

**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*

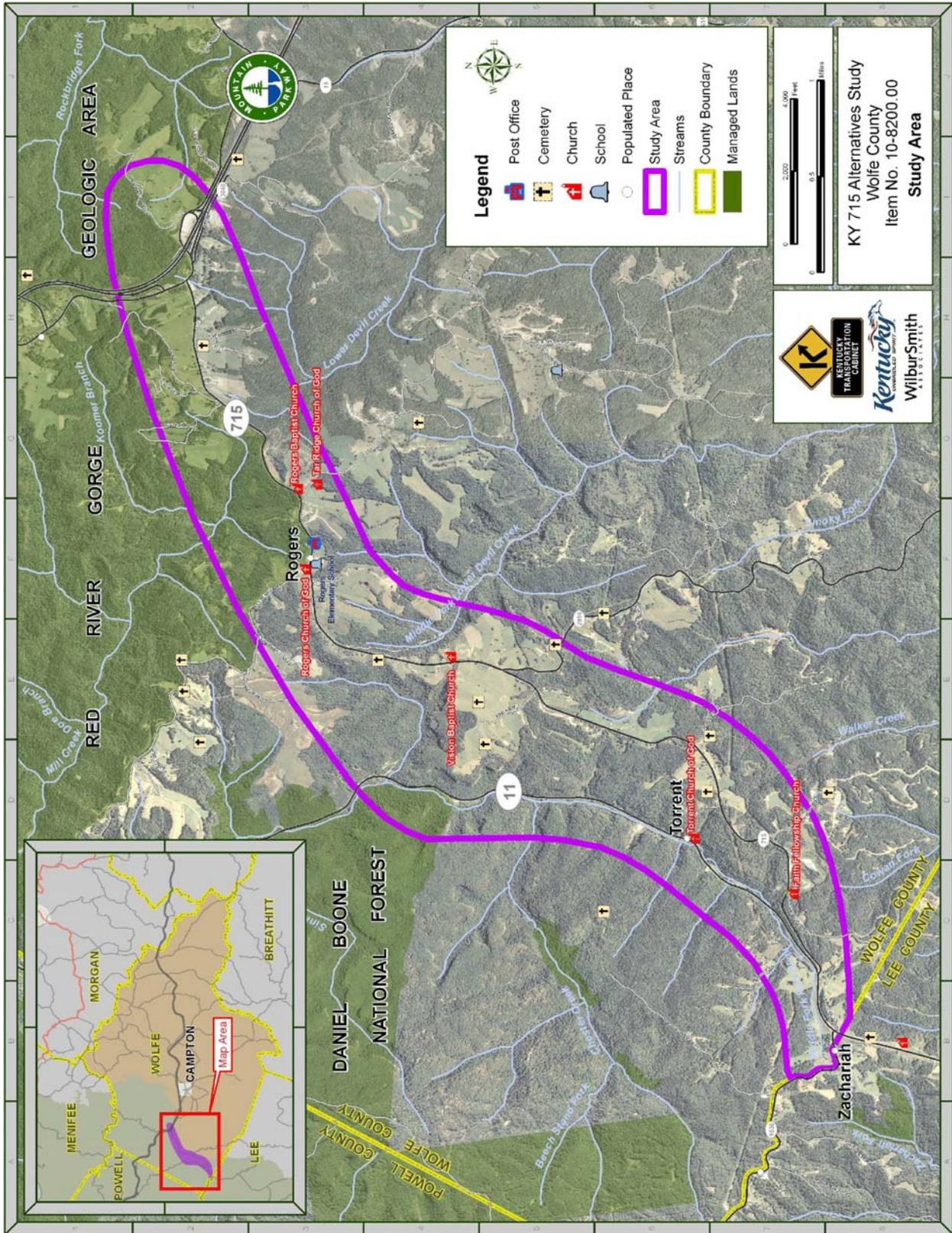
### **Traffic Characteristics**

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.



## 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.

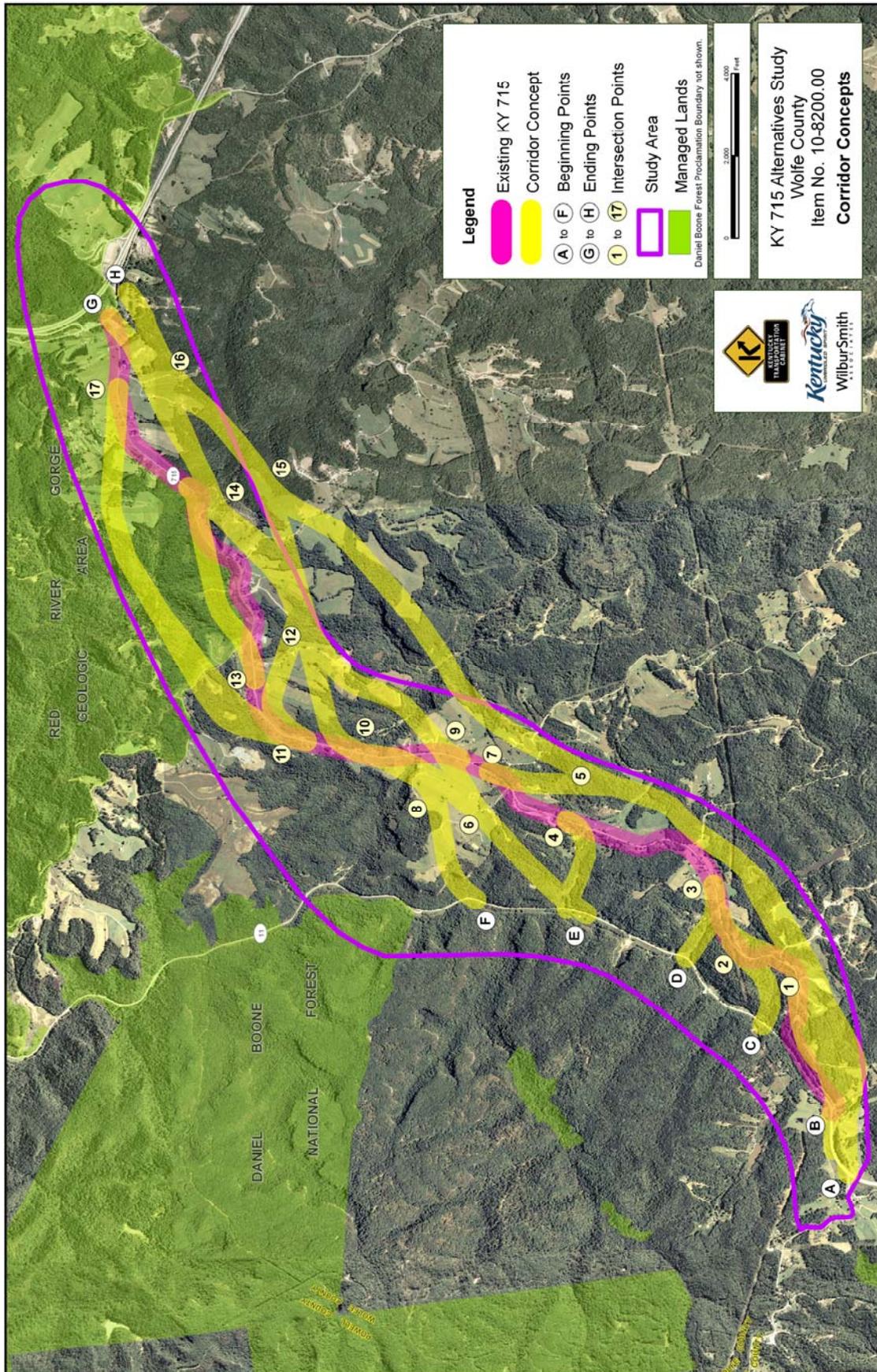
The top five transportation problems along KY 715 were identified as sharp curves, narrow shoulders, large trucks, poor visibility, and high speeds. Several specific problem locations were identified by attendees, and these were considered during the study.

## 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.



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.

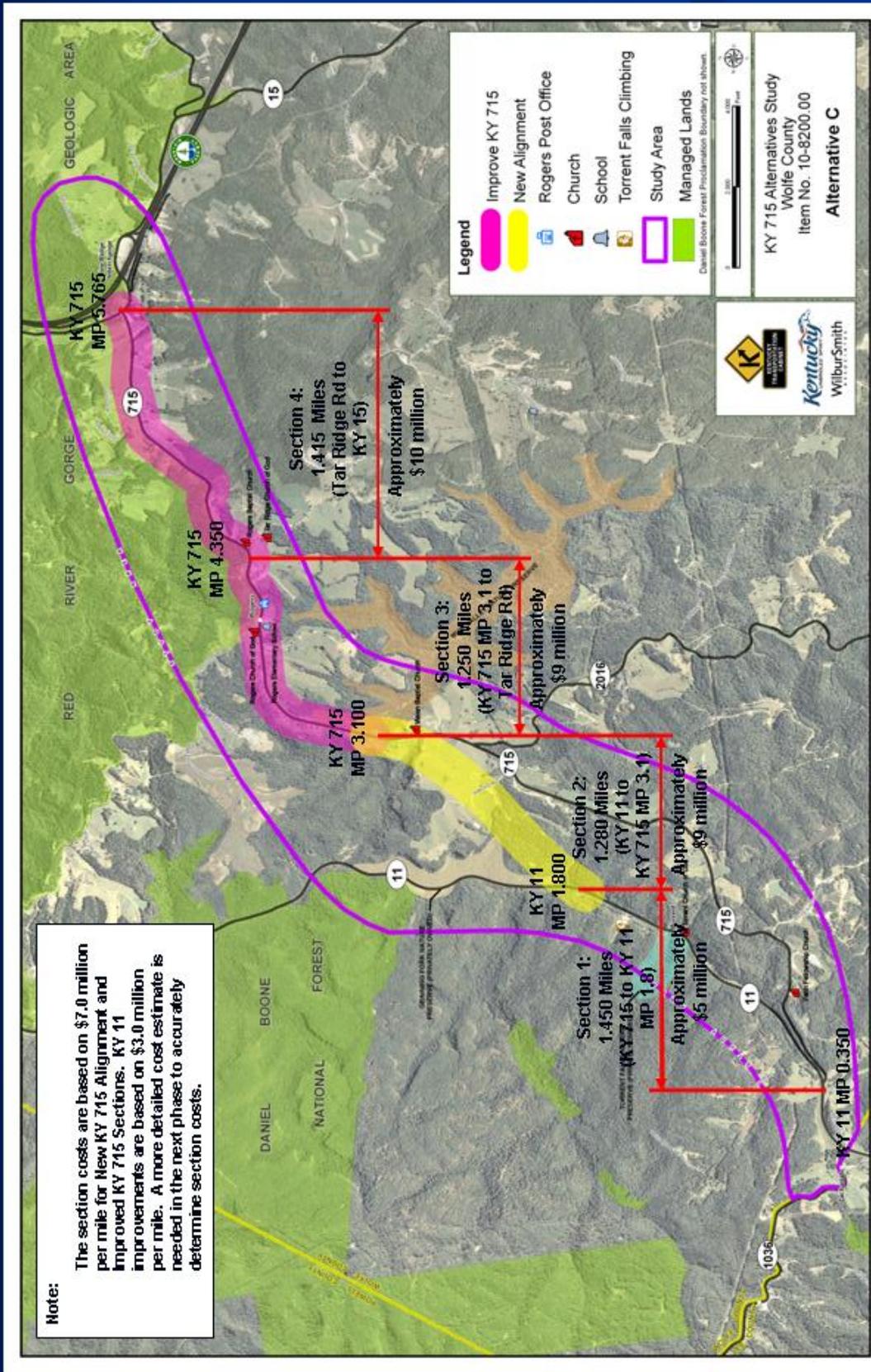
### Cost Estimates

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
<b>Total</b>	<b>\$41,000,000</b>	<b>\$34,000,000</b>

# Alternative C – Potential Construction Sections





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
<b>Total</b>	<b>\$33,000,000</b>	<b>\$26,000,000</b>

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:

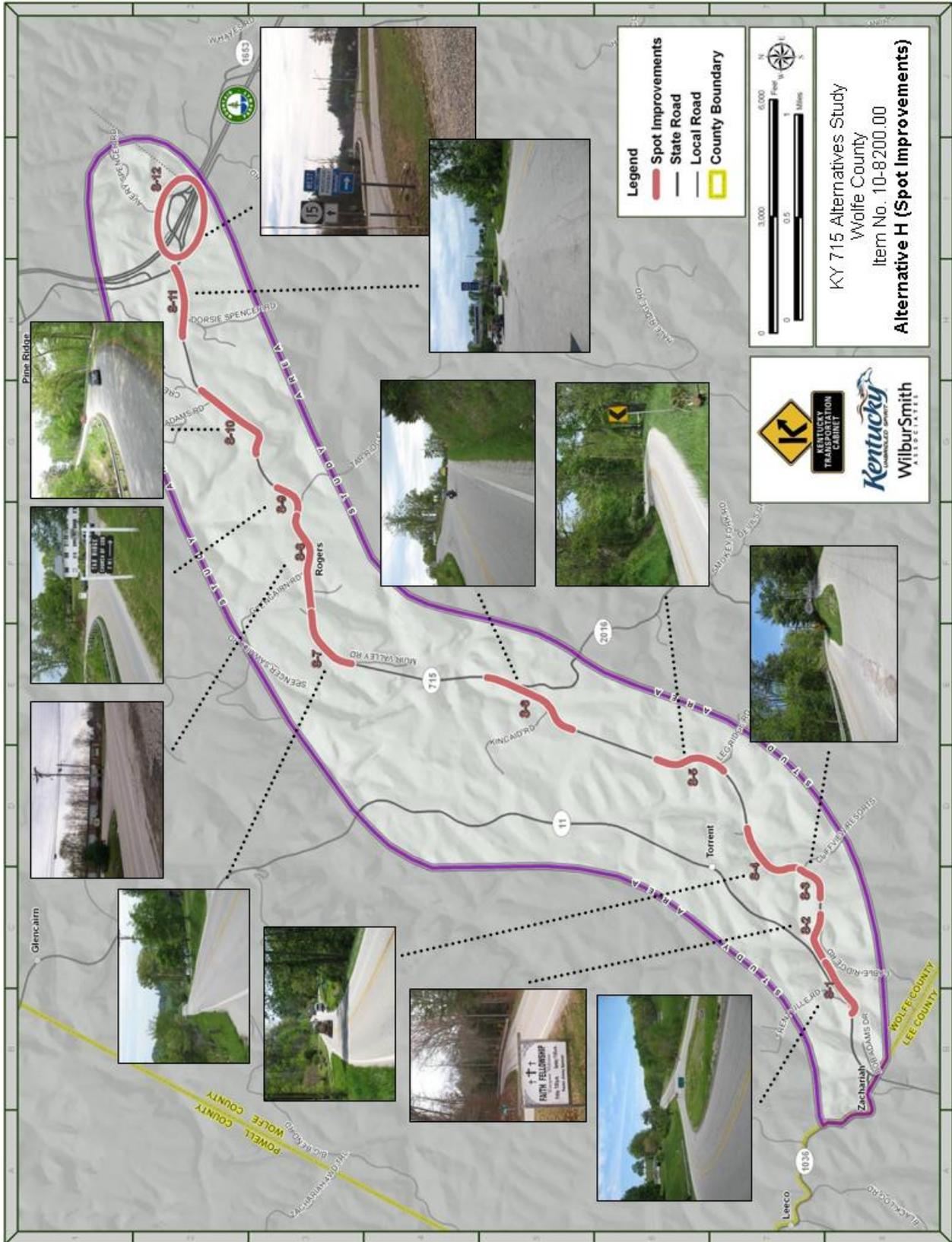
1. Spot S-10: Spruce Gap Curve - Includes Booth Road Intersection
2. Spot S-8: Includes Glencairn Road Intersection
3. Spot S-6: Includes Intersection with Kincaid Road and KY 2016
4. Spot S-2: Includes Cable Ridge Road Intersection
5. Spot S-3: South of entrance to Cliffview Resorts
6. Spot S-5: Includes 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.



## 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
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Study documents can be viewed at the following website:

[http://www.planning.kytc.ky.gov/planning\\_studies.asp](http://www.planning.kytc.ky.gov/planning_studies.asp)

