project is to improve connectivity between KY 11 and the Mountain Parkway. KY 715 is currently incompatible with the two major facilities it connects.

- KY 715 is a two-lane road with narrow lanes, narrow shoulders, many horizontal and vertical curve deficiencies, and poor passing sight distance.
- On the southern end, KY 715 intersects with KY 11. Between KY 715 and Beattyville to the south, KY 11 has been designed and reconstructed to higher design standards than KY 715, with 12-foot lanes, 10-foot shoulders, little or no horizontal or vertical deficiencies, and good sight distance.
- On the northern end, KY 715 connects with KY 15 for a short distance and ultimately to the Mountain Parkway, a four-lane, high-speed expressway with 12-foot lanes and 10-foot shoulders.

Connectivity can be improved by achieving other important goals of the project, as follows:

- Address geometric deficiencies on KY 715;
- Increase safety on KY 715; and
- Improve access to the Mountain Parkway.

Typical view along KY 715

Additional project goals can also be addressed with the proposed improvement to KY 715, as follows:

- Continue the London to Ashland Corridor improvements;
- Improve access to area attractions;
- Accommodate bicycles and pedestrians on KY 715; and
- Provide mobility/relief against major incidents such as earthquakes, hostile acts, or other catastrophe that might close Clays Ferry Bridge along I-75.

Following is further discussion on the project purpose and need for the proposed improvement to KY 715.

- **Address geometric deficiencies**. KY 715 is currently functionally classified as a rural collector. If this route was improved and made part of the proposed London to Ashland Corridor, KY 715 could be upgraded to a rural arterial. As KY 715 follows the terrain, there are a number of sharp curves and steep hills that do not meet current state design standards for rural collectors and/or rural arterials (assuming 55 mph design speed, 8% superelevation, and rolling terrain), further described as follows:
    - Twenty-eight (28) of the 32 horizontal curves along KY 715 do not meet the minimum radius requirement of 965 feet.
    - Forty-five (45) of the 49 vertical curves along KY 715 do not meet the minimum stopping sight distance or headlight sight distance requirement of 495 feet.
    - Forty-one (41) of the 98 grade segments (2 grade segments per vertical curve) along KY 715 exceed the maximum grade requirement. Thirty-five (35) of the 41 segments exceed only the more stringent grade requirement for rural arterials. The other six of

the 41 segments exceed the grade requirement for both rural collectors and rural arterials.

- KY 715 currently has 9-foot wide lanes and two-foot wide shoulders, compared with 12-foot lanes and 10-foot shoulders along KY 11 (from KY 715 south to Beattyville) and along the Mountain Parkway.

The KY 715 study area includes the interchange at Exit 40 along the Mountain Parkway. All four interchange ramps at this location have ramp acceleration and deceleration lengths that do not meet AASHTO guidelines and/or KYTC common practice.

A short segment of KY 15 connects KY 715 and the Mountain Parkway interchange. To ensure continuity, any improvements to KY 715 and/or the KY 15/Mountain Parkway Interchange should consider this section of KY 15. No as-built plans were available for this roadway segment but geometric deficiencies are believed to exist. Because KY 15 serves as the link between KY 715 and the Mountain Parkway, improvements to KY 15 should be considered along with any other system improvements.

- **Increase safety.** The current roadway configuration limits sight distance and travel speed. In addition to passenger cars and trucks, school buses travel KY 715 daily, and local citizens are very concerned about school bus safety in this area. Comments from the first public meeting and the pubic input surveys indicated that many vehicles, especially trucks, travel too fast for conditions. Following is a summary of safety issues in the study area:
  - Between 2002 and 2006, 48 crashes were reported along the study portion of KY 715. Four of those were fatal crashes. Study area residents report that three fatal crashes have occurred since 2006, citing speed as one of the likely causes.
  - Four “high crash spots” and one “high crash segment” were identified along the study portion of KY 715. “High crash spots” are any section of road 0.1 miles in length or less with a critical rate factor (CRF) over 1.0. “High crash segments” are any section of road with a critical rate factor over 1.0. CRF compares the number of crashes along the road of interest to similar facilities in Kentucky. A CRF above 1.0 (i.e., a “high crash spot” or “high crash segment”) indicates that crashes are occurring more than expected.
  - The most common type of crashes were single-vehicle crashes involving a vehicle leaving the driving lane and hitting another object. Because lanes and shoulders are narrow, there is not much space for correction once a car leaves the driving lane. If another car is coming in the opposite direction, a head-on collision may occur. There were five head-on crashes reported on KY 715 during the analysis period (2002-2006). These crashes are often severe, resulting in major injuries or fatalities. Three of five head-on crashes along KY 715 during the analysis period resulted in fatalities.
  - The next most common type of crash was the angle crash involving vehicles turning to and from KY 715 at intersecting roads and driveways. Curves, hills, and roadside objects limit sight distance for vehicles pulling out of or onto side roads and driveways along the route. One incapacitating and two non-incapacitating injuries resulted from the nine angle crashes that occurred along KY 715 during the analysis period.
  - Rogers Elementary School has access directly from this roadway. Approximately 125 students are currently enrolled in Rogers Elementary School. The access point for the school is located in both a horizontal and vertical curve, plus there is a cross street and a broad entrance to a local market immediately across the road. This results in some limited sight distance for school buses, parents, teachers, staff, and

others entering and leaving the school property at a location where other vehicle conflicts may occur for those entering or leaving the cross street or the local business. Many attendees at the first public meeting for the KY 715 Alternatives Study mentioned the school entrance as a location of particular concern.

- High truck traffic and speeding trucks were two of the most frequently mentioned issues by local residents at the first public meeting. In particular, it was felt that tanker truck volumes had increased recently due to increased business by a Beattyville distributor. According to KYTC HIS data, the study portion of KY 715 carries up to 2,760 vehicles per day including 8.6% truck traffic. This road is expected to carry as much as 4,400 vehicles per day by the year 2030 (based on a 2.05% estimated growth rate).

- **Improve access to the Mountain Parkway (KY 9000) for residents of Lee, Owsley, and Wolfe Counties.** The parkway provides the primary access for east-west travel in this portion of the state, described as follows:

  - According to KYTC HIS data, the Mountain Parkway carries approximately 8,200 vehicles per day through the study area.
  - The Mountain Parkway is the main arterial from Southeastern Kentucky to Central Kentucky. It provides the primary regional access to isolated rural communities and populations, and its connection to I-64 is imperative to opening up the region and making medical, education, shopping and other facilities and services in Lexington and Ashland (and points beyond) reasonably accessible.
  - The Mountain Parkway between KY 715 and KY 205 (17.6 miles) is part of the proposed London to Ashland Corridor.

Other important goals for the project include the following:

- **Continue the London to Ashland Corridor improvements.** A long term goal of this project and others like it is to create an improved route in eastern Kentucky from I-75 near London to I-64 near Ashland, thus, opening the area for greater accessibility to other parts of the state and the nation and enhancing economic development opportunities**.**

  - The proposed London to Ashland Corridor begins on the north side of London near the KY 80/US 25 intersection near I-75 Exit 41 and terminates at the KY 1/7 junction with I-64 (Exit 172) north of Grayson. The study portion of KY 715 was identified in the "London to Ashland Programming Study" completed in July 2006 by the Kentucky Transportation Cabinet.

    Approximately 143 miles of existing roadway segments make up the corridor. It essentially follows along KY 30 between London and Booneville, along KY 11 between Booneville and KY 715, along KY 715 to the Mountain Parkway, along the Mountain Parkway to KY 205 at Helechawa, along KY 205 from Helechawa to US 460 south of West Liberty, along US 460 to KY 7 at West Liberty, and along KY 7 from US 460 to Grayson and I-64.

    For the KY 30 and KY 11 sections of the London to Ashland Corridor, a 1998 Advance Planning Report defines the project purpose by stating that "maintaining and improving this route is necessary to assure a safe and efficient corridor for highway travel through this area … as part of a major London to Ashland Corridor from I-75 to I-64."

- **Improve access to area attractions.** Within the Daniel Boone National Forest, the Natural Bridge State Park and the Red River Gorge attract a large number of tourists over

a wide area. Improving access to these sites may also help enhance adventure tourism draw for the region.

- **Accommodate bicycles and pedestrians.** Safety for all modes of transportation is an important consideration, including bicycles and pedestrians.
    - KY 715 is a state-designated bike route and is part of both the TransAmerica and Midland Kentucky Bike Trails. As such, KY 715 is used for bike rallies and races.
    - According to the KYTC's Pedestrian and Bicycle Travel Policy (July 2002), accommodation of bicycles will be considered on all new or reconstructed state-maintained roadways. The Policy identifies seven criteria of which a project must meet one or more of to be considered for bicycle accommodations. The study portion of KY 715 meets the following criterion: "Bicycle traffic exists along the current roadway: This may be determined by the observation of bicycle traffic or by the public-involvement process". The Policy also states that: "Public interest in and demand for bicycle accommodations are determined at the planning and preliminary engineering public-involvement stages." Since this route is designated as a state bike route, accommodation of bicycle traffic will be considered during the planning study process.
    - The proposed KY 715 improvement could also provide better and safer facilities for pedestrian traffic. Of special concern, KY 715 passes through the small community of Rogers, which has many residences, an elementary school, a post office, a market, and other small businesses. Shoulders along the existing road are extremely narrow or non-existent, making it potentially unsafe for pedestrians to walk to and from their homes and other facilities. This would only worsen as traffic continues to increase over time. An improved KY 715 along the existing route could provide wider shoulders and/or a curb and gutter section with sidewalks to better accommodate pedestrian traffic. Alternatively, a new KY 715 off the existing alignment would divert higher speed, through traffic from the Rogers community, thereby making it safer for pedestrians to walk along the existing road.
- **Providing mobility/relief against major incidents that might close Clay's Ferry Bridge along I-75.**
    - I-75 is a key north-south freight corridor. Along this route are points considered to be "critical assets and key infrastructure" in maintaining the movement of goods throughout the United States. The I-75 Clay's Ferry Bridge is recognized as such a critical asset and key infrastructure. Clay's Ferry Bridge, located at the Madison and Fayette County line, carries approximately 65,000 vehicles per day on six lanes (3 in each direction) and is one of the major highway freight corridors in the US for truck movements. An incident at this bridge could lead to a road closure, which is more likely to cause a bottleneck to the system than at other locations due to a lack of alternate routes and other connections. This would seriously impede highway system connectivity and cause a major disruption to truck flows in this corridor and, thus, potentially severe impacts on the economy in Kentucky and the southeastern US. Therefore, it is important to provide alternatives to bypass this location, if delay or closure were to occur. The London to Ashland Corridor could provide an alternative for traffic traveling from the south along I-75 bound for I-64 east.
    - At the first public meeting, several citizens expressed concern over the potential for major traffic volumes to be diverted through Wolfe County via the study portion of KY 715 in the event of a closure of Clay's Ferry Bridge.

8. INITIAL ALTERNATIVES DEVELOPMENT AND EVALUATION

Following the existing conditions review and first round of public involvement, preliminary improvement concepts were developed on and off the existing KY 715 roadway. This chapter presents the development and refinement of the corridor concepts, a detailed "Level 1" Screening, and input from the project team.

A. Development of Corridor Concepts

The existing conditions analysis and the first round of public, local official, and agency input were used to identify approximately 40 to 50 possible combinations of potential improvement corridors for KY 715. In addition, a No-Build Alternative and a Spot Improvements Alternative were identified for further consideration.

The initial corridors are shown in **Figure 8.1**. Each segment is identified by an alphanumeric identification "name" that indicates the beginning point, ending point, and, in some cases, intermediate points along the corridor.

Each corridor alternative "name" begins with the letter A, B, C, D, E, or F. These represent the beginning point along KY 11, as follows:

- Location B corresponds to the existing intersection of KY 11 and KY 715.
- Location A is just east of the existing intersection of KY 11 and KY 715. This location was chosen to better facilitate a potential corridor alternative east of existing KY 715.
- Locations C, D, E, and F are west of the existing intersection of KY 11 and KY 715. Each of these points was chosen to correspond with a potential gap in the clifflines between KY 11 and the existing KY 715 roadway.

A number in the corridor "name" description represents an intermediate point along the existing route where the alternative diverts from the existing KY 715 alignment. Lower numbers are farther south; a corridor without a number in its name does not lie along the existing alignment at all.

The final letter in each name represents where the corridor terminates. There are two distinct endpoints which have been given letter designations, G and H:

- Point G is the location of the existing KY 15-KY 715 intersection.
- Point H is just east of that intersection and was intended to better provide a direct KY 715 route to the KY 15 interchange with the Mountain Parkway.

With all of the various options, there are about 40 to 50 potential corridor alternatives. However, for ease of analysis, these were reduced to seven "corridor concepts", as shown on the maps in **Figures 8-2 through 8-8**, although these may not include all possible corridor alternatives. That is, other combinations and options may be possible for any of the segments shown in the Initial Corridor Concepts map (**Figure 8.1**). However, the seven identified corridors seemed to represent the range of potential concepts and were used to better guide the discussion and evaluation of alternatives.

Other than environmental and community impact issues, the differences among these various concepts and options were based primarily on these questions:

- Where should the improvement begin?
- Should KY 715 or KY 11 be the through route on the southern end?
- Should the improvement be primarily on the existing alignment or on new alignment, or some combination of the two?

- Should a bypass of Rogers be provided?
- Where should the improvement end, i.e., at the existing location or somewhere else?
- At the KY 15 northern terminus, should KY 715 be considered as the through route since it is proposed to be part of a future London-to-Ashland corridor?

These questions were considered in the development of the concepts (and options) shown on the KY 715 "corridor concept" maps.

Here is a brief explanation of the seven corridor concepts:

- Corridor Concept 1, Existing Alignment: This corridor would improve the existing KY 715 totally along the existing alignment to the maximum extent possible.
- Corridor Concept 2, Existing Alignment with Off-Alignment Options: This corridor represents the improvement of all or portions of existing KY 715 to the northern terminus at Point G, including:
  - Six KY 11 tie-down options (Points A through F) as the southern terminus of the improvement;
  - Various options off the existing alignment (with optional convergence/divergence at Points 1, 2, 3, 4, 8. 9, 10, and 15); and
  - Bypass options for Rogers (Points 10 to 15).
- Corridor Concept 3, Western/Eastern Corridor: This corridor is located in the study area on a new alignment just east of the existing alignment from Southern Terminus E to Northern Terminus G or H, but with the option of re-joining existing KY 715 from Point 15 to Northern Terminus G.
- Corridor Concept 4, Near Eastern Corridor on New Alignment: This is also an eastern corridor largely on new alignment from Southern Terminus A or B to Northern Terminus G or H. It is essentially the same as Concept 2 from Point 7 to either of the northern termini.
- Corridor Concept 5, Far Eastern Corridor on New Alignment: This eastern corridor is totally on new alignment from Southern Terminus A or B to Northern Terminus G or H. Part of it is outside the original study area (from approximately Point 5 to Point 12). The goal was to try to find a route that would be located primarily along the crest of hills wherever possible.
- Corridor Concept 6, Western Corridor: This is a corridor west of the existing alignment from Southern Terminus E or F to Northern Terminus G. This concept includes a portion of existing KY 715 from Point 9 to 10.
- Corridor Concept 7, Eastern/Western Corridor: This corridor is primarily on new alignment, but it also uses part of existing KY 715. It lies east of existing KY 715 from Southern Terminus A or B to Point 5, follows existing KY 715 from Point 5 to Point 10, is located on a new alignment west of existing KY 715 from Point 10 to Point 17, and then follows existing KY 715 from Point 17 to Northern Terminus G.

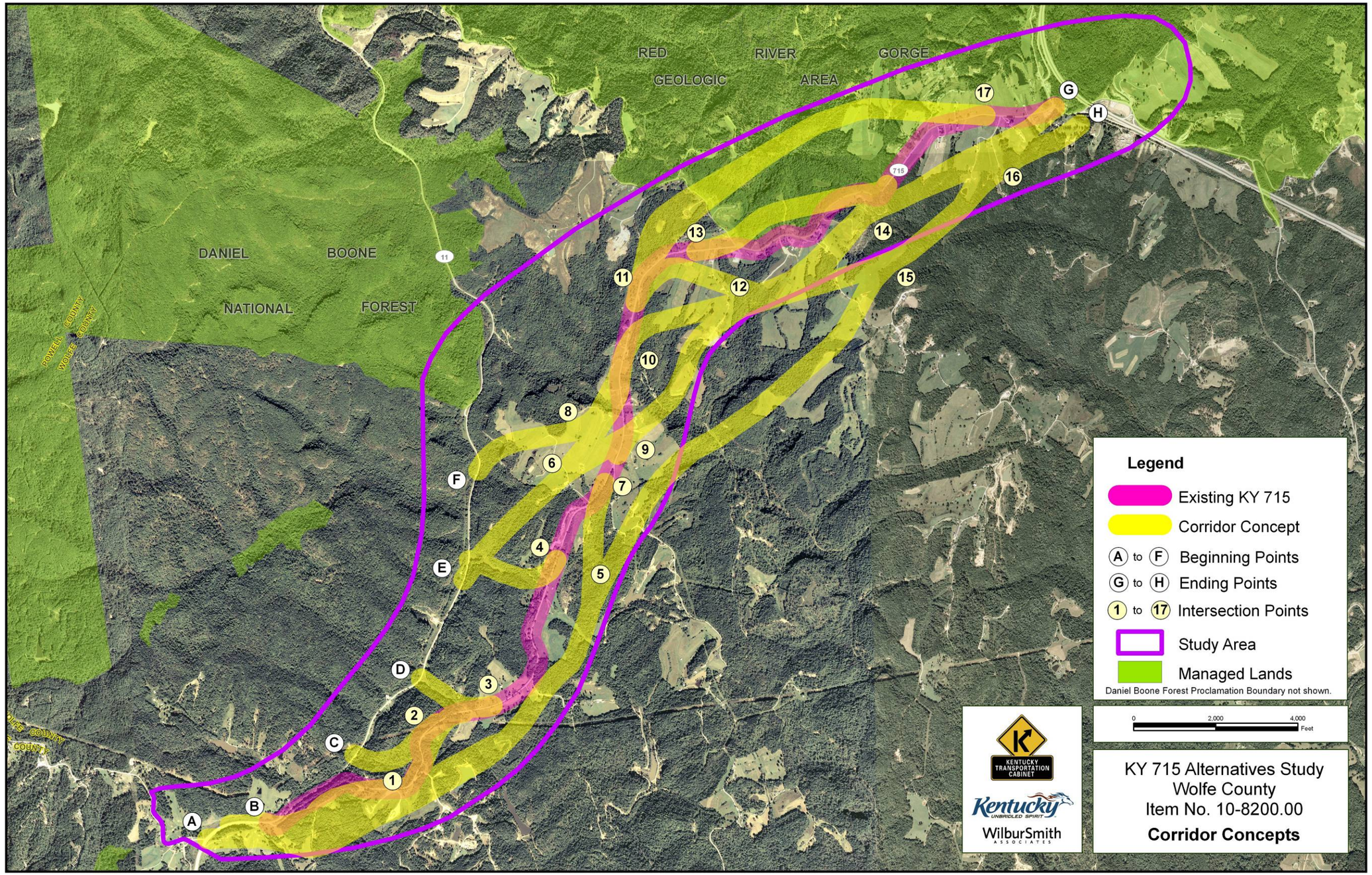


Figure 8.1 – Initial Corridor Concepts

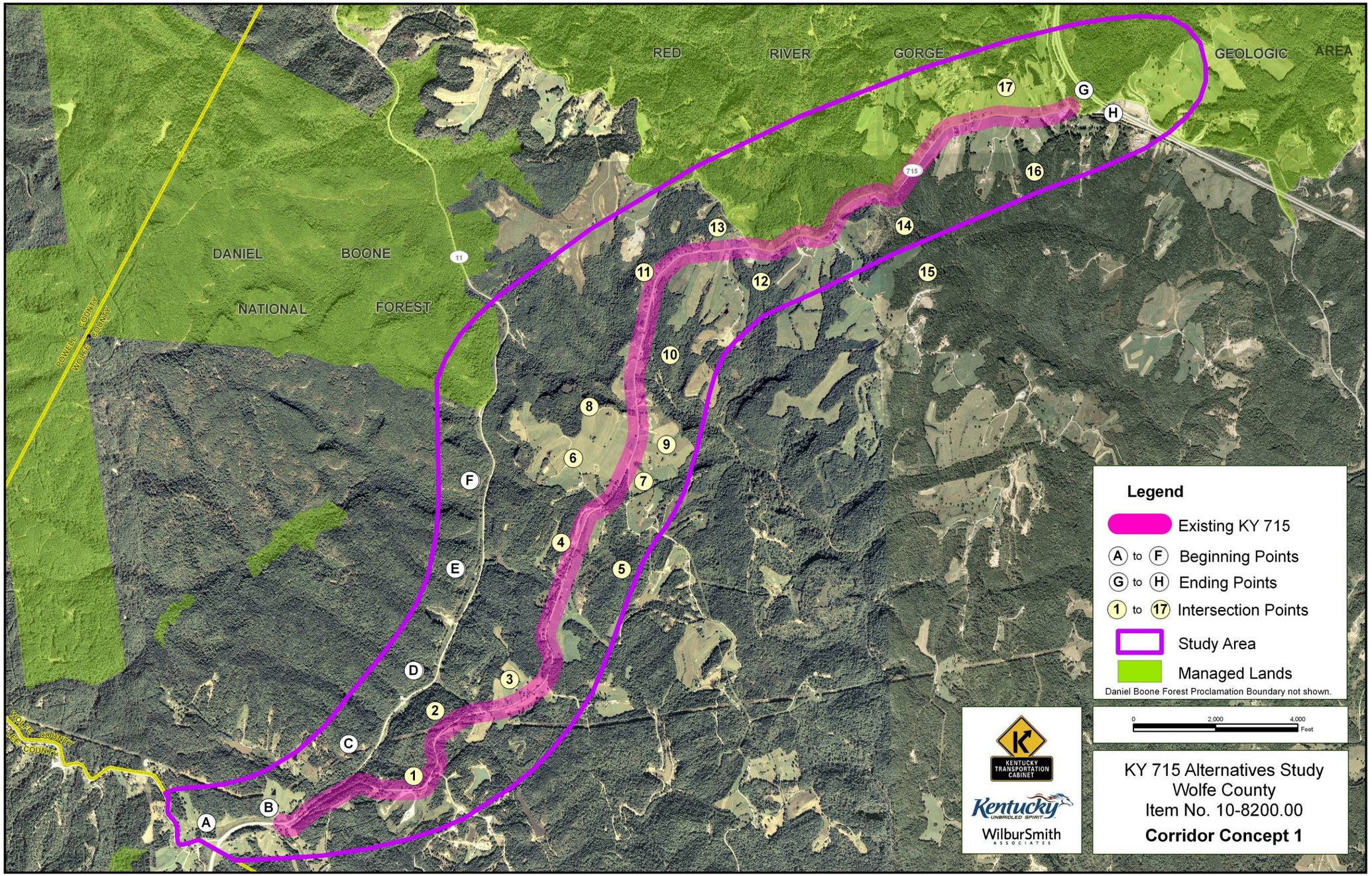


Figure 8.2 – Corridor Concept 1: Existing Alignment

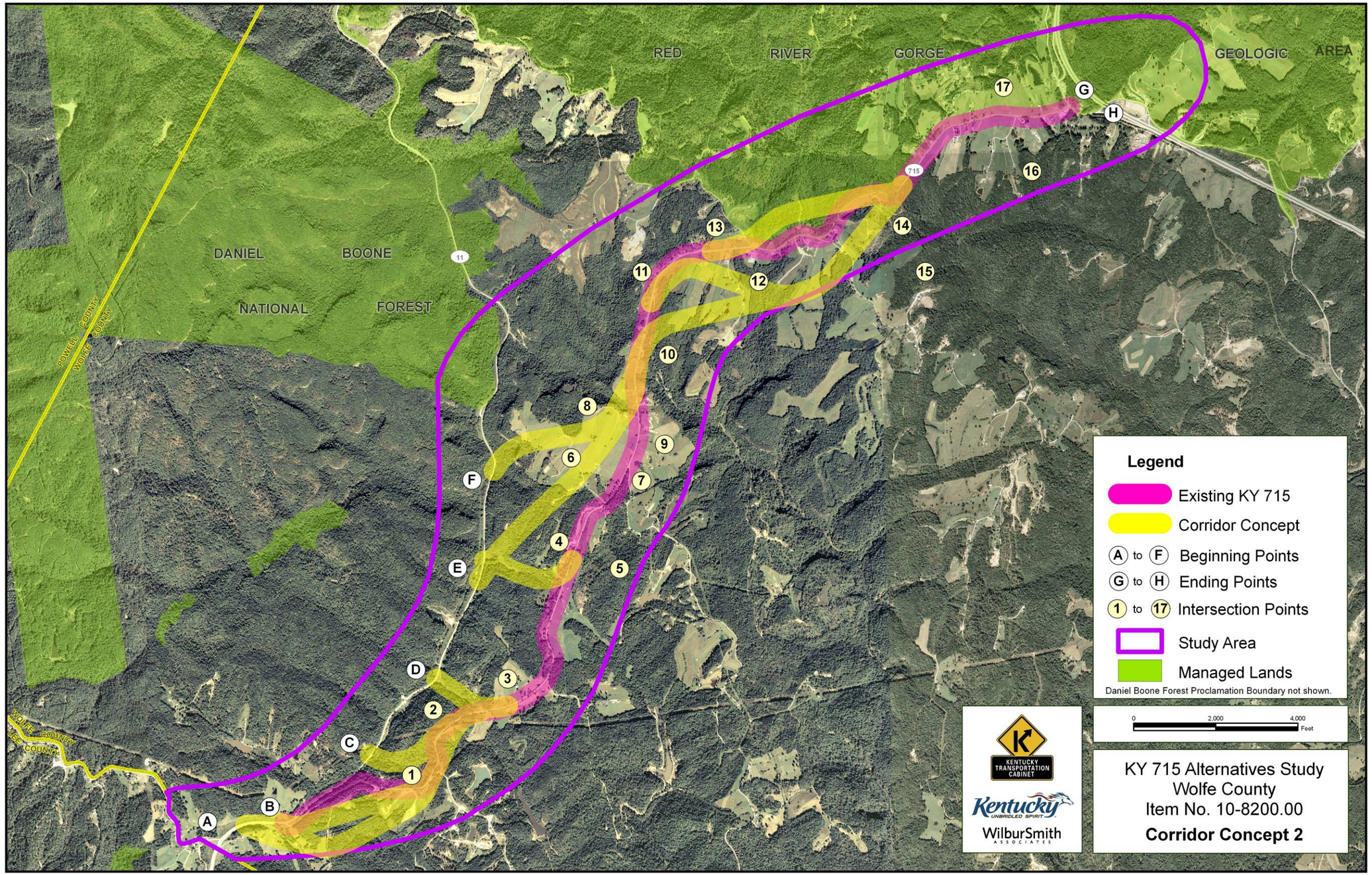


Figure 8.3 – Corridor Concept 2: Existing Alignment with Off-Alignment Options

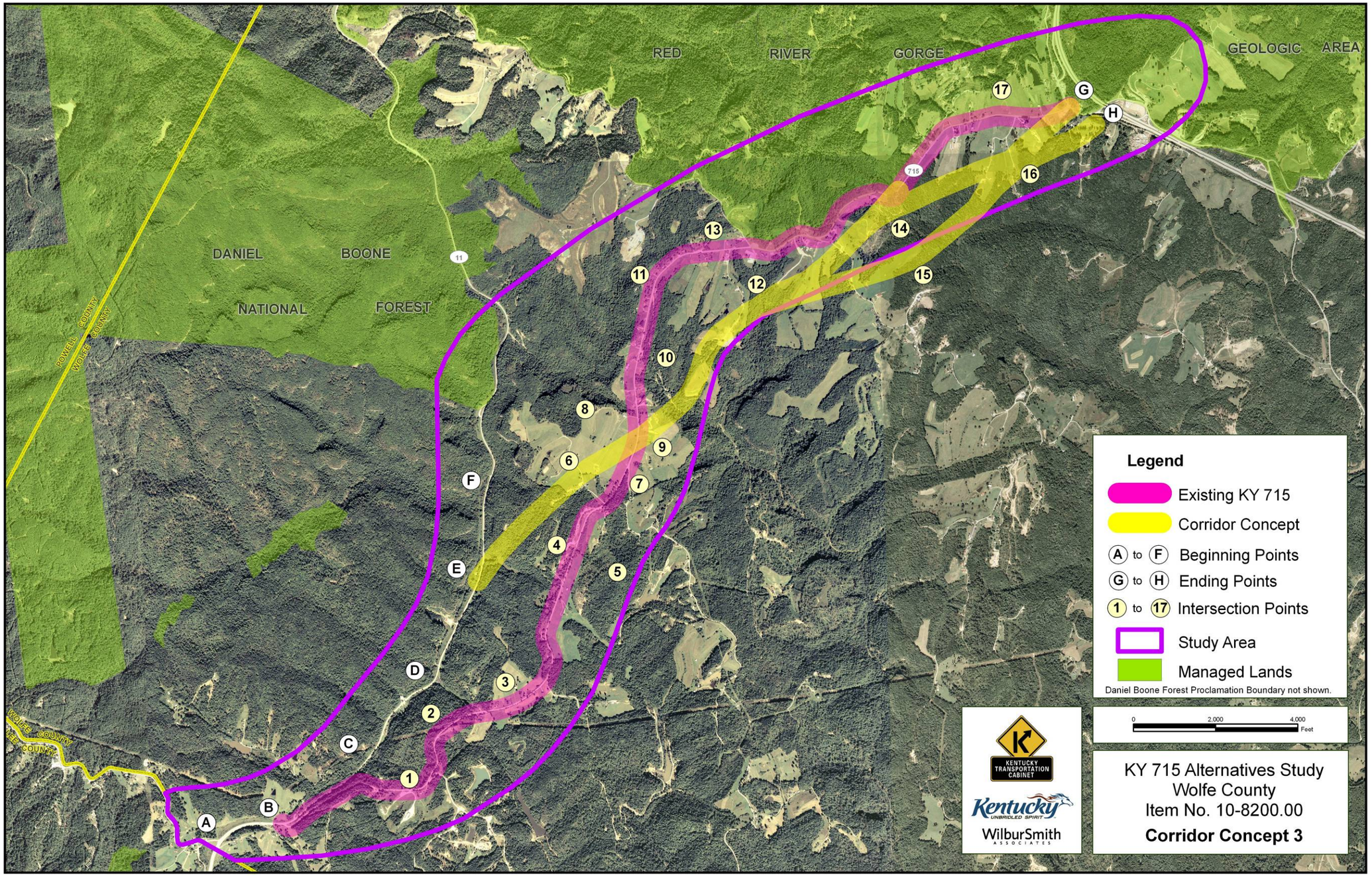


Figure 8.4 – Corridor Concept 3: Western/Eastern Corridor

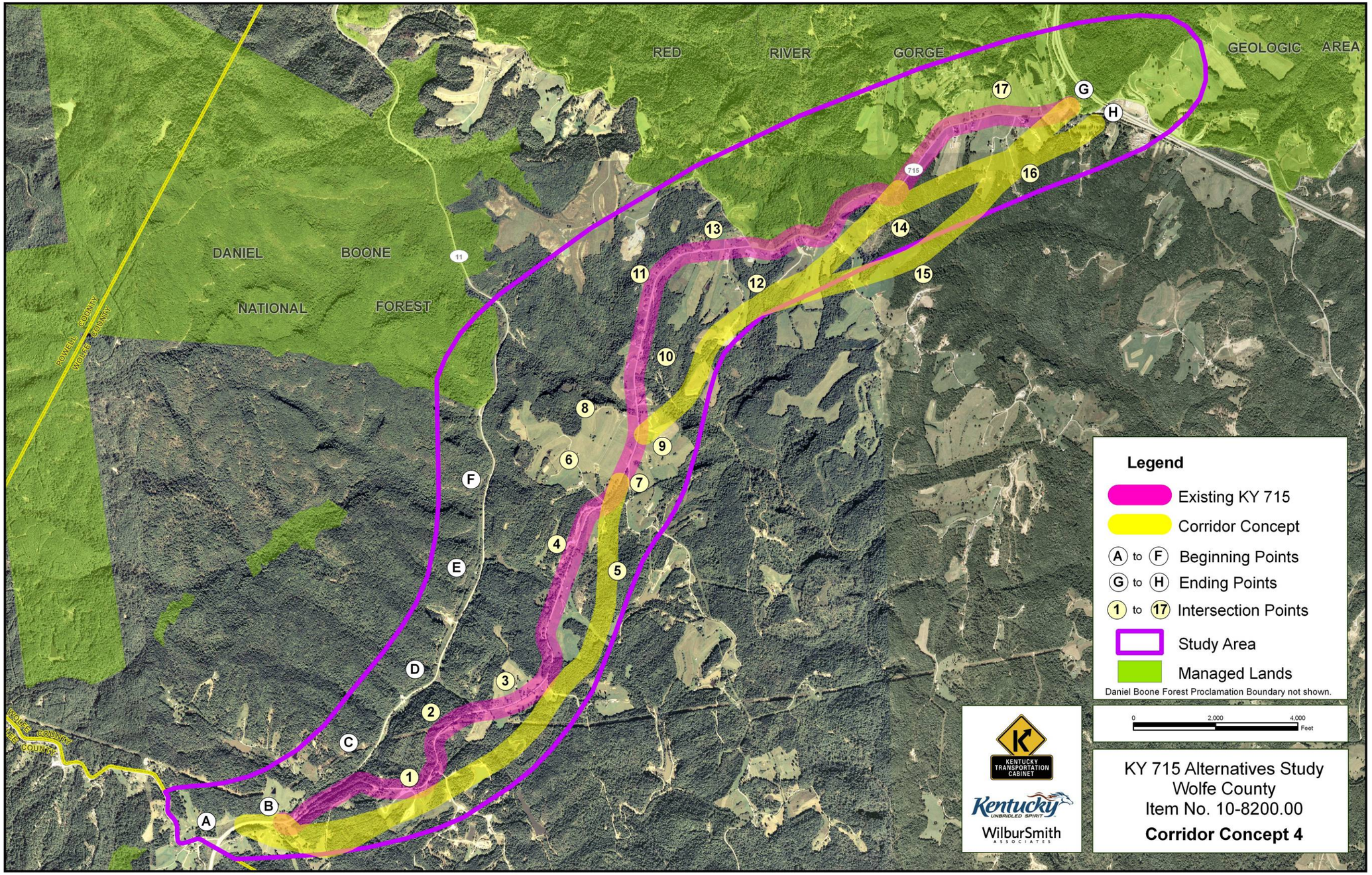


Figure 8.5 – Corridor Concept 4: Near Eastern Corridor on New Alignment

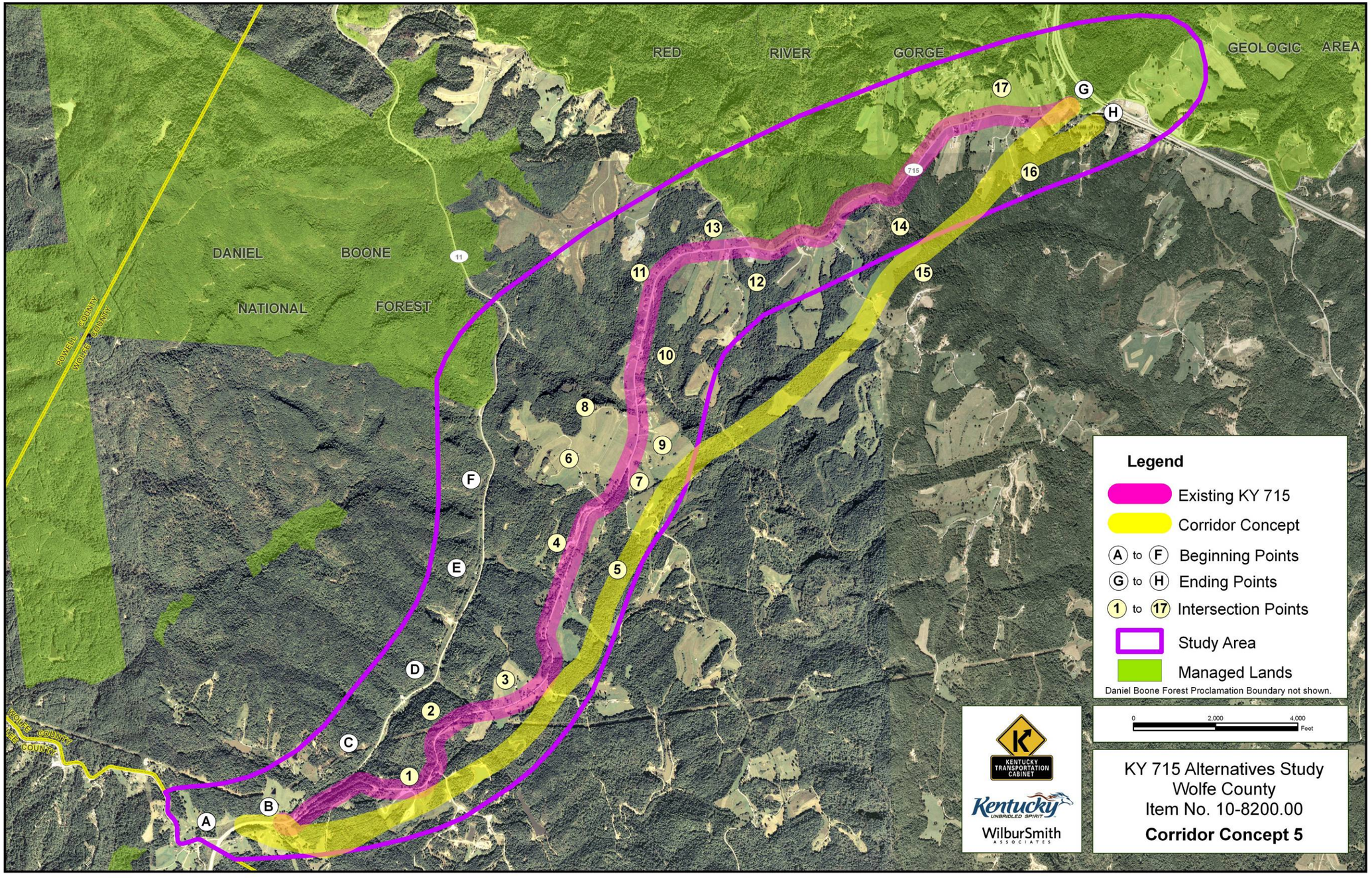


Figure 8.6 – Corridor Concept 5: Far Eastern Corridor on New Alignment

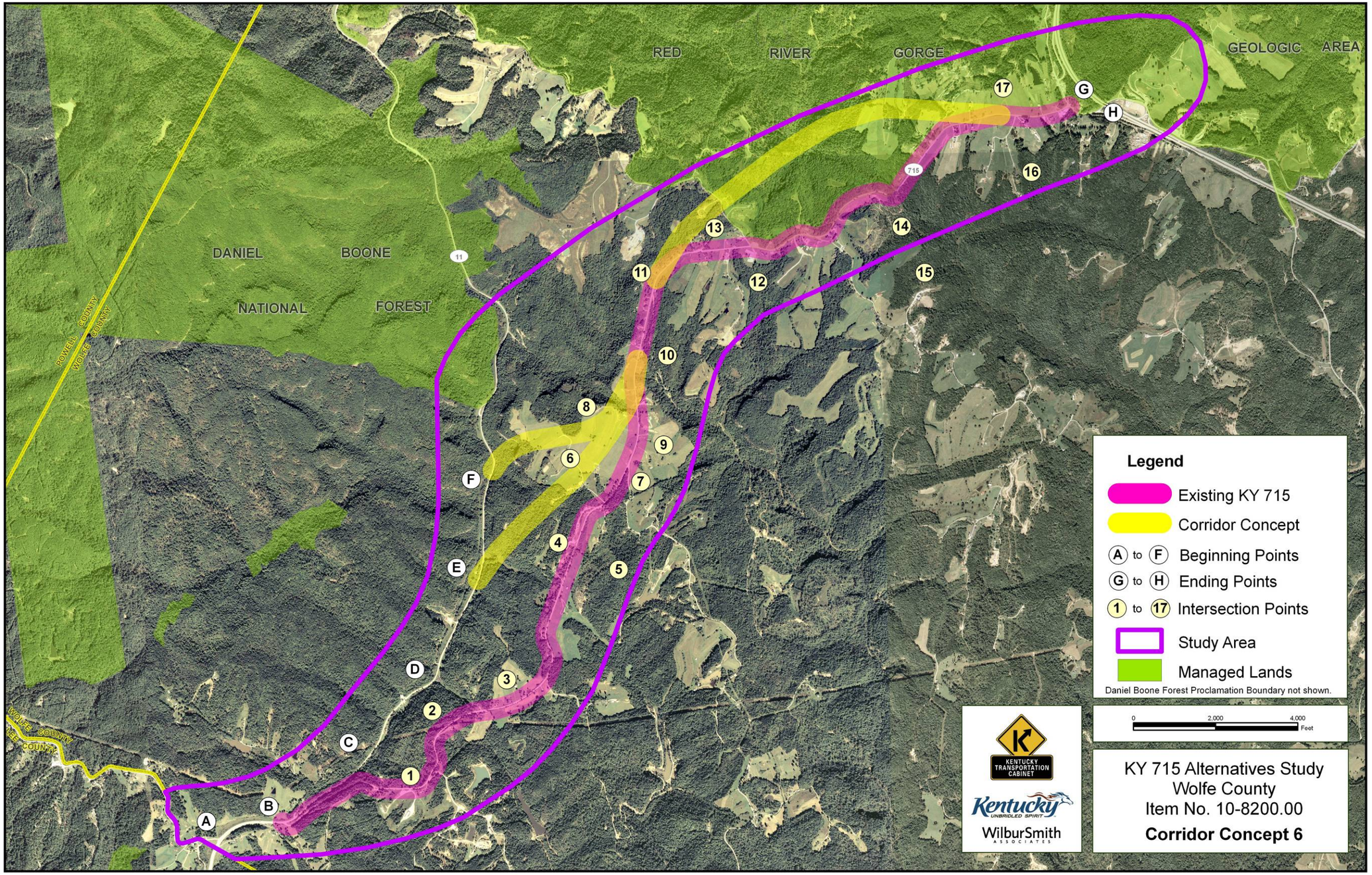


Figure 8.7 – Corridor Concept 6: Western Corridor

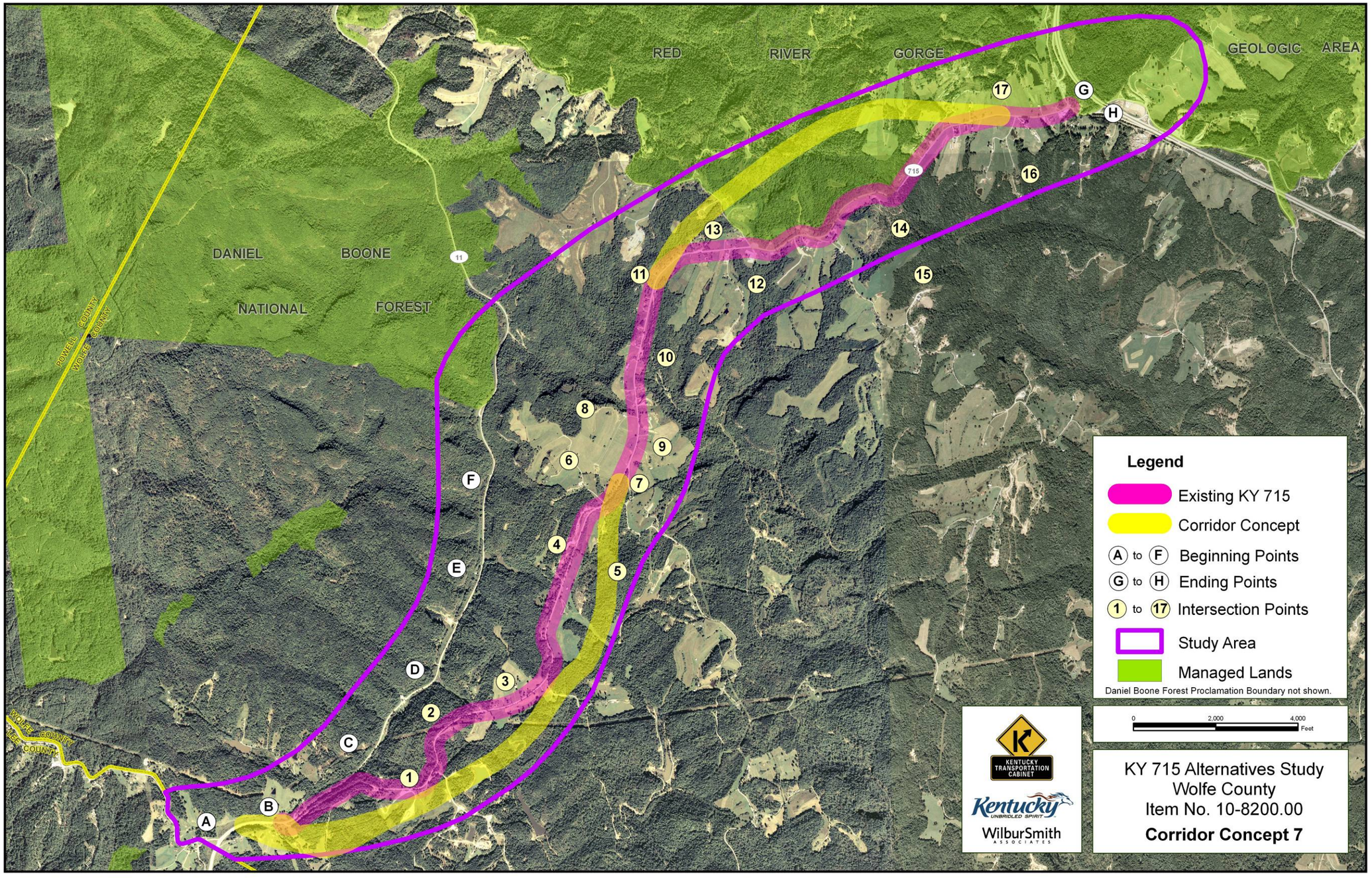


Figure 8.8 – Corridor Concept 7: Eastern/Western Corridor

B. Initial Interchange Concepts

In addition to the development of corridor alternatives, consideration was given to potential improvements to the KY 15-Mountain Parkway interchange near the northern terminus of the proposed KY 715 project. Although an interchange improvement could be beneficial in improving access from KY 715 to the Mountain Parkway, this assessment is separate from and independent of the proposed KY 715 improvement. As always, the No-Build alternative is a viable consideration for the proposed interchange improvement project.

Five potential interchange improvement "build" concepts were developed. Concepts 1 through 4 are shown in **Figure 8-9** and Concept 5 is shown in **Figure 8-10**. Following are descriptions of the five concepts.

- Interchange Concept 1: This concept reconfigures the connection between KY 715 and KY 15, bringing KY 15 to a stop condition at KY 715. The reconstructed interchange and road network fully complies with current geometric standards.
- Interchange Concept 2: This concept maintains the current configuration of the connection between KY 715 and KY 15, bringing KY 715 to a stop condition at KY 15. The reconstructed interchange and road network would fully comply with current geometric standards.
- Interchange Concept 3: This concept reconstructs the interchange ramps to current geometric standards by reconfiguring the eastbound ramps and extending the acceleration and deceleration lengths on the westbound ramps to meet KYTC common practice. This context sensitive design minimizes impacts to the surrounding area by maintaining current conditions on the rest of the road network.
- Interchange Concept 4: The interchange ramp acceleration and deceleration lengths would be extended to meet AASHTO guidelines and/or KYTC common practice. This context sensitive design significantly minimizes impacts to the surrounding area by maintaining the existing interchange geometry and the rest of the road network.
- Interchange Concept 5: The interchange ramps would be removed and all access to KY 715 would have occur via Exit 42 at Quillins Chapel Road (KY 1653). This would include the upgrading of Quillins Chapel Road to improve access between KY 15 and the Mountain Parkway interchange. Since this would only involve the removal of the existing access ramps, there is no conceptual representation in Figure 8-9 for this potential interchange alternative.

C. Level 1 Screening

The purpose of the Level 1 Screening process was to eliminate alternatives that did not warrant further consideration before undertaking a more detailed analysis. For the Level 1 Screening of the seven corridor concepts, criteria were developed based on how well the corridor concepts:

- Satisfied the project purpose and need and/or additional project goals;
- Appeared to have fewer potential environmental and community impacts; and
- Compared with regard to constructability and planning level cost estimates.

Of special concern were potential impacts to the Daniel Boone National Forest; Red River Gorge; the close-knit community of Rogers; and both the abandoned railroad tunnel and the clifflines along the KY 715 since each is not only as an engineering challenge, but also a wildlife habitat for threatened and endangered species.

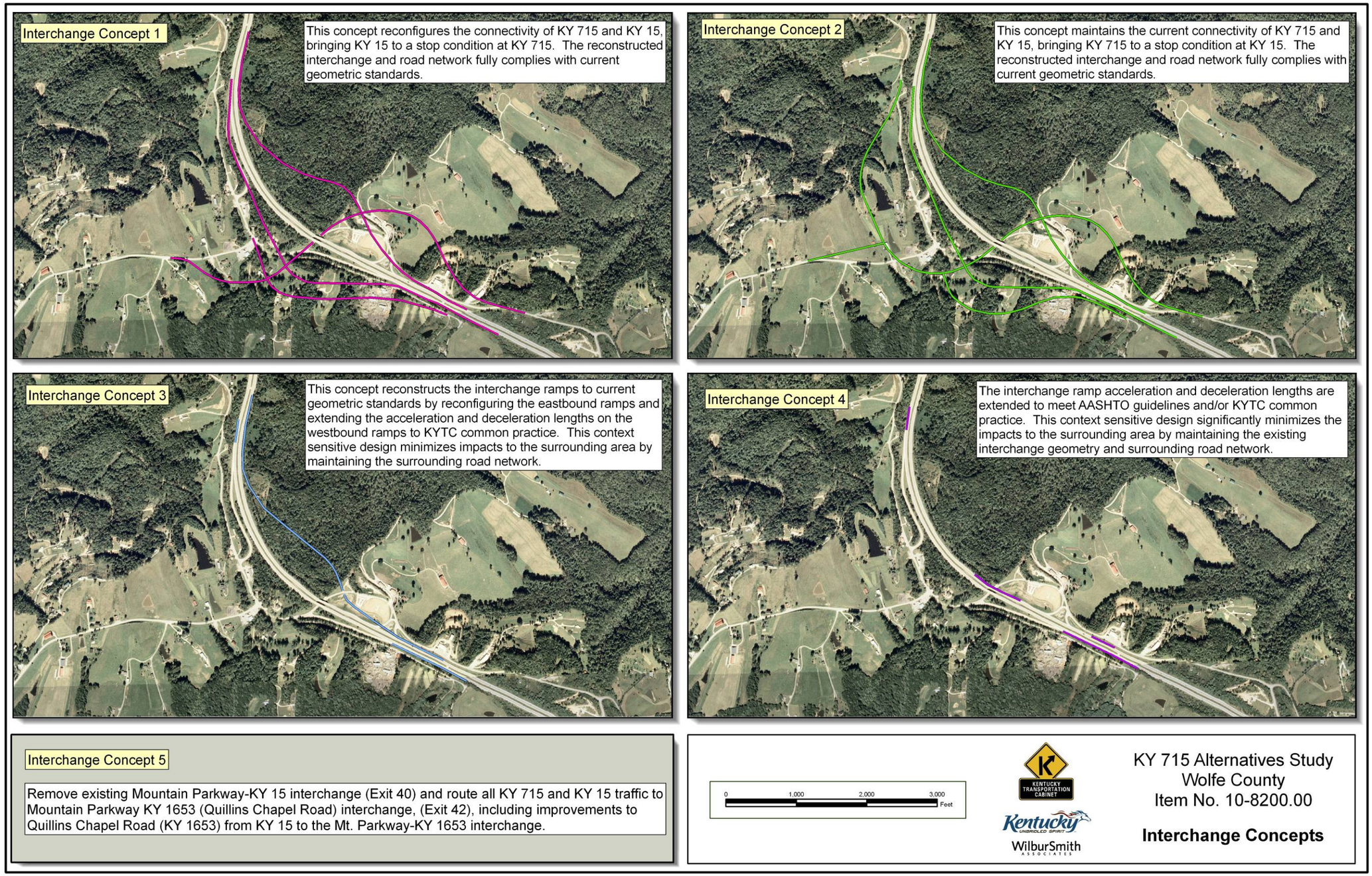


Figure 8.9 – Interchange Concepts

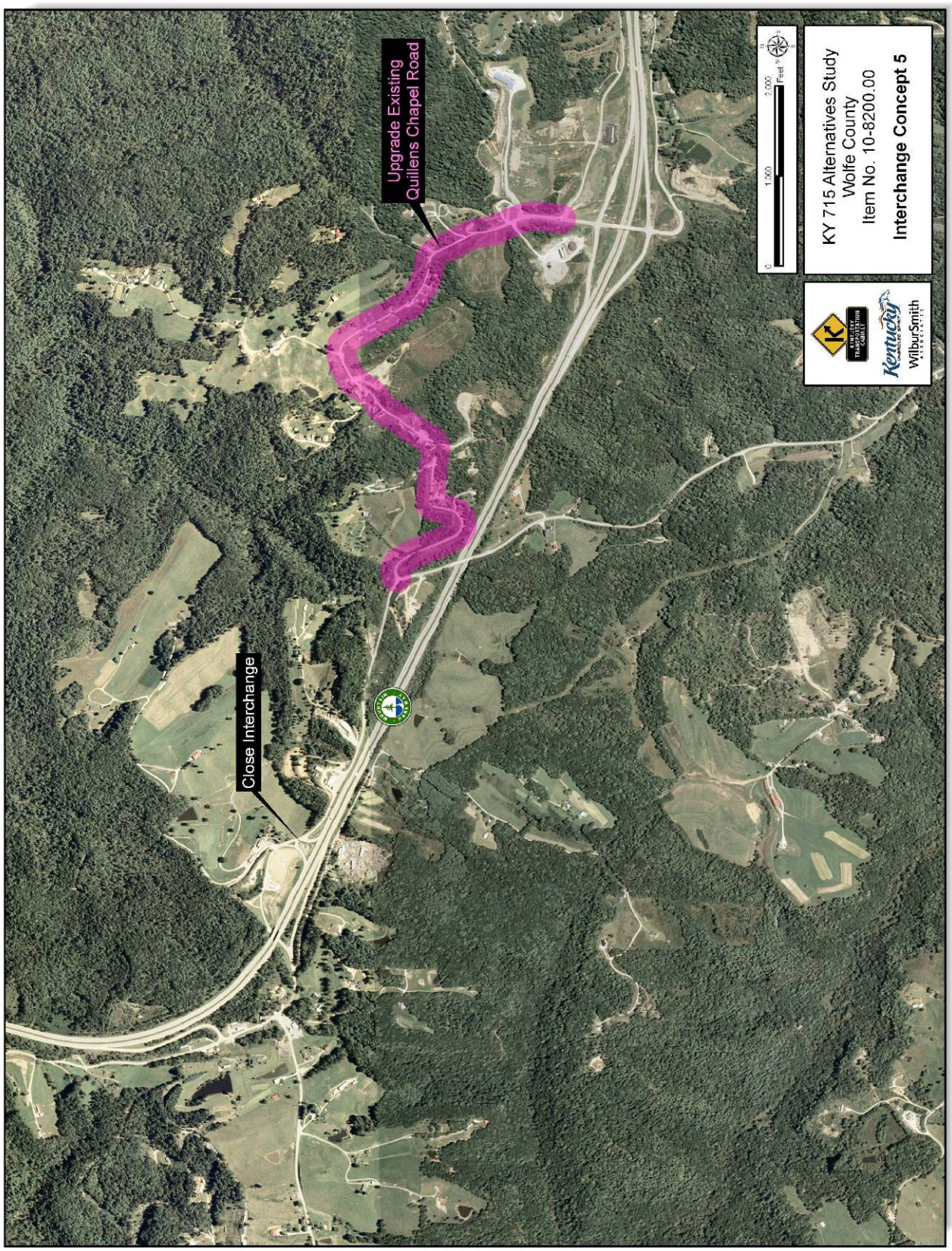


Figure 8.10 – Interchange Concept 5

The alternatives were given a comparative review using quantitative and qualitative evaluations based on the existing conditions data and both resource agency and public input. Based on these comparisons, each corridor alternative and interchange option was assigned a High, Medium, or Low rank for each category, as shown in **Tables 8.1 and 8.2.**

The results of the Level 1 Screening were presented to the project team on March 15, 2007, as discussed below.

D. Second Project Team Meeting

The Second Project Team Meeting was conducted on May 28, 2008, at the KYTC District 10 Office in Jackson, Kentucky. At this meeting, the KY 715 preliminary corridor concepts were discussed along with the results of the Level 1 Screening. The meeting minutes are included in **Appendix D**. Key comments and decisions by the project team for development of the final alternatives are as follows:

- WSA would review the grades for the segments that begin at C, D, E, and F to see if any of them would be acceptable for further consideration. A grade of up to 8% would be acceptable. In particular, WSA will see if segment C-2 would be acceptable, since it may be less expensive than A-1.
- Any improvement at points C, D, E, or F would probably also require that a section of KY 11 would be upgraded. That would add to the cost of the project, plus it would be difficult due to the cliffs and the stream on either side of the road.
- One of the biggest issues is what to do in the area of the abandoned railroad tunnel under KY 715. It was noted that someone in the past had proposed using the abandoned tunnel as a tourist attraction. WSA was asked to find out who owns the tunnel and if they plan to do anything with it in the future.
- Improving existing KY 715 over the tunnel could present problems, but going around it (segment 3-5 east) also has problems due to the Cliffside Resort property and a small lake located nearby. It was decided that the 3-5 off-line segment should be reinstated and considered as an option in Alternative 3.
- Bill Madden proposed a new alternative beginning south of point A (near the KY 11 intersection with the access road to Zachariah) which would go further east, around the Cliffside Resort area, and tie in at point 3. WSA was asked to consider this alternative/option for further review.
- It was thought that KY 11 was a National Scenic Byway, so WSA was asked to see if there are any Scenic Byway improvement restrictions for KY 11.
- The following corridor alternative segments were eliminated from further consideration: C-2 , D-3, E-4, E-6-9 , E-6-8-10, F-8-10, 1-3, 5-15, 10-12, 11-17, and 13-14. The eliminiation of these segments also resulted in the elimination of four of the seven corridor concepts.
- In addition to the No Build alternative and further consideration of the other input at the meeting, three of the original corridor alternatives would be carried forward: (1) an improvement along the existing alignment, beginning at or near Point B and ending at Point G; (2) an improvement along the existing alignment, with a bypass of Rogers, two different tie-down options at or near Point A or B, and ending at Point G; and (3) an eastern alternative that, optionally, could be on a totally new alignment or use some portions of existing KY 715, beginning at or near Point A or B and ending at Point G or H.
- Spot improvements will be included in the final alternatives.

The additional analysis raised in the meeting and the evaluation of the final corridor alternatives will be discussed further in **Chapter 9** of this report.

Following a group discussion of the proposed interchange concepts, the following decisions were made:

- Interchange Concepts 1 and 2 should not be carried forward primarily due to potential major impacts on the Red River Gorge area, homes and businesses; potential confusion for motorists; and excessive cost.
- Interchange Concept 5 should not be carried forward because removing Parkway access at this location would have major impacts on businesses located on or using KY 715, as well as community residents who use this access point to travel to work and/or services outside the immediate area.
- Concepts 3 and 4 should be carried forward. However, WSA should review the cost estimate for Concept 4 to see if it includes the widening of the Mountain Parkway Bridge over KY 15.
- It was noted that the ramps for Concept 3 are located in the Red River Gorge/Daniel Boone National Forest managed land, so there may be a 4f issue. To address this possibility, WSA was also asked to investigate a tight clover type improvement closer to existing KY 15 (near the tractor dealer) to see if it might be feasible.
- WSA should also review the design concepts to make sure that there is proper bridge clearance on KY 15 or if KY 15 might need to be lowered.

Table 8.1 – Corridor Concept Segments Level 1 Screening

Segment	Distance / Length (miles)	Constructibility/Implementation				Potential Impacts																
						Community Cohesion					Other Community/Cultural Impacts					Environmental Impacts						
		Grades	Utilities	Geotechnical	Stream Crossings	ROW - Homes	ROW - Businesses	Schools	Churches	Cemeteries	Farmlands *	Parks / Daniel Boone National Forest / Red River Gorge Geologic Area	Environmental Justice	Historic Properties	Archaeology Sites	UST Sites	T & E Species	Wildlife Habitat	Wildlife Mgmt Areas	Wetlands	Streams	Other
Begin Segments																						
A-1	1.00	Satisfactory	(1) (2) (3)	Average	Average	Medium	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Medium	Medium	Low	High	Medium	(1)
C-2	0.45	Least Desirable	(1) (2) (3) (4)	Average	Satisfactory	Low	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low	Low	Low
D-3	0.37	Least Desirable	(1) (2) (3)	Average	Satisfactory	Low	Low	Low	Medium	Medium	Low	Medium	Low	Medium	Low	Low	High	High	Low	Low	Low	(2) (3)
E-4	0.45	Least Desirable	(1) (2) (3)	Average	Satisfactory	Low	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Low	High	High	Low	High	Low	Low
E-6-9	1.03	Average	(1) (2) (3)	Average	Satisfactory	Medium	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Low	High	High	Low	Medium	Low	Low
E-6-8-10	1.28	Satisfactory	(1) (2) (3)	Average	Satisfactory	Low	Low	Low	Low	High	Low	Medium	Low	Low	Low	Low	High	High	Low	Medium	Low	Low
F-8-10	0.91	Average	(1) (2) (3)	Average	Satisfactory	Low	Low	Low	Low	High	Low	Medium	Low	Low	Low	Low	High	High	Low	Medium	Low	Low
Connecting Segments																						
1-3	0.70	Satisfactory	(4)	Average	Satisfactory	Low	Medium	Low	Low	Low	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Low	High	Low	Low
3-5	0.65	Satisfactory	Satisfactory	Average	Average	Low	Low	Low	Low	Medium	Medium	Medium	Low	Low	Low	Low	Medium	Medium	Low	Low	Medium	Low
5-7	0.57	Satisfactory	(1) (2) (3)	Average	Satisfactory	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium	Medium	Low	Medium	Low	Low
5-12	1.65	Satisfactory	(1) (2) (3)	Average	Average	Low	Low	Low	Low	Medium	Low	Medium	Low	Low	Low	Low	Medium	Medium	Low	low	Medium	Low
5-15	2.17	Satisfactory	(1) (2) (3)	Average	Least Desirable	Medium	Low	Low	Low	Medium	Medium	Low	Low	Low	High	Low	Medium	Medium	Low	Low	High	Low
9-12	0.81	Satisfactory	(1) (2) (3)	Average	Least Desirable	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium	Medium	Low	Medium	High	(1)
10-12	0.82	Satisfactory	(1) (2) (3)	Average	Least Desirable	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Low	Low	High	High	Low	Low	High	Low
11-12	0.75	Satisfactory	(1) (2) (3)	Average	Average	Medium	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium	(5)
11-17	1.97	Satisfactory	(1) (2) (3)	Average	Least Desirable	Medium	Low	Low	Low	Low	Medium	High	Low	Low	Low	Low	Low	Low	Low	Low	High	Low
12-14	0.58	Satisfactory	Satisfactory	Average	Average	Medium	Low	Low	Medium	Low	Medium	Low	Low	Low	Low	Low	Medium	Medium	Low	Medium	Medium	(1)
12-15	0.73	Satisfactory	(1) (2) (3)	Average	Average	Medium	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Low	High	High	Low	Low	Medium	Low
13-14	0.95	Satisfactory	(1) (2) (3)	Average	Average	Medium	Low	Low	Low	Low	Medium	High	Low	Low	Low	Low	Medium	Medium	Low	Low	Medium	Low
14-16	0.67	Satisfactory	(1) (2) (3)	Average	Average	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	High	Low	Low	Medium	Low
15-16	0.67	Satisfactory	Satisfactory	Average	Average	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Low	Low	Medium	Medium	Low	Low	Medium	Low
End Segments																						
16-G	0.36	Satisfactory	(1) (2) (3)	Average	Average	Low	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Medium	Low
16-H	0.47	Satisfactory	(1) (2) (3)	Average	Average	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Medium	Low	Low	Low	Medium	Low
17-G	0.33	Satisfactory	(1) (2) (3)	Average	Satisfactory	Medium	Medium	Low	Low	Medium	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Medium	Low	Low

(1) Water/Sewer
(2) Telephone
(3) Electricity
(4) Major Transmission Line

(1) Oil/Gas Wells
(2) Spring
(3) Abandoned RR Tunnel
(4) Post Office
(5) Sewage Treatment Plant

KEY:

Low/Satisfactory	Lowest likely impacts; Satisfactory for this measure.
Medium/Average	Mid-range of impacts; Somewhat unsatisfactory for this measure.
High/Least Desirable	High likely impacts; Least Desirable for this measure.

Table 8.2 – Interchange Options Evaluation

Interchange Options	Evaluation Measures			
	Traffic Operations	**Environmental Impacts**	**Community (Cohesion, loss of access, impacts to businesses)**	**Initial Construction Cost Estimate**
1	Satisfactory	High	Not Desirable	$18,000,000
2	Satisfactory	High	Not Desirable	$21,000,000
3	Average	Medium	Satisfactory	$10,000,000
4	Not Desirable	Low	Satisfactory	$4,000,000
5	Average	Low	Not Desirable	$7,000,000

KEY:

Low/Satisfactory	Lowest likely impacts; Satisfactory for this
Medium/Average	Mid-range of impacts; Somewhat unsatisfactory.
High/Not Desirable	High likely impacts; Least Desirable for this measure.

9. FINAL ALTERNATIVES DEVELOPMENT AND EVALUATION

This chapter presents an overview of the development and detailed evaluation (Level 2 Screening) of the final corridor alternatives developed by the project team.

A. Revised Conceptual Alternatives

Based on decisions made at the second project team meeting, three corridor concepts remained. The revised conceptual alternatives are generally described as follows:

- Initial Alternative 1: Improve Existing KY 715
- Initial Alternative 2: Improve Existing KY 715, with options for a bypass of Rogers, a new termnus at Point E west of the existing KY 15-KY 715 intersection, and a new eastern aligment segment at the southern terminus from Point A to Point 1
- Initial Alternative 3: Eastern corridor alternative, mostly on new alignment, and with three options for tying into KY 15 at Points A, B, or AA; multiple options for tying into KY 715; and two options for tying into KY 15 at Points G and H.

B. New Eastern Corridor

Based on a proposal made at the second project team meeting, an additional corridor concept was developed. This corridor would connect with a new southern terminus, designated as Point AA, located on KY 11 approximately 2 miles south of the KY 11-KY 715. This corridor was evaluated along with the original three revised conceptual alternatives (Initial Alternatives 1 – 3 presented in **Section A**).

C. Project Team Meeting (August 1, 2008)

The revised conceptual alternatives, including the new proposed alternative described in **Section B**, are shown in **Figure 9.1, Figure 9.2,** and **Figure 9.3**.

A “Level 2” Screening was completed for the various segments that made up the three conceptual alternatives, as discussed in the following sections. A third project team meeting was held on August 1, 2008 to discuss the results and determine what final alternatives should move forward for presentation to the public. The minutes of the August 1, 2008 meeting are included in **Appendix D**. Key decisions reached at the August 1st project team meeting included the following:

- Segment AB-1 (Initial Alternative 2) should not move forward as a separate planning level alternative, although it could be included as a design-level alternative for the reconstruction of the existing route if the project moves forward to Phase 1 Design.
- Segment AA-18 (Initial Alternative 3) should not move forward since it has several potential environmental issues and has a cost estimate that is approximately $20 million more (about 50% higher) than the other alternatives.
- Segment 12-14-16-G (Initial Alternative 3) should move forward for further consideration at the planning level, but segment 12-15-16-H (Initial Alternative 3) should not since the two segments are functionally the same; however, a connection to H could be considered as a design-level alternative if the project moves forward to Phase 1 Design.
- The group discussed the remaining segments and the importance of having stand-alone alternatives, rather than alternatives with many options (such as Initial Alternatives 2 and 3). The remaining segments chosen to move forward resulted in eight “build” alternatives (including a Spot Improvements Only alternative) to be submitted for input by local officials, stakeholders, resource agencies, and the public.

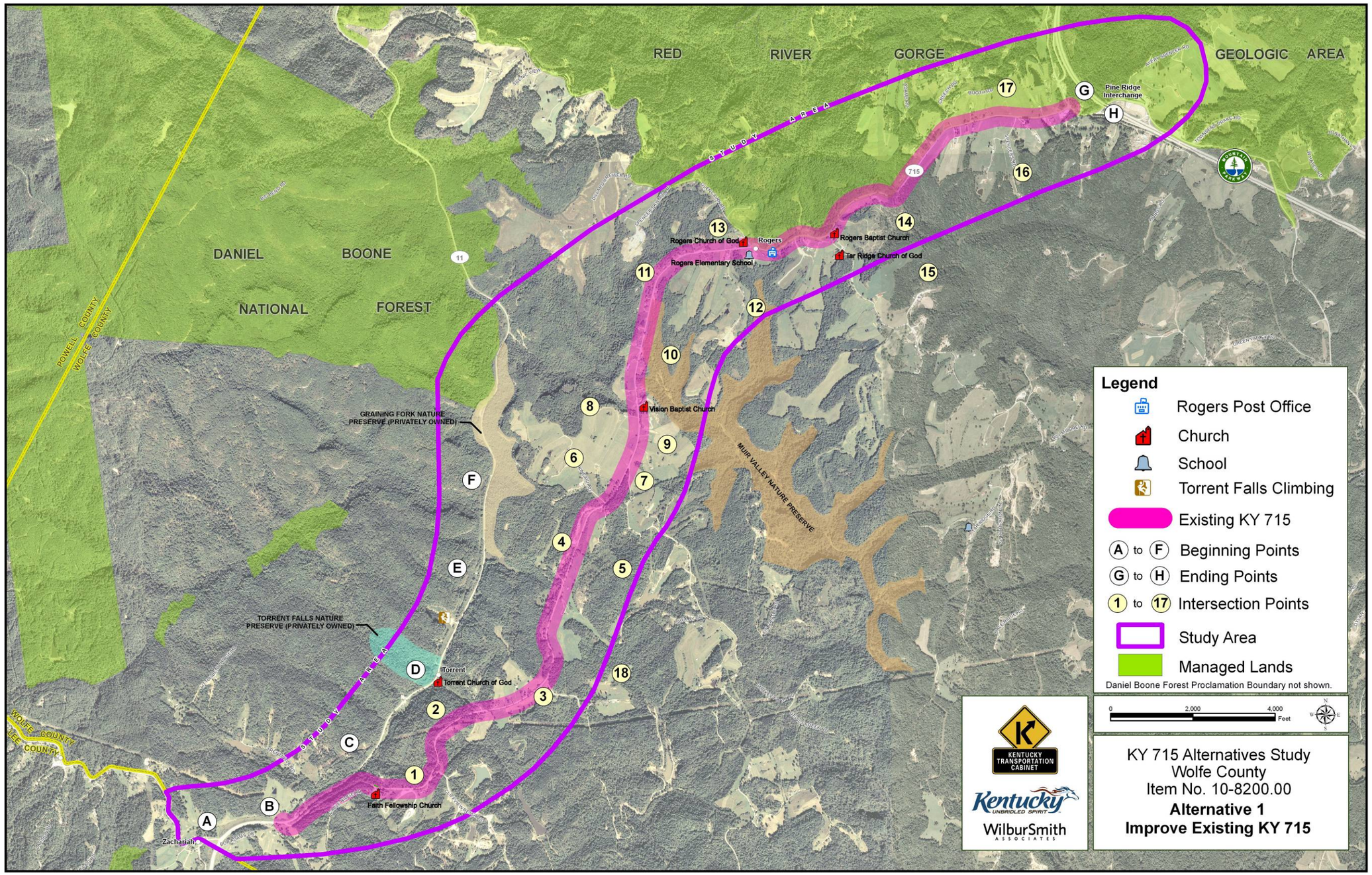


Figure 9.1 – Initial Alternative 1: Improve Existing KY 715

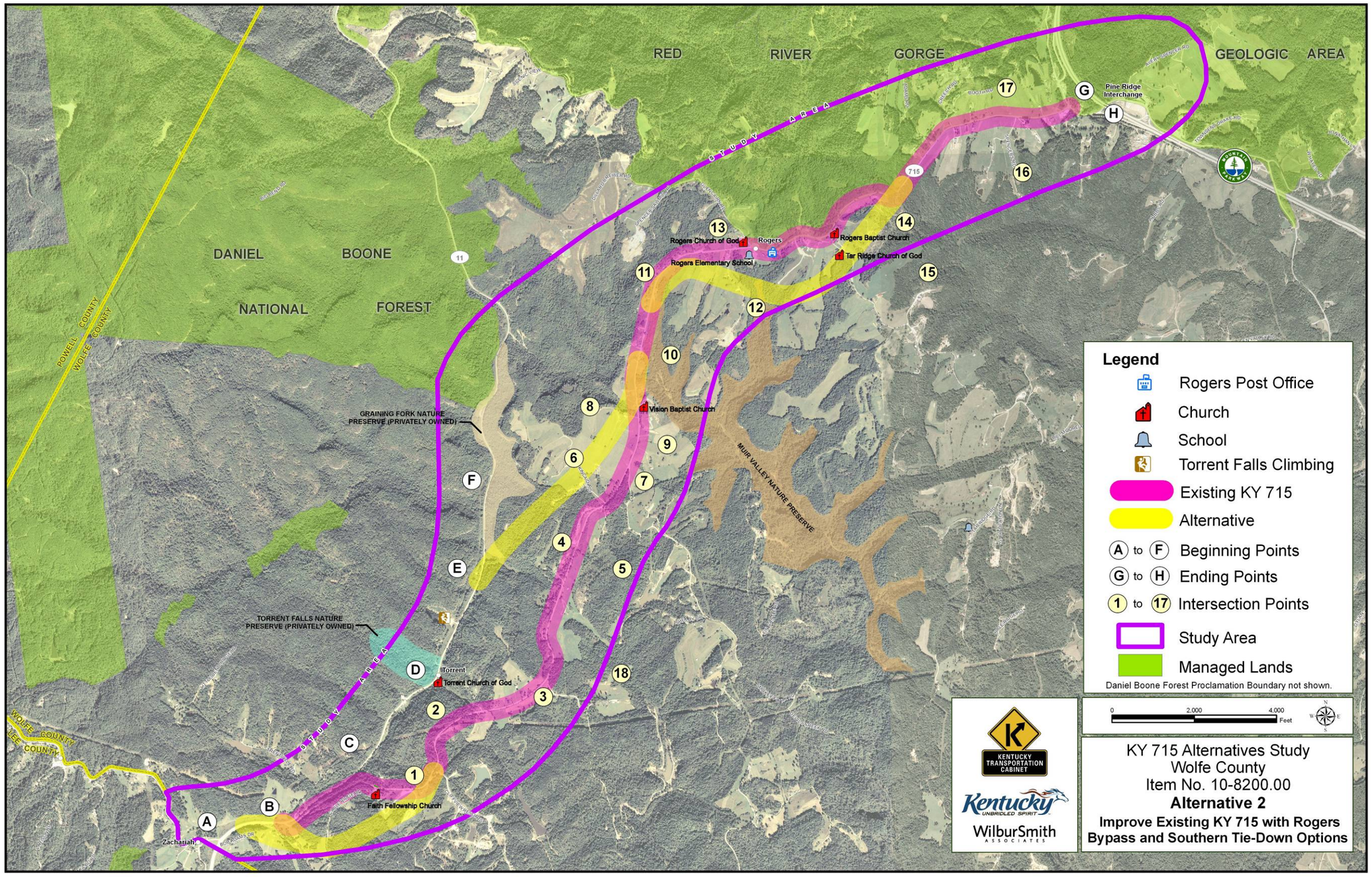


Figure 9.2 – Initial Alternative 2: Improve Existing KY 715 with Rogers Bypass and Southern Tie-Down Options

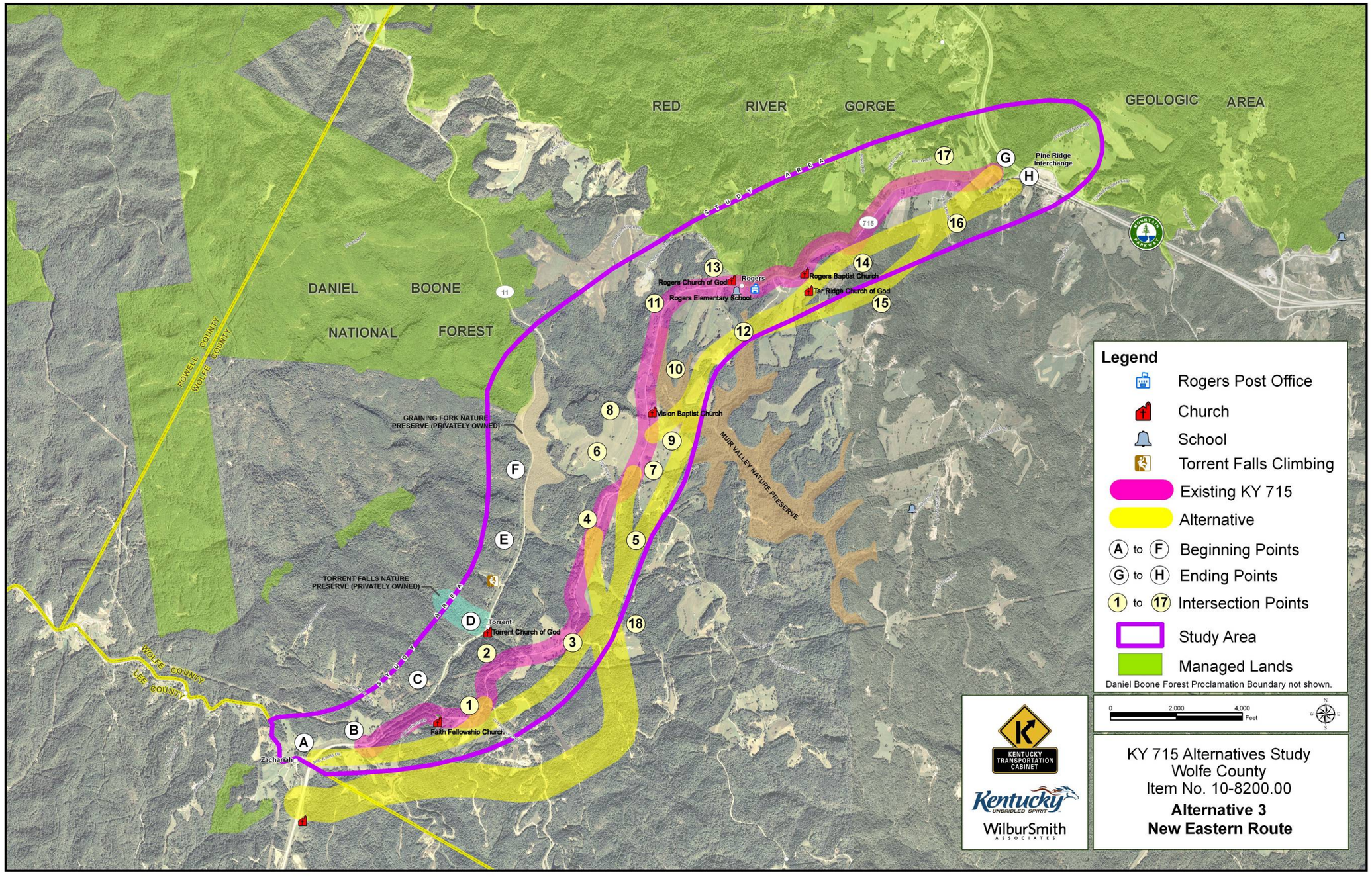


Figure 9.3 – Initial Alternate 3: New Eastern Route

The Level 2 Screening initially addressed individual segments that made up multiple options for the revised conceptual alternatives; therefore, it is cumbersome (and perhaps confusing) to present the results for all options for the three revised conceptual alternatives (Intial Alternatives 1 – 3). For clarity and convenience, the discussion of the Level 2 Screening is presented for the final "full build" corridor alternatives which were developed as a result of the August 1, 2008 project team meeting and presented in **Section D**. The Level 2 Screening of the final "full build" corridor alternatives is presented in **Section F**.

The group also discussed potential Spot Improvements and Interchange Alternatives. These are discussed further in **Sections E** and **Section K**, respectively.

D. Final "Full Build" Corridor Alternatives and Level 2 Screening Process

After dismissal of the newly proposed corridor beginning at Point AA, the various segments or options for the remaining revised conceptual alternatives were then developed as separate alternatives for presentation to local officials, stakeholders, resource agencies, and the public. This resulted in seven final "full build" corridor alternatives, designated as **Alternatives A through G**.

The final "full builld" corridor alternatives (**Alternatives A through G**) are shown in **Figure 9.4 through 9.10**, along with traffic data for each. The Level 2 Screening referenced in Section C was then modified to address these final alternatives. The findings, including the traffic analysis, are discussed in **Section F** of this chapter. The No-Build scenario was also included in the Level 2 Screening.

For evaluating impacts, the following corridor widths were established:

- Existing KY 715 in rural areas: 500 feet
- New routes in rural areas: 1,000 feet
- Existing KY 715 in urban areas: 150 feet
- New routes in urban areas: 500 feet

Secondary field and data reviews were conducted for each of the final corridor alternatives, focusing on environmental issues, geotechnical concerns, cultural resources, and environmental justice impacts. Reported impacts are recorded for the total corridor width; actual impacts will be less severe.

Traffic forecasts and cost estimates were also prepared for each of the final "full build" alternatives.

E. Spot Improvements

In addition to the "full build" alternatives, 11 locations along existing KY 715 and the KY 15-Mountain Parkway interchange were selected for potential spot improvement locations. These were identified based on existing deficiencies, safety concerns, and community input. In the August 1, 2008 meeting, the project team agreed that all 11 spot locations should move forward for public consideration. Using these, a Spot Improvements Only alternative, consisting of doing all spot improvements rather than a "full build" project, was designated as **Alternative H** for further evaluation and/or consideration.

Figure 9.11 shows the spot improvement locations (Alternative H) on a map, and **Table 9.1** provides summary information for each of the proposed spot improvements.

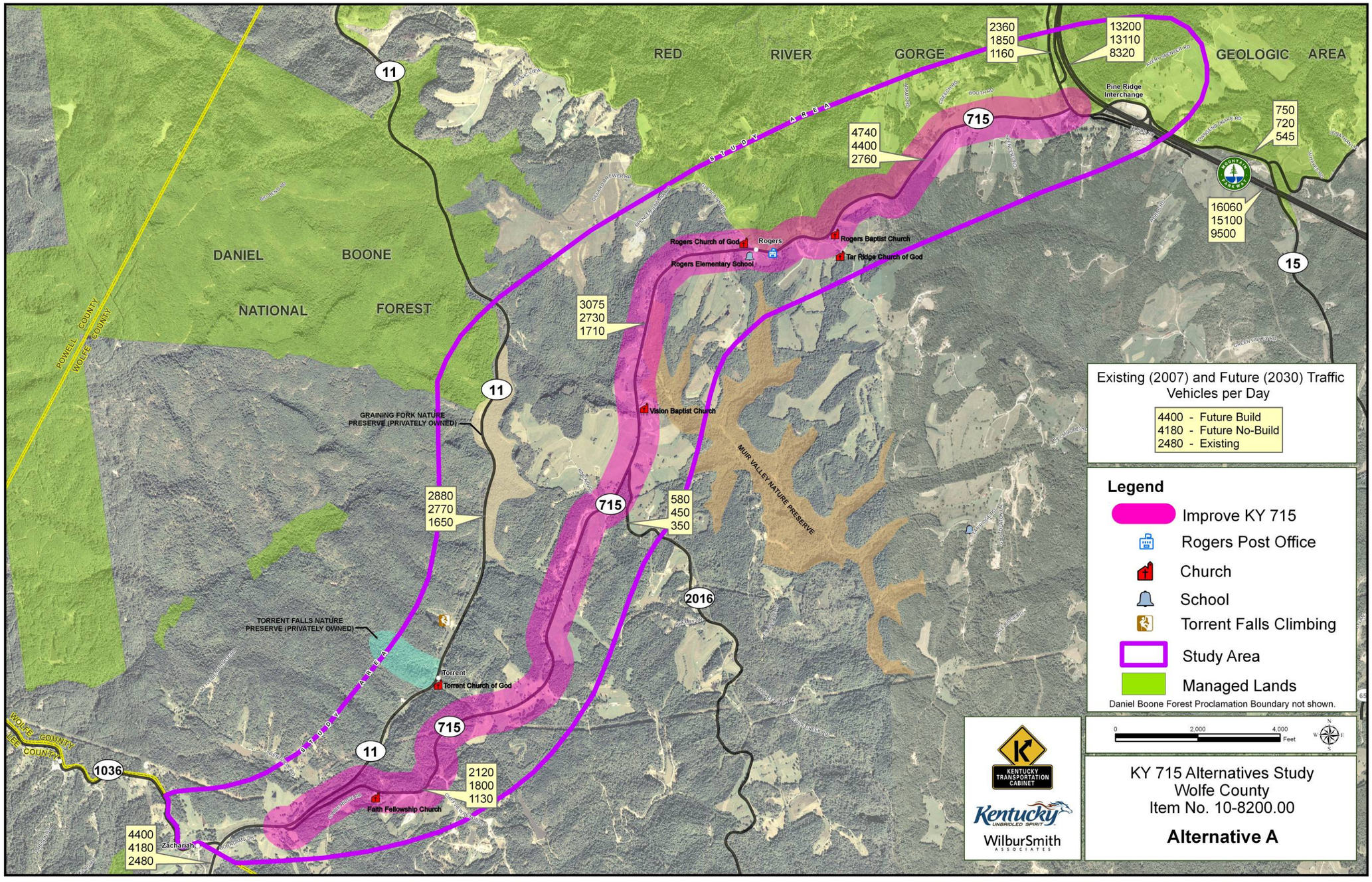


Figure 9.4 – Alternative A

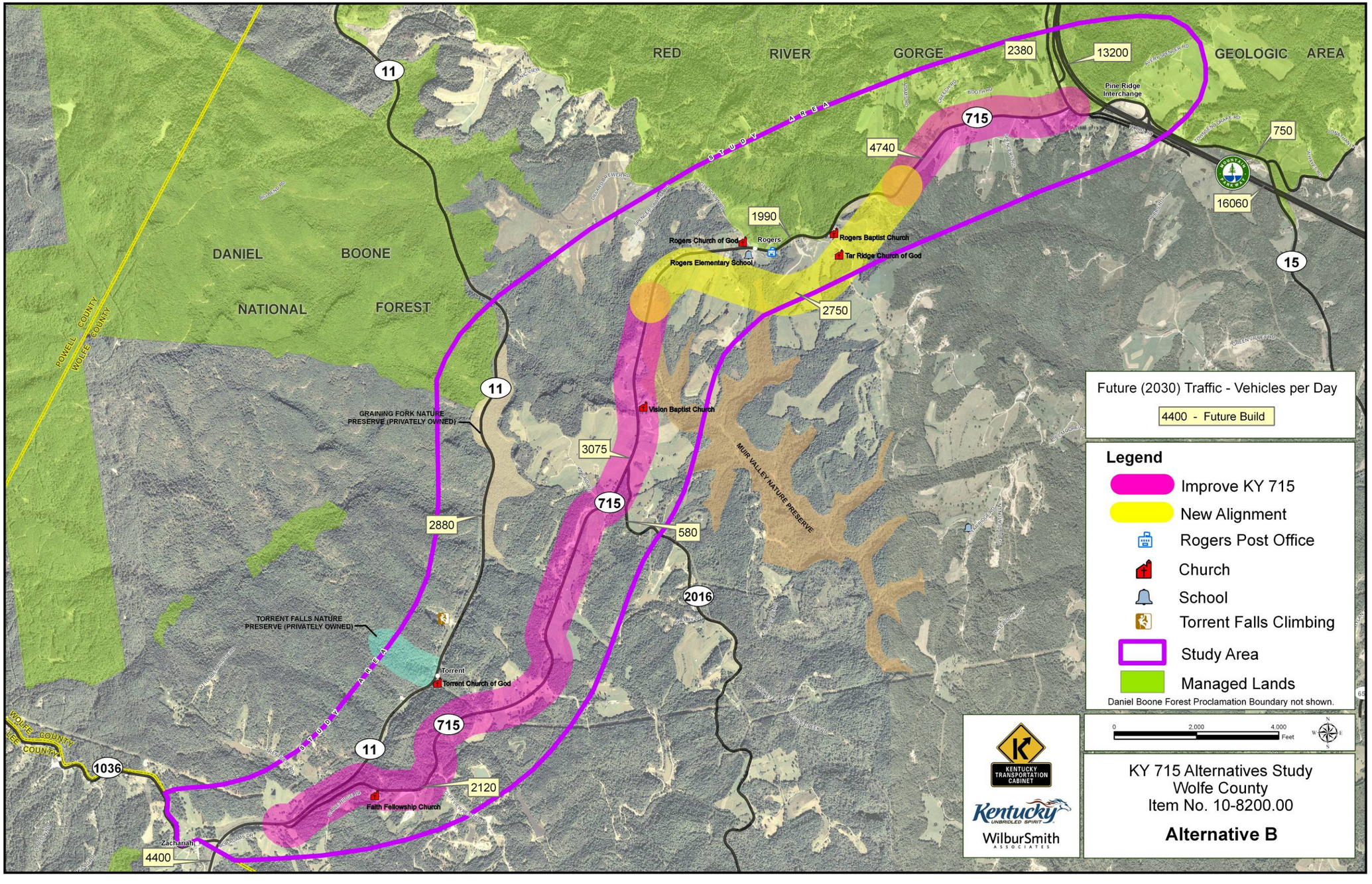


Figure 9.5 – Alternative B

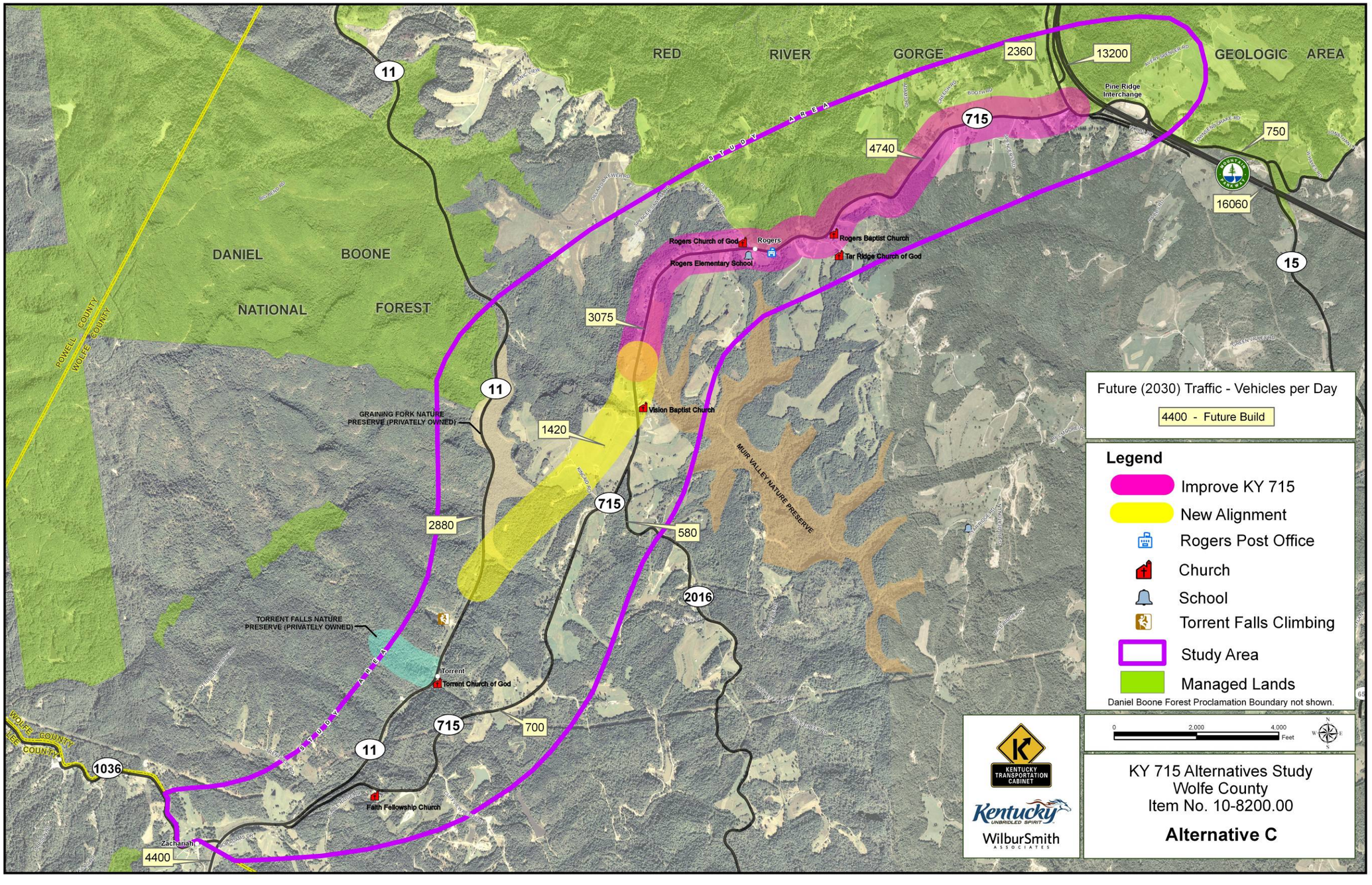


Figure 9.6 – Alternative C

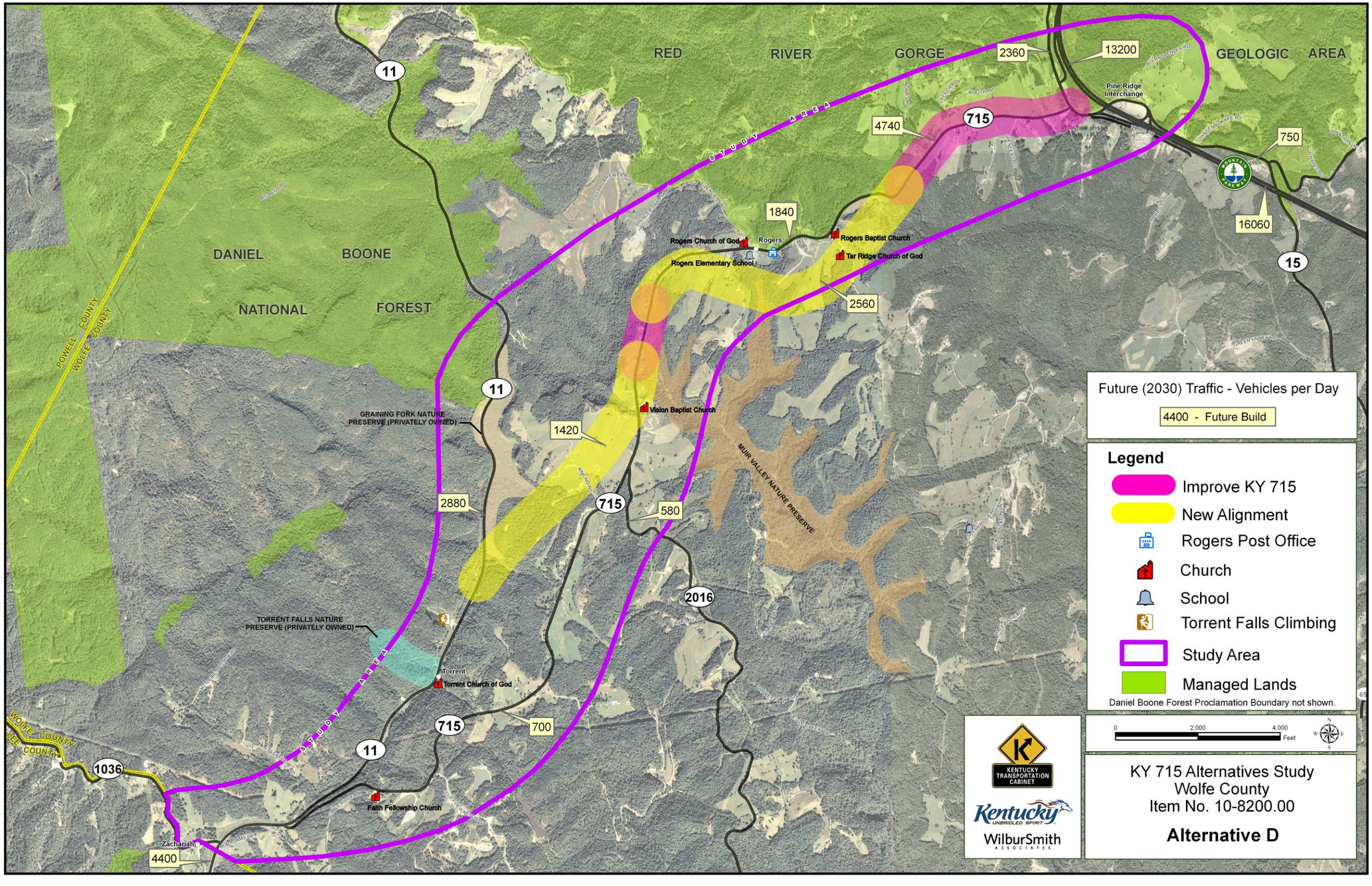


Figure 9.7 – Alternative D

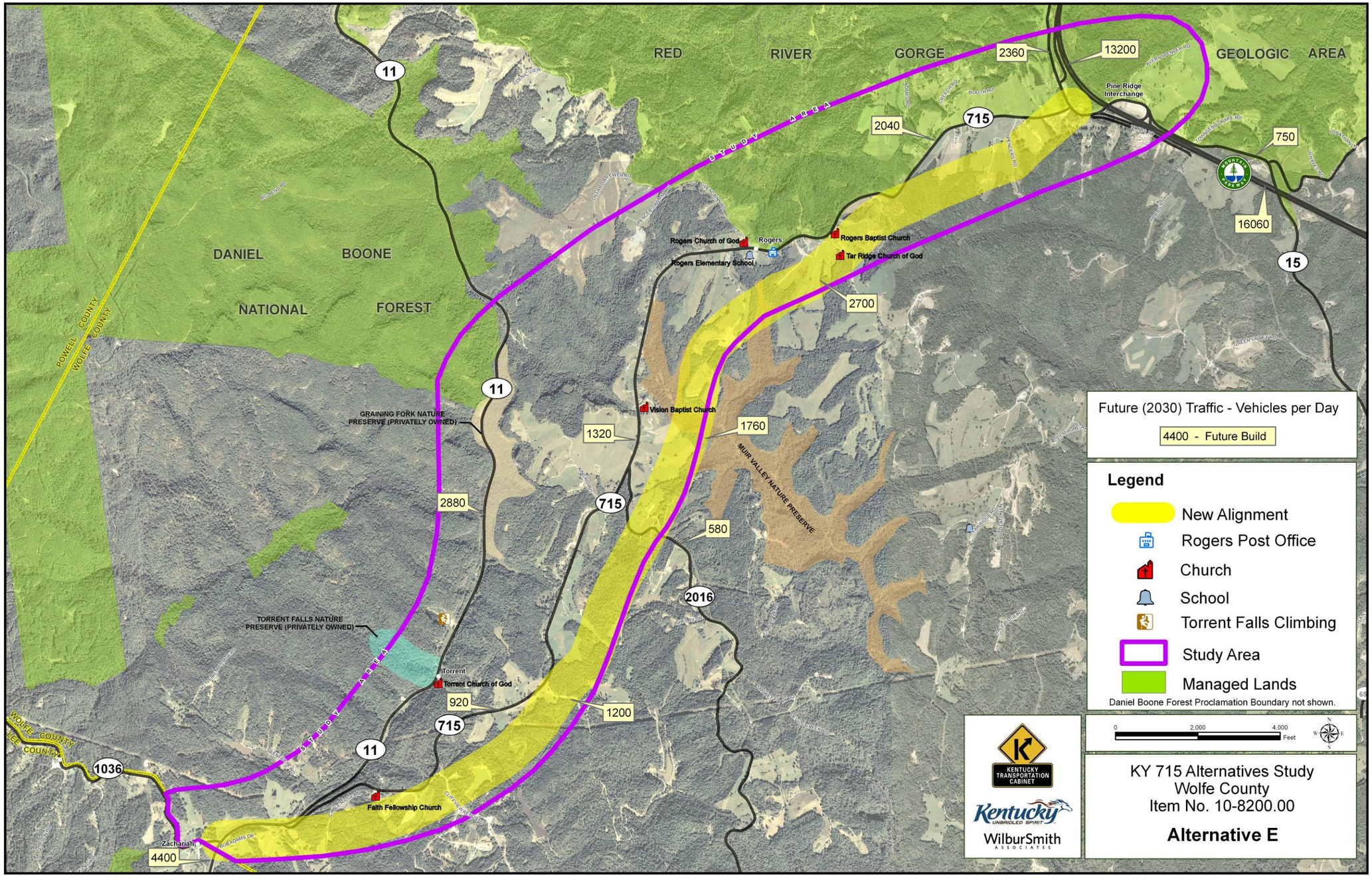


Figure 9.8 – Alternative E

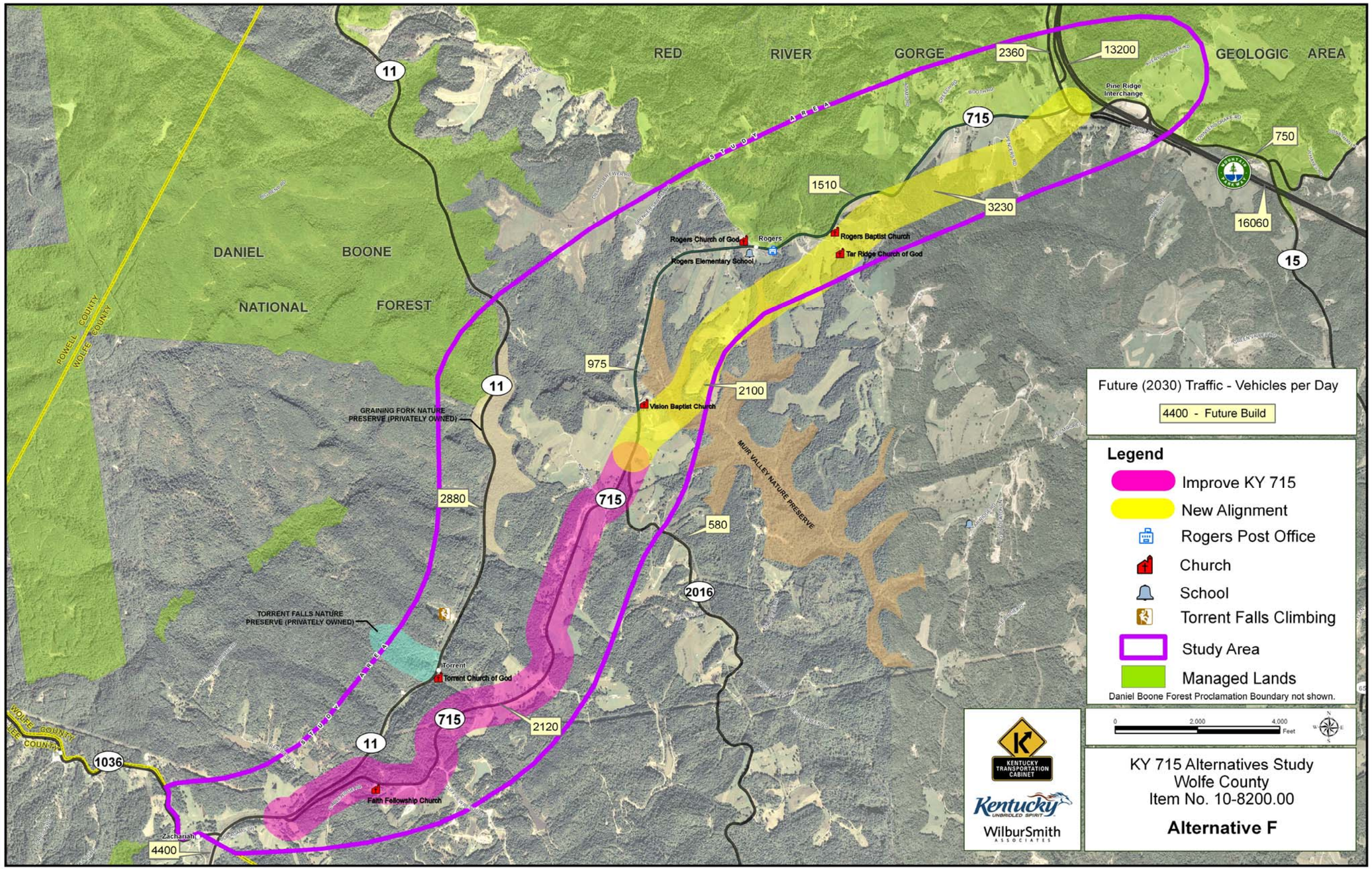


Figure 9.9 – Alternative F

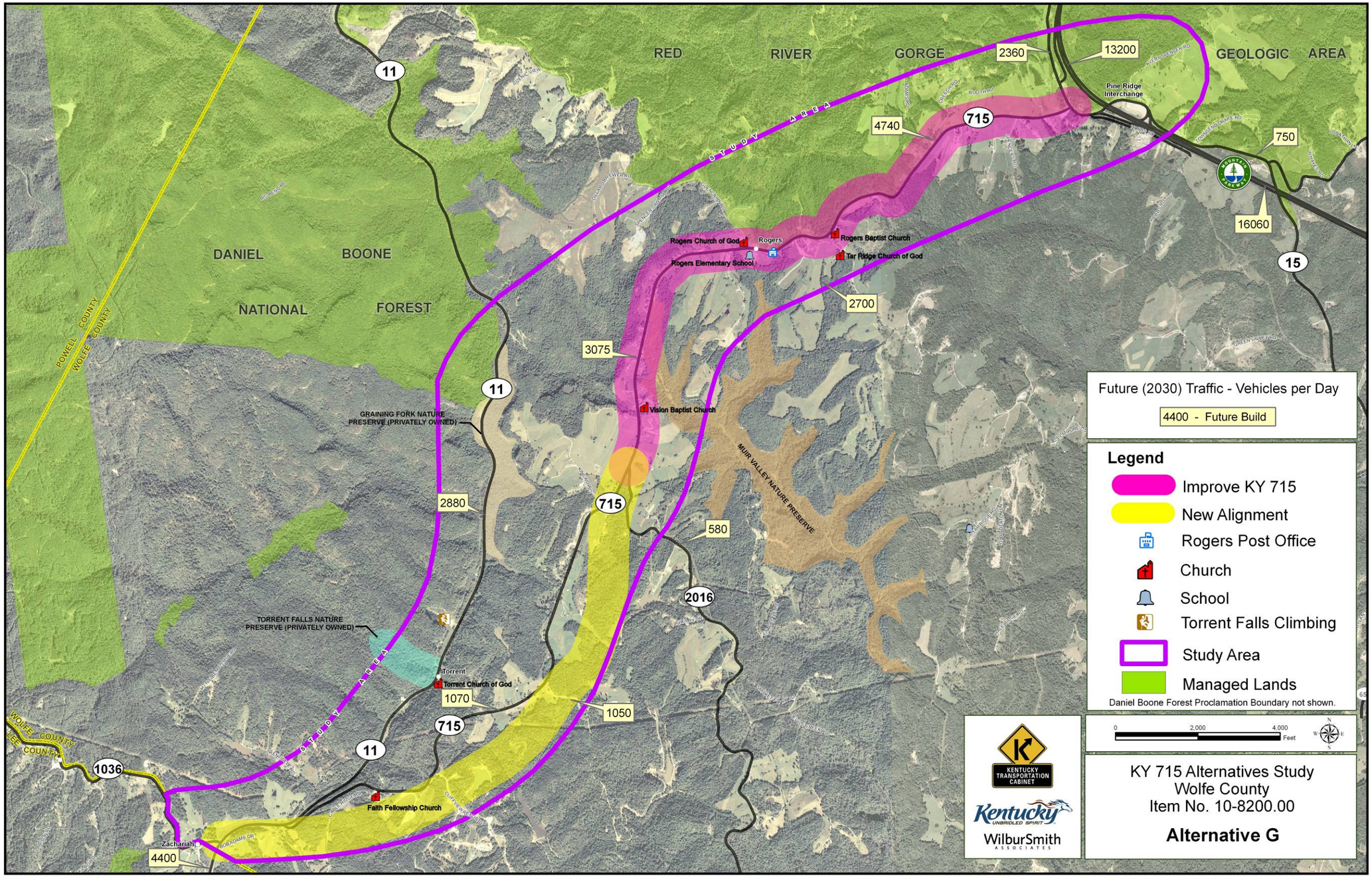


Figure 9.10 – Alternative G

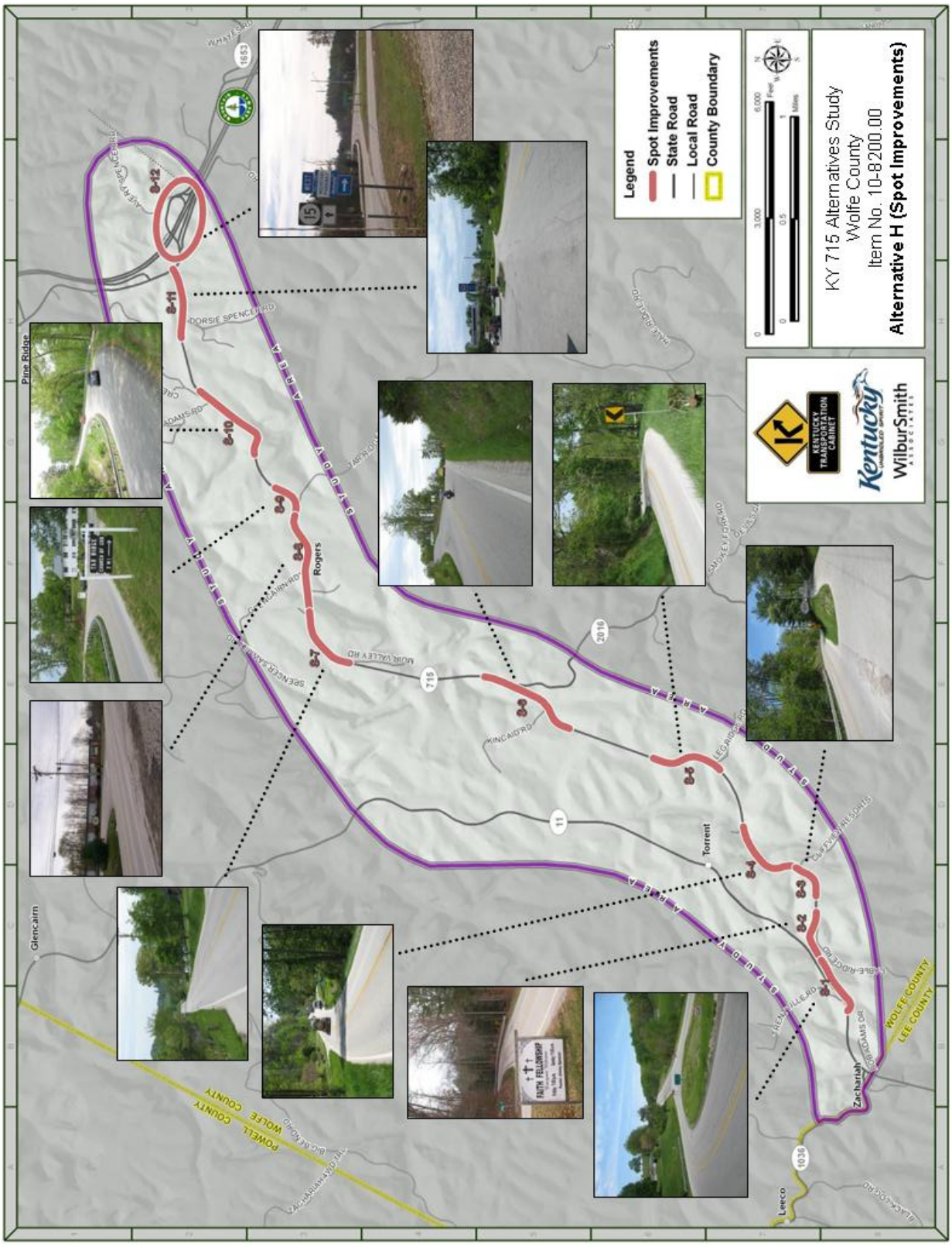


Figure 9.11 – Alternative H (Spot Improvements)

Table 9.1 – Proposed Spot Improvement Projects

Spot Improvement ID	Improvement Location	KY 715 Milepoint (MP)	Project Purpose	Description of Need	Description of Proposed Improvement	Potential Major Impacts	Design Cost Estimate (2008 Dollars)	Practical Design Cost Estimate (2008 Dollars)	Utility Cost Estimate (2008 Dollars)	ROW Cost Estimate (2008 Dollars)	Construction Cost Estimate (2008 Dollars)	Total Cost Estimate (2008 Dollars)	Practical Design Construction Cost Estimate (2008 Dollars)	Practical Design Total Cost Estimate (2008 Dollars)
S-1	KY 715/KY 11	0.0 - 0.3 (also includes MP 0.2 - MP 0.5 along KY 11)	Mobility and Safety	Skewed Intersection and Steep Grade on KY 715	Add a designated left turn lane on KY 11 and KY 715. Realign KY 715 so it is perpendicular to KY 11 at the intersection. Lower grade on KY 715.	Possible Stream Mitigation along KY 11	$340,000	$280,000	$320,000	$50,000	$3,410,000	$4,400,000	$2,820,000	$3,470,000
S-2	KY 715	0.3 - 0.5	Mobility and Safety (addresses location of 1 fatal crash)	Horizontal Curve and Stopping Sight Distance	Realign KY 715.	Large amounts of excavation	$250,000	$220,000	$110,000	$50,000	$2,450,000	$3,080,000	$2,180,000	$2,560,000
S-3	KY 715	0.6 - 0.8	Mobility and Safety (addresses location of 1 fatal crash)	Horizontal Curve and Stopping Sight Distance	Realign KY 715. Realign Cliffview Resort Road so it is perpendicular to KY 715 at the intersection.	-	$200,000	$170,000	$120,000	$50,000	$2,030,000	$2,570,000	$1,710,000	$2,050,000
S-4	KY 715	0.8 - 1.2	Mobility and Safety (addresses high crash spot)	Horizontal Curve and Roadside Ditch	Realign KY 715.	-	$200,000	$160,000	$200,000	$50,000	$2,040,000	$2,650,000	$1,600,000	$2,010,000
S-5	KY 715	1.5 - 1.9	Mobility and Safety (addresses high crash spot)	Horizontal Curve and Stopping Sight Distance	Realign KY 715. Realign Smith Road so it is perpendicular to KY 715 at the intersection.	Possible Home Relocation	$190,000	$150,000	$200,000	$170,000	$1,930,000	$2,640,000	$1,530,000	$2,050,000
S-6	KY 715	2.3 - 2.8	Mobility and Safety	Horizontal Curve and Stopping Sight Distance	Add a designated left turn lane on KY 715 for KY 2016. To improve Stopping Sight Distance realign KY 2016 so it intersects KY 715 at the top of the hill. Realign KY 715 around Kincaid Road.	Possible Home Relocation	$130,000	$90,000	$260,000	$150,000	$1,250,000	$1,880,000	$910,000	$1,410,000
S-7	KY 715	3.5 - 3.8	Mobility and Safety	Horizontal Curve and Stopping Sight Distance	Realign KY 715.	Possible Home Relocation	$40,000	$30,000	$60,000	$130,000	$430,000	$690,000	$300,000	$520,000
S-8	KY 715	3.8 - 4.3	Mobility and Safety	Horizontal Curve, Stopping Sight Distance and Access Management	Realign KY 715 and add a center turn lane, curb & gutter with storm sewer and sidewalks. To improve Stopping Sight Distance realign the School Access Road and Glencairn Road so it intersects KY 715 at the top of the hill.	Possible Home Relocations	$190,000	$180,000	$270,000	$280,000	$1,930,000	$2,850,000	$1,820,000	$2,550,000
S-9	KY 715	4.3 - 4.5	Mobility and Safety	Horizontal Curve and Stopping Sight Distance	Realign KY 715. Realign Tar Ridge Road so it is perpendicular to KY 715.	Possible Home Relocation	$100,000	$80,000	$130,000	$150,000	$1,010,000	$1,470,000	$760,000	$1,120,000
S-10	KY 715	4.7 - 5.1 (includes Spruce Gap Curve)	Mobility and Safety	Horizontal Curve and Stopping Sight Distance	Realign KY 715.	Possible Home Relocations	$230,000	$190,000	$180,000	$387,000	$2,330,000	$3,317,000	$1,940,000	$2,697,000
S-11	KY 715/KY 15	5.4 - 5.8 (also include MP 13.8 - MP 14.2 along KY 15)	Mobility and Safety (addresses location of 1 fatal crash, high crash spot, and high crash segment)	Horizontal Curve and Stopping Sight Distance	Add a designated left turn lane on KY 15 and KY 715. Realign KY 715 near the Spencer Road intersection to improve Sight Distance. Realign KY 15 just west of KY 715 to improve Sight Distance.	-	$220,000	$170,000	$400,000	$100,000	$2,230,000	$3,120,000	$1,670,000	$2,340,000
KY 715 Spot Improvement Cost Totals							***$2,090,000***	***$1,720,000***	***$2,250,000***	***$1,567,000***	***$21,040,000***	***$28,667,000***	***$17,240,000***	***$22,777,000***
S-12	Mountain Parkway Interchange (Exit #40)	NA	Safety	Does not meet current interchange guidelines	Reconstruct interchange ramps to extend acceleration and deceleration lanes and to provide additional vehicle storage capacity on the Parkway exit ramp for eastbound traffic	Possible Business Relocation, Possible Environmental Impacts	$350,000 - $2,1000,000	N/A	$220,000 - $310,000	$2,780,000	$3,460,000 - $20,950,000	$3,810,000 - $26,040,000	N/A	N/A

F. Level 2 Screening of Final "Full Build" Corridor Alternatives

Based on a review of the information gathered to date, the Level 2 Screening was applied to each of the final "full build" corridor alternatives. A High, Medium, and Low rating was assigned to the screening criteria, which included project purpose, other project goals, traffic impacts, environmental impacts, community cohesion impacts, cultural-historic impacts, geotech issues, and cost estimates. The results were displayed in an evaluation matrix used to compare the final alternatives, as shown in **Table 9.2**. This information was presented at the final public meeting held on October 7, 2008. Following is a discussion of some of the findings.

1. Project Purpose and Other Project Goals

All of the "build" alternatives would meet the Purpose and Need and other goals of the project. However, Alternative A is slightly less satisfactory since the other alternatives allow for a new alignment for all or part of the existing roadway. This would lead to the diversion of traffic from the community of Rogers and, therefore, better mobility (due to greater overall speeds and less travel time) and a greater improvement in safety due to better access control and reduced conflicts. The No Build alternative would not meet the Purpose and Need of the project.

2. Traffic Analysis

Traffic forecasts were made for the No Build alternative based on a historical growth rate of 2.05%, as discussed in Chapter 2. Traffic forecasts would be similar for the Spot Improvement alternative(s). Using the Kentucky Statewide Travel Demand Model, traffic forecasts were also made for the seven "full build" alternatives.

The results are included on the maps showing the final alternatives (**Figures 9.4 through 9.10**). Major findings are as follows:

- In 2007, the average daily traffic (ADT) on existing KY 715 ranged from 1,130 vehicles per day (VPD) near the southern terminus to 2,760 vpd near the northern terminus, as shown in Figure AA. If no improvement is made, the future traffic on existing KY 715 is expected to range from 1,800 to 4,400 vpd in 2030.
- Alternative A, an improvement to existing Alternative 715, would divert some trips diverted from other roadways, resulting in ADTs ranging from 2,120 near the southern terminus to 4,740 vpd near the northern terminus in the year 2030.
- For Alternative B, future 2030 traffic would also range from 2,120 to 4,740; however, a proposed bypass would divert an estimated 2,750 vpd (almost 60% of the traffic, leaving an estimated 1,990 vpd on the existing route in Rogers.
- Alternative C, which relocates the southern terminus about two miles west of the existing KY 15-KY 715 intersection, would divert about 1,420 vpd (about 67%) in 2030 at the southern terminus, leaving about 700 vpd of residual traffic on the existing roadway. For the northern section, the future traffic would be the same as Alternative A.
- Alternative D is the same as Alternative C except it includes a bypass of Rogers. The 2030 traffic forecasts show the same traffic diversion as C (i.e., 1,420 vpd on the new alignment and 700 vpd on the existing alignment) and the same traffic diversion as B for the bypass (i.e., 1,990 through Rogers and 2,750 on the new bypass).
- The 2030 traffic forecasts for Alternative E, a totally new eastern alignment, shows about a 57% traffic diversion as follows: 1,200 vpd near the southern terminus, leaving 920 vpd on the existing roadway; 1,760 just south of Rogers, leaving 1,320 on the existing roadway; and 2,700 near the northern terminus, leaving 2,040 on the existing roadway.

Table 9.2 – Final Alternatives Level 2 Screening

Segment	Project Purpose: Improve connectivity between KY 11 and the Mountain Parkway.			Project Goals				Year 2030 Traffic Estimate	Impacts				Cost	
	Address geometric deficiencies on KY 715	Increase safety on KY 715	Improve access to the Mountain Parkway	Continue the London to Ashland Corridor improvements	Improve access to area attractions	Accommodate bicycles and pedestrians	Provide mobility/relief against major incidents		Environmental Impacts	Community Cohesion Impacts	Geotechnical Impact	Cultural - Historic Impact	Total Cost (Millions)	Total Cost Practical Design (Millions)
Alternative A - Improve Existing KY 715														
Alternative A (Improve Existing KY 715)	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Average	Average	Average	Satisfactory (Avg. if Practical Design)	Average	2100 - 4700 vpd (300 vpd increase over the Future No-Build)	Low	Low - Medium	Medium	Medium	$38.1	$32.2
Alternative B	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	2100 - 4700 (2700 on new Rogers bypass, 2000 on existing KY 715 through Rogers)	Medium	Medium	Medium	Medium	$45.2	$39.2
Alternative C	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	2100 - 4700 (1400 on new alignment)	Medium	Medium	Medium	Medium	$27.3	$19.7
Alternative D	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	2100 - 4700 (1400 on new alignment)	Medium	Medium - High	Medium	Medium	$34.4	$26.7
Alternative E	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	Satisfactory (Avg. if Practical Design)	Satisfactory	2100 - 4700 vpd (new eastern route carries 1200-2700 vpd)	Medium - High	Medium	Medium	Low - Medium	$63.1	$58.9
Alternative F	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory - Average	Satisfactory - Average	Satisfactory - Average	Satisfactory (Avg. if Practical Design)	Satisfactory - Average	2100 - 4700 vpd (new eastern route in the northern portion of the study area carries 2100-3200 vpd)	Medium - High	Medium	Medium	Medium	$55.3	$50.2
Alternative G	Satisfactory (Avg. if Practical Design)	Satisfactory (Avg. if Practical Design)	Satisfactory - Average	Satisfactory - Average	Satisfactory - Average	Satisfactory (Avg. if Practical Design)	Satisfactory - Average	2100 - 4700 vpd (new eastern route in the southern portion of the study area carries 1050 vpd)	Medium - High	Low - Medium	Medium	Low - Medium	$45.1	$40.3
Alternative H (Spot Improvements)	Average	Average	Least Desirable-Average	Least Desirable	Least Desirable-Average	Least Desirable	Least Desirable	1800 - 4400 vpd	Low	Low	Low	Low	$28.7 (+ cost to improve interchange)	$22.8
Alternative X (No Build)	Least Desirable	Least Desirable	Least Desirable	Least Desirable	Least Desirable	Least Desirable	Least Desirable	1800 - 4400 vpd	Low	Low	Low	Low	$0	$0

KEY:

Low/Satisfactory	Lowest likely impacts; Satisfactory for this measure.
Low-Medium/Satisfactory-Average	Combination: Between Low and Medium Impacts
Medium/Average	Mid-range of impacts; Somewhat unsatisfactory for this measure.
Medium-High/Least Desirable-Average	Combination: Between Medium and High Impacts
High/Least Desirable	High likely impacts; Least Desirable for this measure.

- Alternative F, which would stay on the existing alignment between KY 11 and KY 2016 and on a new alignment from KY 2016 to KY 15, shows 2030 traffic forecasts of 2,120 near the southern terminus and traffic diversion of 3,230 vpd (about 68%) to the new alignment, leaving 1,510 vpd on the existing alignment.
- Alternative G, which would be on a new alignment from KY 11 to KY 2016 on the southern end and on the existing alignment between KY 2016 and KY 15 to the north, shows 2030 traffic forecasts of 2,120 near the southern terminus and traffic diversion of 3,230 vpd (about 68%) to the new alignment, leaving 1,510 vpd on the existing alignment near the northern terminus.
- Based on the traffic forecasts and typical cross sections that comply with accepted design guidelines, newly constructed segments for each alternative would be anticipated to function at a Level of Service C or better.
- Alternatives on new alignment between KY 2016 and KY 15 would divert most of the through traffic, especially truck traffic, from Rogers, one of the main concerns of local residents. This would improve overall mobility and safety along KY 715.

3. Environmental/Community Issues

For Alternative A, the primary impacts of concern include residences, churches, a wetland, a spring, and structures associated with the community of Rogers. Additional concerns for Alternatives A, B, and F include an inactive mine as well as an abandoned railroad tunnel. Where improvements are made only to the existing road (primarily Alternatives A, B, C, F, and G), socioeconomic impacts would be low, depending on where the improvements are made. Natural environment impacts are also low for improvements along existing KY 715.

The majority of the project's potential socioeconomic impacts will be to agricultural land and residential properties, including the extremely cohesive community of Rogers and the Cliffview Cabins area off KY 715 in the southern portion of the corridor. However, there are no agricultural districts, prime farmland, or statewide important soils in the study area.

Alternatives F and G appear to come very close to two churches, Naomi Primative (sic) Baptist Church in Rogers and Faith Fellowship Church near Zachariah. Alternatives B, D, E and F encroach upon the privately owned Muir Valley nature preserve and recreation area which is not only a natural resource, but also one of the major tourist destinations in the region, along with the Red River Gorge area and the Daniel Boone National Forest.

According to input received from the Muir Valley owners, the 400-acre Muir Valley preserve is a major rock-climbing venue that attracts over 10,000 visitors annually from throughout the nation and from other countries.

Wetlands were not determined or delineated, i.e., the project corridors were not walked in their entirety to verify National Wetland Inventory (NWI) mapping. Therefore, wetland size and jurisdictional status is not known with certainty, although there are several farm ponds, a small lake at the Cliffview area, a spring, and several other wetlands in the KY 715 corridor study area. Any wetland containing ingress and egress points should be considered potentially jurisdictional, thus, requiring USACE coordination. For planning purposes, the wetland on Walker Creek may be considered a jurisdictional wetland.

The project corridor contains areas of favorable habitat for threatened and endangered species, including the Indiana bat, gray bat and Virginia big-eared bat, as well as white-haired goldenrod. Bat habitats include clifflines, caves, forested areas, and possibly the abandoned railroad tunnel under the existing roadway near the southern section of KY 715.

There are many oil and gas wells located in the study area, and the possibility of encountering unmapped mine adits and oil or gas wells anywhere throughout the project corridor cannot be ruled out.

There are no historic properties that have been previously surveyed within the corridor study area. Approximately 30 potential historic structures, including residences, churches and businesses, along with several cemeteries, are located along KY 715, which could be a factor for Alternatives A, B, C, F, and G. For these alternatives, there is a possibility for historic and prehistoric archaeological sites within the new alignment due to existing residences and topography. For the eastern alternatives (E, F, and G), the farmed and wooded terrain, the numerous drainages, and ridge tops signal a likelihood for prehistoric archaeological sites to be present. The cultural resource impacts for the eastern corridors are moderate.

The alternatives with the highest potential impacts are as follows:

- Alternatives B and D: Rogers Bypass (homes, churches, wastewater treatment plant, and Muir Valley recreation area)
- Alternatives E and F, New Eastern Corridor (T&E species habitat, farmland, cliff lines, churches, Muir Valley recreation area, and Cliffview Cabins).
- Alternative G: Southern tie-down at KY 11 (potential oil and gas wells, wetland, and homes)

4. Cost Estimates for Final Corridor Alternatives

The cost estimates for each of the "build" alternatives are shown in the evaluation matrix in **Table 9.2**. Two levels of cost estimates were developed for each corridor alternative: one set of estimates for a roadway improvement that would meet all current design guidelines and another set for a "practical solutions" design. The full design improvements included two 12-foot lanes, 8-foot shoulders, and the "practical solution" design included 11-foot lanes and 6-foot shoulders.

Alternative C ($19.7 million) and Alternative D ($23.7 million) have the lowest cost estimates, while Alternative E ($43.9 million) and Alternative F ($42.1 million) have the highest.

G. Final Interchange Alternatives and Evaluation

Based on input received at the March 28, 2008 project team meeting, Interchange Concepts 1, 2, and 5 had been dismissed (see **Chapter 8**). Therefore, only two alternatives, Concepts 3 and 4, were carried forward.

However, a new Interchange Concept 6, a tight clover-type improvement near KY 15, was proposed by the project team and subsequently investigated (**Figure 9.12)**.

The proposed improvements for Interchange Concept 3 could impact one home and a heavy equipment rental business, both near the Mountain Parkway interchange and its ramps. It also intersects a small forested tract with some bat habitat, but with marginal goldenrod habitat. All impacts north of the existing roadway lie within the managed lands of the Red River Gorge Geologic Area, a part of the Daniel Boone National Forest. While the potential impacts may be considered *de minimis*, any impacts to the forest's managed lands will require coordination with the US Forest Service. No streams or wetlands, nor any historical properties or known archaeological sites, appear to be within the proposed corridor improvements.

For Interchange Concept 4, proposed improvements lie within the existing right-of-way. Social and natural environment impacts are low to non-existent.

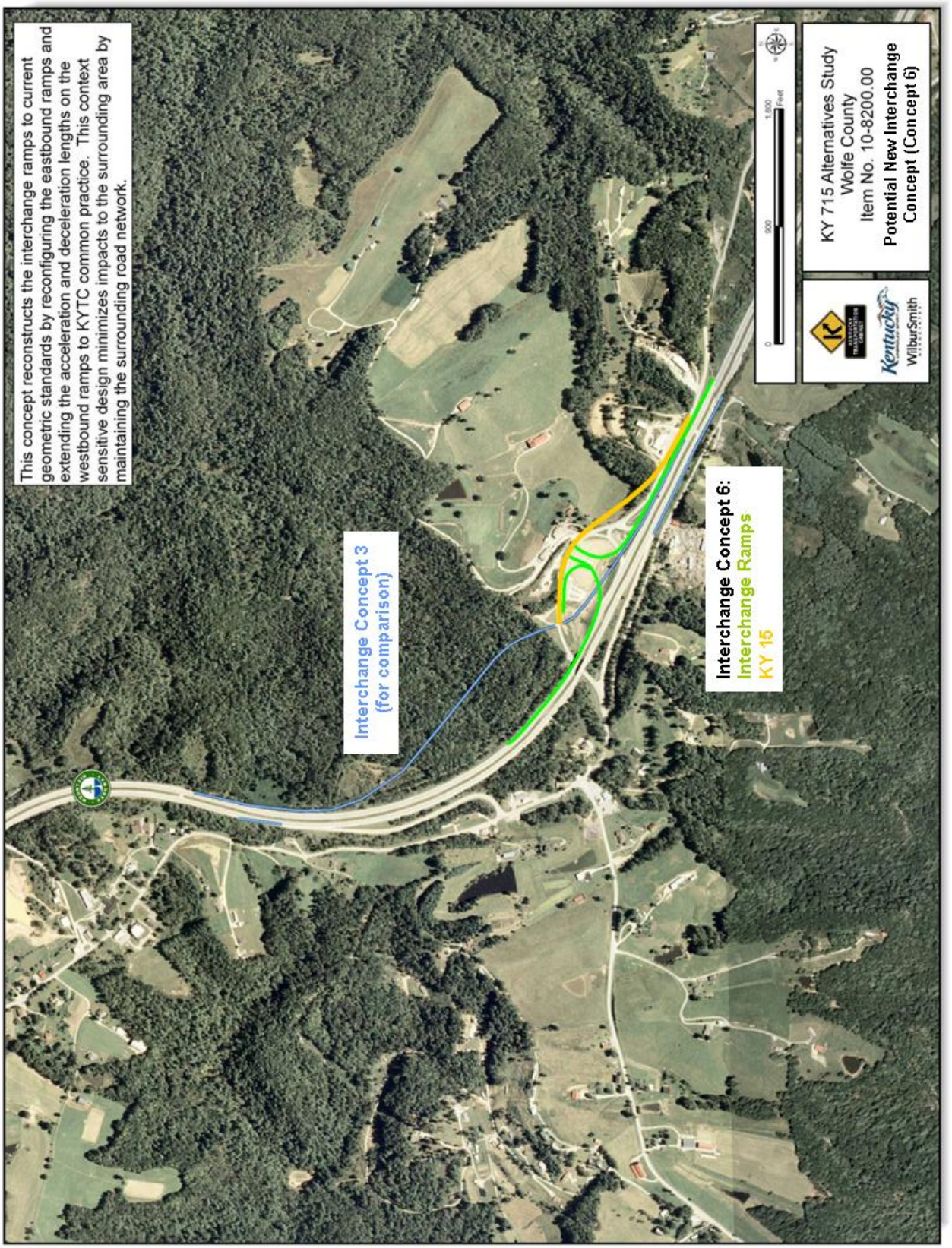


Figure 9.12 – Potential New Interchange Concept (Concept 6)

It was determined that the new Interchange Concept 6 would require the relocation of KY 15, which could lead to additional environmental and community impacts outside the KY 715 corridor.

In the August 1, 2008 project team meeting, the group agreed that Interchange Concepts 3 and 4 were the most viable interchange concepts; however, it was also agreed that no apparent major safety problems exist at the interchange now and that the interchange improvement is not the focus of the KY 715 study.

Therefore, it was decided that the interchange concepts would not be presented to the public or screened further. Instead, the interchange analysis and the viable options would be documented in the final study report for future consideration as a separate project.

10. ADDITIONAL CABINET, PUBLIC, AND AGENCY INPUT

As part of the public involvement portion of this study, meetings were held in August, September, and October of 2008 with the project team, local officials, stakeholders, the and the public. The purpose of these meetings was to update participants about what took place after the first round of community involvement activities.

Summary information was provided on the existing conditions, all technical analyses, the alternatives development process, and the corridor evaluation process.

In addition, letters, information, and maps of the alternatives were sent to Federal, state, and local resource agencies and stakeholders to get additional input.

Public and Agency Involvement

Project Team Meetings

Local Elected Officials Meetings

Stakeholder Meetings

Public Involvement Meetings

Public Comment Surveys

Resource Agency Coordination

Copies of the meeting minutes are included in **Appendix D**.

The following sections summarize the meetings and the resource agency input.

A. Project Team Meeting (August 1, 2008)

The third Project Team Meeting was held on August 1, 2008, at the KYTC District 10 Office building in Jackson, Kentucky. The project team convened to preview the Level 2 Screening results on the remaining corridors and prepare for the upcoming local officials, stakeholders, and public meetings. The Project Team agreed on the final corridor alternatives, the findings of the Level 2 Screening, the proposed spot improvements, and other information to be presented to local officials, stakeholders, and the public.

B. Local Officials and Stakeholders Meeting (September 11, 2008)

A meeting with local elected officials and stakeholders was held on September 11, 2008 at the University of Kentucky County Extension office in Campton, Kentucky. Existing conditions data, public input from the initial involvement meetings and surveys, corridor alternatives, Level 2 screening data, and spot improvements were presented. After the project team presentation, discussion among local officials focused on the proposed alternatives.

General consensus was that the study portion of KY 715 is the region's only option to getting access to the Mountain Parkway, because KY 11 cannot be improved through the Red River Gorge area. There was some interest in bicycle and pedestrian accommodations as part of the project. The discussion did not yield any clear preferences for any of the corridor alternatives or spot improvements.

C. Public Information Meeting - Round 2 (October 7, 2008)

A second public meeting was held at the Rogers Elementary School on October 7, 2008. The meeting was designed to communicate the study process and findings to the public and solicit input on the developed build alternatives.

The meeting was set up as an open-house format to facilitate one-on-one discussions between staff and attendees, with areas for viewing a slideshow presentation, examining exhibit boards, completing a survey, and providing feedback on alternative maps. The details of the meeting are included in a second Public Meeting Summary Notebook on file with KYTC's Division of Highway Design and Division of Planning.

1. General Comments

Attendees were invited to ask questions or discuss concerns with KYTC and consultant staff. General comments and concerns received during the feedback process included:

- Several people expressed concerns about losing homes and farmlands if a road is constructed;
- A safety problem does exist on KY 715;
- Improving the existing route is better for the community members than constructing a new alignment; and
- Trucks are causing most of the roadway issues:
  - The large volume of trucks using the road,
  - High speeds,
  - Limited passing opportunities,

2. Public Comment Survey Responses

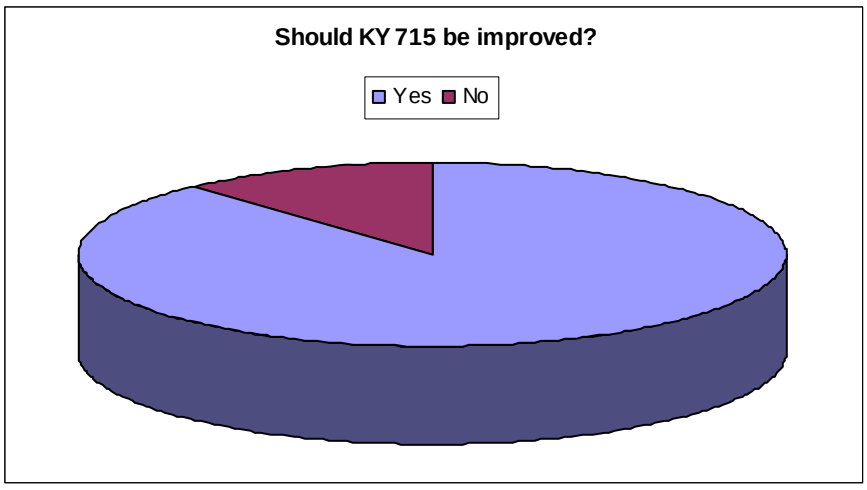
As part of the public meeting handout, the KYTC supplied a survey form so that citizens of the area could provide input on the project. The results from all surveys received as part of the second phase of the public involvement process are summarized in the following paragraphs.

Seventy-two (72) survey forms were returned at or after the meeting. The following summarizes the input received by way of the survey forms.

3. Survey Summary

88% of survey respondents indicated that KY 715 needs to be improved (**Figure 10.1**).

Figure 10.1– Public Meeting Survey: Need for Improvement



Survey responders were asked to select their first and second preferences among the proposed alternatives. Results indicated that responders preferred Alternative H (Spot Improvements) among other alternatives. This alternative was chosen 32 times as either a first or second preference of responders.

Alternatives C and D (combined) and Alternative A were the second most popular. Both were selected as first or second preference 27 times. It was decided to combine the results for the C

and D alternatives because they have the same termini and differ only by the bypass of Rogers (included in Alternative D), thus, indicating a preference for an alternative that would intersect with KY 11 at that point. Alternative C was given a slight preference between the two alternatives (14 for C and 13 for D).

Alternative E followed with 21 votes as first or second preference.

The No-Build followed in order of preference with 12 votes for first or second priority.

Survey responders were asked to select their first through fifth preference for spot improvements. Results are summarized below by (a) total score – for scoring purposes, spot improvements ranked number 1 received 5 points and points were then decreased by 1 point for each subsequent ranking, e.g., spot improvements ranked number 5 received 1 point;. (b) spots that were most often ranked by responders as priority 1 through 3; and (c) spots that were most cited as the number 1 priority.

a. Total Score	b. In Top 3	c. Ranked #1
S-10	S-10	S-10
S-6	S-6	S-8
S-9	S-8	S-6
S-8	S-2	S-2
S-2	S-5	S-7
S-3	S-9	S-5
S-1	S-1	S-9
S-4	S-7	S-11
S-12	S-4	S-12
S-5	S-12	S-1
S-7	S-3	S-4
S-11	S-11	S-3

D. Resource Agency Coordination - Round 2 (October/November 2008)

Many local, state and federal resource agencies and stakeholders, with diverse areas of public responsibility, were included in this planning process. Input was solicited through written requests on two occasions.

Resource Agencies

Local Agencies
Local Interest Groups
KYTC Division Offices
Other State Agencies
Federal Agencies

The first round of input, discussed in Chapter 6, gathered information to help frame the purpose of the project and to help identify potential issues, impacts, and alternatives.

For this second round of coordination, agencies received a map depicting the nine build corridor alternatives and were requested to comment on these corridors. Copies of the informational letter distributed by the KYTC and response letters from the various resource agencies are located in **Appendix F** and are summarized below.

The following 10 agencies responded by offering comments or concerns regarding the project:

- Kentucky State Police (November 3, 2008) - An improved KY 715 corridor would benefit the area by lowering traffic collisions and making a safer roadway to Rogers Elementary School. To date in 2008 the State Police have received more calls for injury and non-injury crashes and for service than in all of 2007.
- Kentucky State Police, Commercial Vehicle Enforcement (November 12, 2008) - We have no concerns related to our agency.
- Kentucky Department of Agriculture (October 14, 2008) - The Department has no comment on the proposed project.
- Kentucky Education Cabinet, Department of Education (October 17, 2008) - Proposed improvements to KY 715 will not directly affect the Education Cabinet and its agencies. However, please advise Mr. Stephen Butcher, Superintendent, Wolfe County Schools, as Rogers Elementary is located along KY 715.
- Kentucky Energy and Environment Cabinet, Department for Environmental Protection, Division for Air Quality (November 13, 2008) - Precautions should be taken to prevent particulate matter from becoming airborne, including covering open bodied trucks and avoiding depositing earth onto paved roadways. Open burning is prohibited for all but the express purposes detailed in the Open Burning Fact Sheet. The project must meet the conformity requirements of the Clean Air Act and the transportation planning provisions of Titles 23 and 49 of the US Code. The division suggests investigating local government requirements as well.
- Kentucky Energy and Environment Cabinet, Department for Environmental Protection, Division of Water (November 25, 2008) - Care should be taken when improvements to KY 715 occur to minimize runoff. Walker Creek, Mill Creek and Lower Devils Creek contain good biological communities and impacts to those systems should be avoided.

  If any water wells or monitoring wells are in areas where they will be eliminated, certified water well or monitoring well drill will be required to properly abandon wells.

  Some of the new alignments cross the Newman Limestone which has the potential for karst development. If any sinkholes are modified to take more surface water than they naturally would, a USEPA Class V Injection Control permit may be needed.

  The construction contractor may need a Groundwater Protection Plan for activities during construction.
- Kentucky Energy and Environment Cabinet, Department for Natural Resources (October 20, 2008) - Mining operations occurred in the early 1980's. A map showing affected areas was attached. No related acid mine drainage occurs within the proposed alternatives. Wetland areas and endangered species may be an environmental concern for construction. Stream mitigation was not performed on any of the mined areas. All projects or mines within the alternatives have a complete bond release from this department. The department has no jurisdiction over those areas.
- Kentucky Energy and Environment Cabinet, KY State Nature Preserve Commission (KSNPC) (November 20, 2008) - There are numerous issues concerning the potential impacts that implementation of this project could have on state and federal listed species. Forested ravines and clifflines in the immediate vicinity are known to harbor several rare plant species including federal threatened White-haired goldenrod and federal species of management concern Lucy Braun's rock cress. There is also potential for negatively impacting rare animal habitat, especially hibernacula, other roosting sites, and foraging habitat for the federal endangered Indiana bat and Virginia big-eared bat. The Kentucky

Transportation Cabinet should closely coordinate with the Kentucky field office of the US Fish and Wildlife Service and state regulatory agencies to assure that impacts to all rare species are avoided or minimized as planning for this project proceeds.

- KYTC Division of Environmental Analysis (November 14, 2008) - The Division provided checklists and comments regarding potential impact to environmental resources, as summarized below.

  The Air Quality and Noise status of the project likely would not be a problem; the project appears to be outside of the area requiring conformity for air quality. The planning study should clearly state that the project originates from the latest conforming STIP.

  Streams and rock shelters appear to be present throughout the area. Impacts to these areas should be avoided. These areas would either pose mitigation issues or have to be avoided or minimized. OSD search is required.

  Impacts to potential archaeological site within the area should be avoided or minimized. OSD search is required.

  Specific details concerning unknown HAZMAT issues including CERCLA sites, hazardous waste generators (RCRA) and underground storage tanks would need to be obtained through a Phase 1 site assessment and an ERD search. Potential Asbestos containing facilities will need to be assessed later once an alignment is selected.

  Potential section 4(f) and 106 issues exist. Several National Register sites including historic bridges, a school and parks are located within the project corridor; impacts to these resources should be avoided or minimized.

  The project could have an impact on low income populations along with there being a few costly church relocations. The existing land use may also change; therefore secondary and cumulative impacts will need to be addressed if federal funds are utilized for the project.

  The Daniel Boone National forest and Muir Valley Nature Preserve management area may pose 6(f) problems.

  Additional comments could be provided when more specific information is available.

- University of Kentucky, Kentucky Geological Survey (November 12, 2008) - Issues that may affect the improvement along KY 715 include slope stability of the weathered shales and fractures related to the Glencairn Fault in the northern part of the study area. None of the geologic features observed in the field (and summarized in the letter) would preclude improvements on or alternative routes along KY 715.

E. Muir Valley Input

Following the public meeting and during the resource agency coordination process, information on the project was distributed via the internet to rock-climbing enthusiasts. As a result, over 130 e-mails and letters were received from rock-climbers and environmental interests from throughout the US and the world.

This input generally indicated that this resource was a major recreational area and tourist attraction, and all of those who communicated with the KYTC were opposed to any corridor alternative that could have a potential impact on the Muir Valley Nature Preserve.

11. RECOMMENDATIONS

This chapter provides recommendations for a proposed project to improve KY 715 in Wolfe County from KY 11 near Zachariah, near the Lee County Line, to to KY 15 and the Bert T. Combs Mountain Parkway. The recommendations made in this chapter are the result of the Alternatives Study process for the KY 715 corridor.

A. Project Purpose and Need

The primary purpose of the proposed project is to improve connectivity between KY 11 and the Mountain Parkway. Connectivity can be improved by achieving other important goals of the project, as follows:

- Address geometric deficiencies on KY 715;
- Increase safety on KY 715; and
- Improve access to the Mountain Parkway.

Additional project goals can also be addressed with the proposed improvement to KY 715, as follows:

- Continue the London to Ashland Corridor improvements;
- Improve access to area attractions;
- Accommodate bicycles and pedestrians on KY 715; and
- Provide mobility/relief against major incidents such as earthquakes, hostile acts, or other catastrophe that might close Clays Ferry Bridge along I-75.

A more detailed discussion of the Project Purpose and Need can be found in **Chapter 7**.

B. Final Project Team Meeting (December 5, 2008)

1. Project Team Discussion

A final project team meeting was held on December 5, 2008, at the KYTC District 10 Conference Room in Jackson, Kentucky. Attendees at the meeting included staff from KYTC District 10, KYTC Division of Planning, the Kentucky River ADD, and the project consultant. The purpose of the meeting was to discuss the findings of the KY 715 Alternatives Study and to finalize the recommendations for improvements along the route. The meeting minutes are included in **Appendix D**.

A concise review of the study process provided a framework to discuss “build” recommendations. The team reviewed the project purpose and need, traffic conditions, crash history information, the Level 1 screening results, environmental highlights, and the Final (Level 2) screening results. Public input surveys from the second round of meetings and resource agency responses were also reviewed to help make the final recommendations.

As discussed in **Chapter 9**, the final alternatives proposed for consideration by the project team included:

- Alternative A: Improve KY 715 along the existing roadway.
- Alternative B: Improve along existing KY 715 but with new bypass around Rogers.
- Alternative C: Combination of new route from KY 11 to existing KY 715 (north of KY 2016) and then improve along existing KY 715.
- Alternative D: Combination of new route from KY 11 to existing KY 715 (north of KY 2016), new Rogers bypass, and improvement along existing KY 715.

- Alternative E: Completely new route located to the east of existing KY 715.
- Alternative F: Combination of improvements along existing KY 715 from KY 11 to KY 2016 and then a new route east of existing from KY 2016 to KY 15.
- Alternative G: Combination of new route east of existing from KY 11 to KY 2016 and improvements along existing KY 715 from KY 2016 to KY 15 .
- Alternative H (Spot Improvements): Fix all or some of the "spot improvement locations".
- Alternative X: No improvements to KY 715.

A review of the public input from the second round of survey questionnaires indicated that Alternatives H, C, A, X (No Build), and G, in that order.

2. Project Team Recommendations

Based upon consideration of project purpose and need, transportation issues, access needs, potential environmental and community impacts, and both public and resource agency/stakeholder input, the project team agreed on the following:

- Alternative C is the most cost-effective, full-build alternative since it utilizes much of existing KY 11, which would not be reconstructed. [NOTE: Alternative C as includes a resurfacing of the portion of KY 11 between points A and C.]
- Alternative C is most desirable in terms of phasing/scheduling and maintenance of traffic during construction.
- With these advantages for Alternative C, it was felt that Alternative C should be further considered in the next phase of project development.
- While Alternative A or C could be built to "practical design" standards, Alternative A (improving existing KY 715) may represent the most "practical solution," which is an important KYTC initiative.
- Alternative A would address all of the deficiencies along the study corridor.
- It was noted that Alternative G could be considered as a variation of Alternative A (i.e., any proposed improvements in the existing KY 715 corridor would also include Alternative G locations as an option). Therefore, Alternative G was dismissed.
- While Alternative C seems promising, potential issues/restrictions may surface for Alternative C related to the Daniel Boone National Forest, terrain, sensitive habitats, and other issues.

Since both A and C have different advantages and issues, the project team agreed that the KYTC should move forward with two full-build alternatives for further consideration in the next phase (in order of priority): Alternative C and Alternative A.

Alternative C was previously presented as **Figure 9.4** and is presented again in this chapter as **Figure 11.1**. Alternative A was previously presented as **Figure 9.6** and is presented again in this chapter as **Figure 11.2**

The location of the new portion of Alternative C should be adjusted to give KYTC more flexibility to minimize impacts (to homes, personal property, and the environment) and maximize benefits (constructability and cost). This flexibility may also provide (1) an opportunity to identify and take advantage of an existing natural incline said to be in the general area of the new alignment at the southern end of the corridor and (2) better independent utility for a potential construction section if the tie-down point on existing KY 715 were located at or near KY 2016.

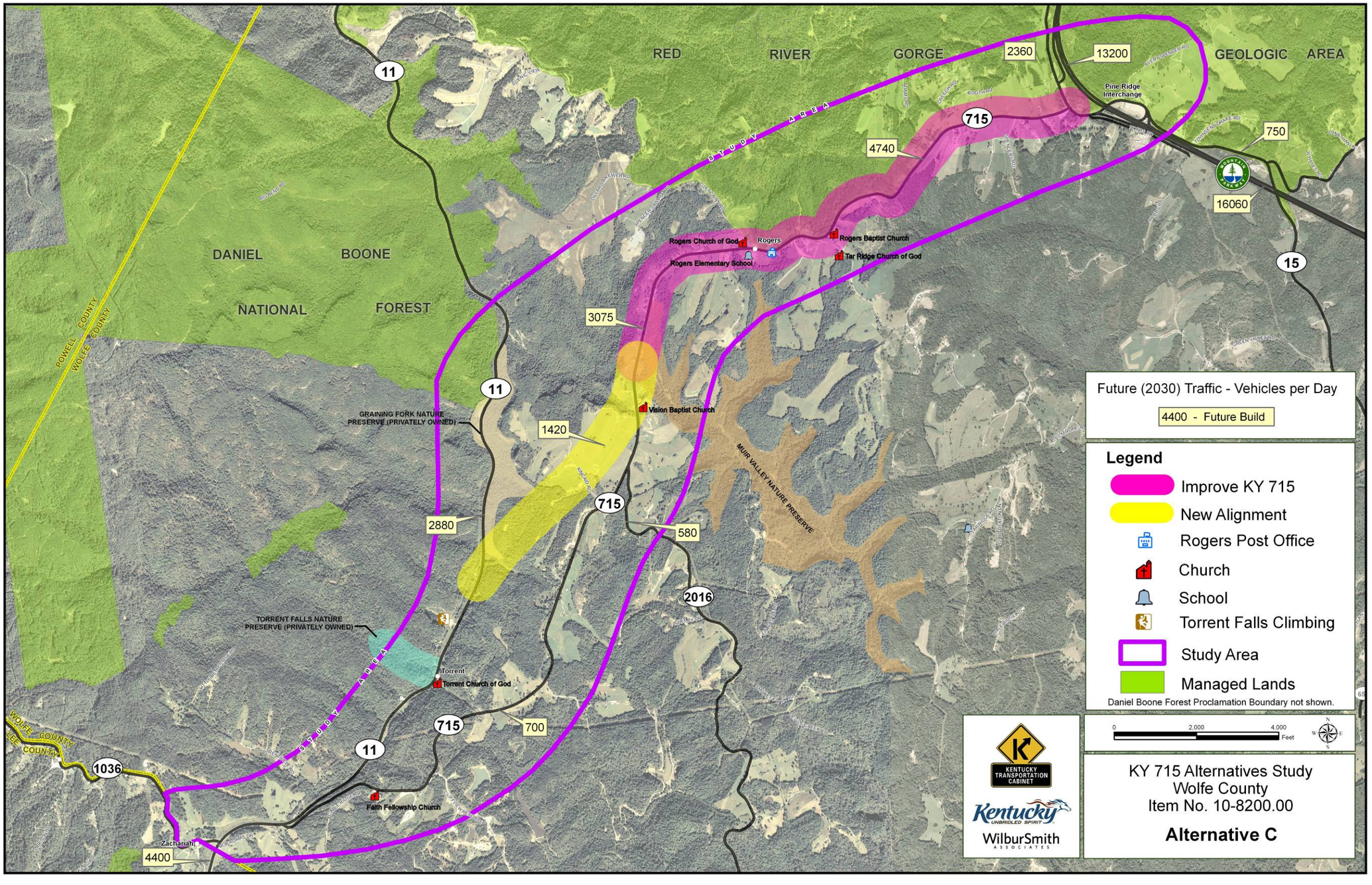


Figure 11.1 – Recommended Alternative - Alternative C

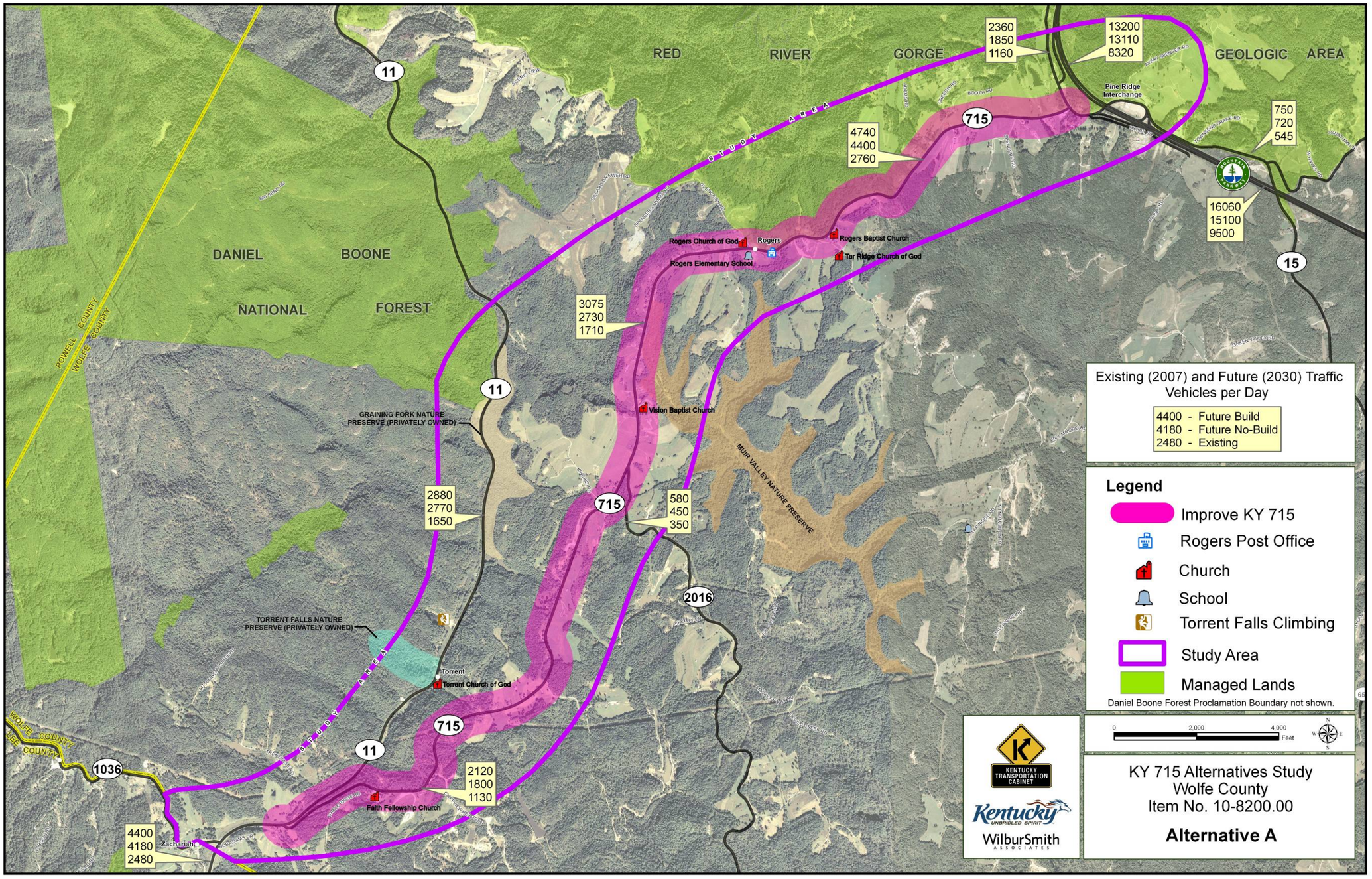


Figure 11.2 – Recommended Alternative - Alternative A

The project team also decided that, as a short-term solution, the proposed spot improvements should be implemented as funding becomes available if implementation of the complete corridor improvement is deferred. Any such improvements should be implemented to be consistent with a future improvement of the entire KY 715 segment, as applicable. The location and detailed information, including cost estimates, for the proposed spot improvements are presented in **Chapter 9, Section E**.

Based on highway geometrics, crash history, and public input, the recommended priorities for spot improvements are as follows:

1. Spot S-10: Spruce Gap Curve - Includes Booth Road Intersection
2. Spot S-8: Includes Glencairn Road Intersection
3. Spot S-6: Includes intersection with Kincaid Road and KY 2016
4. Spot S-2: Includes Cable Ridge Road Intersection
5. Spot S-3: South of entrance to Cliffview Resorts
6. Spot S-5: Includes intersection with Leg Ridge Road
7. Spot S-4: North of entrance to Cliffview Resorts
8. Spot S-9: Includes Tar Ridge Road Intersection
9. Spot S-1: Includes KY 11 and Trentville Road Intersections
10. Spot S-7: South of Glencairn Road
11. Spot S-11: Includes KY 15 Intersection

Spot S-12, improving the Mountain Parkway Interchange (Exit #40), ranked near the bottom of the public survey. Therefore, it does not appear to be a major concern for local residents and highway users. This is consistent with what the project team had discussed and agreed upon at the third project team meeting (August 1, 2008). Such an improvement is not the focus of this planning study and will not be analyzed further.

However, the interchange concepts are presented and discussed in **Chapter 8** and **Chapter 9** for consideration as a separate project if this interchange improvement is programmed by the KYTC in the future. There is no recommendation at this time regarding this interchange.

C. Design Criteria and Considerations

Potential design criteria and considerations for the proposed KY 715 Corridor in Wolfe County, including typical cross-sections, are discussed in this section for planning purposes only and are only intended to provide information and guidance and not a final recommendation.

1. Typical Section

Two cross-sections were used to prepare planning level cost estimates: one that would fully comply with KYTC design guidelines and one that is consistent with KYTC's current "practical solutions" initiative, as follows:

- The first cross-section includes two 12-foot wide lanes, turn lanes at major intersections, 8-foot wide shoulders (with 6-foot paved) and a 10-foot wide clear zone for rural areas. The urban section would include 12-foot wide lanes, 4-foot wide sidewalks and 2-foot curb and gutters in the urban section through the community of Rogers.
- The second cross-section (i.e., the "practical solution" option) consisted of two 11-foot wide lanes, 4-foot wide shoulders (with 2-foot paved), and a 6-foot wide clear zone in

rural areas. The urban section would include 11-foot wide lanes, 4-foot wide sidewalks and 2-foot curb and gutters through Rogers.

While these two cross-sections may provide some guidance, it is recommended that the final typical section be considered in the next phase. This would depend in part on a KYTC policy decision regarding the future importance of KY 715 as part of the proposed London to Ashland corridor. Therefore, specific geometric parameters should be defined during future design phases of the project, as more detailed information becomes available.

2. Access Control

Consideration should be given to partial access-control for any portions of the proposed improvement that is on new alignment.

3. Bicycle and Pedestrian Transportation

As discussed previously, sidewalks are recommended for the urban section through the community of Rogers to enhance mobility and safety. Since this portion of KY 715 is part of a designated Midland Kentucky bicycle touring route and is sometimes used for bike rallies, consideration should be given to the proper accommodation of bicycles along this route, if determined to be warranted and if feasible. This could include appropriate signage, paved shoulders, and appropriate placement of rumble strips on the shoulder. Paved shoulders also provide the opportunity for pedestrian travel in the rural areas of the route.

4. Daniel Boone National Forest and Red River Gorge

KY 715 is the eastern boundary of the Daniel Boone National Forest and is close proximity to the Red River Gorge area, and it provides access to KY 11 which is part of the Red River Gorge Scenic Byway. Therefore, consideration should be given to these factors, as appropriate, to potential visual impacts in the design phase.

D. Summary of Environmental Issues for Future Phases

A number of issues related to environmental factors and sensitive land uses identified through this study should be considered as this project moves into future phases. These issues have been discussed in greater detail in previous chapters. Important issues include:

- Daniel Boone National Forest/Red River Gorge: Land in the northeastern portion of the study area shown as National Forest Service lands is actually private land and is outside the DBNF and Red River Gorge Geologic Area. NFS lands make up approximately 62 acres of the study area. Actions on the NFS lands must be consistent with the Forest Plan. Approximately 75% of the NFS lands are within Cliffline and Riparian Prescription Areas, which also includes Source Water Protection and Habitat Diversity Emphasis Prescription Areas. Inclusion of wildlife-friendly passages is encouraged during the design phase. Early involvement with the NFS staff is also encouraged to ensure appropriate environmental analysis and compliance with applicable laws. Coordination should go through the Cumberland Ranger District (Contact: Dave Manner at 606-784-6428, extension 100). The DBNF may pose Section 4(f) and Section 6(f) issues.
- Muir Valley Nature Preserve: Based on extensive input received about its recreational and tourism importance, attempts should be made to avoid (or certainly minimize) impacts to the Muir Valley Nature Preserve. Mitigation measures should also be considered, if any impacts are foreseen in the next phase of project development. Coordination should be undertaken with the owners and/or the Friends of Muir Valley organization to help address any issues related to this resource. The Muir Valley Nature Preserve may pose Section 6(f) issues.

- Threatened and Endangered Species: Four endangered species potentially occur within the study area (Indiana bat, gray bat, the Virginia big-eared bat, and white-haired goldenrod). To address impacts to the bat species and their habitats, tree cutting should be limited to between mid October and late March. Further investigation may be necessary to identify additional roosting/hibernating sites. A biological assessment should be conducted to comply with Section 7 of the Endangered Species Act
- Water Quality/Aquatic Habitats: Consideration should be given to potential water quality issues in the numerous streams, springs, and wetlands within the area. Any affected wetlands should be delineated; impacts may require permits from the US Corps of Engineers and/or the Kentucky Division of Water.
- Cemeteries and Unmarked Graves: There are a number of cemeteries documented or observed in the project area. Based on public input, other cemeteries may be unmarked and may be encountered during construction.
- Cultural Resources/Archaeology: There are no National Register historic sites located in the vicinity; however there is a potential to encounter unrecorded historic structures and archaeological sites eligible for listing on the National Register of Historic Places. Cemeteries and rock shelters may be potential archaeological sites.
- Environmental Justice: Environmental justice issues may exist related to low-income populations. These should be closely monitored during future phases of this project due to concentrations of this demographic in the region.
- Community Impacts: Rogers is a close-knit isolated community, largely centered on the Rogers Elementary School and the US Post Office. Consideration should be given to potential impacts to this community and its resources.
- Abandoned Railroad Tunnel: An abandoned tunnel in the Torrent area runs from the head of Walker Creek in a northwesterly direction under existing KY 715 to the Middle Fork of Red River. The tunnel may provide winter habitat for the Indiana bat, as well as year-round habitat for gray bat and Virginia big-eared bat.

E. Engineering and Construction Considerations

Construction-related issues were also identified throughout this study, including construction phasing and potential issues to be considered.

1. Cost Estimates

After selection of **Corridor Alternative A** and **Corridor Alternative C** for further consideration, the preliminary cost estimates for these two alternatives were reviewed and some adjustments were made. The final cost estimates for both the "full design" and the "practical solution design" options are shown in **Table 11.1**.

Table 11.1 – KY 715 Cost Estimates by Phase for Alternatives A and C (2009 $)

Phase of Project Development	Alternative A		Alternative C	
	Full Design	Practical Solution	Full Design	Practical Solution
Design	$4,000,000	$3,000,000	$3,000,000	$3,000,000
Right-of-Way	$5,000,000	$4,000,000	$4,000,000	$3,000,000
Utility	$3,000,000	$3,000,000	$3,000,000	$3,000,000
Construction	$29,000,000	$24,000,000	$23,000,000	$17,000,000
Total	**$41,000,000**	**$34,000,000**	**$33,000,000**	**$26,000,000**

2. Construction Sections and Cost Estimates

For **Corridor Alternative C**, preliminary construction sections and cost estimates are shown in **Figure 11.3**. Suggested construction priorities are as follows (priorities in parentheses):

- Section 1 – Minor widening on KY 11 from KY 715 to approximately 1.800 (Priority 4)
- Section 2 – From KY 11 to/just north of KY 2016 at about MP 3.100 (Priority 1)
- Section 3 – From KY 2016 or MP 3.1 to Tar Ridge Road (Priority 3)
- Section 4 – From Tar Ridge Road to KY 15 (Priority 2)

For **Corridor Alternative A**, preliminary construction sections and cost estimates are shown in **Figure 11.4**. Based on safety issues and public input for these sections, suggested priorities for the construction of each section are as follows (priorities in parentheses):

- Section 1 – From KY 11 to or Jim Smith Road (Priority 1)
- Section 2 – From Jim Smith Road to KY 2016 (Priority 3)
- Section 3 – From KY 2016 to Tar Ridge Road (Priority 4)
- Section 4 – From Tar Ridge Road to KY 15 (Priority 2)

These construction sections and priorities are presented here as guidance for programming and for consideration in the next phase of project development. However, it is recommended that the final termini and priorities for the construction sections should be determined in the next phase, depending on the selected alternative and based on more detailed information.

3. Construction Issues

A summary of the potential issues related to construction of the proposed alternative include:

- Erosion and Sediment Control: Measures should be utilized to control erosion and sedimentation during and after the commencement of earth-disturbing activities. Careful consideration should be given to erosion control methods; a Best Management Practices for Construction Activities guide is available from the Kentucky Division of Conservation.
- Air Quality: According to the Kentucky Environmental and Public Protection Cabinet, Division of Air Quality, the following Kentucky Administrative Regulations apply to the proposed project: (1) 401 KAR 63:010 Fugitive Emissions; (2) 401 KAR 63:005 Open Burning; (3) the Clean Air Act; and (4) Title 23 and Title 49 of the United States Code. Applicable regulations in the local government should also be considered.
- Waste Management: Solid wastes occurring as part of the construction process should be disposed of at a permitted facility. Underground Storage Tanks are located in the project area. USTs and contaminants should be properly addressed as they are encountered.
- Traffic Operations: Maintenance of traffic and residential access should be preserved throughout the construction process.
- Geotechnical Considerations: The project may encounter pre-or post-landslide hazards. Also, some sandstones and siltstones will crumble where they are uncemented. There are numerous oil wells and gas wells in the area, as well potential underground voids left from previous deep mining activity. Cut slopes in the Corbin Sandstone may be required to be flatter than normal because of the sandstone being poorly cemented and friable. Erosion of exposed slopes is also of concern.
- Abandoned Railroad Tunnel: The abandoned tunnel that runs under existing KY 715 may have stability issues related to the material over the tunnel.

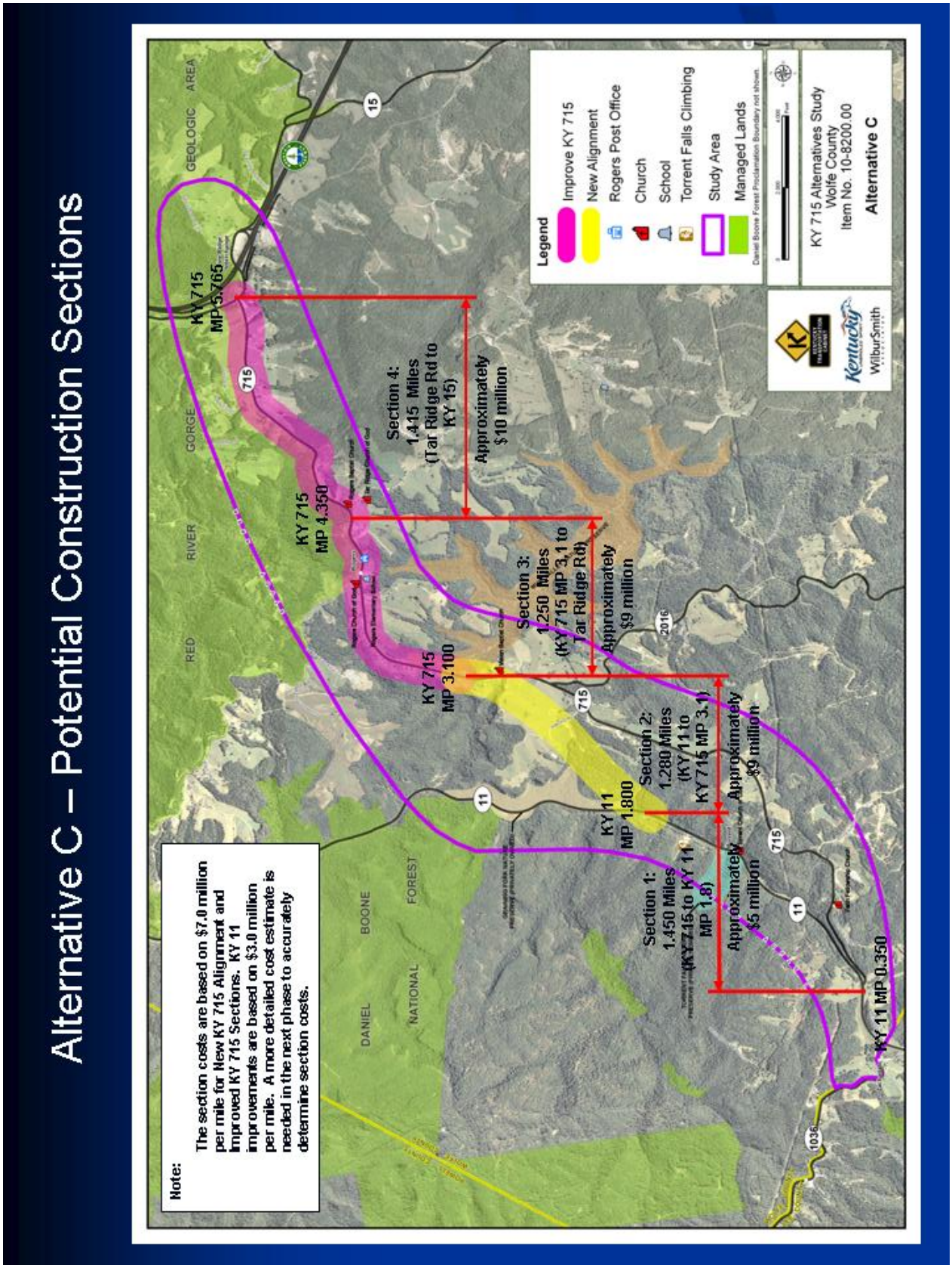


Figure 11.3 – Alternative C - Potential Construction Sections

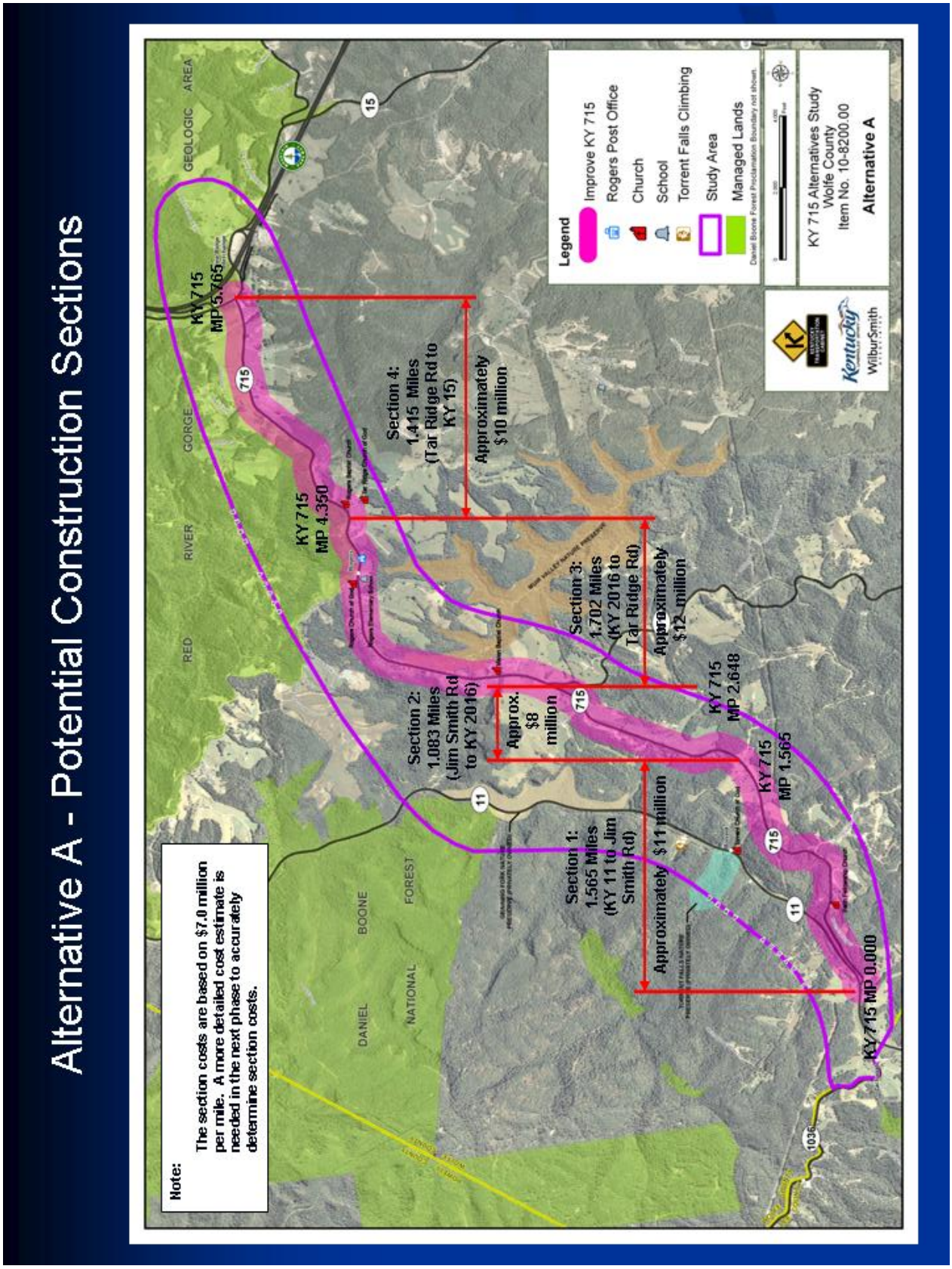


Figure 11.4 – Alternative A - Potential Construction Sections

KY 715 Alternatives Study
Appendix A – Study Area Photos

Appendix A – Study Area Photos

KY 11 (northbound) and KY 715 Intersection

KY 715 (southbound) and Cable Ridge Road Intersection

KY 715 (northbound) and Cliff View Resort Road Intersection

KY 715 (northbound) and Smith Road Intersection

KY 715 (southbound) and KY 2016 Intersection

KY 2016 and KY 715 (northbound) Intersection

KY 715 (southbound) and Weber Valley Lane Intersection

KY 715 (southbound) and Rogers-Glencaim Road Intersection

City of Rogers – KY 715 Southbound

KY 715 (northbound) and Tar Ridge Road Intersection

KY 715 (northbound) Milepoint 4.8

KY 715 (northbound) and Adams Road Intersection

KY 715 (southbound) and KY 15 Intersection

KY 15 and KY 715 Intersection

KY 15 (norththbound) Milepoint 13.8

Mountain Parkway Exit 40 (eastbound ramps)

Muir Valley

Roadside Cemetery

KY 715 Alternatives Study

Appendices on CD

Appendix B – Environmental Overview

Appendix C – Geotechnical Overview

Appendix D –Meeting Minutes

Appendix E – Resource Agency Coordination Round I

Appendix F – Resource Agency Coordination Round II